Oregon State University Bulletin

1995-96 General Catalog

Please note
Admitted students receive a copy of the OSU *General Catalog* when they first enroll. The Catalog may also be purchased for $5 per copy from the OSU Book Store or the Registrar's Office.

The OSU *Graduate Catalog* is available free to prospective graduate students from the Graduate School Office. It may also be purchased for $3.50 per copy from the OSU Book Store.

Other Sources of information about Oregon State University include the *Summer Term Bulletin,* distributed by the Summer Term Office; and the *Viewbook*, available through the Office of Admissions. All of these bulletins are free.

The address for all campus offices:
Oregon State University
Corvallis, Oregon 97331

University Information, call:
(503) 737-0123 or 737-1000

Admission Information, call:
(503) 737-4411

Oregon State University
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Every effort has been made to ensure the accuracy of information in the *General Catalog*. However, Oregon State University or the Oregon State Board of Higher Education may find it necessary from time to time to make changes in courses, curricula, or degree requirements. Students already admitted to a program in which such changes have been made will be reasonably accommodated, if possible, to ensure their normal progress for a degree. A student may, however, still be required to conform to changes in courses, curricula, or degree requirements as deemed necessary by Oregon State University or the State Board of Higher Education.

Catalog Coordinator: Madge Patterson
Assistant Editor: Jenna Showell
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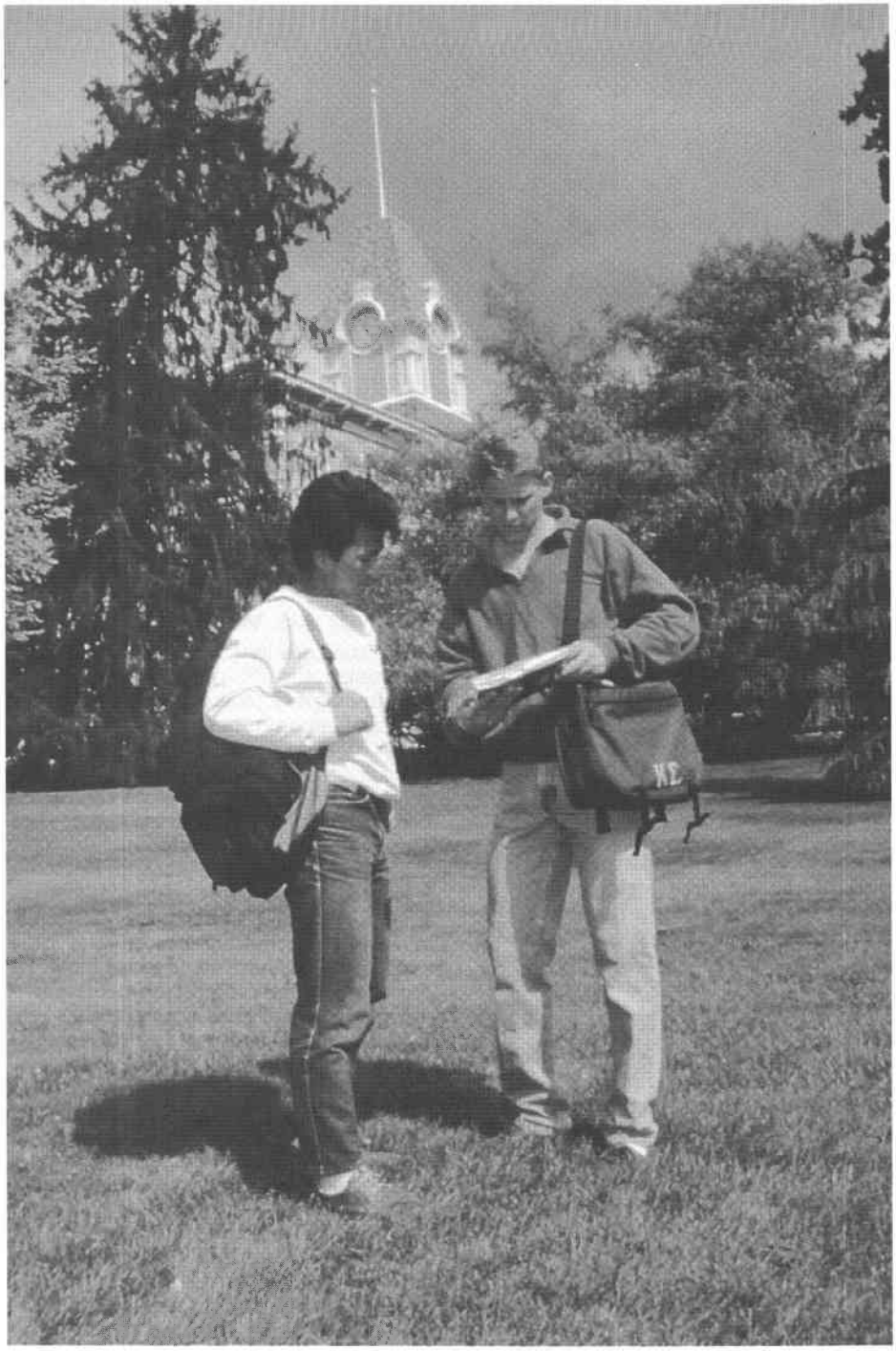
Welcome to Oregon State University



Students are our most important asset at Oregon State. We start with some of the best and make them better. From the time you first enroll, Oregon State's effort is directed toward making your college career successful and rewarding.

Oregon State University is known worldwide for the excellence of its programs and the quality of its people.

Excellence and quality represent our dedication to provide the best possible education to every student, to expand knowledge through research, and to assist the people of Oregon through a commitment to service.

OSU provides its students with an exciting and challenging atmosphere in which education and research occur side by side and complement each other.

Through a dedicated and highly regarded faculty, a well-equipped library, exceptional research facilities, a variety of special educational opportunities, and a wide range of extracurricular activities, OSU encourages students to develop as individuals and as knowledgeable participants in a democratic society.

That Oregon State is successful in these efforts is demonstrated by the large numbe of OSU graduates holding leadership positions in business, government, and the professions.

Among OSU's outstanding graduates is Linus Pauling, the only person ever to win two individual Nobel prizes in different categories. Pauling recently named OSU as the repository for his papers and medals. In addition, Oregon's most recent Rhodes Scholar is an OSU graduate.

Employers recognize the value of an Oregon State University education, and each year more of them make recruiting visits to OSU than any other school in the state. The Career Planning and Placement Center receives and posts notices of more than 20,000 job vacancies annually.

And when Oregon State graduates are hired to fill those vacancies, the employers know they are getting the best.

For example, our engineering graduates traditionally score among the highest in th nation on the examination required for licensing in their profession. During each o the past three years, the passing rate for OSU grads has been 96 percent or better.

OSU's highly regarded accounting program is one of only 61 accredited programs in the nation. In a recent year, OSU accounting graduates ranked first in the nation in passing the Uniform CPA Examination. Graduates of about 1,000 schools take the test.

A recent study ranked the OSU College o Forestry as the first of its kind in the nation The facilities and research forests at OSU ar unmatched by those in any other state.

These examples aren't the exception. In one instance after another, Oregon State and our students are among the best anywhere.

You Have a Choice

Whatever your educational and career goal there is a strong chance that Oregon State University has a program that's right for you. Students at OSU have the opportunity to choose from about 10,000 courses. The University offers nearly 200 different undergraduate programs and more than 95 graduate degrees.

The University's many programs also include preprofessional preparation in dental hygiene, dentistry, medical technology, medicine, nursing, occupational therapy, optometry, physical therapy, podiatry, and veterinary medicine.

That variety doesn't come at the expense of individuality or quality, however. Most OSU classes have fewer than 30 students, allowing students and faculty members to get to know each other and work more closely together. And even the larger classes

generally have small lab or discussion sessions to increase learning opportunities.

Students who have demonstrated superior scholastic ability and can benefit from a degree of extra challenge may participate in honors courses. Through special colloquies, seminars, and research projects, students have an opportunity to increase their awareness and understanding by carefully examining and analyzing selected issues and themes.

The world becomes part of the OSU campus through various foreign study programs that allow students to earn regular University academic credit while studying overseas. OSU students participate in programs in Australia, China, Denmark, Ecuador, England, France, Germany, Hungary, Italy, Japan, Korea, Netherlands, New Zealand, Scotland, and Ukraine. Study abroad programs generally range from one term to a full year. Even students who choose not to study in another country have the opportunity to learn about other peoples and other cultures because about 10 percent of the University's students come from other countries.

OSU students who would like to study in another part of the United States have an opportunity to do that. Through National Student Exchange, students can spend up to a year at one of more than 70 colleges and universities in 39 states and continue to earn regular academic credit toward their OSU degree.

The Army, Navy, Marines, and Air Force offer ROTC programs on the OSU campus for men and women who want to serve as commissioned officers in the armed forces after graduation. Scholarships are available through the programs, and participants are paid during the final two years. OSU is the only school in the state with all three services represented in its ROTC programs.

OSU's Experimental College offers noncredit, nongraded courses on a wide variety of topics. More than 200 courses are listed in the Experimental College catalog and more than 2,000 people enroll in the courses each term. Examples of topics recently offered are aerobics, beer making, cooking, massage, and yoga.

When You Need Help

Every student at OSU has an academic adviser to help plan a course of study suited to his or her academic and career goals and to provide general assistance and support throughout the student's stay at OSU.

To get new students started on the right track, Oregon State offers special orientation programs for freshmen and transfer students.

Summer advising sessions are held for incoming freshmen to allow them to become familiar with the campus and register for classes. Fall term transfer students and new freshmen who didn't participate in the summer program attend an orientation session just before the start of school. Orientation programs also are available at the start of winter and spring terms.

In addition, freshman and transfer orientation classes that meet throughout the first term have proved successful in helping new students make the sometimes difficult transition from high school to college or from one college to another.

Students who need additional help to ensure their success at OSU are encouraged to take advantage of programs such as Educational Opportunities and Exploratory Studies.

The Educational Opportunities Program offers assistance to minority students and others who traditionally have been denied equal access to academic opportunities. The program helps students who have the potential for success in college even though in some cases they may not meet regular OSU admission requirements.

University Exploratory Studies is a program providing special counseling to students who want help in choosing an appropriate major area of study and making career plans.

For students who need financial assistance, many scholarships, grants, loans, and work-study jobs are available through the OSU Office of Financial Aid. The office also helps students find on-campus and off-campus jobs.

During the past year, some 9,500 Oregon State students received more than $22 million in various forms of assistance to help them pay for their college education.

It's Not All Work

When students need time away from classes and studies, the OSU campus and the surrounding area provide an almost limitless choice of opportunities.

At OSU there are nearly 350 recognized clubs and organizations, for example. Most students choose to be involved in at least two or three activities while at Oregon State. The groups range from social and athletic clubs to academic and honor societies. Included are such areas as drama, student government, and student-run publications, radio, and television stations.

OSU students have many recreational opportunities. Intercollegiate and intramural athletics are popular, and most OSU students take advantage of the University's recreational facilities for exercise or for informal sports such as swimming, tennis, weightlifting, running, and racquetball.

The Memorial Union offers a place to gather between or after classes and have a snack, study, visit with friends, watch television, or just sit back and take it easy.

In the evenings and on weekends, OSU offers a wide range of intercollegiate athletic events and cultural and social activities, such as lectures, concerts, recitals, dances, and special campus events.

THE UNIVERSITY

Oregon State University provides diverse educational opportunities through the undergraduate and graduate programs of its 12 colleges and two schools. The University is typified by a variety of academic choices which include studies in scientific, technological, interdisciplinary, and professional as well as liberal arts fields. A Land Grant, Sea Grant, and Space Grant university with beginnings in the 1850s, OSU is now home to some 14,300 undergraduate and graduate students, representing about 90 countries and every state in the nation. In addition to its regular educational programs, the University conducts extensive research programs, administers the Extended Education Service in all Oregon counties, and maintains branch agricultural experiment stations at several locations throughout the state. Further research is done by the University at its Astoria Seafood Laboratory and at Yaquina Bay in Newport, where the OSU Mark O. Hatfield Marine Science Center is located.

GUIDING PRINCIPLES

Students are our most important clients. The quality and completeness of their education is our top priority.

We have the responsibility to students, staff, and faculty to help them grow personally and professionally.

We have a responsibility to society to contribute to its social, aesthetic, and economic well-being.

Our social responsibility extends to offering informed criticism even when that criticism may not be well received, and we maintain an internal environment that will nurture this important contribution.

Flexibility, change, and constant improvement are essential to our continued success.

In instruction, research, and service activities, we honor and impart principles of academic honesty, freedom, and integrity.

Diversity is a key to our success. Not only are our doors open to men and women alike without regard to race, ethnicity, personal belief, disability, or sexual preference; we also have a moral obligation to open the doors wider for any groups that are underrepresented or that have suffered from discrimination.

MISSION

Oregon State University serves the people of Oregon, the nation, and the world through education, research, and service.

Oregon State extends its programs throughout the world and is committed to providing access and educational opportunities to minorities and to challenged and disadvantaged students.

Oregon State has an inherent commitment to provide a comprehensive array of high quality educational programs in the sciences, liberal arts, and selected professions. The University encourages students, both on and off campus, to develop an enriched awareness of themselves and their global environment.

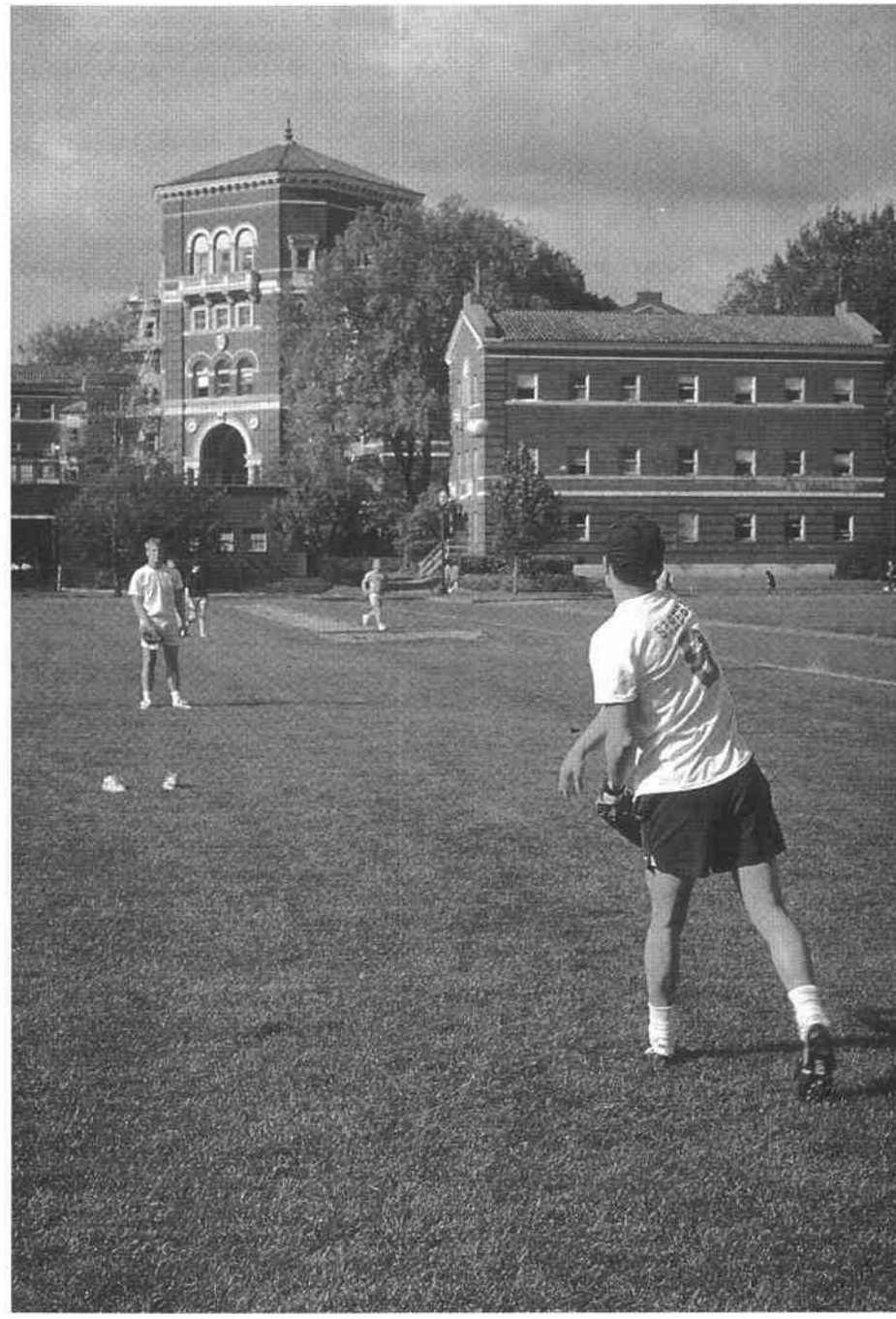
Through research, Oregon State extends the frontiers of knowledge in the sciences, liberal arts, and in all aspects of natural, human, and economic resources. Oregon State contributes to the intellectual development and the economic and technological advancement of humankind.

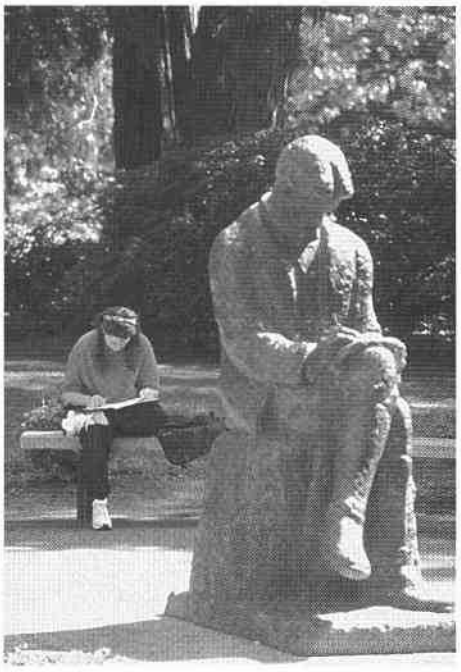
As a Land Grant, Sea Grant, and Space Grant university, Oregon State has a special responsibility for education and research enabling the people of Oregon and the world to develop and utilize human, land, atmospheric, and oceanic resources. Unique programs of public service throughout Oregon supplement campus-based University teaching and research.

GUIDELINES

The highest aspiration of a university is to free people's minds from ignorance, prejudice, and provincialism and to stimulate a lasting attitude of inquiry. Oregon State University shares this aspiration with universities everywhere.

Accordingly, Oregon State University accepts the charge of the Oregon State Board of Higher Education that it provide a general education for its students so "that they will acquire the knowledge, skills, and





wisdom for (a) personal development and enrichment, particularly through arts and letters; (b) responsible participation in a democratic society; (c) an understanding of the scientific methodology which has wrought a revolution in the ways of knowing and the extent and application of knowledge; and (d) an understanding of other cultures and natures as well as our own."

Oregon State University's basic goal is to create a better academic environment for the intellectual and humane development of the men and women of the academic community and to maintain OSU as a center in which the freedoms to think, to learn, to relate, to experiment, and to develop standards of criticism and excellence are encouraged.

Accreditation

Oregon State University is accredited by the Commission on Colleges of the Northwest Association of Schools and Colleges. The University is authorized to offer undergraduate- and graduate-level certificates, baccalaureate, master, doctorate, and first professional degrees by the Oregon State Board of Higher Education.

In the College of Science, the Chemistry degree program is approved by the American Chemical Society. The College of Business is accredited by the American Assembly of Collegiate Schools of Business.

The College of Forestry is accredited by the Society of American Foresters. In the College of Agricultural Sciences, the Rangeland Resources program is accredited by the Society for Range Management.

The Chemical, Civil, Computer, Electrical and Electronics, Industrial, Manufacturing, Mechanical, and Nuclear Engineering baccalaureate programs in the College of Engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. The Construction Engineering Management program is accredited by the American Council for Construction Education.

The College of Home Economics and Education is accredited by the Council for Professional Development of the American Home Economics Association. The Dietetic option in Nutrition and Food Management is approved by the American Dietetic Association. The School of Education is accredited by the National Council for Accreditation of Teacher Education for preparation of elementary and secondary teachers. The Counseling program is accredited by the Council of Accreditation of Counseling and Related Education Programs.

In the College of Health and Human Performance, the Environmental Health program is accredited by the National Environmental Health Science and Protection Accreditation Council, the Athletic Training option under the Exercise and Sport Science program is accredited by the National Athletic Training Association, and the Health Care Administration program is accredited by the Association of University Programs in Health Administration.

The College of Pharmacy is accredited by the American Council on Pharmaceutical Education, and the College of Veterinary Medicine by the American Veterinary Medical Association: Council on Education.

The Student Heath Service office is accredited by the American Association for Ambulatory Health Care.

History

From its first days as a small private college 137 years ago, Oregon State University has developed into the major research and teaching institution it is today.

OSU's roots go back to 1858, with the founding of an academy incorporated as Corvallis College. College-level courses were introduced into the curriculum about 1865, and two men and one woman fulfilled the requirements for baccalaureate degrees in 1870, becoming the first graduates of a state-assisted college in the western United States.

State aid to higher education in Oregon started on October 27, 1868, when Corvallis College was designated as "the agricultural college of the State of Oregon."

In its early days, Corvallis College was maintained by the Methodist Episcopal Church, South, and was only partly state-supported. The state assumed complete control in 1885.

With that assumption of control, the college became known as Oregon Agricultural College. The name was changed to Oregon State College in the 1920s and Oregon State University on March 6, 1961.

In designating Corvallis College as Oregon's agricultural institution, the state legislature accepted the provisions of the Morrill Act, signed into law by President Abraham Lincoln on July 2, 1862. The act provided grants of land to be used by states for the sole purpose of endowing, supporting, and maintaining publicly controlled colleges.

Following designation of the college as a land grant institution, agriculture was added to the existing arts and science curriculum in 1869. The curriculum continued to expand, with professorships in commerce (1880), agriculture (1883), household economy (1889), and engineering (1889) resulting in the establishment in 1908 of the professional schools of commerce, agriculture, home economics, and engineering. The first summer session also was held in 1908.

Curricular growth continued with the schools of forestry (1913), mines (1913), pharmacy (1917), education (1918), basic arts and sciences (1922), and health and physical education (1931).

In 1932, the Oregon State Board of Higher Education established the School of Science for the state system at Corvallis, eliminated the School of Mines, and reduced the School of Health and Physical Education to a division. Major work in business administration was discontinued but was reinstated when the College of Business was established (first as a division) in 1943.

The College of Liberal Arts was established (as the School of Humanities and Social Sciences) in 1959, and the College of Oceanography was created (as a school) in 1972. The College of Health and Physical Education was reinstated (as a school) in 1974, and the College of Veterinary Medicine was established (as a school) the following year. In 1983, all schools of the University, except the School of Education, were redesignated as colleges. In 1989, the School of Education became a college. In 1991, the College of Education merged with the College of Home Economics, and is now a unit within the College of Home Economics and Education.

Presidents of the institution since its founding are William A. Finley, 1865-72; Benjamin L. Arnold, 1872-92; John M. Bloss, 1892-96; H. B. Miller, 1896-97; Thomas M. Gatch, 1897-1907; William Jasper Kerr, 1907-32; George Wilcox Peavy, 1934-40; Frank Llewellyn Ballard, 1940-41; Francois Archibald Gilfillan, 1941-42 (acting); August Leroy Strand, 1942-61; James Herbert Jensen, 1961-69; Roy Alton Young, 1969-70 (acting); Robert William MacVicar, 1970-1984; John V. Byrne, 1984-present.

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ORGANIZATION OF THE UNIVERSITY

The **President** is the chief executive officer of the University, appointed by the **Oregon State Board of Higher Education**, and responsible for the overall leadership and direction of the University. The **Provost and Executive Vice President** is the chief academic and operating officer and is responsible for the daily operations of the University.

The academic programs of Oregon State University are divided among twelve **colleges**, and the **Graduate School**, each with a **dean** or **director** responsible for all faculty, staff, students, and programs.

The twelve colleges are the College of Agricultural Sciences, College of Business, College of Engineering, College of Forestry, College of Health and Human Performance, College of Home Economics and Education, College of Liberal Arts, College of Oceanic and Atmospheric Sciences, College of Pharmacy, College of Science, the College of Veterinary Medicine, and the University's Honors College.

Colleges are divided into **departments** administered by a **department head** or **chair.** Each department may offer several **programs of study** leading to **degrees, certificates, options, or minors** requiring a specific group of **courses** for completion.

Some courses and programs described in the *General Catalog* are offered throughout the year (at a variety of sites) by the Oregon State University Office of Continuing Higher Education. A list of currently offered courses is available from that office. In addition, **Summer Session** is directed by the **Office of Academic Affairs.** Courses offered during Summer Session are published each year in the *Summer Session Bulletin.*

This catalog lists requirements for each program, as well as all regular courses offered by Oregon State University. A number of special temporary or "X" courses are also offered each year and are listed in the *Schedule of Classes.*

The *Graduate Catalog* describes the requirements for graduate degrees and policies that pertain to graduate students and their individual programs. A summary of graduate programs, general regulations, and the Graduate School is provided in the *General Catalog.*

DEFINITIONS

The following terms are used throughout the catalog or by advisers.

Academic Year—The time period containing the academic terms Fall, Winter, and Spring (currently September 15 through June 15).

Adviser—A faculty member appointed by the department or college to advise students through their college experience.

BA Degree—The Bachelor of Arts is conferred for broad and liberal education in humanities, arts, social sciences, and sciences. College BA requirements provide a) a breadth of preparation in these fields that is significantly greater than that required of all undergraduates through the Baccalaureate Core; and b) foreign language proficiency certified by the Department of Foreign Languages and Literatures as equivalent to that attained at the end of the second year course in the language.

BS Degree—The Bachelor of Science degree is conferred for focused curricula that emphasize scientific ways of knowing and quantitative approaches to understanding in the sciences and social sciences, and for curricula in professional fields.

Baccalaureate Core—The University's general education requirements.

Blanket Numbered Courses—Reserved number courses such as 401/501/601. See Reserved Number Course.

Certificate Program (Undergraduate)—A specified interdisciplinary program of study leading to an official certificate and notation on the transcript. A certificate program draws from more than one department, rather than a single department (as with minors). The certificate program must be taken in conjunction with a formal degree program.

Course—An organized unit of instruction or research. Types include lectures, recitations, laboratories, discussions, internships, clerkships, reading and conference, independent study, and other categories of courses.

Credit—Credits vary, depending upon the type of course and level at which it is offered. One credit is generally given for three hours per week—in and out of class—of work. For example, each hour of class lecture is generally expected to require two hours of work out of class and so one credit would be given for a lecture course that met for one 50 minute period each week. One credit is typically given for a laboratory course that meets for 2 to 3 hours per week for an entire term. Equivalent credits are given for recitations, discussions, and other types of courses. All credits given in the General Catalog refer to quarter credits.

Curriculum—(plural curricula) An organized program of study and courses required for a specific degree or certificate program.

Degree—An academic award granted upon satisfactory completion of a set of collegiate level educational requirements.

Baccalaureate Degree: an approved academic award given for the satisfactory completion of an instructional program requiring at least four but not more than five years of full-time equivalent college level academic work which included the following: (1) institutional general education requirements (i.e., Baccalaureate Core); (2) major area of study requirements; and (3) may include minor, supporting area, or elective requirements. The conditions and conferral of the award are governed by the faculty and ratified by the Oregon State Board of Higher Education.

Doctoral Degree: An approved academic award given as a sign of proficiency in scholarship and for the satisfactory completion of an instructional program requiring at least three years of full-time equivalent academic work beyond the baccalaureate degree, the completion of which signifies recognized competence, original research and/or the capacity to do independent advanced graduate level analysis. The conditions and conferral of the award are governed by the faculty and ratified by the Oregon State Board of Higher Education.

First Professional Degree: an academic award granted for an instructional program the completion of which (1) signifies completion of the academic requirements to begin practice in the profession, (2) requires at least two years of full time equivalent college level work prior to entrance, and (3) usually requires a total of at least five years of full-time equivalent academic work to complete the degree program, including prior required college level work plus the length of the professional program itself (example, D.V.M. in Veterinary Medicine). The conditions and conferral of the award are governed by the faculty and ratified by the Oregon State Board of Higher Education.

Master's Degree: An approved academic award given as a mark of proficiency in scholarship and for the satisfactory completion of an instructional program requiring at least one but not more than two years of full-time equivalent academic work beyond the baccalaureate degree. The conditions and conferral of the award are governed by the faculty and ratified by the Oregon State Board of Higher Education.

Discipline—A field of study in which a student may concentrate, such as sociology, anthropology, or mathematics.

Electives—Courses that students may select, either for general knowledge or for fulfilling specific degree requirements.

Grade Point Average—Total number of grade points received for grades divided by total number of credits attempted. A 4 point grade scale is used at OSU.

Graduate Area of Concentration—Subdivision of a major or minor in which a strong graduate program is available. Areas of concentration may be shown on the program of study but are not listed on the transcript.

Graduate Major—Area of specialization, approved by the State Board of Higher Education, in which students may qualify for a graduate degree.

Graduate Minor—A graduate academic area that clearly supports the major.

Lower Division Courses—Course offerings at a level of preparation usually associated with freshmen and sophomore students.

Interdisciplinary—A term that refers to a course or program that integrates concepts, knowledge, or faculty from several fields of study.

Major (Undergraduate)—The undergraduate major is an extensive program of study in a designated subject area.

Minor (Undergraduate)—A secondary field of specialized study which may be offered by an academic unit for its own majors and/or majors from other academic units. Minors require at least 27 credits, 12 of which must be in upper division courses.

Option (Undergraduate)—Options are for students of a specific major. Options consist of at least 21 designated credits of course work, 15 of which must be at the upper division level. If all requirements have been met, the option may be listed on a student's transcript.

Perspectives Courses—Courses that integrate fundamental knowledge from science and liberal arts disciplines to develop cultural, historic, and scientific perspectives.

Reading and Conference—A course focused on reading assignments to be completed in conferences with the instructor.

Reserved Numbered Courses—Certain blocks of numbers that have been assigned for specific courses that may be taken for more than one term. The credits being granted vary according to the amount of work done.

100-110 and 200-210: Survey or foundation courses in the liberal arts and sciences

401/501/601: Research Course

402/502/602: Independent Study Course

403/503/603: Thesis/Dissertation

404/504/604: Writing and Conference

405/505/605: Reading and Conference

406/506/606: Special Problems/Special Projects

407/507/607: Seminar

408/508/608: Workshop

409/509/609: Practicum/Clinical Experience

410/510/610: Internship/Work Experience

Sequence—Two, three, or four closely related courses that are usually taken in numerical order and through more than one term.

Skills Courses—Courses designed to give the student fundamental mathematical, communication, and fitness competence.

Synthesis Courses—Upper-division courses that emphasize interdisciplinary, critical thinking approaches to global, technological, and societal issues.

Term—Usually one-third of the school year. Terms at OSU are divided into fall, winter, and spring terms (also referred to as "quarter"). Summer term is generally an 8- or 11-week session during the summer.

Upper Division Courses—Course offerings at a level of preparation usually associated with junior or senior students.

Waive—This term refers to decisions of advisers to "waive" a course or courses in a student's program. Typical reasons include transfer credit for equivalent courses, equivalent experience in the profession or discipline, and petitioning for and successfully completing an examination. Waiving courses usually does not decrease the total credits required for completion of the degree or program; students should discuss this with their adviser.

Writing Intensive Courses (WIC)—Designated upper division courses in the major discipline that use student writing as a significant approach to learning. WIC courses must meet a variety of requirements, as do other courses in the Baccalaureate Core.

READING A COURSE DESCRIPTION

The elements of a typical course description found under department headings in the colleges that follow are illustrated by the political science course below:

PS 422H/PS 522. INTERNATIONAL LAW (3). Theories and historical development of international law, problems in development classic cases. PREREQ: PS 101, PS 202, or PS 205 or PS 206. CROSSLISTED as ANTH 422/ANTH 522. (NC)

Designator: (PS) an abbreviation representing the department offering the course. PS indicates that the course is offered through the Department of Political Science.

Number: (422) indicates the level of the course; this is an upper division, undergraduate course. 400-level courses (PS 422) are offered for undergraduate credit, while the 500-level course (PS 522) is offered at the graduate level. (See Course Numbering System.)

Letter Suffix: (PS 422H) When a letter follows the course number, the letter indicates that there is something special about the course that students should know. For instance, PS 422H would be an honors course.

Title: (INTERNATIONAL LAW)

Credit: (3) the number of credits awarded for successful completion of the course.

Graduate Credit: All courses numbered 500 or 600 level may be taken for graduate credit. Courses numbered 500-599 are generally taken by masters candidates and courses numbered 600-699 are taken by doctoral candidates.

Course Description: (Theories and historical development of classic cases.) A brief description of what will be taught in the course.

PREREQ: (PS 101, PS 102, or PS 205 or PS 206) the background necessary for successful performance in a course. Students may attempt a course without having prerequisites if they have obtained the consent of the instructor to do so. If consent is not obtained, then students who have not fulfilled published prerequisites may be disenrolled from the course during the first week of classes. Occasionally a course will have a COREQ, usually indicating a course to be taken simultaneously with the course described. REQ: a requirement for that course.

CROSSLISTED: (CROSSLISTED as ANTH 422/ANTH 522) means the same course is also offered through another department; course numbers, titles, descriptions, and prerequisites are the same for both courses.

DUAL LISTING: (NE 444/NE 544) means the course is offered at both the upper division and graduate level. Students wanting undergraduate credit take the course at the 4xx number, and students wanting graduate credit take the course at the 5xx number. Students taking the course for graduate credit may be assigned extra work and/or have their work graded against a higher standard.

(NC): Area study requirement for students majoring in the College of Liberal Arts. Four symbols are used in the college to indicate courses which may be used to fulfill requirements in each of the areas:

(FA) Fine arts

(H) Humanities

(NC) Non-western culture

(SS) Social studies

COURSE NUMBERING SYSTEM

Throughout the State System of Higher Education, courses follow this basic course numbering system:

0-99. Noncredit or credit courses of a remedial, terminal, or semiprofessional nature not applicable toward degree requirements.

100-299. Lower division courses.

300-499. Upper division courses.

500-599. Graduate courses offered primarily in support of master's degree level courses but which are also available for doctoral level credit. Seniors of superior scholastic achievement may be admitted on approval of instructor and department head concerned.

600-699. Graduate courses offered principally in support of doctoral level instructional programs but also available for master's program credit.

700-799. Professional or technical courses which may be applied toward a professional degree (such as D.V.M.) but not toward other graduate degrees (such as Ph.D.).

800-899. In-service courses with limited application toward advanced degrees.

These calendars are offered for planning purposes.
Official calendars with full details will be published in the *Schedule of Classes*.

FALL TERM, 1995

Preregistration – for currently enrolled students
May, 1995

Summer Orientation and Advising Program (SOAP)) for new students
Late June and July

Continuous Registration and Schedule Adjustment
August and September

New Student Orientation, Advising and Registration – for students not participating in SOAP
September 20-22, Wednesday-Friday

Classes Begin
September 25, Monday

Late Registration and Add/Drop
Begins September 25, Monday

Thanksgiving Vacation
November 23-26, Thursday-Sunday

Finals Week
December 4-8, Monday-Friday

End of Fall Term
December 8, Friday

WINTER TERM, 1996

Preregistration Activities–for continuing students
November-December

Orientation and Registration for new students
Prior to the term

Classes Begin
January 8, Monday

Late Registration and Add/Drop
Begins January 8, Monday

Martin Luther King, Jr. Day
January 15, Monday

Finals Week
March 18-22, Monday-Friday

End of Winter Term
March 22

SPRING TERM, 1996

Preregistration activities for continuing students
February-March

Orientation and Registration for new students
Prior to start of term

Classes Begin
April 1, Monday

Late Registration and Add/Drop
Begins April 1

Memorial Day
May 27, Monday

Finals Week
June 10-14, Monday-Friday

End of Spring Term
June 14, Friday

Commencement
June 16, Sunday

Admission to Oregon State

Oregon State University welcomes all students without regard to race, creed, sex, marital status, sexual preference, age, religion, handicap, or national origin who provide evidence of suitable preparation for course work at the university level.

UNDERGRADUATE ADMISSION
FRESHMAN ADMISSION

WHEN TO APPLY

The application and fee must be *postmarked* by the respective deadline.

TERM OF ENTRY	APPLICATION DEADLINE
Summer 1995	March 1, 1994
Fall 1995	March 1, 1994
Winter 1996	December 1, 1995
Spring 1996	February 23, 1996
Summer 1996	March 1, 1996
Fall 1996	March 1, 1996

These deadlines are subject to change without notice as circumstances demand.

THE ADMISSION PROCESS

Take your completed application and the $50 **nonrefundable** application fee for those applying for Summer Session '95 and beyond to your high school counselor. Ask the counselor to attach an official high school record and mail everything to the Office of Admissions in the envelope provided. Be sure to affix sufficient postage.

Telefax (FAX) credentials are **not** considered official but could be used for initial evaluation purposes. Our FAX number is (503) 737-2482. Portfolios, video tapes, essays and personal interviews are not required of applicants.

EVALUATION PROCESS

Admission to Oregon State University is selective and competitive. Successful completion of all minimum admission requirements guarantees admission to the University.

All course work taken from the 9th grade through high school graduation is used in the GPA calculation. We do not add points for AP, Honors, IB, or Distinguished Scholar courses. In addition, if you repeated a class in either high school or college, the grades are averaged. Pluses and minuses are not used in the GPA calculation.

Complete applications are first reviewed to confirm successful completion of the 14 high school subject requirements. We then calculate an **unweighted** GPA on the standard 4-point grading scale. Finally, we check for SAT I or ACT scores. For those who qualify for admission on GPA & subject requirements, there is no minimum SAT I or ACT score requirement. The *most recently* reported test scores are on the Letter of Admission. Applicants are notified of their admission status on a rolling basis.

SELECTION PROCESS

High school preparation as measured by the rigor of high school course work and the grade-point average provides the greatest indication of potential for success at the university level. Therefore, OSU carefully considers the quality and quantity of courses completed in high school. In addition, applicants are expected to maximize the academic preparation available in their particular high school. OSU expects that the most rigorous or advanced level of course work should be pursued. At least three solid subjects (such as English, science, mathematics, foreign languages, etc.) should be scheduled for the senior year.

MINIMUM REQUIREMENTS FOR ADMISSION CONSIDERATION

Grade-Point Average

A minimum of 3.00 on the standard unweighted 4-point scale as calculated by the Office of Admissions guarantees admission when other requirements are met.

Alternative to GPA: Applicants who do not meet the minimum high school GPA requirement will be considered on a combination of high school GPA and SAT I/ ACT test scores that predict success at OSU as well as other factors previously described.

College Preparatory Subject Requirements

Entering freshmen must complete the following subjects **by high school graduation:**

English (4 units)
4 years study of English language, literature, speaking, listening, and writing, with emphasis on and frequent practice in writing expository prose

Mathematics (3 units)
1 year algebra
2 additional years of college preparatory mathematics. **Regardless of the pattern of math courses or the number of years of math taken, the math course work must culminate at the algebra II (or equivalent) or higher level to meet the math requirement**

Social Studies (3 units)
1 year of U.S. history
1 year of global studies (world history, contemporary world cultures, geography, modern problems, etc.)
1 years of social studies elective (government, economics, religion, psychology, etc.)

Science (1 units)
1 year each of two different preparatory sciences such as biology, chemistry, physics, or earth and physical science. One year laboratory experience recommended.

Other College Preparatory Courses (2 units)
May be a foreign language (highly recommended), computer science, fine and performing arts, or other college preparatory electives, including advanced-level vocational-technical courses. 2 units of foreign language replace this "elective" option for students beginning Fall 1997.

ALTERNATIVES TO SUBJECT REQUIREMENTS

Students unable to fulfill the subject requirements will be eligible for admission by:

1. Earning a 1230 total score on three College Board Achievement Tests or SAT II Subject Tests (English, Math level I or II, and a third test of choice)

OR

Admission to Oregon State

KAY CONRAD
Director of Admissions

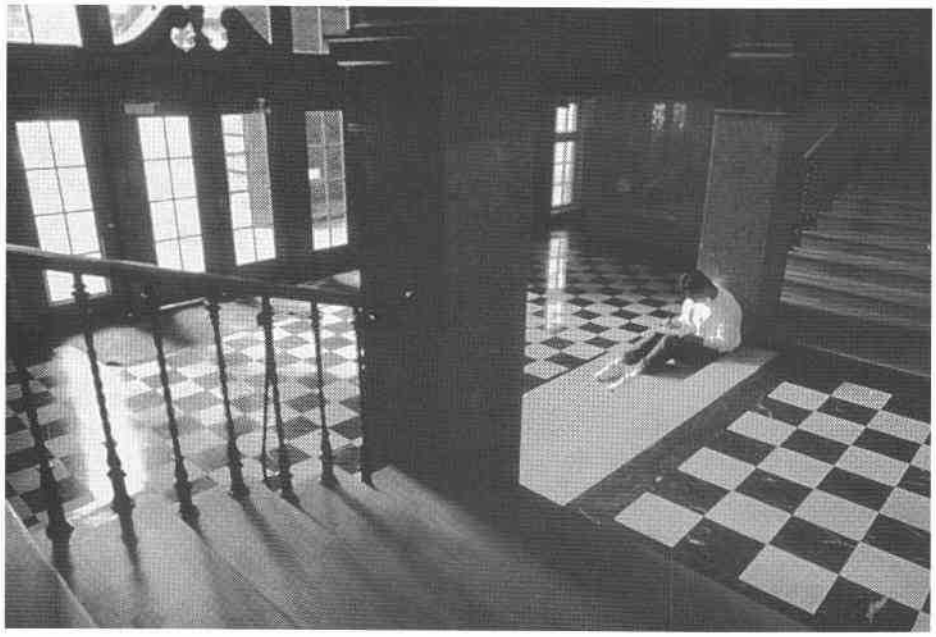
CLAY TORSET
Assistant Director

GEORGE GAINES
Assistant Director

GUADALUPE MARTINEZ
Admissions Officer

CHERYL HANSEN
Admissions Officer

ELLEN CHAN
Admission Counselor



2. Successfully completing course work (high school or college transfer) for specific subject deficiencies.

Alternatives should be completed by high school graduation.

Test Requirements

Freshman applicants (except those applying on the basis of GED scores) must submit Scholastic Assessment Test (SAT I) or American College Test (ACT) scores. Test scores are used to determine course placement and are not a factor in the selection process for fully qualified applicants. Test scores are a factor when consideration is given to applicants not meeting the minimum high school GPA requirement.

High School Graduation

Public high school students must graduate from standard or accredited high schools. Private high school students must graduate from accredited high schools.

Graduates of nonstandard or unaccredited high schools or home schooled students will be eligible for admission by achieving:

1. A minimum composite score of 970 on the SAT I or 23 on the ACT-Enhanced

AND

2. A total score of 1230 on three College Board Achievement Tests or SAT II Subject Tests (English, Math level I or II, and a third test of choice).

NON-GRADUATES

Students who have not earned a high school diploma and are applying for admission on the basis of GED scores qualify by achieving:

1. A minimum average score of 58

AND

2. A minimum score of 40 on each of the five GED tests.

OLDER STUDENTS

Applicants who graduated from high school prior to 1985 qualify by meeting the minimum grade-point average requirement for entering freshmen. The high school subject requirements are waived. SAT I or ACT scores are expected from those with GPA below 3.00.

PETITION FOR ADMISSION BY EXCEPTION

Students who believe they may not meet the admission requirements are encouraged to submit a handwritten essay explaining their circumstances with their application. Letters of recommendation are also helpful. Students not approved for admission will be provided with information about the petition procedure. Deadlines are in effect each term for appeals. For additional information, write or call the OSU Office of Admissions.

ADVANCED STANDING CREDIT

Oregon State University awards ungraded credit for achievement on certain College Board Advanced Placement (AP) examinations. Information pertaining to specific AP credit policies are available in high school counseling centers or may be obtained from the OSU Office of Admissions. OSU's college code is 4586 for those wishing to have their scores sent. Advanced standing credit may also be granted for scores of 5 or higher on the International Baccalaureate (IB) Higher Level examinations. Official IB certificates are required in order for credit to be awarded.

TRANSFER ADMISSION

WHEN TO APPLY

The application and fee must the *postmarked* by the deadline and applicants *must be fully eligible* for consideration by the deadline.

Term of Entry	Application Deadline
Summer 1995	May 26, 1995
Fall 1995	June 15, 1995
Winter 1996	October 13, 1995
Spring 1996	February 23, 1996
Summer 1996	May 24, 1996
Fall 1996	June 15, 1996

These deadlines are subject to change without notice as circumstances demand.

CRITERIA FOR GUARANTEED ADMISSION

U.S. Citizens and Permanent Residents:

- Successful completion of no less than 36 (24 semester) graded, transferable credits from (an) accredited U.S. institution(s)
- Minimum cumulative GPA of 2.25
- Grade of C- or better earned in the following courses:
  a. College-level writing beginning with WR 121 (English Composition) or equivalent
  b. Mathematics course with course content of College Algebra for which the prerequisite is Intermediate Algebra
- Eligibility to return to most recent college or university attended
- Consideration will be given to applicants with a 2.00 GPA and an associate of arts degree from an Oregon community college.

Computation of GPA: The official policies of OSU regarding academic record evaluation include:

- grades of repeated courses are averaged
- only college-level, transferable credits are counted in those accepted in the GPA computation (vocational-technical course grades are not included)

Students with at least 12 but fewer than 36 graded transferable hours of credit will be considered on the basis of their high school records and test scores, and must have a 2.25 GPA on all collegiate work attempted.

International Applicants

International undergraduate applicants should request an International Student Application from the Office of Admissions. In addition to the requirements noted above on work completed in the U.S. they must have:

• A minimum TOEFL score of 550 if native language is not English.

Evaluation of and Transferability of Credit

Only official records are used to evaluate eligibility for admission and transferability of credit.

Official transcripts of all college work attempted must be submitted directly from the Registrar's Office of each institution. Telefax (FAX) credentials are **not** considered official but could be used for initial evaluation purposes. Our FAX number is (503) 737-2482.

OSU accepts in transfer all college-level courses successfully completed at colleges or universities accredited by an appropriate

accreditation agency. An Advanced Standing Report acknowledging the courses accepted by the University will be sent by the Admissions Office with the official letter of admission.

Persons transferring to OSU from a community or junior college may have up to 108 term credits (72 semester units) accepted toward their bachelor's degree. If the school previously attended used the semester system, one semester credit equals 1.5 quarter credits at OSU.

OSU's academic regulations provide for the acceptance of some vocational or technical courses after registration, not at the time of admission. Credit will be granted if the student's administering department finds that vocational or technical courses have satisfied certain bachelor's degree requirements. Students with such courses should contact the Admissions Office for help in obtaining credit.

PETITION FOR ADMISSION BY EXCEPTION

Students who do not meet admission requirements may petition for admission by exception. For further information, write or call the Office of Admissions. Deadlines for appeals are in effect for each quarter.

Acceptance of credit from a two-year institution (OSU Academic Regulation 2):

a. Oregon State University accepts for credit toward a baccalaureate degree all college transfer work completed in an Oregon or other accredited community college up to 108 lower division credits. An OSU student who has completed 108 lower division credits must obtain approval of a petition in advance before completing additional lower division work at a two-year institution if credit for such additional work is to count toward graduation. Transfer credits and grades are not used in calculating the OSU cumulative GPA. Students who hold the Associate of Arts or other transfer degrees and who have 90 or more credits accepted in transfer will be granted junior standing. Such standing does not necessarily imply that OSU institutional, college, or division and departmental requirements normally satisfied by OSU students prior to their junior year have been satisfied. Students who have received Associate of Arts degrees from Oregon community colleges will be considered to have met the Perspectives and Skills (except WIC) areas of the Baccalaureate Core. They must complete the upper division Synthesis areas of the Core. Students transferring from approved institutions of higher education ordinarily will be given Baccalaureate Core credit in the Perspectives and Skills areas on a course-by-course basis for work that is judged to be equivalent in content. They must complete upper division Synthesis Courses.

b. Block transfer of vocational-technical credit from accredited or state-approved community colleges into specific departmental programs at Oregon State University may be awarded up to 45 credits on the basis of proficiencies, work experience, and/or technical courses as determined by the appropriate department, but without assignment of grade. Such credits will apply to the agreed transfer program only, and the credit will not be awarded until completion of the program by the student and these credits will not be used to classify students. The 45 credits, or portion thereof, transferred will count as part of the 108 credits defined in paragraph a above.

c. Lower division credit for specific vocational-technical community college courses may be awarded for equivalent OSU course work when equivalency is validated by the OSU department offering the equivalent work. Equivalent credit will be awarded only upon the recommendation of the appropriate department or college, and approval by the Academic Requirements Committee. If the vocational-technical community college course and the equivalent OSU course vary in credits, the number of course credits that may be granted will be the lesser of the two. These credits will count as part of the 108 credits defined in paragraph a above. OSU departments offering courses which have been identified as equivalent to designated community college vocational-technical courses shall review the equivalency annually and forward a dated list of the equivalent community college courses to the Academic Requirements Committee.

d. In cases where paragraph b above is not applicable, up to 24 credits of lower division credit for specific vocational-technical community college courses may be awarded (but without assignment of grade) for nonequivalent OSU course work when the proficiencies, training, or experiences gained by the student are recognized by the appropriate OSU department and college. Credit will be awarded only upon the recommendation of the appropriate department or college, and approval of the Academic Requirements Committee. No more credit will be offered by OSU than was offered by the community college for the course involved in a given transfer. The course prefix and number to be used in awarding of such credit is VocT 100. The 24 credits, or portion thereof, awarded will count as part of the 108 term credits defined in paragraph a above. The credit will not be granted until completion of the student's program and these credits will not be used to classify students. In the event the student transfers into another OSU department, the new department will reevaluate the appropriateness of such vocational-technical training or experience. This provision may not be used in combination with that in paragraph b above.

ADMISSION AS A NON-DEGREE UNDERGRADUATE STUDENT

The non-degree undergraduate student category is designed to aid the enrollment of a person who at the time of application is not planning to complete degree requirements at OSU or who, for reasons which are judged to be acceptable, does not meet regular admission requirements.

The Office of Admissions may consider for entrance as a non-degree student:

1. A person qualified for regular admission but not planning to earn a degree at OSU.

2. A person who is not qualified for regular admission, is at least four years beyond the date that his or her high school class has graduated, and is not planning to earn a degree at OSU. **This does not apply to a person who has attended college.**

3. A high school junior or senior with a grade-point average of at least 3.00 who is recommended (in writing) by his or her principal for enrollment in a specific course (or courses).

4. A nonresident ethnic minority applicant who does not meet regular admission requirements but desires to enter some specialized OSU academic program not available in the applicant's state.

5. An otherwise qualified applicant who has been unable to obtain complete and/or official credentials required to document admission as a regular student.

Recorded credit will be applied to a degree only if the non-degree student qualifies according to Academic Regulation 1 in the Schedule of Classes as a regular student and satisfies regular admissions procedures and regulations. Non-degree students who enroll in seven (7) or fewer credits are not subject to nonresident tuition rates.

SELECT A MAJOR

Undergraduates and postbaccalaureate applicants must select a college and a major within that college. Applicants are provided with a list of major codes from which to select the appropriate one to enter on the application form. University exploratory Studies Program is a choice available to undergraduate who are undecided about a major. Applicants must note that because programs are administered by the college that sponsors them, admission to OSU **does not** mean admission to a particular professional college or program. Examples are the professional programs in engineering and pharmacy which require separate applications submitted directly to the respective college. Postbaccalaureate applicants are admitted to the University **only** if the desired department approves.

ADMISSION OF POSTBACCALAUREATE STUDENTS

Postbaccalaureate students are those either seeking a second bachelor's degree or pursuing an undergraduate certificate program. Applicants for consideration must meet the same application deadline and GPA requirements as transfers. The GPA is computed on the first baccalaureate degree plus any subsequent credit earned. Applicants must include a Statement of Objective of 150-200 words with their applications. Academic departments may impose additional requirements. Applications are available from the Office of Admissions.

Admission with Graduate Standing

To be considered for admission to the Graduate School, an applicant must have a baccalaureate degree from an accredited college or university, as well as a scholastic record, background, or other evidence that indicates the ability to do satisfactory graduate work. See Graduate School for further information on advanced degree, postbaccalaureate, and nondegree, graduate student status. Also see Graduate Admission Procedure.

Admission of International Students

An international student is admitted according to standards established for each country by the admissions committee. Basically such a student must (a) be qualified to enter a university or graduate school in his or her own country; (b) have achieved a superior scholastic record on the basis of his or her own grading system; and (c) have certified English proficiency as indicated by a score of 550 or more on the Test of English as a Foreign Language (TOEFL).

University conditional admission of international students presenting TOEFL scores from 500 through 549 may be granted. Such conditional admission requires (a) on-campus testing of English language proficiency prior to enrollment, (b) compliance with the subsequently specified plan for English and academic course work during each quarter until such time as the student qualifies for nonconditional admission. Appeals from the specified plan are made to the head adviser at the undergraduate level and to the Graduate School at the graduate level.

Exceptions to the English proficiency test requirement are: (a) those applicants from English speaking countries such as Canada, United Kingdom, etc., (b) those graduate applicants who have finished a previous degree in an English speaking country, (c) those who have completed English course work or taken other tests deemed to be equivalent to the required minimum score on the TOEFL.

A student with less than a four-year bachelor's degree, or with a diploma, certificate, or title not accepted by OSU as equivalent to a bachelor's degree, may apply for undergraduate admission but may not enter the Graduate School.

All records in a foreign language must include the originals accompanied by a certified English translation. A complete description of all schooling from primary or elementary school to present level of training is needed to permit better understanding of academic preparation. A GPA of 2.25 (undergraduate) and grades of "A" or "B" (graduate) are necessary on work accepted in transfer from an American college or university.

Admission to Summer Session

Students who wish to begin work on a degree during Summer Session at OSU must satisfy regular admission requirements and apply by the specified deadlines.

Admission to Professional Programs

To protect students and professional standards, the admission and retention requirements and standards for evaluation and acceptance of transfer credit are often in addition to general admission and transfer requirements. Admission to Oregon State University does not, therefore, automatically admit students to its professional programs. Because professional education is accredited and approved by societies established by the professions, students admitted to these programs must be prepared to undertake the curriculum at whatever level they enter it and to maintain program standards.

Admission from Voc-Tec or Institutions with Accreditation Not Recognized by OSU

Admission from an unaccredited or vocational-technical institution is determined by the appropriate admissions committee. Students admitted from voc-tec or unaccredited colleges are on probation until they have achieved a satisfactory record at OSU. After three terms of work at OSU satisfactory to the Office of Admissions, a student may request validation of work done in an unaccredited or vocational-technical institution of collegiate rank.

Credit for Military Experience

Veterans of the U.S. Armed Forces are granted physical education and/or ROTC credit but do not receive college credit for service schooling, USAFI tests, or courses. Application should be made to the veterans' clerk (Registrar's Office) during the first term of attendance at Oregon State University.

Admission Procedure

Questions regarding admission and applications for admission, accompanied by the $50 nonrefundable application fee (payable to Oregon State University), should be addressed to the Office of Admissions.

Application for undergraduates, postbaccalaureate, graduates and nondegree students are available from the Office of Admissions. The applicant requests the high school principal and/or the registrar of each college attended to forward certified transcripts of all academic records directly to the Office of Admissions for evaluation. All records submitted become the property of OSU. Transcripts for transfer students must include all academic work beyond high school and, for graduate students, the last two years (90 quarter credits or 60 semester credits) of the first BS/BA degree and all records beyond the initial bachelor's degree.

Placement Examinations

High school seniors planning to enter OSU must take the SAT I or the ACT. (See Admission.) Either test, along with high school and other records, provides the academic adviser with valuable information about the student's educational development, abilities, and aptitudes.

Other placement examinations may be required in certain majors.

Students who enter the University with previous language training from another institution and who wish to continue their study of the language are required to take a language proficiency examination to determine placement level.

Registration Procedures

Once admitted to Oregon State University, the information and procedures for registration become increasingly important. Registration periods, with published dates, are set aside each term. Complete registration instructions, procedures, and deadlines for which every student is fully responsible are detailed in the annual *Schedule of Classes*, available on campus. A student is officially registered and eligible to attend classes only when all procedures have been completed, including payment of tuition and fees.

In addition to the basic information regarding registration, the *Schedule of Classes* is an essential source document to the student for the academic calendar, fee schedule, academic and other student regulations and procedures, and final week schedule, as well as for the listing of courses offered during the academic year.

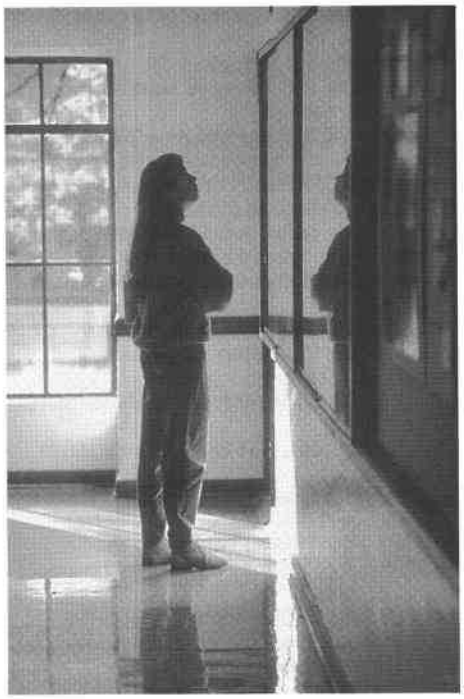
Reenrollment

Undergraduate students who wish to reenroll in the University after an absence may do so providing they were eligible to reenroll their last term of attendance. Students who have been absent *4 or more terms*, not including summer terms, should contact the Registrar's Office to reactivate their records. All others may proceed with registration following the registration instructions in the current *Schedule of Classes*.

Reenrolling students who have attended another college or university since their last term at OSU are required to report that enrollment at the time of reentry. Official transcripts must be forwarded to the Office of the Registrar. Students with transfer work less than 2.0 GPA are reminded of the graduation requirements which stipulates that an overall 2.0 GPA is needed in all college work.

All reenrolling students are reminded of the responsibility to update any outdated records information. Current addresses will be needed. Contact the Office of the Registrar for changes to records.

Earning a Degree at Oregon State



University Graduation Requirements

Current graduation requirements are printed each year in the "Academic Regulations and Procedures" section of the *Schedule of Classes*, along with other information on a wide range of topics—from minimum credits for full-time status to adding courses. All students are encouraged to review this part of the *Schedule of Classes* each year for the most up-to-date information about OSU requirements and procedures.

Many of the University, college, and degree requirements are under review with the possibility of revision. Students should contact the college and/or department for graduation requirements.

Students with questions about baccalaureate graduation requirements are encouraged to contact their adviser. Students needing assistance in selecting a major or selecting an adviser may wish to call or stop by the college office.

The Baccalaureate Experience

Oregon State University is a Land Grant University with a mission that includes a strong commitment to undergraduate education. Central to this commitment is the establishment of an intellectual environment that encourages the formation of the essential characteristics of the educated person—curiosity, rigorous observation, critical thinking, tolerant understanding, and a commitment to lifelong learning. The diverse academic programs in each of the distinctive colleges are unified by common expectations for the achievement of the baccalaureate degree.

Graduates with a baccalaureate degree from Oregon State University should be able not only to appreciate the intrinsic value of human knowledge, but also to use it to engage in both scientific and philosophical inquiry. Critical thinking and problem solving, integrating knowledge from a wide range of fields, are essential components of the degree. Oregon State University graduates should also possess intellectual curiosity, understanding of diverse cultural heritages, and a proper regard for different values, ideas, and cultures.

The baccalaureate degree includes:

a) Baccalaureate Core
b) an in-depth study in at least one major; and
c) individual elective courses.

Minors are available in many areas and are required in certain programs. Students should check departmental requirements.

The Baccalaureate Core

The Baccalaureate Core emphasizes writing, critical thinking, cultural diversity, the arts, sciences, literature, lifelong fitness, and global awareness. Included are 48 credits plus a writing intensive course in the major. The course *categories* are listed below. ***Individual courses are listed later in this section.***

Baccalaureate Core Requirements

Skills (15)

No single course may be used by a student to satisfy more than one area of the core even though some courses are approved for more than one area.

Writing I (3)
Writing II (3)
Writing III/Speech (3)
Mathematics: MTH 105 or higher level mathematics (3)
Fitness (3)
WIC (Writing Intensive Course, upper division, included in credits for major)

Perspectives (27)

No more than two courses from any one department may be used to satisfy the Perspectives area of the core.

Physical Science (including lab) (4)
Biological Science (including lab) (4)
Plus choice of additional physical or biological science (including lab)
Western Culture (3)
Cultural Diversity (3)
Literature and the Arts (3)
Social Processes and Institutions (3)
Difference, Power, and Discrimination (3)

Synthesis (Upper Division) (6)

Both synthesis courses may not be taken in the same department.

Contemporary Global Issues (3)
Science, Technology, and Society (3)

Total (48) + WIC

Major Program

In-depth study in one area is required in each baccalaureate degree. Major requirements often include not only courses within the given discipline but also necessary prerequisites and work in related areas.

Students must satisfy all the requirements of their major department, and the dean's certification of fulfillment of all requirements of the major college is also required.

Total Credits

No baccalaureate degree program may total less than 180 credits. Many baccalaureate degree programs require more. As this catalog is being published, a number of majors that currently require more than 180 credits are considering reductions in the total number of credits required. Departments should be contacted for the most up-to-date information.

Upper Division Courses

A minimum of 60 credits of the total number (must be in courses numbered 300 and/or 400). (Courses numbered 500 or 600 may also be counted in the 60-credit upper division requirement, but they may not simultaneously be counted for graduate degree requirements.) At least 24 upper division credits must be taken in the major.

Grade Point Average (GPA)

Students must attain a minimum cumulative OSU GPA of 2.00.

Academic Standing

Oregon State University expects students to maintain satisfactory academic progress toward degree completion. At the conclusion of each term, grade point averages are calculated and academic standings determined for students seeking a baccalaureate degree according to the criteria outlined below.

a. Academic Warning: Students with a term GPA below 2.0 will be placed on Academic Warning.
b. Academic Probation: Students who have completed two or more terms at OSU and have an OSU cumulative GPA below 2.0 will be placed on Academic Probation. Students who attain a cumulative GPA of 2.0 or better are removed from Academic Probation.
c. Academic Suspension: Students who are on Academic Probation and have a subsequent term GPA below 2.0 will be placed on Academic Suspension. Students who are academically suspended are denied all the privileges of the institution and of all organizations in any way connected to it, including any University recognized living group.
d. Reinstatement To The University: Suspended students will be considered for reinstatement to the University after two years or completion of a minimum of 24 quarter credits of transferable college-level work at an accredited college or university, with a GPA of 2.5 or above.

RESIDENCE REQUIREMENT

Candidates for undergraduate degrees must earn their last 45 credits in course work offered by OSU or 45 of the last 60 credits if authorized by the student's dean.

A minimum of 15 credits of upper division credits must be taken in the student's major from courses regularly listed in the OSU *General Catalog* or *Schedule of Classes*.

Credits earned through certain designated programs such as a foreign study program sponsored by the Oregon State System of Higher Education or an OSU off-campus degree program (approved by OSSHE) may be used in fulfilling the residence requirement. Credits earned by special examination may not be used to meet the residence requirement. A student must be enrolled at OSU in regular standing, not as a "special admit," before undertaking academic work to satisfy residence. For more information, students should consult their advisers.

DEGREE CANDIDATES

To become a candidate for a degree a student must have achieved senior standing and must make formal application for the degree. The student must file an application with the registrar two terms preceding the term in which he or she expects to complete requirements for a degree.

REENROLLING STUDENTS

Reenrolling students are reminded that graduation requirements may have changed. Students are responsible for consulting their college for changes in their curriculum. If a program has been discontinued, students cannot expect to continue pursuit of that program. Reenrolling students are also reminded that individual retention and reenrollment standards of specific colleges may be in effect.

TRANSFER CREDIT FOR GENERAL EDUCATION COURSES

Decisions on transfer courses meeting specific Baccalaureate Core or 1988-90 General Education requirements will be made by OSU college head advisers. Some requirements may be met by advanced placement. For more information, contact a college head adviser.

APPROVED BACCALAUREATE CORE COURSES

The Oregon State University Baccalaureate Core will continually be enriched. Courses approved for the Baccalaureate Core at the time this catalog was published appear below. Students must complete a total of 48 credits plus the Writing Intensive Course (WIC)

SKILLS COURSES (15)

Writing I (3)

WR 121 English Composition (3)

Writing II (3)

LS 201 News Writing (3)
PHL 121 Reasoning and Writing (3)
WR 214 Writing in Business (3)
WR 222 English Composition (3)
WR 224 Introduction to Fiction Writing (3)
WR 241 Introduction to Poetry Writing (3)
WR 323 English Composition (3)
WR 324 Short Story Writing (3)
WR 327 Technical Writing (3)
WR 330 Understanding Grammer (3)
WR 341 Poetry Writing (3)

Writing III/Speech III (3)

Any Writing II courses listed above not taken to satisfy Writing II requirement or,
COMM 111 Public Speaking (3)
COMM 114 Argument and Critical Discourse (3)
COMM 218 Inter Personal Commun (3)

Mathematics (3)

MTH 105 Introduction to Contemporary Mathematics (or higher level mathematics) (3)

Fitness (3)

HHP 231 Lifetime Fitness for Health (3)

Plus WIC course

PERSPECTIVES COURSES (27)

No more than two courses from any one department may be used by a student to satisfy the *Perspectives* category of the core.

Physical Science (with lab) (4)

CH 122, 123 General Chemistry (5 each)
CH 201, 202, 203 Chemistry for Engineering Majors (3 each)
CH 221, 222, 223 General Chemistry (5 each)
CH 224, 225, 226 Honors General Chemistry (5,5,5)
GEO 101,102 Earth Science (4 each)
GEO 201 Geology of the Interior of the Earth (4)
GEO 202 Geol of the Surface of the Earth (4)
MSU 121 Literature and Materials of Music I (3)
PH 104 Descriptive Astronomy (4)
PH 106 Perspectives in Physics (4)
PH 201, 202, 203 General Physics (5 each)
PH 205 Solar System Astronomy (4)
PH 206 Stars and Stellar Evolution (4)
PH 207 Galaxies, Quasars, and Cosmology (4)
PH 211, 212, 213 General Physics with Calculus (4 each)

Biological Science (with lab) (4)

BB 351 Elementary Biochemistry (with Laboratory)] (5)
BI 101, 102, 103. General Biology (4 each)
BI 211, 212, 213 Introductory Biology (5 each)
BOT 101 Botany: A Human Concern (4)
FOR 240 Forest Biology (4)
MB 230 Introductory Microbiology (4)

Plus choice of second course in Physical or Biological Sciences (with lab)

Western Culture (3)

AIHM 379 The Built Environment of Western Cultures (3)
AIHM 380 The Built Environment of Western Cultures (3)
ART 204, 205, 206 Introduction to Art History —Western (3 each)
EC 319 Economic History & Development of the U.S. (3)
ENG 110 Introduction to Film Studies (3)
ENG 125 Film Comedy (3)
ENG 201, 202, 203 Shakespeare (3 each)
ENG 204, 205, 206 Survey of English Literature (3 each)
ENG 207, 208, 209 Literature of Western Civilization (3 each)
ENG 215 Classical Mythology (3)
ENG 253, 254, 255 Survey of American Literature (3 each)
ENG 317, 318, 319 The American Novel (3 each)
FR 331, 332, 333 French Culture and Society Since the Revolution (3 each)
GEO 106 Geography of the Western World (3)
GEO 326 Geography of Europe (3)
GEO 329 Geography of the United States and Canada (3)
GER 331, 332 German Culture (3 each)
HST 101, 102, 103 History of Western Civilization (3 each)
HST 201, 202, 203 History of the United States (3 each)
HST 260, HST 261, HST 262. American Lives (2 each)
MUS 102 Sound and Silence: Music in Human Experience (3)
PHL 150 Great Ideas in Philosophy (3)
PHL 201 Introduction to Philosophy (4)
PHL 205 Ethics (4)
PHL 207 Political Philosophy (4)
PHL 220 World Views and Values: in the Bible (4)
PHL 221 World Views and Values: New Testament (4)
PHL 230 Christianity & Western Culture (4)
PHL 301, 302, 303 History of Western Philosophy (4 each)
PHL 360 Philosophy and the Arts (4)
PHL 365 Law in Philosophical Perspective (4)
PS 206 Introduction to Political Thought (4)
RUS 331, 332, 333 Russian Culture (3 each)
SPAN 331, 332, 333 The Cultures of Spain and Portugal (3 each)
SPAN 336, 337, 338 Latin American Culture (3 each)
TCS 200 Twentieth Century Amer Realities (3)
TCS 201 Twentieth Century Amer Dreams (3)

Cultural Diversity (3)

ANTH 210 Comparative Cultures (3)
ANTH 311, 313, 314, 315, 316, 317, 318, 319 Peoples of the World (3 each)
ART 207 Indigenous Art of the Americas (3)
CHN 331, 332, 333 Chinese Culture (3 each)
ENG 210, 211, 212, 213 Literature of Non-European Civilization (3 each)
ENG 360 Native American Literature (3)
GEO 105 Geography of the Non-Western World (3)
GEO 325 Geography of Africa (3)
GEO 327 Geography of Asia (3)
GEO 328 Geography of Latin America (3)
HST 320 Ancient Near East (4)
HST 350, 351 Modern Latin America (4 each)
HST 381, 382 History of Africa (4 each)
HST 387, 388 Islamic Civilization (4 each)
HST 391, 392 East Asia (4 each)
HST 485 Politics and Religion in the Modern Middle East (3)
JPN 331, 332, 333 Japanese Culture (3 each)
MUS 108 Musical Cultures of the World (3)
NFM 216 Food in Non-Western Culture (3)
PHL 160 Quests for Meaning: World Religions (4)
PHL 311, 312, 313 History of Nonwestern Religious Ideas (3-4 each)
PHL 371 Philosophies of China (4)
PHL 372 Philosophies of India (4)
PHL 373 Philosophies of Japan (4)
RUS 331, 332, 333 Russian Culture (3)

Literature and the Arts (3)
ART 101 Introduction to the Visual Arts (4)
ART 204, 205, 206 Introduction to Art History —Western (3 each)
ENG 104, 105, 106 Introduction to Literature (3 each)
ENG 110 Introduction to Film Studies (3)
ENG 201, 202, 203 Shakespeare (3 each)
ENG 204, 205, 206 Survey of English Literature (3 each)
ENG 207, 208, 209 Literature of Western Civilization (3 each)
ENG 210, 211, 212, 213 Literature of Non-European Civilization (3 each)
ENG 215 Mythology (3)
ENG 245 The New American Cinema (3)
ENG 253, 254, 255 Survey of American Literature (3 each)
ENG 260 Literature of American Minorities (3)
ENG 265 Films for the Future (3)
ENG 275 The Bible as Literature (3)
ENG 317, 318, 319 The American Novel (3 each)
ENG 362 Women's Voices in American Literature (3)
ENG 374 Modern Short Story (3)
MUS 101 Music Appreciation (3)
MUS 103 Great Composers (3)
MUS 107 Folk Music of North America (3)
MUS 109 Introduction to Jazz (3)
MUS 121 Literature and Materials of Music I (3)
RUS 332 Russian Culture (3)
TA 147 Introduction to Theatre (3)
TA 330, TA 331, TA 332 History of the Theatre (3 each)

Social Processes and Institutions (3)
ANTH 110 Introduction to Cultural Anthropology (3)
EC 201, 202 Introduction to Macroeconomics (3 each)
HOEC 201 Individual and Family Develop (3)
PS 101 American Politics (4)
PS 102 American Government (4)
PS 200 Introduction to Political Science (4)
PSY 201, 202 General Psychology (3 each)
SOC 204 Introduction to Sociology (3)
SOC 205 Institutions and Social Change (3)
WS 223 Women: Self and Society (3)
WS 224 Women: Personal and Social Change (3)

Difference, Power, and Discrimination (3)
AG 301 Ecosystem Science of Pacific Northwest Indians (3)
ANTH 451 Sociolinguistics (3)
COMM 327 Ethnicity and Communication (3)
ENG 220 Topics in Difference, Power, and Discrimination (3)
FW 240 Multicult Perspect in Natural Resources (3)
HDFS 443 U.S. Families: Gender, Race, Class (3)
PHL 280 Ethics of Diversity (4)
PS 363 American Political Thought (4)
PS 399 Current Problems in Politics: The Civil Rights Movement and Its Legacy (4)
SOC 426 Social Inequidility (3)
SOC 430 Gender and Society (3)
TCS 200 20th Century Realities: The U.S. (3)
WS 414 T/Systems of Oppression in Women's Lives (3)
WS 499 T/Building Bridges: Unlearning Racism (3)
WS 499 T/The Mexican-American Woman: Chicano Feminism (3)

SYNTHESIS COURSES (6)

The two courses used to fulfill the *Synthesis* requirement may not be in the same department.

Contemporary Global Issues (3)
ANTH 380 Cultures in Conflict (3)
ANTH 462 Minority Cultures in China (3)
ANTH 482 World Food & the Cultural Implications of International Agricultural Development (3)
ANTH 483 Medical Anthropology (3)
ANTH 484 Wealth & Poverty (3)
ANTH 487 Language in Global Context (3)
ANTH 488 Business & Asian Culture (3)
AREC 351 Natural Resource Management (4)
AREC 433 International Agricultural Development (3)
AREC 461 Agricultural and Food Policy Issues (4)
BA 300 The Global Environment of Business (4)
BI 301 Human Impacts on Ecosystems (3)
ENG 414 Criticism, Culture and World Community (3)
ENG 416 Power and Representation (3)
ENG 498 Women and Literature (3)
FOR 365 Issues in Natural Resources Conserv (3)
FW 325 Global Crises in Resource Ecology (3)
GEO 300 Environmental Conservation (3)
GEO 350 Population Geography (3)
H 312 AIDS and Sexually Transmitted Diseases in Modern Society (3)
HDFS 450 Families & Quality of Life in the Developing World (3)
HDFS 471 The World Consumer (3)
HST 317 Why War? A Historical Perspective (4)
HST 342 Christianity in Russia (3)
MB 390 The World According to Microbes (3)
NFM 415 Global Food Resources and Nutr (3)
PHL 443 Values and Human Ecology (3)
PS 345 The Politics of Developing Nations (4)
RNG 468 International Rangeland Resource Management (3)
SOC 480 Environmental Sociology (3)
TCS 300 World Community in the Twentieth Century: Development (3)
TCS 301 World Community in the Twentieth Century: Underdevelopment (3)
WS 480 International Women (3)

Science, Technology, & Society (3)
AG 492 Technology Transfer in Agriculture (3)
AIHM 465 Historic Textiles (3)
ANS 315 Animal Prod Issues of Concern to Society (3)
ANTH 330 Evolution of People, Technology, and Society (3)
ANTH 432 The Archaeology of Domestication & Urbanization (3)
ANTH 481 Natural Resources & Community Values (3)
ART 367 History of Design (3)
BB 331, 332 Intro to Molecular Biology (3 each)
BI 333 Environmental Problem Solving (3)
BI/BOT 489 Analysis of Environmental Issues (3)
CE 356 Technology and Environmental Systems (3)
CH 374 Technology, Energy, and Risk (3)
CS 391 Social & Ethical Issues in Computer Science (3)
CSS 335 Water Resource Science (3)
CSS 395 World Soil Resources (3)
ENG 415 Industrialism and the English Novel (3)
ENT/BI 300 Plagues, Pests and Politics (3)
FST 421 Food Law (3)
GEO 300 Environmental Conservation (3)
GEO 321 Changing Human Landscapes (3)
GEO 411 Development of Geologic Thought (3)
H 445 Occupational Health (3)
HST 481 Environmental History of the U.S. (4)
HSTS 411, 412, 413 History of Science (3 each)
HSTS 415 Theory of Evolution and Foundation of Modern Biology (3)
HSTS 416 Science and the Emergence of Modern Society 100 (3)
HSTS 417 History of Medicine (3)
HSTS 418, 419 Science and Society (3 each)
HSTS 421 Technology and Change (3)
NFM 312 Issues in Nutrition and Health (3)
PH 313 Energy Alternatives (3)
PH 331 Sound, Hearing, and Music (3)
PH 332 Light, Vision, and Color (3)
PHL 444 Bioethics (3)
PS 476 Science and Politics (4)
RNG 477 Agroforestry (3)
SOC 456 Science and Technology in Social Context (3)
Z 345 Introduction to Evolution (3)
Z 348 Human Ecology (3)

APPROVED WRITING INTENSIVE COURSES (WIC)

The WIC course must be taken in the major

College of Agricultural Sciences
AG 421 Leadership Development in Agriculture (3)
ANS 437 Sheep Production Systems (3)
ANS 440 Dairy Production Systems (3)
ANS 444 Beef Production Systems (3)
AREC 461 Agricultural & Food Policy Issues (4
BRR 403 Senior Thesis (4)
CSS 315 Nutrient Management and Cycling
CSS 480 Cropping Systems and Decision Making (4)
FST 423 Food Analysis (5)
FW 481 + FW 482. Wildlife Ecology plus Senic Project (3, 2)
FW 497 Aquaculture (3)
HORT 311 Plant Propagation (4)
HORT 351 Greenhouse & Controlled Environments for Crop Product (4)
HORT 418 Golf course Maintenance (4)
HORT 470 Horticulture System (3)
HORT 480 Cropping Systems and Decision Making (4)
RNG 403 Senior Thesis (3)

College of Business
BA 469 Strategic Management and Business Policy (4)

College of Engineering
CE 321 Engineering Materials (4)
CHE 414 Chemical Engineering Laboratory (3
CS 361 Software Engineering (4)
ECE 422 Data Acquisition II (4)
ECE 435 Power Electronics II (4)
ECE 453 Control Engineering II (5)
ECE 475 Senior Design Project (3)
ECE 482 Optical Electronics (4)
IE 497 Industrial Engineering Analysis and Design (3)
IE 498 Industrial Engineering Analysis and Design (3)
ME 351 Mechanical Lab (4)
NE 484/RHP 484 Applied Radiation Safety (3)

College of Forestry
FOR 460 Forest Policy (4)
FP 411, 412, 413 Forest Products Project I, II, III (2,1,

College of Health and Human Performanc
EXSS 481 Analysis of Critical Issues in Exercis and Sport Science (3)
H 430 Health Policy Analysis (3)
H 440 Environmental Health (3)

H 476 Planning Health Programs (3)
H 482 Problems and Research in Safety (3)

College of Home Economics and Education
AIHM 345 Interior Merchandising Proced (3)
AIHM 370 Textile and Apparel Market Analysis (4)
AIHM 378 Consumer Housing (3)
HDFS 461 Program Development and Evaluation (4)
NFM 416 Cultural Aspects of Foods (3)
NFM 419 Human Nutrition Laboratory (2)

College of Liberal Arts
AMS 407 American Studies Seminar (3)
ANTH 370 Age, Sex, and Family (3)
ART 301 Writing in Art and Design (3)
COMM 418 Interpersonal Communication Theory (3)
COMM 422 Small Group Theory and Research (3)
COMM 430 Theoretical Issues in Communication Inquiry (3)
COMM 432 Gender and Communication (3)
COMM 456 History of Rhetoric (3)
COMM 458 History of Rhetoric II (3)
COMM 459 Contemporary Theories of Rhetoric (3)
COMM 464 Rhetorical Criticism (3)
EC 328 Introduction to Economic Research (3)
ENG 407 Seminar (3)
ENG 431 John Milter (3)
ENG 445 Studies in Nonfiction: the Essay as Literature (3)
ENG 452 Film Criticism & Thought (3)
ENG 455 Continental European Literature I (3)
ENG 456 Continental European Literature II (3)
ENG 457 Continental European Literature III (3)
ENG 470 Studies in Poetry (3)
ENG 480 Studies in Literatures, Cultures, and Society (3) (specified sections)
FR 439 French/Francophone Studies (3)
GER 411 Fourth-Year German (3)
HST 407 History Seminar (5)
HSTS 415 Theory of Evolution and Foundation of Modern Biol (GS prior to Fall '92) (3)
HSTS 416 Science and the Emergence of Modern Society (GS prior to Fall '92) (3)
HSTS 417 History of Medicine (GS prior to Fall '92) (3)
HSTS 418 Science and Society (GS prior to Fall '92) (3)
HSTS 419 Science and Society (GS prior to Fall '92) (3)
MUS 324 History of Music I (3)
MUS 325 History of Music II(3)
MUS 326 History of Music III(3)
PHL 407 Philosophy Seminar (3)
PS 414 Interest Groups (4)
PS 419 Topics in American Politics (4)
PS 429 Topics in Judicial Politics (4)
PS 459 Topics in International Relations (4)
PS 479 Topics in Bureaucratic Politics and Administrative Theory (4)
PSY 430 Animal Behavior (3)
PSY 440 Cognition Research (3)
PSY 460 Advanced Social Research (3)
PSY 460 Advanced Social Research Methods (3)
PSY 470 Psychometrics and Psychological Testing (3)
PSY 480 Case Study Methods (3)
SPAN 438 Topics in Luso-Hispanic Culture (3)
TA 330 History of the Theatre I (3)
TA 331 History of the Theatre II (3)
TA 332 History of the Theatre III (3)
WR 411 Writing for Teachers (3)
WR 493 The Rhetorical Tradition and the Teaching of Writing (3)
WR 495 Comp, Literature, and Literacy (3)

College of Pharmacy
PHAR 432 Writing in the Pharmaceutical Sciences (2)

College of Science
BB 493 Biochemistry Lab (2)
BI 333 Environmental Problem Solving (GS prior to Fall '92) (3)
BI 371 Ecological Methods (3)
BI 489 Analysis of Environmental Problems (GS prior to Fall '92) (3)
BOT 341 plus BOT 342. Plant Ecology/Writing About Plant Ecology (4)
CH 463 Experimental Chemistry (3)
GEO 411 Development of Geologic Thought (3)
GEO 427 Volcanology (4)
GEO 462 Geographic Field Techniques (4)
GEO 463 Intro Solid Earth Geophysics (4)
GEO 464 Seismic Reflection Interpretation (4)
GEO 490 Geologic Field Methods (4)
MB 307 Advanced General Microbiology Lab (2)
MTH 333 Fundamental Concepts of Topology (3)
MTH 338 Non-Euclidean Geometry (3)
MTH 401 Independent Research (3)
MTH 458 Numerical Solution of Ordinary Differential Equations (4)
MTH 473 History of Mathematics (3)
PH 401 Research and PH 403. Thesis (3)
Z 414 Research and Perspectives (2)

OTHER GRADUATION REQUIREMENTS

B.A. Degree Requirements

The Bachelor of Arts degree is conferred for broad and liberal education in humanities, arts, social science, and sciences. Requirements for the B.A. degree differ significantly from those for a Bachelor of Science degree (B.S.) in the same department. Many departments offer only one or the other of the two baccalaureate degrees. Check departmental curricula for detailed information. The B.A. degree requires foreign language proficiency equivalent to that attained at the end of the second year course in the language as certified by the Department of Foreign Languages and Literatures.

Concurrent Baccalaureate Degrees

Students may concurrently earn two or more bachelor's degrees; for example, a B.A. or B.S. with the same or different major.

Students must a) meet the institutional, college, and departmental requirements of the curricula represented by the degrees; b) complete for each additional degree a minimum of 32 credits more than the requirements of the curriculum requiring the least number of credits; c) complete each additional 32 credits in residence.

Subsequent Baccalaureate Degrees

A student who has previously earned a bachelor's degree from OSU may receive a second such degree if all requirements are met. The minimum of 32 credits may be completed at any time.

Students with a baccalaureate degree(s) from an accredited institution other than Oregon State University may be granted a baccalaureate degree from OSU upon satisfying the college, and departmental requirements of the curriculum represented by the degree. Such a student also may obtain concurrent degrees from Oregon State University by satisfying the requirements for concurrent degrees.

A student seeking a concurrent or subsequent baccalaureate degree(s) also must satisfy the University's residence requirements.

Requirements for Certificates

See individual certificate programs described in this catalog.

Requirements for Advanced Degrees

For advanced degree requirements see the Graduate School section of this catalog and the 1992-93 *Graduate Catalog*. Students who take courses they wish to apply toward an advanced degree before they have received baccalaureate degrees may have a limited number of credits reserved by petition. Also see Reserving Credits in the Graduate School section. A graduate student also may obtain baccalaureate degrees from Oregon State University by satisfying the requirements for subsequent degrees.

APPLYING FOR GRADUATION

Students should consult with their adviser to check progress toward graduation requirements. Progress will be based on the formally declared major, options, minors, degree, and other applicable requirements. Applications should be obtained and filed in the Office of the Registrar two terms before expected graduation so progress can be monitored each term.

Once the application has been filed, the Office of the Registrar will audit and return two copies to the college each term—one for the adviser and one for the student. Students who wish to have minors or options shown on their transcript must indicate the minors or options they intend to complete when filing the application to graduate.

It is important that the student submit the application before the final quarter so he or she has time to complete any deficiencies *prior* to the last quarter.

Students who wish to change graduation dates after the first application must file the change in the Office of the Registrar *before* the final quarter.

Degrees are granted at the end of any quarter, and students are encouraged to attend the June Commencement exercises if they wish.

DEGREES WITH DISTINCTION

Grade-point averages are computed on the basis of all work attempted at OSU. Graduates who have been in attendance at OSU for at least two years are awarded degrees with distinction as follows:

Summa cum laude—3.85-4.00 GPA
Magna cum laude—3.70-3.84 GPA
Cum laude—3.50-3.69 GPA

These distinctions are noted on diplomas.

Majors, Minors, Certificates

Minors: U (Undergraduate); G (Graduate) *Certificates:* C *Degrees:* B (Bachelors); M (Masters); MAIS (Master of Arts in Interdisciplinary Studies); D (Doctorate)

■ Minors (Undergraduate and Graduate); ▲ Certificates; ○ Options; ● Degrees

AGR: College of Agricultural Sciences; **BUS:** College of Business; **CLA:** College of Liberal Arts; **ENGR:** College of Engineering; **FOR:** College of Forestry; **GS:** Graduate School; **HEE:** College of Home Economics and Education; **HHP:** College of Health and Human Performance; **OC:** College of Oceanic and Atmospheric Sciences; **PHAR:** College of Pharmacy; **SCI:** College of Science; **VM:** College of Veterinary Medicine; **OSU:** interdisciplinary degree programs

		Minors		Cert	Degrees			
Majors/Minors/Certificates	**College**	**U**	**G**	**C**	**B**	**M**	**MAIS**	**D**
Accounting[1]	BUS			▲	○			
Actuarial Science	SCI	■			○			
Adult Education	HEE		■			●	●	
Advanced Mathematics Education	HEE/SCI					●		
Air Force Studies	ROTC	■						
(Agri) Business	AGR				○			
Agricultural and Resource Economics	AGR		■		●	●	●	●
Agricultural Business Management	AGR	■			●			
Agricultural Chemistry	AGR		■					
Agricultural Economics	AGR	■						
Agricultural Education	AGR		■			●	●	
Agricultural Sciences	AGR	■						
Agriculture	AGR		■			●		
American Studies	CLA				●			
Animal Production	AGR				○			
Animal Reproduction Development	OSU				○			
Animal Sciences	AGR	■	■		●	●	●	●
Anthropology	CLA	■	■		●		●	
Apparel Design	HEE				●			
Apparel, Interiors, Housing, and Merchandising	HEE		■			●	●	●
Applied Anthropology	CLA		■			●		
Apparel Ethics	HEE/SCI			▲				
Applied Exercise and Sport Science	HHP				○			
Applied Genetics	OSU				○			
Applied Health	HHP	■			○			
Applied Mathematics	SCI				○			
Applied Physics	SCI				○			
Applied Visual Arts	CLA				●			
Archaeology/Physical Anthropology	CLA				○			
Art	CLA		■		●		●	
Art History	CLA				○			
Athletic Administration	HHP	■						
Athletic Training	HHP				○			
Atmospheric Sciences	OC		■			●		●
Biochemistry and Biophysics	SCI/AGR		■		●	●	●	●
Biology	SCI	■			●			
Biology Education[2]	HEE/SCI					●		
Biophysics	SCI				○			
Bioresource Engineering	ENGR/AGR		■			●		●
Bioresource Research	OSU				●			
Biosystems Modeling	OSU				○			
Biotechnology	OSU				○			
Botany	SCI/AGR	■			●			
Botany and Plant Pathology	SCI/AGR		■			●	●	●
Business Administration	BUS/FOR	■	■		●	●	●	
Chemical Engineering	ENGR		■		●	●	●	●
Chemical Physics	SCI				○			
Chemistry	SCI	■	■		●	●	●	●

		Minors		Cert	Degrees			
Majors/Minors/Certificates	**College**	**U**	**G**	**C**	**B**	**M**	**MAIS**	**D**
Chemistry Education[2]	HEE/SCI					●		
Child and Adolescent Health	HHP				○			
Chinese	CLA	■						
Choral Conducting	CLA				○			
Civil Engineering	ENGR		■		●	●	●	●
Civil Engineering-Forest Engineering	ENGR/FOR				●			
College Student Services Administration	GS		■			●		
Composition (Music)	CLA				○			
Communication	CLA	■			○			
Community College Education	HEE		■				●	
Community Health	HHP	■	■		○			
Comparative Veterinary Medicine	VM		■					●
Comprehensive (Mathematics)	SCI				○			
Computational Physics	SCI				○			
Computer Engineering	ENGR				●			
Computer Science	ENGR	■	■		●	●	●	●
Construction Engineering Management	ENGR				●			
Counseling	HEE		■			●	●	●
Crop and Soil Science	AGR				●			
Crop Science	AGR	■	■		○	●	●	●
Cultural Anthropology	CLA				○			
Cultural Resource Management	FOR				○			
Dietetics	HEE				○			
Early Childhood Education	HEE				○			
Earth Information Science and Technology	OSU		■		○			
Earth Materials	SCI				○			
Earth Science	SCI				○			
Economics	CLA/AGR/FOR	■	■		●	●	●	●
Education	HEE		■			●	●	●
Electrical and Computer Engineering	ENGR		■			●	●	●
Electrical and Electronics Engineering	ENGR				●			
Elementary Education[2]	HEE					●		
Elementary Education (Pre-M.A.T.)	CLA/SCI				○			
Engineering Physics	ENGR				●			
English	CLA	■	■		●	●	●	
Entomology	SCI/AGR	■	■		●	●	●	●
Environmental Chemistry	OSU				○			
Environmental Engineering	ENGR	■			○			
Environmental Geosciences	SCI	■						
Environmental Health	HHP	■			○			
Environmental Health and Safety	HHP				●			
Environmental Health Management	HHP		■			●	●	
Environmental Resource Interpretation	FOR				○			

Majors/Minors/Certificates	College	Minors U	Minors G	Cert C	Degrees B	Degrees M	Degrees MAIS	Degrees D
Environmental Sciences	OSU	■			●			
Equine Science	AGR	■	■		○			
Ethnic Studies	CLA				●			
Exercise and Sport Science	HHP				●			
Family Finance	HEE				○			
Family Resource Management	HEE		■			●	●	●
Financial Services	BUS				○			
Fine Arts	CLA				○			
Fisheries and Wildlife	AGR	■						
Fisheries/Business	AGR				○			
Fisheries Science	AGR		■		●	●	●	●
Fishery Science	AGR				○			
Fitness Program Management	HHP				○			
Food Quality	OSU				○			
Food Science	AGR	■						
Food Technology	AGR	■						
Food Science and Technology	AGR		■		●	●	●	●
Food Systems Management	HEE	■			○			
Foods in Business	HEE				○			
Foreign Languages and Literatures (French, German, Spanish)	CLA		■				●	
Forest Biology	FOR				○			
Forest Engineering	FOR		■		●	●	●	●
Forest Engineering-Civil Engineering	FOR/ENGR				●			
Forest Harvesting	FOR				○			
Forest Management	FOR	■			●			
Forest Products	FOR	■	■		●	●	●	●
Forest Recreation Resources	FOR	■			●			
Forest Resources	FOR		■		○	●	●	●
Forest Science	FOR		■			●	●	●
Forest Soils	FOR				○			
French	CLA	■			●		●	
General Agriculture	AGR				●			
General Anthropology	CLA				○			
General Business	BUS				○			
General Entomology	SCI				○			
General Health Care Administration	HHP				○			
General Mathematics	SCI				○			
General Rangeland Resources	AGR				○			
General Science	SCI		■		●	●		●
Genetics	SCI		■			●	●	●
Geography	SCI		■		●	●	●	●
Geological Engineering[4]	ENGR				●			
Geology	SCI	■	■		●	●	●	●
Geomorphology-Engineering Geology	SCI				○			
Geophysics	OC/SCI		■		○	●		●
German	CLA	■			●		●	
Gerontology	HEE		■	▲			●	
Graphic Arts	CLA				○			
Health and Safety Administration	HHP		■			●	●	
Health Care Administration	HHP				●			
Health Education	HEE/HHP		■			●	●	
Health Promotion and Education	HHP				●			
Health Science	HHP	■						
History	CLA	■	■		●		●	

Majors/Minors/Certificates	College	Minors U	Minors G	Cert C	Degrees B	Degrees M	Degrees MAIS	Degrees D
Home Economics	HEE		■			●	●	
Home Economics Communication	HEE				○			
Home Economics Education[2]	HEE		■			●		
Horticulture	AGR	■	■		●	●	●	●
Horticultural Science	AGR				○			
Housing Design	HEE				○			
Housing Services	HEE				○			
Housing Studies	HEE				●			
Human Development and Family Sciences	HEE				●			
Human Development and Family Studies	HEE		■			●	●	●
Human Performance	HHP		■			●	●	●
Individual and Family Development	HEE				○			
Individual Studies	AGR/SCI				○			
Industrial Engineering	ENGR		■		●	●	●	●
Insect Pest Management	SCI	■						
Instrumental Conducting	CLA				○			
Instrumental Performance	CLA				○			
Integrated Science Education[2]	HEE/SCI					●		
Interdisciplinary Studies	GS		■				●	
Interior Merchandising	HEE				●			
International Agricultural Development	AGR	■	■				●	
International Agricultural Economics	AGR	■						
International Business	BUS				○			
International Studies	OSU				●			
Irrigation Engineering	ENGR	■						
Japanese	CLA	■						
Landscape Design	FOR				○			
Language Arts Education[2]	HEE/CLA					●		
Latin American Affairs	CLA			▲				
Law Enforcement	FOR				○			
Liberal Studies	CLA				●			
Long Term Care Administration	HHP				○			
Management	BUS				○			
Management Information System	BUS				○			
Manufacturing Engineering	ENGR				●			
Marine Resource Management	OC		■			●		
Marine Resources	AGR				○			
Marketing Management	BUS				○			
Materials Science	ENGR		■			●	●	
Mathematical Physics	SCI				○			
Mathematical Sciences	SCI	■			●			
Mathematics	SCI	■	■		●	●	●	●
Mathematics Education	SCI/HEE		■			●		●
Mechanical Engineering	ENGR		■		●	●	●	●
Medical Technology	SCI				●			
Merchandising Management	HEE				●			
Metallurgical Engineering[3]	ENGR				●			
Microbiology	SCI/AGR	■	■		●	●	●	●
Military Science	ROTC	■						
Mining Engineering[3]	ENGR				●			
Molecular and Cellular Biology	SCI		■					●
Movement Studies for the Disabled	HHP		■			●	●	

Majors/Minors/Certificates	College	Minors U	Minors G	Cert C	Degrees B	Degrees M	Degrees MAIS	Degrees D
Music	CLA	■	■		●		●	
Music Education[2]	HEE/CLA					●		
Music History	CLA				○			
Natural Resources	OSU/FOR				●			
Naval Science	ROTC	■						
Nuclear Engineering	ENGR	■	■		●	●		●
Numerical Analysis (Mathematics)	SCI				○			
Nutrition	HEE	■						
Nutrition and Food Management	HEE		■		●	●	●	●
Nutrition Science	HEE				○			
Occupational Safety	HHP	■			○			
Ocean Engineering	ENGR		■			●		
Oceanography	OC	■	■			●		●
Operations Research	SCI		■			●	●	
Optical Physics	SCI				○			
Peace Studies	CLA			▲				
Pest Biology and Management	OSU				○			
Pest Management	SCI				○			
Piano Performance (Music)	CLA				○			
Pharmacy	PHAR		■		●	●	●	●
Philosophy	CLA/FOR	■	■		●		●	
Photography	CLA				○			
Physical Activity and Development	HHP				○			
Physical Education[2]	HEE/HHP		■			●	●	
Physics	SCI	■	■		●	●	●	●
Physics Education[2]	HEE/SCI					●		
Plant Growth and Development	OSU				○			
Plant Physiology	GS		■			●		●
Political Science	CLA	■	■		●		●	
Poultry Science	AGR	■	■			●	●	●
Pre-Therapy	HHP				○			
Pre-Veterinary Medicine	SCI				○			
Psychology	CLA	■	■		●		●	
Professional Technical Education	HEE					●		
Public Administration	FOR				○			
Public Education/Extension	AGR				○			
Public Health	HHP		■			●		●
Pure Mathematics	SCI				○			
Radiation Health Physics	ENGR	■	■		●	●		
Range Management	AGR/FOR				○			
Range Science	AGR				○			
Rangeland Resources	AGR	■	■		●	●	●	●
Range/Forestry/Fire Management	AGR				○			
Range/Soils	AGR				○			
Range/Wildlife	AGR				○			
Range Resources	FOR				○			
Regional Studies	SCI	■						
Resource Economics	AGR/FOR	■			○			
Resource Geography	SCI	■						
Resource Planning	FOR				○			
Rural and Resource Planning	SCI	■						
Russian	CLA	■						
Russian Studies	CLA			▲				
Science Education	SCI		■			●		●
Science, Technology, and Society	CLA			▲				
Scientific and Science/Pre-Veterinary Medicine	AGR				○			
Scientific and Technical Communication	CLA		■			●	●	
Sedimentary Geology	SCI				○			
Sociology	CLA	■	■		●		●	
Soil Science	AGR	■	■		○	●	●	●
Spanish	CLA	■			●		●	
Speech Communication	CLA		■		●		●	
Sports Leadership	HHP				○			
Statistics	SCI/AGR/FOR		■		○	●	●	●
Structure-Tectonics-Geophysics	SCI				○			
Sustainable Ecosystems	OSU				○			
Teaching	HEE		■			●		
Technology Education	HEE				●			
Theatre Arts	CLA	■			○			
Tourism	FOR				○			
Toxicology	GS/OSU		■		○	●	●	●
Turf and Landscape Management	AGR				○			
Twentieth Century Studies	CLA			▲				
Veterinary Medicine	VM							●
Veterinary Science	VM		■			●		
Visual Arts	CLA	■						
Vocal Performance (Music)	CLA				○			
Water Resources	AGR		■				●	
Wildland Ecology	AGR				○			
Wildlife	FOR				○			
Wildlife Resources	FOR				○			
Wildlife Science	AGR		■		●	●	●	●
Women Studies	CLA		■	▲	○		●	
Wood Engineering and Science	FOR				○			
Wood Industry Management	FOR				○			
Worksite Health Promotion	HHP	■			○			
Writing	CLA	■						
Writing Education	CLA		■					
Zoology	SCI	■	■		●	●	●	●

Pre-Professional Health Programs: ❑ Dental Hygiene; ❑ Dentistry; ❑ Medical Technolog
❑ Medicine; ❑ Nursing; ❑ Occupational Therapy; ❑ Optometry; ❑ Osteopathy;
❑ Pharmacy; ❑ Physical Therapy; ❑ Podiatry; ❑ Veterinary Medicine.

[1]Post-baccalaureate certificate.
[2]MAT Program
[3]Joint program with the University of Idaho.

Estimated Fee and Tuition Schedule (per term) for 1995-96

Term credits	Resident undergrads	Nonresident undergrads	Resident graduate students	Nonresident graduate students
Full-Time				
12-21 credits	$1085.00	$3,245.00	—	—
9-16 credits	—	—	$1,685.00	$2,707.00
Overtime				
Each additional credit	74.00	254.00	164.00	279.00

Graduate Assistants—Teaching or research assistants pay $199 a term plus $164 each overtime credit. Consult the Graduate School Office for full details.

NOTE: These figures are estimates only. Fees and tuition for 1995-96 were not established at the time of publication; call the Office of Registration for current rates.

Regular Tuition Fees

Students paying regular fees are entitled to services maintained by OSU for the benefit of students. These services include use of the library; use of laboratory equipment and materials; medical attention and advice at the Student Health Center; use of gymnasium equipment, including gymnasium suits and laundry service; the student newspaper; admission to some athletic events; and admission to concerts and lectures. No reduction in fees is made to students who may not wish to use these privileges. Staff and senior citizens do not receive these services.

Advance Tuition Deposit

$200.00
New and freshmen students should expect to make an advance tuition deposit as an indication of intent to enroll. Deposits are not refundable after the due date indicated on the "intent to enroll" form mailed to newly admitted freshmen (for Fall Term only).

Special Fees

(subject to change without notice)

Application Fee (nonrefundable), $50.00
Must accompany admission application.

Late Registration Fee
Students registering after scheduled registration dates of any term pay a late registration fee of $40.00. Also applies to part-time students.

Return-of-Check Fee, $15.00
If institutional charges are met by a check which is returned, a fee will be charged in the amount of $15.00.

Change-of-Program Fee
Add, per course, $10.00
Drop, per course, $10.00
S-U change, per course, $10.00
The student pays this fee for each change in his or her official program.

Reinstatement Fee, $25.00
If for any reason a student has his or her registration canceled during a term for failure to comply with the regulations of the institution, but is later allowed to continue his or her work, the student must pay the reinstatement fee.

Special Examination Fee
Examination for credit, per exam $40.00
Transcript Fee, first copy, $5.00
Added copies at same time, $1.00.

Staff Fee (except staff auditors) per credit, $15.00
Staff members may register for courses at an $15-per-credit-hour rate. An employee whose appointment is equivalent to .50 or more may take up to 10 credits a term at this rate. Payment of fees entitles member to instructional and library privileges only. There is no refund for a staff member withdrawing from or dropping classes.

Senior Citizen Fee: Charge for special materials only. Persons 65 or older may attend class on a noncredit, space-available basis. Incidental fee privileges are not provided.

Microfilming Doctoral Thesis minimum, $50.00

Individual Music Lesson Fee (consult Department of Music) per term, $100.00 to $200.00

Determining Residency for Fee Purposes

In determining a student's residency, the OSU Office of Admissions follows the administrative rules of the State Board of Higher Education on residence classification, excerpted below.

Residence Requirements for Those Requesting Reclassification After November 1, 1993.

Definitions

For the purpose of rules 580-10-030 through 580-10-045, the following words and phrases mean:

1) "Domicile" denotes a person's true, fixed, and permanent home and place of habitation. It is the place where a person intends to remain and to which the person expects to return when the person leaves without intending to establish a new domicile elsewhere.

2) "Financially independent" denotes a person who has not been and will not be claimed as an exemption and has not received and will not receive financial assistance in cash or in kind of an amount equal to or greater than that which would qualify him or her to be claimed as an exemption for Federal Income Tax purposes by another person except his or her spouse for the current calendar year and for the calendar year immediately prior to the year in which application is made.

3) A "dependent" is a person who is not financially independent.

Determination of Residence (580-10-030)

For purposes of admission and instruction fee assessment, OSU classifies a student as Oregon resident or nonresident. In determining resident or nonresident classification, the primary issue is one of *intent*. If a person is in Oregon primarily for the purpose of obtaining an education, that person will be considered a nonresident. For example, it may be possible for an individual to qualify as a resident of Oregon for purposes of voting or obtaining an Oregon driver's license and not meet the residency requirements established by these rules.

An *Oregon resident* is a financially independent person who, immediately prior to the term for which Oregon resident classification is requested:

1) Has established and maintained a domicile in Oregon of not less than 12 consecutive months; and
2) Is primarily engaged in activities other than those of being a college student.
   a) A student may be considered primarily engaged in educational activities regardless of the number of credits for which the student is enrolled. However, a student who is enrolled for more than seven credits per semester or quarter shall be presumed to be in Oregon for primarily educational purposes.
   b) Such period of enrollment shall not be counted toward the establishment of a bona fide domicile of one year in this state unless the student proves, in fact, establishment of a bona fide domicile in this state primarily for purposes other than educational.

An Oregon resident is also a person who is dependent on a parent or legal custodian who meets the Oregon residency requirements of these rules.

The criteria for determining Oregon resident classification shall also be used to determine whether a person who has moved from Oregon has established a non-Oregon residence.

If institution records show that the residence of a person or the person's legal custodian upon whom the person is dependent is outside of Oregon, the person shall continue to be classified as a nonresident until entitlement to resident classification is shown. The burden of showing that the residence classification should be changed is on the person requesting the change. The effective date for this rule is November 1, 1993

Residence Consideration Factors (580-10-031)

The following factors, although not necessarily conclusive or exclusive, have probative value in support of a claim for Oregon resident classification:

1) Primary engagement in activities other than those of a student and reside in Oregon for 12 consecutive months immediately prior to the beginning of the term for which resident classification is sought;
2) Reliance upon Oregon resources for financial support;
3) Domicile in Oregon of persons legally responsible for the student (OSSHE Rules);
4) Acceptance of an offer of permanent employment in Oregon; and
5) Ownership by the person of his or her living quarters in Oregon.

The following factors, standing alone, do not constitute sufficient evidence to affect classification as an Oregon resident:

1) Voting or registration to vote;
2) Employment in any position normally filled by a student;
3) Lease of living quarters;
4) Admission to a licensed practicing profession in Oregon;
5) Automobile registration;
6) Public records (birth and marriage records, Oregon driver's license);
7) Continuous presence in Oregon during periods when not enrolled in school;
8) Ownership of property in Oregon, or the payment of Oregon income or other Oregon taxes; or
   a) Domicile in Oregon of the student's spouse;

Reliance upon non-Oregon resources for financial support is an inference of residency in another state.

The resident classification of a dependent person shall be that of his or her parents or legal custodians, or, in case of divorce or other similar circumstances, the parent or legal custodian upon whom the person is financially dependent, unless the dependent has been in Oregon with the other parent or a legal custodian and established Oregon residency under these rules 12 months prior to the term for which Oregon resident classification is requested.

Evidence of Financial Dependency (580-10-033)

In determining whether a student is financially dependent and whether his or her parent, or legal custodian has maintained a bona fide domicile in Oregon for one year, a student must provide:

1) Legal proof of custodianship;
2) Evidence of established domicile of parent or legal custodian;
3) Identification of the student as a dependent on the federal income tax return of the parents, or legal custodian.

Additional documentation to substantiate dependency during the current calendar year may be required at a later time if deemed necessary by the institution.

A student who provides evidence that he or she is a dependent of a parent or legal custodian who has maintained a one-year domicile in Oregon shall not be required to establish a one-year domicile prior to classification of resident status, provided such a student may not be classified as a resident while receiving financial assistance from another state or state agency for educational purposes.

Residence Classification of Aliens (580-10-040)

An alien holding an immigrant visa or an A, E, G, I, or K visa, or granted refugee or political asylum status, or otherwise admitted for permanent residence in the United States is eligible to be considered an Oregon resident if OAR 580-10-030 is otherwise satisfied. The date of receipt of the immigrant visa, the date of approval of political asylum or refugee status, or the date of approval of lawful permanent residence, whichever is earlier, shall be the date upon which the 12 months and other residency requirements under OAR 580-10-030 shall begin to accrue.

Notwithstanding any other rule, an alien possessing a nonimmigrant or temporary, i.e., B, C, D, F, H, J, L, or M visa cannot be classified as a resident.

Changes in Residence Classification (580-10-041)

If an Oregon resident student enrolls in an institution outside of Oregon and later seeks to reenroll in an OSSHE institution, the residence classification of that student shall be reexamined and determined on the same basis as for any other person.

A person whose nonresident legal custodian establishes a permanent Oregon residence as defined in OAR 580-10-030 during a term when the dependent is enrolled at an OSSHE institution, may register as a resident at the beginning of the next term.

Once established, classification as a resident continues so long as the student remains in a continuous academic year enrollment in the classifying institution.

A person who seeks classification as a resident under these rules shall complete and submit a notarized Residence Information Affidavit. The affidavit and all required supportive documents and materials must be submitted by the last day to register for the term in which resident status is sought.

No OSSHE institution is bound by any determination of residency except by duly authorized officials under procedures prescribed by these rules including timely submittal of the notarized affidavit.

Review of Residence Classification Decisions by IRC (580-10-045)

1) An interinstitutional review committee (IRC) is established consisting of the officers determining student residence classification at department institutions and a member of the chancellor's staff, selected by the chancellor. The member of the chancellor's staff shall serve as chairperson. A majority of the members of the committee shall constitute a quorum. A majority of a quorum may make decisions.
2) Residence cases of unusual complexity, especially where there may be conflict of rules, may be referred by an institution residence classification officer to the IRC for decision.
3) Any person who is aggrieved by the institution residence classification may, within ten (10) days of the date of mailing or other service of the classification decision, appeal to the IRC. An aggrieved person may supply written statements to the IRC for its consideration in reviewing the case and may also make an oral presentation to the IRC. The decision of the IRC shall be final unless appealed.
4) A person dissatisfied with the IRC decision may, within ten (10) days of the date of the mailing or other service of the IRC decision, appeal the IRC decision to the Vice Chancellor for Academic Affairs or designee. An appeal to the Vice Chancellor shall be in writing only. The Vice Chancellor's decision shall be final.
5) A person granted a meritorious hardship exception to residency under this rule prior to July 1, 1990, shall not lose the exception solely because of the repeal of the exception authorization.

Residents Under WICHE (580-10-047)

A certification officer designated by the board shall determine the residence classification of any person seeking certification as an Oregon resident, pursuant to the terms of the WICHE compact. Any person dissatisfied with the decision of the certification officer may appeal to the IRC. The decision of the IRC shall be final unless further appeal is made to the Vice Chancellor for Academic Affairs pursuant to OAR 580-10-045(4).

RESIDENCE REQUIREMENTS EFFECTIVE UNTIL NOVEMBER 1, 1993.

In Oregon, as in all other states, instruction fees at publicly supported four-year colleges and universities are higher for nonresident students than for resident students. Through the payment of taxes, Oregon residents contribute to the general fund of the state from which the legislature appropriates funds comprising the major source of support for State System colleges and universities. Currently, nonresident students are assessed instruction fees that approximate the full cost of instruction.

The rules used in classifying resident status assure that only bona fide residents are assessed the resident fee. The rules allow only domiciled persons to be classified as residents for tuition fee purposes. Domicile is a matter of intent to establish a home at a particular place and abandon another one. Further, the rule requires a 12-month durational residency in Oregon. In qualifying for the 12-month rule, the months must be consecutive and continuing during which only short absence of vacations (21 total days in 12 consecutive months) are allowed. The rules provide a means for persons to present evidence of action they have taken to become permanent residents of Oregon (for reasons other than enrolling in college) and thus be eligible to be assessed the resident fee through meeting the 12-month requirement as stated in OAR 580-10-030 (2).

The classification rule (580-10-030) in Section (2) states that the determination of residence shall be based on consideration of all relevant objective factors. All State System residence classification officers must interpret the following as well as other possibly pertinent factors:

1) Abandonment of prior out-of-state residence—This includes abandonment of the non-Oregon residence of the student and his or her parent or guardian.
2) History, duration, and nature of noneducational activities in Oregon—Involvement in Oregon life outside of being a student, such as working, homemaking, civic involvement, etc., supports an inference that the student is in Oregon not solely for the purpose of obtaining an education. Note: Residence is not established by mere attendance at an institution of higher education and physical presence in the state while attending such an institution.
3) Source of financial support, including location of source of support and amounts of support—Evidence of Oregon-based income, bank accounts, investments, etc. are expected. (Receipt, from a non-Oregon resident of support greater than the difference between resident and nonresident tuition at the institution where residence is sought, whether or not the student is actually claimed as a dependent for tax purposes, is a strong inference of nonresidency.) A **parental affidavit** is required to document the amount of support from parents or guardians.
4) Location of family—Presence of family (married students) and/or other relatives in Oregon can support an intent to become a permanent resident.
5) Ownership of real property—Owning one's own home or investment property in Oregon can support an intent to become a permanent resident.
6) Location of household goods—It is expected that all personal property will have been moved to Oregon.
7) Filing of income tax return as an Oregon resident—Persons with income in Oregon are expected to file an Oregon income tax return. NOTE: Nonresident students (or parents of dependent students) who pay Oregon income or property taxes but reside outside the state of Oregon, are not residents for fee-payment purposes.
7) Place of vehicle and voter registration—An Oregon resident usually has a vehicle licensed in Oregon, has an Oregon driver's license (if a driver), and if registered to vote, is registered in Oregon.

Completing the Residence Information Affidavit (available from the Office of Admissions) will supply most of the information needed to determine residency (except as required in #3). However, any documents which tend to support any factor should be attached to the affidavit. In some instances, specific supporting documentation may be requested after the affidavit has been filed.

Appeal: If a claim to residency is denied by the residence officer, appeal may be made to the Interinstitutional Review Committee (IRC) through that officer. Submitting additional information in writing as well as a personal appearance to present one's case to the committee is permitted. Claims denied by the IRC may be appealed within ten (10) days of the date of the mailing or other service of the IRC decision, to the Vice Chancellor for Academic Affairs or designee. The only recourse to a claim denied by the ARC is the courts.

Administrative Rules Governing Residence Classification

Determination of Residence (580-10-030)

1) For purposes of admission and instruction fee assessment, department institutions shall classify all students (except students attending a summer session) as Oregon resident or nonresident.
2) For this purpose, an Oregon resident is a person with a bona fide fixed and permanent physical presence established an maintained in Oregon **of not less than twelve consecutive months immediately prior to the term for which residence status is requested.** Determination of residence includes finding it to be the place where the person intends to remain and to which the person expects to return
2) when leaving Oregon without intending to establish a new domicile elsewhere and shall be based on consideration of all relevant objective factors, including but not limited to abandonment of prior out-of-state residence; history, duration, and nature of noneducational activities in Oregon; sources of financial support, including location of source of support and amounts of support; location of family; ownership of real property in Oregon; presence of household goods in Oregon; filing of Oregon income tax return as an Oregon resident; and state of vehicle and voter registration. Residence is not established by mere attendance at an institution of higher education and

physical presence in the state while attending such an institution.

3) The criteria established in section 2 of this rule shall also be used to determine whether a person who has moved from the state has established a non-Oregon residence.

4) If institution records show that the residence as defined in OAR 580-10-030(2) of a person or the person's legal custodian is outside of Oregon, the person shall continue to be classified as a nonresident until entitlement to resident classification is shown. The burden of showing that the residence classification should be changed is on the person requesting the change.

Residence Classification of Armed Forces Personnel (580-10-035)

1) For purposes of this rule, armed services means officers and enlisted personnel of the United States Army, Navy, Air Force, Marine Corps, and Coast Guard.

2) Notwithstanding OAR 580-10-030, members of the armed services and their spouses and dependent children who reside in this state while assigned to duty at any base, station, shore establishment, or other facility in this state or while serving as members of the crew of a ship which has an Oregon port of shore establishment as its home port or permanent station shall be considered residents for purposes of the instruction fee.

3) An Oregon resident entering the armed services retains Oregon residence classification until it is voluntarily relinquished.

4) An Oregon resident who has been in the armed services and assigned on duty outside of Oregon must return to Oregon within sixty days after completing service to retain classification as an Oregon resident.

5) A person who continues to reside in Oregon after separation from the armed services may count the time spent in the state while in the armed services to support a claim for classification as an Oregon resident.

6) The dependent child and spouse of a person who is a resident under section 2 of this rule so shall be considered an Oregon resident. "Dependent child" includes any child of a member of the armed forces who (a) is under 18 years of age and not married, otherwise emancipated, or self-supporting, or (b) is under 23 years of age, unmarried, enrolled in a full-time course of study in an institution of higher learning, and dependent on the member for over one-half of their support.

Residence Classification of Aliens (580-10-040)

1) An alien holding an immigrant visa or an A, E, G, I, or K visa, or otherwise admitted for permanent residence in the United States, is eligible to be considered an Oregon resident if OAR 580-10-030 (2) is otherwise satisfied. The date of receipt of the immigrant visa or the date of approval of an alien's application for lawful permanent residence, whichever is earlier, shall be used for determining residence under rule 580-10-030.

Changes in Residence Classification (580-10-041)

1) If an Oregon resident student transfers to an institution outside of Oregon and later seeks to re-enroll in a department institution, the residence classification of that student shall be re-examined and determined on the same basis as for any other person.

2) If a person whose nonresident legal custodian establishes a permanent Oregon residence as defined in OAR 580-10-030(2) during a term when the dependent is enrolled at a department institution, the enrolled person may register as a resident at the beginning of the next term.

3) Once established, classification as a resident continues so long as the student remains in continuous academic-year enrollment in the classifying institution.

4) A person who seeks classification as a resident under these rules shall complete and submit a notarized Residence Information Affidavit. The affidavit must be submitted by the last day to register for the term in which resident status is sought.

PAYMENT OF STUDENT FEES

Payment of Nonresident Instruction Fee (580-10-080)

1) All students classified as nonresidents shall pay a nonresident fee.

2) Refunds of the nonresident fee may be granted if the student shows that the classification previously assigned was in error, but no such refund shall be made unless the student applies and submits all supporting information for residency status prior to the last day to register for the term in which the student seeks change of status.

Waiver of Nonresident Instruction Fee (580-10-081)

1) Notwithstanding the provisions of rule 580-10-080, the following nonresident students shall be permitted to pay instruction fees at the same rates as Oregon resident students.

ENROLLMENT OF SPOUSE AND DEPENDENT CHILDREN (580-10-086)

The spouse and dependent children of regular Department staff members with a full-time equivalent of at least .50 may enroll as students at resident fee rates in department institutions.

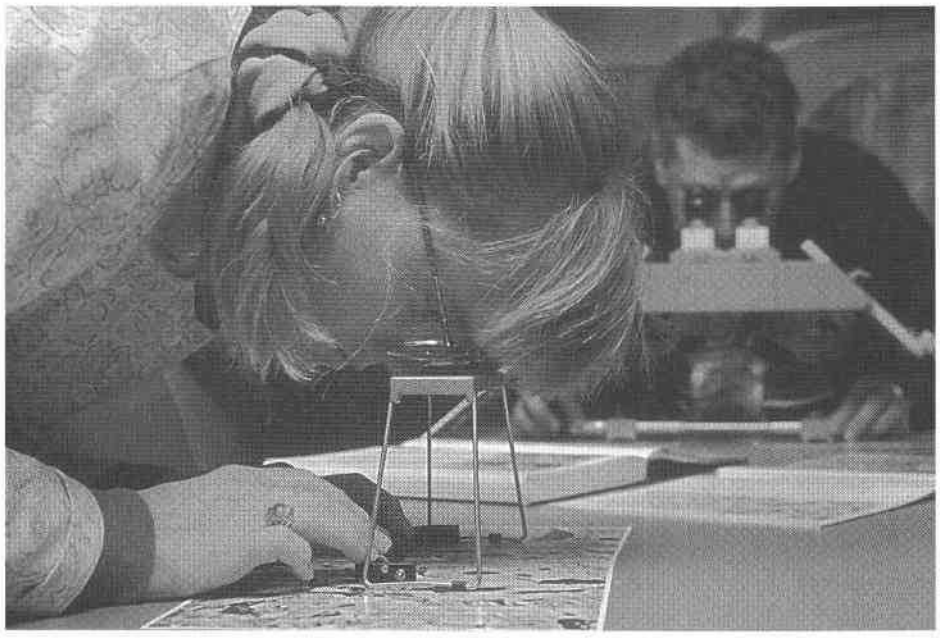
STUDENT EXCHANGES (580-10-085)

1 (a) Under the WICHE student exchange program, certification of students as Oregon residents for purposes of attending institutions not under board control or in other states shall be guided by rules set forth in Division 10. In order to be considered for WICHE certification, the student's completed application must be received by the certifying officer on or before October 15 of the year preceding admission. An application received after that date in an envelope postmarked not later than October 15 will be deemed to have been received on the 15th. Residency shall be determined as of the date of the application for WICHE certification, not as of the date of expected admission or registration to an institution.

(b) Persons applying for WICHE certification must be certified as Oregon residents and placed in ranked preference order within each program. Ranked preference order is determined by a score based on the grade point average of all college work plus .25 times the number of years of residence in Oregon up to a maximum of ten years.

2 (a) The department and separate institutions may enter into agreements with individual institutions in other states or other countries whereby resident students specified by name in the Oregon institutions may transfer to the other institution, and an equal number of students specified by name from the other institution may transfer to the Oregon institution with a reciprocal waiving of additional fees ordinarily assessed to nonresident students in both institutions.

Grades, Regulations and Records



GRADING SYSTEM

Grades

The grading system consists of twelve basic grades, A, A-, B+, B, B-, C+, C., C-, D+, D, D- and F. A denotes exceptional accomplishment; B, superior; C, average; D, inferior; F, failure. Other marks are I, incomplete; W, withdrawal; R, thesis in progress; P, pass; N, no credit; S, satisfactory (A-C-); U, unsatisfactory (D+-F).

When a requirement of a course has not been completed for reasons acceptable to the instructor and the rest of the academic work is passing, a report of I (incomplete) may be made and additional time granted. The I is only granted at the discretion of the instructor. If a student misses the final without notification and approval acceptable to the instructor, the instructor will report the grade that is appropriate for the requirments of the course. The instructor states the deficiency and the deadline for completing the missing work on the grade roster. The additional time awarded shall in no case exceed one calendar year. To remove the I grade, the student must complete the deficiency within the allotted time and the instructor will then submit the appropriate grade. If the student fails to complete the work within the allotted time the instructor has the option of either submitting a substitute grade or allowing a permanent grade of I to remain on the student's record. The I grade will have no effect on the student's grade point average.

Students may withdraw from a course. In such cases, a grade of W is assigned. A student who discontinues attendance in a course without official withdrawal receives a grade of F in the course.

Grade Points

Grade points are computed on the basis of 4 points for each credit of A grade, 3.7 for each credit of A- grade, 3.3 for each credit of B+ grade, 3.0 for each credit of B grade, 2.7 for each credit of B- grade, 2.3 for each credit of C+ grade, 2.0 for each credit of C grade, 1.7 for each credit of C- grade, 1.3 for each credit of D+ grade, 1.0 for each credit of D grade, .7 for each credit of D- grade, and 0 for each credit of F. Marks of I, W, P, N, R, S, and U are disregarded in the computation of points. The grade point average (GPA) is the quotient of total points divided by total credits; total credits are the number of term credits in which grades A, B, C, D, and F are received.

ACADEMIC REGULATIONS

Satisfactory Academic Standing (Undergraduate students)

Oregon State University expects students to maintain satisfactory academic progress toward degree completion. At the conclusion of each term, grade point averages are calculated and academic standings determined for students seeking a baccalaureate degree. Students whose standings evidence a lack of satisfactory progress will be warned of this condition and advised to seek help from their academic advisors.

Academic Warning: Students with a term GPA below 2.0 will be placed on Academic Warning.

Academic Probation: Students who have completed two or more terms at O.S.U. and have an O.S.U. cumulative GPA below 2.0 will be placed on Academic Probation. Students who attain a cumulative GPA of 2.0 or better are removed from Academic Probation.

Academic Suspension: Students who are on Academic Probation and have a subsequent term GPA below a 2.0 will be placed on Academic Suspension.

Academic Suspension is recorded on the student's academic record. Students who are academically suspended are denied all privileges of the institution and of all organizations in any way connected to it, including any University recognized living group.

Suspended students will be considered for reinstatement to the University after two years or completion of a minimum of 24 quarter credits of transferrable college level work at an accredited college or university, with a GPA of 2.5 or above.

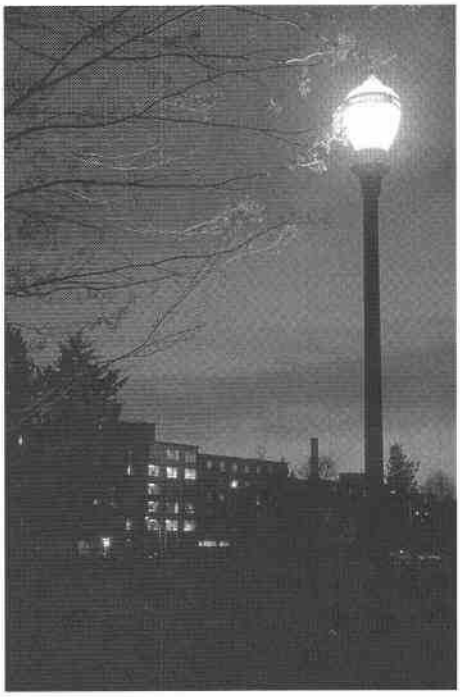
The Faculty Senate Committee on Academic Standing is charged with the responsibility for enforcement of the regulations on Satisfactory Academic Standing. Additionally, this committee has discretionary authority to grant exceptions and to develop guidelines for the administration of these regulations.

Attendance

An instructor has the privilege of considering class participation in arriving at a student's grade, but it is not intended that attendance in and of itself normally be a factor in measuring a student's academic accomplishment in a course.

Other Limitations

Academic performance is not the sole criterion for admission to and continuation in certain courses and programs at the University, such as practicum courses and internships. The University may find it necessary to evaluate a person's background to determine his or her likelihood of maintaining standards of professional conduct that are necessary in the academic discipline or profession. An evaluation may take into consideration current performance as well as past experiences and actions that could affect a student's ability to perform in the particular course or program.



Student Conduct Regulations

All students enrolled at Oregon State University are expected to conform with certain basic regulations and policies that have been developed to govern the behavior of students as members of the University community. These regulations have been formulated by the Student Conduct Committee, the Student Activities Committee, the University administration, and the State Board of Higher Education. Violations of the regulations subject a student to appropriate disciplinary or judicial action. The regulations and the procedures for disciplinary action and appeal are outlined in detail in the OSU *Schedule of Classes* published every academic year.

Student Records

Family Educational Rights and Privacy Act of 1974, Public Law 93-380, as amended, provides that Oregon State University students have the right to inspect their education records that are maintained by Oregon State University; the right to a hearing to challenge the contents of those records when they allege the records contain misleading or inaccurate information; the right to give their written consent prior to the release of their records to any person, agency, or organization other than University officials and certain authorized federal and state authorities. The Student Records Policy is printed in its entirety in the *Schedule of Classes*. Information about specific procedures is available upon request from the Office of the Registrar.

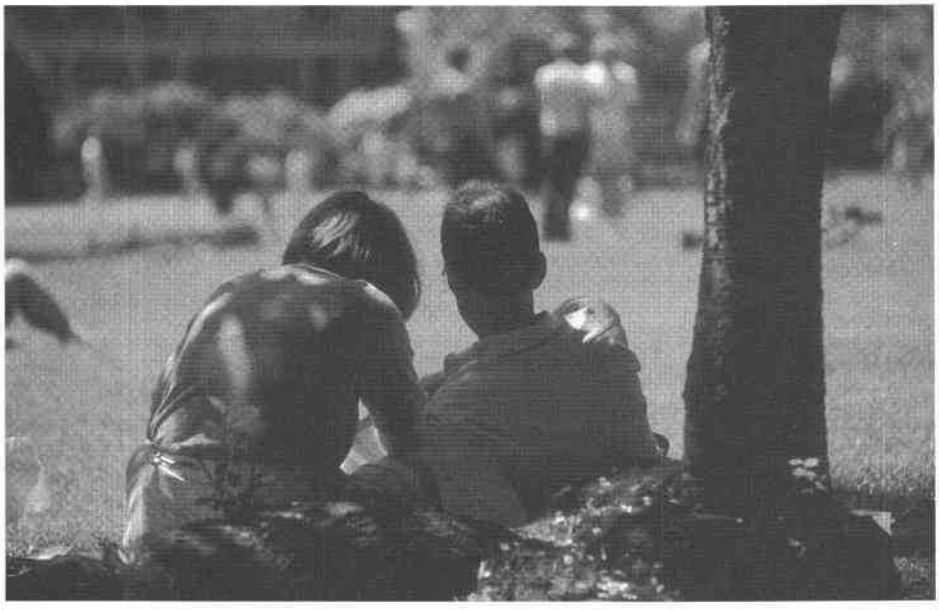
Progress Standards for Veteran Students

Oregon State University students who are receiving benefits from the Veterans Administration are subject to the Satisfactory Progress Standards as set forth in 38 U.S.C. section 1674, 1724, 1775, and 1776, in addition to those established by the University as published in the Academic Regulations. The following apply only to students who are receiving VA benefits including Reservists under Chapter 106:

1. Students must complete with a passing grade (A through D-, I, P, R, S) and an overall term grade-point average greater than 2.00 the following number of credits in courses specifically required for the student's major based upon the term's VA certification:

   Undergraduate Students
   Full-time—12 credits
   Three-quarter time—9 credits
   One-half time—6 credits

   Graduate Students
   Full-time—9 credits
   Three-quarter time—7 credits
   One-half time—5 credits
2. Students must complete all drop procedures within the first ten days of the term and withdrawal procedures within the first four weeks of each term. Students dropping or withdrawing must notify the Veteran's Clerk in the Registrar's Office and may be subject to the noncompliance provisions of the Satisfactory Progress Standards.
3. Students who do not meet the above provisions will be notified that they are on probation insofar as the Veterans Administration progress standards are concerned. If a student's deficiency is not corrected within two consecutive terms, the University will notify the Veterans Administration of his or her unsatisfactory progress.
4. Students who withdraw entirely from the University (except where there are circumstances beyond the control of the student) will not be subject to the two-term probationary period and will be reported immediately to the Veterans Administration as making unsatisfactory progress due to withdrawal. Recertification will be made when the student is granted readmission to the University.
5. Students determined as making unsatisfactory progress will be recertified upon obtaining the written approval of the VA Counseling Service or adjudicator at the VA's Portland regional office. A certificate of eligibility of such consent must be presented to the Veterans' Clerk. An exception to the above will exist for students who are suspended from the University and are granted reinstatement by the University's academic deficiencies committee.
6. Students dismissed from the University for unsatisfactory conduct will be reported as making unsatisfactory progress. Only upon rescission of the dismissal by the University will recertification be made.



Financial Aid

Oregon State University's financial aid program provides assistance and advice to students who would be unable to pursue their education at the University without such help. Scholarships, grants, loans, and part-time employment are available to meet the difference between what the student and the student's family could reasonably be expected to provide and the expected cost of attending OSU.

EXPENSES

The OSU Financial Aid Office develops standard student budgets to use as a guide to determine need and to make financial aid awards. They are reviewed each year and revised accordingly. Individual student budgets may vary depending on lifestyle and individual needs.

For the 1995-96 academic year (9 months), expenses are listed below. (Tuition and fees will be set by the State Board of Higher Education at a later date and are subject to change without notice.)

	Resident	Nonresident
Tuition and fees	$3,048	$9,096
Board and room	3,990	3,990
Books and supplies	720	720
Miscellaneous	2,322	2,322
	$10,080	$16,128

Graduate students tuition is $4,722 for Oregon residents and $7,590 for nonresidents.

Financial aid applicants are assigned the appropriate student budget. Pharmacy, Engineering, and MBA students have an additional study resource fee assessed. Individual student budgets may be adjusted for child care cost for children under 12, medical and/or commuting cost. Miscellaneous includes such items as transportation, clothing, laundry, recreations and personal supplies. Miscellaneous costs allow the student flexibility in spending priorities.

ELIGIBILITY

To qualify for financial aid, a student must be a U.S. citizen or an eligible non-citizen, admitted and enrolled at least half-time at the University in an academic program leading to a degree or certificate and have financial need. Students must also be making satisfactory academic progress, not owe a refund on a Federal grant or be in default on a Federal educational loan and have a Social Security number.

Each year students must submit a financial aid application to a processor approved by the Federal Government. The processor analyzes the information in accordance with a method prescribed by Congress. A detailed financial analysis is then forwarded to Oregon State University. Upon receiving the financial report from the processor, the financial aid adviser determines a student's eligibility for financial aid funds. Applicants are awarded aid according to financial need, meeting application deadlines and their willingness to accept the package as provided by the OSU Financial Aid Office.

To qualify for financial aid, a student must demonstrate financial need, be a U.S. citizen or have an immigrant visa, and be enrolled as a full-time student. The only exception is for part-time students (6-11 credit hours) who may qualify for Pell Grant and Federal Direct Stafford Loan.

Financial aid is not available to students who plan to attend OSU only during summer term.

In applying for financial aid, a student is required to submit a Free Application for Federal Student Aid to the Federal processing center. This service uses a fair and uniform analysis system based on a student's family income, assets, and other resources to determine need. Upon receiving the financial report from the needs analysis service, the financial aid staff determines a student's eligibility for financial aid funds.

Once students establish eligibility for financial aid, they will be awarded aid, provided they meet the deadlines stipulated below and are willing to accept the package as provided by the OSU Financial Aid Office. Of the financial aid applications received by OSU by March 1, 1995, for the 1995-96 academic year, 60 percent of the eligible applicants received some form of financial assistance.

APPLICATION PROCEDURES

Students should apply for financial aid by completing the Free Application for Federal Student Aid (FAFSA) or the Renewal Application and sending it to the federal processor. Renewal Applications are mailed to students who applied for aid in the previous 1994-95 academic year. Entering freshman should obtain the FAFSA from their high school. Applications are generally available in early November at the high schools or from the OSU Financial Aid Office.

Applicants should list Oregon State University and code 003210 on the application to the federal processor. This ensures that the information is sent to OSU on our computer system.

Money is limited with students who complete the application process by March 1 having the best chance of receiving priority funding. This means your financial aid application must be processed by the federal processor and sent to OSU by this date. To allow time for your financial aid application to be processed and transmitted to Oregon State University, applicants should mail the application to the processor by February 1. Entering students are also required to have an admission application on file with the OSU Admissions Office.

Applications received by our office from the processor by our March 1 deadline will be considered for our priority funding. Students will be notified of their eligibility in April. Applicants who miss the deadline will be considered late with limited funding being available.

Students transferring from another college or university are also required to supply our office with a financial aid transcript (FAT) from all schools previously attended. This important requirement must be met even if no aid was received at the previous institution.

KEITH MCCREIGHT
Director

EMILIO VEJIL
Associate Director

REBECCA MARTINEZ
Associate Director

PATTI BRADY-GLASSMAN
Assistant Director

BARBARA DUNN
Assistant Director

NANCY VAN DE WATER
Assistant Director

TYPES OF AID

The three types of basic financial aid offered by federal and state programs and the university are: grants and scholarships, loans and work-study. Undergraduate students who submit a Free Application for Federal Student Aid (FAFSA) or a Renewal Application to Oregon State University are considered for six major types of financial aid. Graduate and postbaccalaureate students are considered for the Federal Perkins Loan, the Federal Work-study Program and the Federal Direct Student Loan Program. Graduate students should also apply through their departments for assistantships and/or research grants.

The provision of financial aid programs are subject to change without notice based on final determination of the regulations by the federal government and funding limits.

GRANTS/SCHOLARSHIPS

Funds that do not have to be repaid.

Federal Pell Grant

Eligibility is based on need as determined by the federal government and as indicated on the Student Aid Report. Available to undergraduates with awards ranging from $200 to $2300 depending on enrollment and allowable educational expenses.

Federal Supplemental Educational Opportunity Grant (SEOG)

Additional grant funds are available to full-time undergraduates with Pell eligibility and high financial need. Award amount for 1994-95 was $600.

State of Oregon Need Grant

Administered by the Oregon State Scholarship Commission (ESSC)O, grants are awarded to full-time undergraduate applicants who are Oregon residents. Twelve terms of eligibility are possible based on need and allowable funding. This grant may be transferred to other eligible institutions. Awards for 1994-95 were $990 each.

Oregon State System of Higher Education Tuition Waiver

The Oregon State Board of Higher Education provides limited funds to help offset increases in tuition. Eligibility is limited to resident undergraduates enrolled full-time with high financial need. Students receiving other tuition scholarships, waivers or grants are not eligible for the fee waiver.

All-Campus Scholarships

The OSU Financial Aid Office and the University Financial Aid Committee administer some scholarship funds. Students who complete the financial aid application process by March 1 are considered for these limited scholarships; a separate application is not required. Eligibility is restricted to undergraduates who have completed fewer than 12 items.

Departmental Scholarships

Each department on campus administers scholarship funds associated with its college and its programs of study. Scholarship committees within the college select recipients in accordance with the bequest of the donors. Students should contact their college or department directly for information and applications. Graduate students should contact their department for information on assistantships, fellowships and graduate scholarships.

LOANS

Borrowed money you repay with interest.

Perkins Federal Loan

Long term, 5% interest rate loan to be repaid nine months after leaving school. Available to undergraduates, postbaccalaureate and graduate students, enrolled full-time with high financial need. The maximum loan amount per year at OSU depends on available funds as determined by a financial aid adviser. The maximum amount for undergraduates is $3,000 per academic year, up to a maximum of $15,000. Graduate students may borrow a maximum of $5,000 per academic year, up to a limit of $30,000 for both undergraduate and graduate study. Interest free loan until repayment begins after you are no longer enrolled at least half-time. Interest is 5 percent a year on the unpaid balance. Payments and the length of the repayment period depend on the size of your debt with 10 years usually being the maximum. Deferments are possible under certain conditions and are handled by the OSU Business Office Affairs, Administrative Services Building.

Federal Direct Student Loans

Direct lending is a new loan program available at Oregon State University beginning summer term 1995. Under direct lending, the federal government lends funds to eligible students through the school. This program replaces the Federal Stafford Loan with funds borrowed through a private lender such as a bank. Eligibility is need based on subsidized or non-need based for unsubsidized as determined by the Financial Aid Adviser. These long term, low interest rate loans have a variable interest rate which is established each year but will not exceed 8.25%. A 4% administrative fee is taken from the amount of the loan by the federal government prior to the funds being disbursed to you.

The loan proceeds will then be applied to your student billing account to cover school charges with any remaining money being refunded to you for living expenses. The Federal Government pays the interest on the subsidized Federal Direct Stafford loan while the student is enrolled in school at least half-time. The maximum loan limits set by the federal government are:
$2625 for the first year of undergraduate
$3500 for the second year of undergraduate study
$5500 per academic year for the remaining years of undergraduate study, up to a total of $23000?–?$8500 per academic year for graduate students for a combined total of $65,000 for undergraduate and graduate study.

An unsubsidized Federal Direct Loan can replace the expected family contribution. In no case can the unsubsidized Federal Direct Loan exceed the difference between the cost of education and other financial aid (including the subsidized Federal Direct Loan).

Independent students may borrow an additional unsubsidized Federal Direct Loan. The additional loan limits are:
$4000 for the first year and second year of undergraduate study
$5000 per academic year for the remaining years of undergraduate study
$10,000 per academic year for graduate students

Federal Direct Parent Loan for Undergraduate Students (PLUS)

Federal Direct Parent Loan is available to parents to assist with educational expenses. The interest rate is variable, not to exceed 9 percent. A parent may borrow up to the cost of education or the difference between the cost of education minus any financial assistance the student may receive. Repayment begins within 60 days of the date of disbursements. An administrative fee of 4% will be charged.

Emergency Loans

The Financial Aid Office maintains a short-term emergency loan fund for students who have been admitted to the University and are enrolled at least half-time. Emergency loans up to a maximum of $300 are available to meet temporary needs during an academic term. The loan is not available between terms and must be repaid by the end of each term.

FEDERAL WORK-STUDY PROGRAM

The Federal Work-Study Program provides part-time employment to students with high financial need to earn money towards their educational expenses. Students earn an hourly wage based on the type of work, their skills and experience. Preference is given to full-time students. Referrals are given by the Financial Aid Office for employment on campus or at an approved site in the community.

EMPLOYMENT

Students who do not qualify for work-study can seek assistance for temporary or part-time employment on-campus with the Student Employment Services. For information, visit or call Student Employment Services, Administrative Services building B008A, Corvallis OR 97331 (503) 737-2779.

For off-campus employment opportunities, the Financial Aid Office will list jobs that employers wish to post. This job board is located outside the financial aid office across from the elevators.

EXPECTED FAMILY CONTRIBUTION

The purpose of financial aid is to fill the gap between college costs and what a family can reasonably be expected to pay. When a student chooses to attend college, they assume the responsibility of paying for their

education. Tax-supported aid programs exist to supplement the families efforts, not to replace them. The information you report on the financial aid application is used in a formula established by Congress that calculates an amount you and your family are expected to pay toward your education.

Student Contribution

Students are expected to contribute toward educational expenses from earnings, savings, and other resources such as child support, Aid to Dependent Children, loans or cash gifts from relatives or friends.

Parent Contribution

Parent contribution is used because the U.S. Congress has said that families have the primary responsibility of funding college education. The information provided by them on the application is used to determine financial strength and ability to contribute. It does not attempt to measure their willingness to contribute. The amount that the parents are expected to contribute is based upon parents' income, net assets, family size and number of family members in college. If necessary, parents may borrow through the Federal Direct PLUS Loan to meet their expected parent contribution..

Dependency Status

Certain questions you answer on the aid application will determine whether you are considered dependent on your parents and must report their income and assets as well as your own, or whether you are independent and must report only your income and assets (and those of a spouse). You are considered independent of your parents if you are:

- 24 years old before January 1, 1996.
- an orphan or ward of the court.
- a veteran.
- a graduate or professional student in 1995-96.
- married or if you have legal dependents other than a spouse.

Applicants should contact the OSU Financial Aid Office if they have concerns regarding their family situation.

Financial Need

Once your expected family contribution (EFC) has been calculated, your need is determined by taking this amount and subtracting it from the cost of education at Oregon State University. If anything is left over, you are considered to have financial need.

The Aid Package

Once a student's need has been determined, an aid packaged is developed based on the availability of funds and the level of need in relation to other student applications. The OSU Financial Aid Office attempts to meet a student's full need, but this is not always possible. Students with extremely high need, limited aid programs and dollar limits within the individual programs may prevent a student from having their full need met..

Scholarships are also a form of financial aid and must be considered in a student's aid package. They may not replace the family contribution. A student's financial aid package may be revised at any time during the school year to include all scholarships being received. Students receiving federal or state aid are limited to a maximum amount of aid which may not exceed the cost of education. The scholarship can be allowed to fill any unmet need. Any necessary reductions are then made from loans and work-study with each student's situation being treated individually.

Award Notification

When a student's financial aid package has been completed, they are sent an award notification which indicates all the types of aid for which they qualified. The award letter indicates the aid programs the student is scheduled to receive and stipulates the conditions of the award. Students should report any scholarships to be received that are not noted on their award letter.

Repayment Policy

Students who withdraw from Oregon State University prior to completion of a term must repay to OSU a portion of financial aid received through Perkins Loan, Pell, SEOG, and State Need Grant programs. The portion of financial aid which must be repaid is calculated based on the date of withdrawal and the amount of aid money remaining after tuition and fees are paid. The amount of aid received is multiplied by the percent of federal aid received from the programs listed above and the percent the student must repay listed below. Aid repaid is applied to the programs in the order listed above.

The cash disbursement repayment policy is as follows:

Week of classes	Percent student repays
1	75
2	75
3	50
4	50
5	25
6	25
7	0

Student Responsibilities

Academic Progress Requirements

Financial aid recipients are required by regulation to maintain satisfactory academic progress in order to continue to receive aid. Undergraduate and postbaccalaureate students attending full-time are required to successfully complete at least 36 credits for the academic year; full-time graduate students must successfully complete at least 27 credits. Letter grades of F, U, N, I, do not apply. Repeated classes also do not count. In addition, a student must meet the University's academic regulations outlined under the section entitled Academic Regulations and complete their degree program within a reasonable period of time as established by the university. Failure to meet these minimum requirements may result in cancellation of aid for subsequent terms or school years. Prior to disbursement each quarter, a student's aid may be withheld or the student may be placed on probation based on prior academic performance. Should aid be withheld for academic reasons, the student will be requested to explain in writing the reasons he or she did not achieve the minimum standard. A decision on continuing aid will be made by the financial aid staff. Decisions may be appealed first to the director of financial aid, the financial aid committee, and then to the dean of students.

Change in Status

Students must notify the Financial Aid Office if they withdraw from the University during a term or do not register for a term. Changes in family status should also be reported (marriage, separation, divorce, childbirth).

Reporting of Other Resources

A financial award may be canceled at any time if there is evidence that the statement of financial conditions was misrepresented on the application. Students must inform the Financial Aid Office promptly of any significant changes ($100 or more) in the information originally submitted.

Funding Statement

Awards may be adjusted during the year by the Financial Aid Office because of inadequate institutional, state, or federal funding, or other unforeseen factors such as changes in student attrition or percentage of award acceptance.

Renewal of Financial Aid

Students must reapply each year to receive financial aid. Oregon State University is not obligated to continue aid beyond the last term stated on the award letter. Receipt of financial aid depends on the student's academic performance, financial need, and the availability of student financial aid funds.

Appeals

Students who are dissatisfied with a decision of a financial aid staff member may appeal that decision, in writing, and then in person to the following persons in the order indicated: the Director of Financial Aid, the Financial Aid Appeals Subcommittee, and the Dean of Students.

Disbursement Procedures

Each term, approved grants, scholarships, and student loans will be credited on the student's billing statement. Any funds left over after school charges have been paid will be refunded at the beginning of each term to the student. Federal Work-Study earnings are paid each month by check for hours worked in the previous monthly pay period.

Scholarships and Awards

All scholarship amounts and criteria subject to change without notice. New scholarships are constantly being established. For additional scholarships, contact the college or department, or financial aid office.

COLLEGE OF LIBERAL ARTS

Listed below are scholarships and awards currently available in the various departments and programs within the College of Liberal Arts. Applications may be submitted for some, while others are selected by the appropriate faculty. If you have any questions, please contact the department concerned.

Dean's Scholarship in the Liberal Arts
Funding equivalent to in-state tuition but open to both in-state and out-of-state students. Awarded annually on the basis of academic achievement to a student enrolled in the College of Liberal Arts.

Bartholomew Memorial Scholarship
For students in Liberal Arts, to be decided by the dean.

CLA Minority Scholarships
A $200 OSU Bookstore scholarship for incoming CLA minority students.

William Q. Wick Memorial Scholarship
$500 scholarship for a CLA undergraduate student with leadership abilities.

James Hart Cook Memorial Scholarship
For a senior majoring in English or Liberal Studies (language arts focus) interested in pursuing a Masters in Teaching.

John and Anne Hatch Scholarship
$500 for an undergraduate student majoring in Foreign Languages and Literature or pursuing coursework in photography who demonstrates strong community or volunteer involvement and who is committed to making a difference in the world.

Anthropology

Thomas C. Hogg Memorial Scholarship
$450 for a foreign student who is a first-year graduate student. Contact Department of Anthropology, Waldo Hall 238.

Kalervo Oberg Award
Presented annually to the outstanding senior in anthropology.

Art

Most scholarships in the Department of Art require achievement in the studio arts and excellence as demonstrated by a portfolio of students' work. Criteria generally includes financial need. For more information, contact the Department of Art, Fairbanks Hall 105.

Fine Art Award in Painting
$100 for a junior, $200 for a sophomore.

Hollands Memorial Art Scholarship
$600. First priority for a female.

Rachel and Harold Hollands Grant
A $400 grant awarded for fall term to a woman art major. Award based on financial need, scholastic achievement, good character, and U.S. citizenship.

Ida M. Matsen Memorial Art Scholarship
$600 scholarship for an undergraduate student.

Matsen-Davidson Scholarship
$900 for a freshman or sophomore.

Norma Seibert Scholarship
$1800 for a student interested in printmaking.

Wayne Takami Memorial Scholarship

Economics

Emory Castle Fellowship
For graduate students working toward a degree in economics, resource economics, or forest resources. Contact B. Starr McMullen, Bal E 319D.

English

Criteria for English Department scholarships generally based on academic performance, with a minimum GPA of 3.50 in English classes. Financial need not a factor. For more information, contact the Department of English, Moreland Hall 240.

Mary Jo Bailey Memorial Fellowship
$100. Preference for women with the goal of teaching college-level English.

Raleigh Clare Dickinson Memorial English Scholarship
$500 for an outstanding English major based on extraordinary academic promise.

Bernard Malamud Memorial Scholarship
Approximately $500 awarded to a high school senior who shows exceptional talent in literature and writing, and intends to major in English at OSU.

Mary Holaday Murray Scholarship in English
$1000 for freshman, sophomore, or junior based on extraordinary academic promise.

Herbert Nelson Memorial Award
$300 to a graduating senior of outstanding promise as a high school English teacher.

Sigurd H. Peterson Memorial Scholarship
Full in-state tuition for a junior or senior with superior academic achievement.

Robert Schwartz Essay Award
$100 for best essay submitted as part of an English course

Roger Weaver Poetry Award
$100 for best poems submitted to contest.

History

Arthur E. Gravatt Award
$300 in awards to two history majors whose seminar papers have the potential for publication.

Robert Wayne Smith Book Award
A $20 credit toward book purchase (other than textbooks) for as many as ten students. Awarded by the Department of History, in cooperation with OSU Bookstores. Selection honors authors of the best research papers or review essays submitted in history courses during the academic year.

Music

Most scholarships in the Music Department are based on performance ability and achievement. Financial need generally not a factor. For additional information and application forms, contact the Department of Music, Benton Hall, Room 101.

Alice Dilworth Memorial Award
Presented annually to an outstanding senior.

Kathleen Byrne Freeman Memorial Scholarship
$1000 to a student specializing in vocal music. Audition required.

Music Education Award
Presented annually to the outstanding senior in music education.

Music Scholarship
Application includes audition of musical talent.

Lois & Wait Rising Scholarship
Application includes audition of musical talent.

Symphonic Band Scholarship
For students participating in concert or symphonic band.

Philosophy

Franklin J. Matchette Award
$100 awarded each spring term by the Department of Philosophy to an undergraduate for excellence in the study of philosophy.

Franklin J. Matchette Prize
$100 presented each spring term by the Department of Philosophy for an outstanding undergraduate essay in philosophy.

Student-Faculty Research Award
Amount awarded varies. Students can be hired as research assistants for faculty research projects.

Psychology

Psychology Scholar Award
Quarterly award of $100 for books to junio or senior psychology major with a GPA of 3.50 or above. Recipient selected by department faculty.

Sociology

Sociology Scholarship Awards
Through the generous donations of the friends of the Department of Sociology, partial support may be available to deserving students in good academic standing. Contact the Sociology Department for additional information.

Speech Communication

D. Palmer Young Memorial Drama Scholarship
In-state tuition for one term (not necessarily awarded every year). Selection by the theater arts faculty, based on student's involvement in and commitment to the theater program, the apparent promise of continuing contribution, and financial need. Not offered every year.

Women Studies

Judy Mann DiStefano Memorial Scholarship
$1500. Yearly award to an undergraduate enrolled in the Women Studies certificate program; based on commitment to feminist ideals, community service or activism, need and achievement. Contact the Women Studies Program, 200 Social Science Hall.

Sally Hacker Memorial Women's Research Fund
Awarded only to undergraduate students at OSU, with preference given to returning women students in the College of Liberal Arts. Grants shall be to assist research related to women's issues and the dissemination of research results.

COLLEGE OF SCIENCE

Unless otherwise stated below, students must have at least 30 credits at OSU to qualify. For additional information on science scholarships and application forms, contact the College of Science, Kidder Hall 128.

Any Science Major
John M. Blanchard Memorial Scholarship
$300 to an entering freshman with preference given to students from Sweet Home High School. Contact Sweet Home High School for more information and application form.

G.V. Copson Memorial Scholarship
Approximately $500 to a junior or senior with a GPA of at least 3.50 overall.

Dean's Scholarship in the Natural Sciences
Full resident tuition for a student in the College of Science with outstanding academic excellence.

Margaret Dowell-Gravatt, M.D., Scholarship
$1000 for a sophomore, junior, or senior majoring in microbiology, zoology, or prehealth, with first priority to female, ethnic minority. Financial need and minimum overall GPA of 2.50 and science GPA of 3.00 required.

Jesse Hanson Scholarship
Approximately 15 $500 scholarships to students with high scholarship, potential for success, unimpeachable character, service to the University through contributions to campus life.

Walter Rudd and June Martin Scholarship
To an outstanding new freshwoman in science or computer science.

Biochemistry/Biophysics
Bend Research Scholarship
$500 for an outstanding biochemistry/biophysics student from central Oregon.

Milton Harris Memorial Scholarship
$500 to outstanding students in biochemistry/biophysics with a minimum GPA of 3.50.

Biology
C.R. Herrick Memorial Scholarship
$300 to a senior majoring in biology.

Chemistry
Milton Harris Memorial Scholarship
$500 to outstanding students in Chemistry with a minimum GPA of 3.50.

William J. Ingram Memorial Fellowship
$500 for a first-year graduate student based on scholarship, research progress, and progress on cumulative exams.

Entomology
Undergraduate Entomology Scholarship
$250 to the top Entomology student.

Geography
Christian Hunt Memorial Scholarship
Approximately six scholarships of $320 awarded annually to undergraduate students with a high degree of personal integrity, honesty, and respect of other people. Intended for students who cannot qualify for other assistance.

Arthur Parenzin Memorial Graduate Research Fellowship
$500 to graduate student in geography nearing completion of M.S. thesis or Ph.D. dissertation.

Geology
Samuel Evans, Jr. Memorial Scholarship
Approximately $300 for a sophomore or junior who has demonstrated evidence of scholarship and professional motivation.

Earl L. Packard Achievement Award
$400 for a senior based on academic achievement and service to the Department and profession.

Math
Paul Copson Memorial Scholarships
Approximately $500 to a junior or senior with good character and a minimum GPA of 3.50.

Harry E. Goheen Memorial Book Award
Approximately $300 to a junior or senior with first priority to under-represented minority students.

Microbiology
Thomas R. Aspitarte Memorial Scholarship in Microbiology
$450 for a junior or senior majoring in environmental microbiology.

Helen A. Hays Women in Microbiology Scholarship
First priority to undergraduate women.

Mark H. Middlekauf Memorial Scholarship
Full in-state tuition for a junior or senior.

Donald L. and Barbara G. Overholser Scholarship
For outstanding junior (for senior year) as recommended by faculty and advisers.

Joseph E. Simmons Memorial Scholarship
Approximately one-half in-state tuition to a junior majoring in microbiology.

Tartar Fellowship
For graduate student in microbiology.

Physics
Paul Copson Memorial Scholarship
Approximately $500 to a junior or senior with good character and a minimum GPA of 3.50.

Physiology
Hugo Krueger Zoology Fellowship
For a graduate student studying physiology.

Predental Program
Kenneth Johnson Scholarship
$500 for an outstanding predental student.

Southern Willamette Valley Dental Society
$500 for an outstanding predental student.

Premedical Program
All scholarships for students studying premed are based on financial need and a minimum GPA of 3.50.

Alumni Physician Scholarship
Approximately $1000 to a senior accepted to medical school.

Ralph Bosworth Memorial Scholarship
Approximately $1000 to a senior accepted to medical school.

Augustin & Rita Gombart Medical Scholarship
Approximately $500 for a junior or senior.

Preprofessional Program
Dora Krueger Memorial Scholarship
A number of awards of approximately $750 each for sophomores, juniors, or seniors majoring in preveterinary medicine. Must have completed 75 credit hours at the close of winter term.

Statistics
Lyle D. Calvin Scholarship
$1000 to a student majoring in statistics.

Ruth Krueger Scholarship
$1000 to an undergraduate or graduate student majoring in statistics.

COLLEGE OF AGRICULTURAL SCIENCES

Agricultural Honors scholarships are for entering students with a record of leadership. Student must have been in the top 10 percent of their high school class, or have a community college transfer GPA of 3.50. For additional information about Agricultural Honors scholarships or non-major specific Agricultural Sciences scholarships, contact Liz Webb, CAS Student Advancement, Strand Ag Hall 137.

Any Agricultural Sciences Major
Leo Anderson, Jr. Memorial Scholarship in Extension Education
For graduate or undergraduate students based on academic achievement, leadership skills, and experience in Extension related activities.

Don Burlingham Memorial Scholarship
Tuition paid for a junior or senior with financial need. Also based on qualities of citizenship, leadership, character, and participation in campus/community activities.

Frank Burlingham Memorial Agricultural Honors Scholarship
Two scholarships of $1000 offered to entering students. Preference for students from the Woodburn, Oregon area.

Karla Chambers Leadership Agricultural Honors Scholarship
Approximately $1000.

Paul Culbertson Memorial Scholarship
Tuition paid for an undergraduate student with financial need. Preference for students from Jackson County, Oregon.

Charles E. & Clara Marie Eckelman Memorial Scholarship
Full-tuition and fees to juniors or seniors, with first priority to students majoring in food microbiology with an emphasis on the dairy industry. Equal weight for selection placed on scholastic performance; need; and

qualities of citizenship, leadership, character, and participation in campus and community events. Five scholarships, for students in the following departments: Microbiology, Food Science & Technology, Animal Science, Agricultural Business, and Agricultural & Resource Economics.

Charles E. & Clara Marie Eckelman Memorial Fellowship
$10,000 to graduate students, with first priority to students majoring in food microbiology with an emphasis on the dairy industry. Equal weight for selection placed on scholastic performance; need; and qualities of citizenship, leadership, character, and participation in campus and community events. Four fellowships, for students in the following departments: Microbiology, Food Science & Technology, Animal Sciences, and Agricultural & Resource Economics.

EOSC Oldfield Scholarship
For students registered within the OSU Agricultural Program at Eastern Oregon State College. For more information, contact Larry Larson, EOSC.

Eugene Fisher Agricultural Honors Scholarship
Approximately $1000.

H. H. Gibson Memorial Scholarship
$500 for a freshman with financial need. Must be a graduate of an Oregon high school who has completed work in vocational agriculture.

Jess Hanson Scholarship
This can be awarded to an incoming freshman or an undergraduate within the College of Agricultural Sciences. Preference will be given to Benton County High School graduates.

Malcolm Johnson Memorial Scholarship
Approximately $1000 for a student from Crook, Deschutes, or Jefferson counties in central Oregon. Based on financial need, scholastic standing, and leadership.

Lawrence E. Kaseberg Memorial Agricultural Honors Scholarship
$1000 to an entering student who has clear potential for career advancement. Priority for student with GPA of 3.80 and above.

Ursula Bolt Knaus Memorial Scholarship
A number of scholarships totaling approximately $14,000 devided annually between undergraduate students in Agricultural Sciences and Engineering.

Earl Meier Memorial Dairy Science Scholarship
Approximately $750 to a junior or senior with an interest in dairy production or dairy science.

Naumes Family Agricultural Honors Scholarship
Approximately $1000.

Ben & Ethel Pubols Memorial Scholarship
For an undergraduate or graduate student. Split on a rotation between Agricultural Sciences and Home Economics.

Dorothy & Harry A. Schoth Memorial Scholarship
For juniors or seniors with financial need and a minimum 3.00 GPA.

Clifford Smith Memorial Agricultural Honors Scholarship
Approximately $1000.

Loren J. Smith Memorial Agricultural Honors Scholarship
$1000 to an entering student based on leadership.

Herb & Anita Summers Agricultural Honors Scholarship
Approximately $1000.

Thornton FFA Scholarship
For current and former FFA members who are Oregon high school graduates, and who have completed at least two years in an agricultural science and technology program. First priority for students in Yamhill and Polk Counties.

Doris M. Tibbets Memorial Scholarship
For a sophomore, junior, or senior who is a well-rounded individual with drive and spirit.

James H. Weatherspoon Memorial Scholarship
For a junior or senior with financial need and an interest in agronomy. Priority for individuals from Baker, Wallowa, or Union counties.

Donald Welp Memorial Scholarship
For undergraduates in Food Science and Technology or Botany and Plant Pathology.

Agricultural & Resource Economics
For additional information and application forms, contact Cheryl Kolbe, key adviser, AREC, Ballard Extension 200B.

Agricultural Cooperative Council of Oregon Scholarship Award
Junior or senior in agricultural economics with an interest in farm cooperatives and agricultural business management.

Agricultural Business Management Scholarship
Agricultural Business Management major with junior or senior standing with a sincere purpose and goal to work in some area of agricultural business management, agricultural interest, and leadership potential. Financial need and scholastic standings considered but not deciding factors.

LeRoy Breithaupt Memorial Scholarship
For a junior or senior based on financial need, academic achievement, and overall University involvement.

William P. "Chip" Harris Memorial Scholarship
For sophomore, junior, or senior residents of Benton County. Must have attended high school for at least two years in Benton County.

Hollands Memorial Agricultural Economic Scholarship
For undergraduate student, based on financial need, scholarship, good character, and U.S. citizenship.

Robert Johnson Fellowship
For a graduate student in agricultural and resource economics.

D. Curtis Mumford Scholarship
For sophomore with a minimum 3.00 GPA. Must be education goal-oriented, career focused, with evidence of academic good standing.

Ermine & Norma Potter Memorial Scholarship
Several scholarships for undergraduate students based on financial need, scholarship, and overall University involvement. Intended for students whose activities have made a contribution to the Department.

Oregon Chapter: American Society of Farm Managers and Rural Appraisers Award
$500 for a sophomore or junior in agricultural economics with an interest in farm management and rural appraising, high scholastic accomplishments, demonstrated leadership and service attitudes, and a resident of Oregon.

Oregon Society of Farm Managers and Rural Appraisers Award
$500 for a sophomore or junior in agricultural economics with an interest in farm management and rural appraising, high scholastic accomplishments, demonstrated leadership and service attitudes, and a resident of Oregon.

Animal Sciences
For additional information and application forms, contact Dale Weber, key advisor, Animal Science, Withycombe Hall 310.

Prosser Clark Memorial Scholarship
For junior or senior with interest in career opportunities in the agricultural sector with an emphasis on livestock.

Hogg-Hubbard Fellowship
$1000 for a graduate student based on interest and experience in the sheep industry. Minimum GPA of 3.00. Financial need considered only when otherwise equally qualified candidates.

I. R. Jones Memorial Book Award
$75 for a student studying animal science with an emphasis on dairying.

Fred & Corinne McKenzie Memorial Fellowship
For students in animal sciences or veterinar medicine with an emphasis in the field of animal reproductive physiology.

Jack Miller Scholarship
$500 to an individual in animal sciences.

Oregon Fryer Commission Scholarship
$1000 to an undergraduate student in the poultry program with financial need. Must be a U.S. citizen with Oregon residence. Additional consideration given to students with previous experience with or relationship to Oregon Broiler Industry members.

Crop & Soil Science
For additional information and application form, contact Gerald Kling, key advisor, Crop & Soil Science, Ag and Life Sciences Bldg., 3005.

L. L. Anderson, Jr. Memorial Scholarship in Soil Science
For undergraduate or graduate student based on scholarship, leadership, and experience in Extension or possible future in Extension.

M. Dale Chipman Memorial Scholarship
For undergraduate students from Oregon or Idaho with financial need.

J. Ritchie Cowan Memorial Fellowship
For international graduate students with financial need whose interest is in agronomy.

Crop & Soil Science Entering Freshman Scholarship
For new freshmen students in Crop and Soil Science. $1,000 per year. Based on scholarship.

Crop Science Scholarship
For an undergraduate student in crop science.

Wilson H. Foote Memorial Scholarship
For an undergraduate student in crop science with financial need.

Donald D. Hill Memorial Scholarship
For an undergraduate student in crop science with financial need.

Arthur King Memorial Scholarship
Tuition plus $500 annual book allowance for sophomore, junior, senior, or graduate student with financial need and a true love of the subject of crop and soil science.

McGuire Crop Science Scholarship
For an undergraduate student with financial need.

Oregon Seed Growers League Scholarship
For undergraduate student in Seed Technology or Crop and Soil Science.

Oregon Seed Trade Association Scholarship
For undergraduate student interested in seed production in Crop and Soil Science.

Wilbur Powers Memorial Scholarship
For undergraduate students in soil science.

Robert H. Warrens Memorial Scholarship
For Junior or Senior undergraduate student taking courses related to farm crops and soil conservation. Amount varies and is based on scholarship.

William Kent Wiley, Jr. Memorial Scholarship
For graduate student specializing in grass seed science. Based on need and scholarship.

Timothy Wirth Memorial Scholarship
For undergraduate student in Crop and Soil Science who graduated from Linn County secondary school programs and with rural farm background.

Fisheries Science & Wildlife Science
For additional information and application forms, contact Charlotte Vickers, Fisheries Science & Wildlife Science, Nash Hall 104.

Roland E. Dimick Memorial Scholarship
$500 for a sophomore based on freshman year academic performance.

Hugo Krueger Fellowship
$1000 to a graduate student for research associated with fish physiology.

H. E. Mastin Memorial Scholarship
Three scholarships of $1000 to entering freshmen based on academic performance and financial need.

Bill Wick Scholarship
$1000 to an undergraduate based on scholarship and leadership abilities.

Thomas G. Scott Achievement Fund: graduate fellowship
$1500 to recognize research potential in graduate students.

Bob and Phyllis Mace Watchable Wildlife Scholarship
Two scholarships of $1000 to undergraduates and postbaccalaureate students based on need and leadership.

Memorial Mentorship
$3000 to an undergraduate with a strong interest in entering the working world upon graduation; based on scholarship and leadership.

Food Science & Technology
For additional information and application forms, contact Dan Farkas, key advisor, Food Science & Technology, Wiegand Hall 100.

Paul Krumperman Memorial Scholarship
$500 to a student in Food Science & Technology.

Oregon Dairy Industries Memorial Scholarship
Scholarships of approximately $500-$750 to undergraduate or graduate students based on financial need and demonstrated interest in dairy processing.

Clifford E. Samuels Memorial Scholarship
$700 to a freshman based on a combination of scholarship, activities, and professional interest.

Don Welp Memorial Scholarship
$1500 to a graduate or undergraduate student. Priority consideration given to sons and daughters of members of OSU's Alpha Theta Chapter of Phi Kappa Theta Fraternity, who graduated from OSU prior to 1975.

Ernest Wiegand Memorial Scholarship
$500 to a senior based on scholarship, leadership activities, and professional interests/development. $700 to a graduate teaching assistant.

General Agriculture/Agricultural Education
For additional information and application form, contact Lee Cole, lead advisor, General Agriculture/Agricultural Education, Strand Ag Hall 112.

Gary McKenzie Agricultural Scholarship
For an undergraduate student, with priority to freshman. First preference for FFA members from a Eugene, Oregon high school. Must have interest in technical agriculture and show performance, character, and leadership through FFA projects.

Horticulture
Along with other criteria, horticulture scholarships are based on financial need. For additional information and application forms, contact Anita Green, Key Adviser, Department of Horticulture, ALS 4155.

Rolland Beglau Memorial Scholarship
$500 for an undergraduate student, with first consideration to individuals who have an Oregon farm background, 4-H, or FFA horticulture experiences. A love and enthusiasm for the production of vegetables and fruit crops is the foremost criteria.

Wilbur Burkhart Memorial Scholarship
For an undergraduate student with an interest in horticulture.

Endicott Farms Undergraduate Scholarship
A $500 award for a student majoring in horticulture with an emphasis in vegetables. Selection criteria are financial need and promise.

Bruce Faddis Memorial Scholarship
In-state tuition for up to three terms for a senior pursuing a career as a golf course superintendent. Must have significant practical experience at golf courses and demonstrate a commitment to the industry via activities in and out of classes, and have involvement with turf projects at the Lewis-Brown farm.

General Dillingham Produce Industry Scholarship
A $1000 award to a junior or senior full-time student intending to enter the fresh fruit and vegetable industry in an area between production and marketing. The award is based on sincerity of purpose, character, leadership, scholastic record, and financial need. Help provided to obtain employment between junior and senior years.

Golf Course Superintendent's Association of America Scholarship
This is a national scholarship available to students pursuing careers as golf course superintendents. Selection is based on scholastic achievement, work experience, and verified financial need. Finalists go to the International Golf Show and interview in person to determine the final award.

Grow and Show Garden Club
One or more awards limited to juniors and seniors in horticulture. Need to show evidence of ability, promise, and need.

Jane Kerr Pratt Memorial Scholarships
Various awards made available through funds from Oregon Community Foundation. Based on graduate of U.S. high school, academic achievement, need & interest in landscape design, propagation and/or use of native plant materials.

Ezra J. Kraus Memorial Scholarship
One or more scholarships to undergraduate students studying ornamental horticulture. Based on ability, promise, and reasonable need.

Ezra J. Kraus Memorial Fellowship
$1500 to a graduate student studying ornamental horticulture. Based on financial need, scholastic merit, and professional potential.

McMinnville Women's Garden Club Scholarship
One scholarship in the amount of $250 given to a junior or senior from Yamhill County majoring in Horticulture.

Gary & Patricia Moss Single Parent Scholarship
Scholarships totaling approximately $3500 annually to undergraduate students with a GPA of 2.50 and above. First priority to female, single parent. Submit financial aid application. Contact Financial Aid Office, Administrative Services Building A218.

Multnomah Chapter DAR Scholarship
Ruth Rose Richardson Park Memorial Award
A $1000 award established by the Multnomah Chapter Daughters of the American Revolution, to be awarded annually to a student of sophomore, junior, or senior standing enrolled in horticulture or landscape design.

National Council of State Garden Clubs, Inc.
$3500 awarded to encourage study of horticulture, floriculture, landscape design, conservation, forestry, botany, agronomy, plant pathology, environmental control, city planning, land management and allied subjects. Only one applicant per state; 20 total awarded.

AGR-EVO Turf Scholarship
$1,000 scholarship to a senior interested in becoming a golf course superintendent. Preference is given to students with good academic records, extensive work experience, and demonstrated involvement in the turf program at OSU.

Northwest Turfgrass Association Scholarship
$1000 scholarship awarded annually to students pursuing careers in the turf industry. Preference is given to students with strong academic records, a history of industry involvement, and potential to become industry leaders.

OSU Horticulture Club Scholarship
$750 awarded based on financial need and Horticulture Club and community involvement. Must be an undergraduate in horticulture and have a minimum 2.25 GPA.

Oregon Federation of Garden Clubs Scholarship
One or more awards for an Oregon resident sophomore or upper division student majoring in ornamental and landscape horticulture. Awarded on the basis of excellence in scholarship, personal qualifications and financial need.

Oregon Golf Course Superintendent's Association (OGCSA) Scholarship
A $500+ scholarship awarded to students of junior standing or higher pursuing careers as golf course superintendents. Preference given to students with strong academic records and extensive golf course work experience. First priority for members of OGCSA who have worked for a member of the organization.

Oregon Horticultural Society
Tuition scholarships to undergraduate students in horticulture or related fields. Preference is given to horticulture majors. Recipients selected by the Oregon Horticultural Society Scholarship Committee.

Oregon Nurserymen's Foundation Scholarships
These scholarships are offered with the intent to encourage students to enter into and complete their academic studies in ornamental horticulture, and then to enter the nursery industry as qualified employees of fellow nursery professionals. *Clackamas Chapter Award:* $850 to a student beginning college studies in an ornamental horticulture field. *Emerald Empire Chapter Award:* $250 to a third year or higher college student majoring in horticulture, landscape architecture or landscape construction, who also graduated from an Oregon high school. Preference will be given to a student from the Emerald Empire/Eugene area. *Greenhouse Growers Award:* $500 to a college student majoring in horticulture with emphasis on greenhouse/floriculture areas. Preference will be given to family members and employees of the OAN Greenhouse Chapter. *Martin Holmanson Memorial Award:* $500 to a college junior or senior student majoring in ornamental horticulture. *Joseph B. Klupenger Award:* $550 to a student majoring in ornamental horticulture who plans to work in the ornamental industry either as an employee or as a family member of a business. *Mt. Hood Chapter Award:* $1675 to a college student majoring in ornamental horticulture. Preference will be given to applicants from nursery areas east of Portland. *Nursery Employee Award:* $500 to a college student in ornamental horticulture who is employed by an OAN member firm. *Nurserymen's Memorial Award:* $1000 to a graduate student research project pertaining to ornamental horticulture. *Patio Alliance Award I:* $1000 to a college student majoring in the turf and landscape management area. *Patio Alliance II:* Two $500 scholarships to beginning college students majoring in ornamental horticulture or related fields. *Retail Chapter Award I:* $1000 to students majoring in ornamental horticulture and related fields. Preference will be given to students who are a son/daughter of an OAN member retailer, or one of their employees. *Retail Chapter Award II:* $1000 to college students majoring in ornamental horticulture and related fields. *Vaughan's Seed Company Award:* $1000 to college students majoring in ornamental horticulture and related fields.

Professional Women in Horticulture
Awarded each fall term. The purpose of the scholarship is to recognize and support excellence in horticulture students.

James H. Weatherspoon Viticulture Fellowship
To supplement graduate research assistantships to candidates conducting thesis research in viticulture.

Microbiology
For additional information and application form, contact the Department of Microbiology, Nash Hall 220.

Mark H. Middlekauf Memorial Scholarship
Usually full in-state tuition for 5 or 6 microbiology majors per school year.

Joseph E. Simmons Memorial Scholarship
Approximately one-half in-state tuition for 3-4 microbiology students per school year.

Ruth Tartar Memorial Fellowship
Approximately $5000 for a graduate student to cover expenses incurred in research.

Rangeland Resources
For more information contact William Krueger, Strand Ag Hall 202.

Dillard H. & Anastasia M. Gates Graduate Scholarship in Rangeland Management
To help with students' personal and professional growth. First priority for Ph.D., then M.S.

L.A. McClintock Farm Scholarship
For outstanding student in rangeland resources.

COLLEGE OF BUSINESS

For additional information on business scholarships and application form, contact College of Business, Bexell Hall 214.

Any Business Major
Anderson/Beta Gamma Sigma Scholarship
$1000 to a senior with a minimum 3.50 cumulative GPA who is a Beta Gamma Sigma member. Based on considerable professional promise and general zeal for life

and career as demonstrated through meaningful involvement in extracurricular activities, letters of recommendation, faculty references, and personal interview.

Lucille Borigo Memorial Scholarship
For senior or graduate student in business who is an Oregon resident and a member of Phi Beta Lambda (Future Business Leaders of America).

Helen Mae Cropsey Memorial Scholarship
$250 to a senior based on scholastic achievement and potential for future success in business. First priority to female.

Marshall & Melissa Dawes Scholarship
$300 scholarships awarded annually to College of Business students for their senior year. Awarded on the basis of scholastic achievement and financial need.

Glenn L. Jackson Memorial Scholarship
$1500 awarded annually to freshmen Oregon residents with a minimum high school GPA of 3.50. May be awarded four consecutive years if 3.50 GPA maintained at OSU.

Edna M. Jesseph Endowed Scholarship
$600 scholarship awarded annually to junior or senior College of Business student(s) based on financial need and potential for future success in business.

Joe D. Lewis Scholarship
$500 scholarship awarded annually to College of Business student(s) based on financial need and potential for future success in business.

Jane Goodale Mann Memorial Scholarship
$1000 to a student with financial need planning a career in business.

Nova Northwest
$500 scholarship awarded annually to a College f Business senior with an option of finance. This award will recognize and support students who have demonstrated outstanding achievement and professional promise.

Louise Jackman Orner Memorial Scholarship
$300 scholarships awarded annually to College of Business students for their junior or senior year. Selection based primarily on academic achievement; however, candidates must be Oregon residents, graduates from an Oregon high school, and have at least a 3.00 accumulative grade-point average from course work completed at Oregon State University. First preference will be given to a woman.

Reser Family Business Scholarship
$500 scholarship awarded annually to a College of Business student who is a member of a family business and has a continuing interest in family business management. The student must be a U.S. citizen and have demonstrated academic achievement and leadership.

Harley J. and Brigitte Smith Scholarship
$250 scholarship awarded annually to College of Business seniors who plan to establish a career in residential investment/ income property (apartments, condos or single family rental property).

Bertha W. Stutz Scholarship
$300 tscholarship awarded annually to a sophomore, junior or senior in the College of Business. Selection criteria include academic achievement and financial need with special consideration to applicants who are long-time residents of Benton County. First preference will be given to a woman.

Western Association of Food Olympic Scholarship
For an OSU Olympic sport student-athlete majoring in business administration.

W.A. Woodard Foundation Scholarship
$500 scholarship awarded annually to College of Business student(s) for their junior or senior year who demonstrated an interest in family business.

Accounting

Arthur Andersen and Company Scholarship
$1,000 scholarship to College of Business students with an accounting option. Selection based primarily on scholarship and professional promise.

Chevron Scholarships
$2,000 scholarship to outstanding College of Business students; one entering their junior year and one entering their senior year with an accounting option. Selection based primarily on scholarship and professional promise.

Coopers and Lybrand Scholarship
$1,000 scholarship awarded annually to outstanding College of Business students who will be entering their senior year with an accounting option. Awarded on the basis of: 1) graduation from an Oregon high school; 2) demonstrated interest in becoming a member of the profession of certified public accountants; 3) overall cumulative grade point average of 3.20 or greater at the time of application; and 4) broad, well-rounded background in on-and off-campus extracurricular activities.

Deloitte and Touche Scholarship
$2,000 scholarship to outstanding College of Business students entering their senior year with an accounting option. Selection based primarily on scholarship and extracurricular activities.

Deloitte and Touche Scholarship
$1,000 scholarship to outstanding College of Business students entering their junior year with an accounting option. Selection by the accounting faculty based primarily on scholarship and extracurricular activities.

Faler Ruck Scholarship
$500 scholarship to an outstanding College of Business student with an accounting option. Selection based primarily on scholarship and professional promise.

KPMG Peat Marwick Scholarship
$500 scholarship to an outstanding College of Business student with an accounting option. Selection based primarily on scholarship and professional promise.

Price Waterhouse Scholarship
$500 scholarship to outstanding College of Business students, who will be entering their senior year (or final year in the case of a post-baccalaureate) with an accounting option. Awarded on the basis of: 1) scholastic achievement–student should have an overall GPA of 3.50 in all business and accounting courses and a minimum 3.20 university cumulative GPA; 2) extracurricular activities with a clear demonstration of leadership capability; and 3) professional promise in the field of public accounting.

Robert E. Shirley Scholarship
For undergraduate student in the College of Business with an accounting option. First preference to minority students who are graduates of an inner-city high school.

Stover Neyhart & Company Scholarship
$1,000 scholarship to outstanding College of Business students entering their senior year with an accounting option. Selection by the accounting faculty based primarily on scholarship and professional promise.

Management Information Systems

Advisory Council Scholarships
$1,000 scholarship to outstanding College of Business students entering their junior year with an option of Management Information Systems (MIS). Awarded on the basis of scholastic achievement, demonstrated leadership, dedication to MIS, and good communication skills.

Andersen Consulting Scholarship
$500 scholarship to outstanding College of Business students entering their senior year with an option of Management Information Systems (MIS). Awarded on the basis of scholastic achievement, demonstrated leadership, dedication to MIS, and good communication skills.

Master of Business Administration School

Maureen Leary Brown Memorial MBA Scholarship
$1,000 scholarship to a student admitted to the MBA Program in the College of Business at Oregon State University. Student must have achieved an undergraduate GPA of 3.25 (on a 4.0 scale). First preference will be given to a woman.

Scholarships Not Administered Through the College of Business

Other scholarships may become available throughout the year for which College of Business students are eligible. These will be announced on the Scholarship Bulletin Board which is located in the hallway on the second floor of Bexell Hall; or Bexell Hall, Room 214.

COLLEGE OF ENGINEERING

For additional information on general engineering scholarships and application forms, contact the College of Engineering, Head Adviser, Batcheller Hall 151.

Any Engineering Major

Inez J. Belknap Memorial Scholarship
$1000 to an undergraduate or graduate student with financial need.

Ralph A. Chapman Memorial Scholarship
$500 to a sophomore, junior, or senior based on scholastic achievement, qualities of leadership, outstanding characteristics of citizenship, and financial need.

Cockeram Family Tau Beta Pi Scholarship
$2500 to an undergraduate or graduate student who is a member of Tau Beta Pi.

George Gleeson Memorial Scholarship
$1000 to an undergraduate student.

Pete Im Memorial Scholarship
$500 to an undergraduate or graduate student with financial need and a minimum GPA of 2.57.

Robert V. Mrazek Memorial Scholarship
$1500 to an undergraduate student, with preference given to high academic achievers who have overcome constraints imposed by family or personal circumstances.

Norman W. Pettijohn Scholarship
$1500 to a freshman who is a graduate of Vernonia High School. Based on capacity to understand math and sciences, and motivation to succeed in college.

June & Truxton Ringe Engineering Scholarship
$400 to a junior or senior who is a resident of Oregon or Washington. Also based on financial need.

Tau Beta Pi Engineering Scholarship
Three scholarships of $500 to a sophomore, a junior, and a senior. Based on academic performance. Contact the president of Tau Beta Pi.

Alfred J. Trommershausen Scholarship
For graduate of Newberg High School, Newberg, Oregon, who has demonstrated outstanding academic and leadership achievement.

Bioresources Engineering

Bioresources Engineering scholarships are based 50 percent on scholarship and 50 percent on extra-curricular activities. Financial need is not a factor. For additional information and application form, contact the Department of Bioresources Engineering, Gilmore Hall 119.

Myron G. Cropsey Agricultural Engineering Scholarship
For undergraduate or graduate students.

Ralph N. Lunde Memorial Scholarship
For undergraduate or graduate students.

Jefferson B. Rodgers Scholarship
For undergraduate or graduate students.

Wade Rain Irrigation Scholarship
For undergraduate or graduate students.

Chemical Engineering

For additional information and application form, contact the Department of Chemical Engineering, Gleeson Hall 101.

Lloyd Covert Memorial Chemical Engineering Scholarship
Based on academic performance.

Gayle Nichols Memorial Scholarship
For a junior or senior based on academic performance.

Roy A. Strandberg Memorial Scholarship
Based on academic performance.

Charles E. Wicks Scholarship
Based on financial need and academic performance.

Civil Engineering/Construction Engineering Management

For additional information and application form, contact Sandy Jameson unless noted otherwise below, Department of Civil Engineering, Apperson Hall 201.

AGC Student Chapter Scholarship
For AGC Student Chapter members. Contact Jan Strombeck, Apperson 111.

Harlan E. Brown Memorial Scholarship
$250-$500 to an undergraduate student based on financial need, minimum GPA of 3.00, and creativity in problem solving.

Jay and Gladys Blair Endowed Scholarship
$750 with first preference to a student from the Northwest. For an outstanding and deserving student enrolled in the transportation curriculum.

Coral Sales/Daniels Scholarship
Six awards of $500 to juniors, seniors, and graduate students based on outstanding leadership qualities and participation in extra-curricular activities. One award to both male and female in Civil Engineering and Construction Engineering Management at each grade level. Contact Jan Strombeck, Apperson 111.

Otto & Marie Hermann Memorial Scholarship
$750-$1000 to a senior based on outstanding characteristics and qualities of citizenship.

Glenn Holcomb Memorial Scholarship
$500-$1500 to a junior or senior with minimum GPA of 3.00.

Jim McCall Memorial Scholarship
For a senior whose interest is in construction. Minimum GPA of 3.00.

Don C. Phillips Memorial Scholarship
$1000-$1800 to a senior or graduate student specializing in environmental engineering.

Col. Robert Gilmore Scott Memorial Scholarship
Approximately 20 scholarships awarded annually to juniors and seniors with financial need and a minimum GPA of 3.00.

Kenneth Spies Memorial Scholarship
$750-$1000 to a senior or first-year graduate student intending a career in environmental engineering.

Edward Worth Memorial Scholarship
$750-$1250 for a senior with a demonstrated interest in geotechnical engineering.

Electrical & Computer Engineering

Electrical & Computer Engineering scholarships are based on academic performance. For additional information and application form, contact the Department of Electrical & Computer Engineering, ECE 202.

Richard Earnheart Scholarship
For a junior or senior.

Douglas Engelbart Scholarship
For a junior or senior.

John F. Engle Memorial Scholarship
For student who specializes in electrical power engineering during senior year. First priority to graduates of Benson High School, Portland.

Grant S. Feikert Memorial Scholarship
For a junior or senior.

Lawrence Fisher Memorial Scholarship
$1000-$1500 for a junior, senior, or graduate student studying electrical power or power generation engineering.

Donald Guinn Scholarship
For a junior or senior with preference for under-represented minority and female students.

Ursula Bolt Knaus Memorial Scholarship
Full in-state tuition for a junior or senior.

Rexwell D. Miller Memorial Scholarship
To benefit graduate students and undergraduate students in electrical engineering.

Wesley Nishimura Memorial Scholarship
Awarded to the top junior in ECE.

Louis Stone Electrical Engineering Scholarship
To a student in electrical engineering.

Industrial & Manufacturing Engineering

Scholarships based on academic performance. For additional information and application form, contact Sabah Randhawa, Department of Industrial & Manufacturing Engineering, Covell Hall 118.

Clayton K. Dart Memorial Scholarship
$1000 to a graduate or undergraduate student.

Garrard-Peters Memorial Scholarship
$500 to a junior or senior.

James Riggs Memorial Scholarship
$1000 to an undergraduate professional program student who is an Oregon high school graduate.

Mechanical Engineering

Scholarships based on academic performance. For additional information and application form, contact G.M. Reistad, Department of Mechanical Engineering, Rogers Hall 204.

Michael Teramura Memorial Scholarship
$500-$800. Based on merit.

Robert Zaworski Memorial Scholarship
$600-$1000. Consideration given for participation in International Education programs.

Nuclear Engineering
Scholarships based on academic performance, financial need, extracurricular activities and career goals. For additional information contact Alan H. Robinson, Department of Nuclear Engineering, Radiation Center C116.

John Grund Memorial Engineering Scholarship
$1400-$1600 to a junior or senior with evidence of interest in safety issues related to the peaceful uses of nuclear energy.

Karl Hornyik Memorial Scholarship.
$500-$600 to a junior or senior nuclear engineering or radiation health physics student.

OSU-Industry Nuclear Engineering & Radiation Health Physics Scholarships.
$2500 plus summer internships to entering freshmen in nuclear engineering or radiation health physics..

COLLEGE OF FORESTRY

Scholarships based on academic performance. Students' prior coursework and background must indicate interest and potential for success in their chosen forestry field. For additional information contact the College of Forestry, Peavy Hall 140.

Any Forestry Major
Autzen Scholarship
$4000 for an outstanding undergraduate majoring in forestry.

Burlington Resources Forestry Scholarships
Five at $1500 to $3000 for outstanding forestry students.

Bob and Beverley Cooper Forestry Scholarship
$500 to a student transferring from the forestry program at Central Oregon Community College.

George M. Cornwall Memorial Scholarship
$1000 for an undergraduate student, with priority to seniors.

Gordon A. & Priscilla E. Duncan Scholarship
Five scholarships at $1000 to juniors or seniors with financial need.

Henry Fang Scholarship
$750 to an undergraduate or graduate student.

Forestry Legacy Scholarship
Three scholarships at $1000 to undergraduate or graduate students.

Harold "Bud" Freres Memorial Scholarship
$3000 to freshman with financial need. First priority to a graduate of a Stayton, Oregon area high school.

James Girard, Jr. Memorial Scholarship
$500 every third year awarded to a freshman.

Green Peter Hoo Hoo Scholarship
$3000 for a student interested in pursuing a career in the forest industry.

Walter A. Gruetter, Jr. Memorial Forestry Fellowship
$500 to a graduate student, with first priority for female.

Helping Hand Scholarship
$3,500 to an undergraduate student in forestry with financial need.

Dorothy D. Hoener Memorial Fellowship
Ten scholarships at $4200 to undergraduate students and five fellowships at $3000 to graduate students based on professional potential, academic achievement, need for graduates in students' area of interest, and financial need.

Eduardo Ruiz Landa Founder's Fund
For forestry graduates from Medellin, Columbia or other forestry or natural resource graduates from other schools in Columbia, Cuba, Ecuador, Chile, Peru, or Panama. Provides round-trip airfare from home country to OSU once, tuition and fees, room and board, books, supplies, and other expenses.

Charles Lord Memorial Forestry Scholarship
$3000 to an undergraduate student.

Mary J.L. McDonald Memorial Fellowship
Three fellowships at $2000 to support graduate students in forestry.

Arnold & Vera Meier Memorial Education Fellowship
$2500 for a top graduate student in forestry.

Alfred W. Moltke Memorial Fellowship
Five fellowships at $3000 to support top graduate students in forestry.

Oregon Society of American Foresters Scholarship
$700 to a junior or senior, with preference for Oregonians showing high potential for success in the forestry profession.

Albert Powers Memorial Scholarship
In-state tuition to an undergraduate student, with preference to Oregon residents who show professional potential.

Rollins, Burdick, Hunter of Oregon, Inc.
$1,000 to an outstanding forestry senior.

Jack & Lila Saubert Scholarship
$2000 for a graduate or undergraduate student.

Schutz Family Education Fellowship
Two fellowships of $2100 to support graduate education.

Joseph Strehle Scholarship Award
$500 for a worthy forestry student

Vance P. & Dorothy D. Shugart Forestry Scholarship
Five scholarships of $1800, with two to seniors, one to junior, one to sophomore, and one to freshman. For Oregon residents with good moral character in the upper one-third of their class.

Forest Engineering
Oregon Logging Conference Scholarships
Four scholarships of $1,500 for Oregon residents with preference to those majoring in forest engineering.

H.F. Scritsmeier Scholarship
One at $1500 for an outstanding forest engineering upper division student.

Lucille D. & Faye H. Stewart Fellowship
$5000-$10000 to top graduate students doing research in forest engineering.

Forest Products
Menasha "Dick Hanson" Fellowship
One at $2000 for a graduate student in forest products

Plywood Pioneers Association Scholarship
$1,000 to a forest products student interested in pursuing a career in the plywood industry.

Portland Hoo Hoo Club Scholarship
$1000 to an undergraduate student.

Forest Resources
Robert Aufderheide Memorial Scholarship
$2000 to support an outstanding undergraduate student in forestry who shows scholarship and financial need. Awarded every third year.

Joe Crahane Memorial Scholarship
Two scholarships of $2000 to freshmen, with preference to top entering students from Oregon.

John R. Dilworth Memorial Fellowship
$1000 to a graduate student.

Floyd Hart Memorial Scholarship
$2000 to a senior with financial need.

Robert F. Keniston Memorial Scholarship
$500 to a junior or senior.

W.F. McCulloch Memorial Scholarship
$1000 to an undergraduate student.

Catherine Cox Merriam Scholarship
$750 to an undergraduate student, with first priority to women and Native-Americans whose career interests lie in forest resource management.

Kurt Jon Peterson Memorial Scholarship
$1000 for an undergraduate student, with preference for Oregonians.

W.R. Randall Memorial Scholarship
$1500 to a undergraduate student with financial need.

Durward F. Slater Memorial Scholarship
Two scholarships of $600 for juniors or seniors based on good character, sincerity of purpose, high scholarship, and potential for success.

C. Wylie Smith III Memorial Scholarship
Two scholarships of $2700 to juniors or seniors with preference to students from the Coos County area.

John R. Snellstrom Memorial Scholarship
Two scholarships of $1000 to juniors whose interest lies in forestry as a career.

T.J. & Margaret O. Starker Memorial Scholarship
$1000 to an undergraduate student based on personal integrity, scholarship, financial need, and commitment to forestry as a chosen career.

David Wolfson Memorial Scholarship
$250 to an undergraduate student with financial need.

Forest Science
Catherine Bacon Memorial Graduate Fellowship
$500 to a graduate student with first preference for female.

Lu Berger Fellowship
$1000 for a student in forest science who is in financial need.

James H. Dukes, Jr. Graduate Fellowship
$500 for a returning doctoral student in forest ecology in the Department of Forest Science.

Harry and Mildred Fowells Fellowship
$1000 for a student in forest science doing research on tree physiology and/or genetics.

Kenneth and Karen Jones Graduate Fellowship
$2000 for a student doing research in alternative silviculture systems.

Bob Tarrant Fellowship
$500 for student studying hardwood silviculture or hardwood-related ecology.

Conrad P. Wessela Graduate Fellowship
For a graduate student conducting research in forest disease control.

COLLEGE OF HEALTH & HUMAN PERFORMANCE

For more information contact Kathleen Heath, assistant dean and head advisor, Women's Building 120.

Any Health & Human Performance Major
Walter Adrion Memorial Education Scholarship
$500 to a junior with demonstrated excellence in wellness, having exemplary wellness habits, and involvement in student activities. Minimum GPA of 3.00

Dean's Health & Human Performance Scholarship
$500 to sophomores and above on the College's Dean's List who show outstanding leadership and service.

Clair Langton Memorial Scholarship
$100 to a junior with minimum 3.25 GPA who has demonstrated leadership and potential for future achievements.

Margaret Frances McGinnis Scholarship
For undergraduate student with first preference for a female who is a graduate of an Oregon high school.

Exercise & Sport Science
For additional information contact Anthony Wilcox, Chair, Department of Exercise and Sport Science, Langton 216.

Eva Seen Memorial Scholarship
In-state tuition to a senior with minimum GPA of 3.25. First priority to women preparing to teach physical education. Also based on contributions to campus and community life, demonstrated leadership quality, harmonious development of mind and body, good character, and potential for future achievement.

Public Health
For additional information, contact Anne Rossignol, Chair, Department of Public Health, Waldo Hall 258.

Carl Anderson Memorial Scholarship
$500 to a junior or senior who demonstrates proficiency in both written and verbal communication, and has demonstrated leadership and professional commitment through campus and community services. Minimum GPA of 3.25.

Walter G. Thorsell Memorial Scholarship
$500 to a junior or senior Oregon resident studying Occupational Safety & Health. Financial need considered only if otherwise equally qualified candidates.

COLLEGE OF HOME ECONOMICS AND EDUCATION

Education
For additional information on Education fellowships and application form, contact Lance Haddon, Assistant Director of Student Service, School of Education, Education Hall 109.

Chaplin and Rieke Memorial Fellowship
$500 for a graduate student in teacher education with financial need and a minimum GPA of 3.50 in the last two quarters of undergraduate study .

Clayton K. Dart Memorial Fellowship
Three $600 awards for graduate students in a vocational/technical program who have financial need.

Scott Henderson Memorial Fellowship
$350 to a student pursuing a master's degree in developmental education.

Elwood J. Keema Education Fellowship
$700 for a graduate student pursuing a Master of Arts in Teaching degree.

Gene Lytle Memorial Education Fellowhip
$250 to a graduate student with financial need who is pursuing a Master of Arts in Teaching degree.

Fred K. Thompson Memorial Scholarship
For students in the field of education.

Mary Jane Wall Education Fellowship
Two $1500 scholarships for graduate students pursuing a degree in counseling.

Home Economics
For additional information on Home Economics scholarships and fellowships, contact Dr. Sandra A. Helmick, Associate Dean, College of Home Economics & Education, Milam Hall 114.

Any Home Economics Major
Phyllis H. Ballou Scholarship
Approximately $700 to an undergraduate student in home economics with financial need.

Nancy Chandler Memorial Scholarship
Approximately three $800 awards to students enrolled in the College of Home Economics & Education based on financial need and high scholarship.

Leone Elliott Covert Scholarship
Two $500 awards given on the basis of scholarship and potential leadership to a freshman in home economics.

Ruth Gill-Hammond Graduate Fellowship for Minority Students
Two fellowships of approximately $2500 for American minority students pursuing a master's or doctoral degree in home economics based on scholarship and need.

Betty Hawthorne Memorial Fellowship
For graduate student.

Jackson County Home Extension Scholarship
One scholarships of approximately $1500. First preference to a Jackson County female in home economics with financial need and high scholarship; preference to sophomores, juniors, and seniors (freshmen may be considered).

Grace A. Johnson Memorial Scholarship
Two scholarships of approximately $300 to sophomores or juniors with financial need. Degree of self-sufficiency is considered.

Josephine County Home Extension Scholarship
Approximately $800 to a Josephine County student in home economics. Awarded on the basis of high scholarship, aptitude, and financial aid.

Kappa Omicron Nu Scholarship
Approximately $250 to a student member of Kappa Omicron Nu (a home economics honor society) with demonstrated leadership skills and commitment to home economics. Additional Kappa Omicron Nu application is required. Award is based on scholarship and financial need.

Kennison Scholarship
Approximately $800 to benefit a student in home economics of an underrepresented minority group; preference to Native Americans.

Kermis Scholarship (Oregon Association for Family and Community Education)
Approximately $400 to a junior or senior with financial need in upper one-third of class with aptitude and interest in a career in Home Economics Extension in Oregon.

Lathrop Scholarship (Oregon Association for Family and Community Education)
Approximately $500 to a junior or senior in home economics with good scholarship, financial need, and an expressed interest in an Extension career in Oregon.

Martha Dreyer MacGregor Scholarship
Approximately two $1000 awards to juniors or seniors in home economics who are Oregon high school graduates with financial need.

Helen McDowall Memorial Scholarship
Approximately three scholarships of $900 to sophomores, juniors, or seniors in home economics from Clackamas County with demonstrated aptitude and interest in home economics.

Ava Milam Clark Fellowship
For graduate student in home economics.

Dorothy Sherrill Miller Scholarship
Approximately two $3000 awards to students in home economics with financial need and high scholarship.

Rita Norris Memorial Fellowship
Approximately ten scholarships of $1000 to graduate students who are Oregon residents pursuing a Master of Arts in Teaching.

Ben and Ethel Pubols Scholarship
Approximately two $700 awards to students in home economics with academic achievement and financial need.

Minnie Price Memorial Scholarship
Approximately five scholarships of $1100 to freshmen who are rural Oregon residents.

June E. and Truxton Ringe Scholarship
Two $600 awards to juniors or seniors in home economics who are residents of either Oregon or Washington with demonstrated scholastic achievement.

Azalea and Charles Sager Scholarship
Approximately $800 to a junior or senior in home economics; preference is given to a resident of Azalea House.

Audrey Wiencken Smith Scholarship
Approximately two $800 awards to juniors or seniors based on high scholarship, financial need, and aptitude.

Esther Taskerud Scholarship
Approximately three $650 awards to undergraduate students in home economics with commitment to the field; preference is given to students with a 4-H background.

Trindle Scholarship (Oregon Association for Family and Community Education)
Approximately $700 to an undergraduate student with aptitude and interest in a Home Economics Extension career in Oregon.

Woods/Foster Fellowship
Approximately $1000 to a graduate student.

Apparel, Interiors, Housing, and Merchandising
Ruth Beckwith Memorial Scholarship
Approximately three $900 awards to undergraduate students, with preference to students specializing in Housing Studies.

Gladys Whipple Goode Memorial Scholarship
Three scholarships of $500 to sophomores or juniors who have demonstrated interest and talent in apparel, interiors, and merchandising. Preference for Oregon residents talented in the field of clothing, textiles, and related arts.

Granite-Meyer Housing Award
$1000 to a graduate student to provide financial assistance with research for studying housing. Award based on relevance and originality of the proposed research, financial need, and scholastic standing.

Dorothy Schilling Memorial Award
Approximately $100 to a junior, senior, or graduate student who has completed at least three credits in courses related to design of fashion apparel, functional clothing, or theatrical costuming. Must have strong demonstrated interest in aesthetic aspects of clothing. Application process includes two letters of recommendation and portfolio of student work. Special application form in Milam 224.

Human Development & Family Sciences
Laurinda Kemper Dickinson Memorial Home Economics Scholarship
Approximately $300 to a home economics student in Human Development and Family Sciences with demonstrated academic promise.

May Dubois Memorial Thesis or Dissertation Grant
$500-$875 to a graduate student with a minimum GPA of 3.50 pursuing a master's degree in home economics education. Must have completed two-thirds of the required hours in the program, including the course on research methods.

The Lyle-Meyer Graduate Fellowship
For graduate student planning a career in family studies.

Philip O'Neill Graduate Fellowship
$200 for a graduate student in Human Development and Family Sciences for teaching potential.

Buena Maris Mockmore Steinmetz Memorial Scholarship
Approximately $450 to a junior, senior, or graduate student with scholastic competence, financial need, and evidence of intent to continue in the field of child development or family relationships.

Nutrition & Food Management
Helen Charley Graduate Fellowship
For graduate student in foods & nutrition.

Arthur E. Gravatt Fellowship
For graduate student in family resource management or nutrition and food sciences, with minor in an area of social science.
Maren-Gribskov Scholarship
Two scholarships of approximately $1800 for undergraduate students majoring in Nutrition and Food Management with an option in dietetics or food systems management.

Annie McDonald Lindsay Memorial Scholarship
Approximately $1000 to an undergraduate student and $2500 to a graduate student studying Dietetics or Nutrition Science. Must have at least one year of studies left. Criteria includes evidence of academic achievement through grades in science.

Jewell Fields Rohlfing Fellowship
Approximately $1000 to a graduate student in Dept. of Nutrition & Food Management.

Ruth Kennedy Tartar Memorial Graduate Research Grant
Approximately two $1500 awards to graduate students to cover expenses incurred in research.

COLLEGE OF OCEANIC AND ATMOSPHERIC SCIENCES

For additional information and application form, contact G. Brent Dalrymple dean, College of Oceanic and Atmospheric Sciences, Oceanography Administration Office.

Chipman-Downs Memorial Fellowship
To assist graduate students in the College of Oceanic and Atmospheric Sciences who require emergency funding.

Curtis and Isabella Holt Memorial Education Fund in Marine Science
For students studying Oceanography.

Richard Mathews Memorial Scholarship
For a deserving graduate student nearing completion of thesis.

Marine Resource Management
Geoffrey Dimmick Memorial Fellowship
Two scholarships to marine resource management graduate students with financial need.

COLLEGE OF PHARMACY

For additional information on Pharmacy scholarships and application form, contact Richard A. Ohvall, dean, College of Pharmacy, Pharmacy Building, Room 205A.

Steve Bartlett Memorial Scholarship
Two scholarships selected by sponsor; preference given to students from Josephine or Jackson counties. Amount varies.

Brauti Family Scholarship
Two $1000 awards to seniors with strong community pharmacy interest and outstanding communication skills. Preference to students from Clatsop and Tillamook Counties, OR.

Claud W. Campbell Scholarship
A $1000 scholarship to a junior or senior with outstanding administrative/organization skills.

O'Deane Faris Scholarship
Need, professional activity in junior year, and scholarship: Amount varies.

Frank and Esther Golden Scholarship
Four scholarships of $800 each for outstanding achievement in both scholastic performance and professional activities.

Curtis and Isabella Holt Memorial Pharmacy Scholarship
Four scholarships of $500 to first-year students. Two scholarships are for OSU students, two are for off-campus students.

Curtis and Isabella Holt Memorial Work Scholarship
Work scholarships to provide financial assistance to deserving graduate students.

Dorman Hyde Memorial Scholarship
$1000 to a senior I who is active in extracurricular activities and demonstrates leadership in professional activities.

Lane County Pharmaceutical Association Scholarship
Need, resident of Lane County. Amount varies.

Linn/Benton Pharmaceutical Association Scholarship
Must be a resident of Linn or Benton County. Amount varies.

J.M. Long Scholarship
Full tuition scholarship to incoming junior, with strong interest in community pharmacy.

Marion-Polk-Yamhill Pharmaceutical Association Scholarship
Two awards to a junior & senior from Marion-Polk-Yamhill counties, strong academics & need. Amount varies.

Mayfield Scholarship
Academic achievement and professional activities: $500

Fred Meek Memorial Scholarship
To a senior I student. Selected on the basis of scholastic ability and financial need. Amount varies.

Fred Meyer Scholarship
Leadership, need, one $500 award.

NACDS Education Foundation
Only second or third year student with a *demonstrated* interest in Community Pharmacy, one award of $1250.

OSPA Scholarship (Oregon State Pharmaceutical Association)
Selected by the OSPA Committee. Amount varies.

Oregon Society of Hospital Pharmacists Scholarship
Selected by OSHP. Amount varies.

Payless Scholarships
Three $3000 scholarships to students with interest and/or background in corporate community practice.

Professional Society of Pharmacists Scholarships
Selected by PSOP. Amount varies.

Sav-on (American Drug Stores)
A $1000 award to a student with experience in corporate community practice.

Walmart Scholarship
A $1000 award based on need, leadership, and community practice.

COLLEGE OF VETERINARY MEDICINE

The scholarships listed below are for veterinary medicine students only. For additional information on scholarships in the College of Veterinary Medicine and application form, contact the Dean's Office, College of Veterinary Medicine, Magruder Hall 200D.

American Animal Hospital Association Scholarship
$250 to a fourth-year student in recognition of outstanding clinical proficiency in small animal medicine and surgery.

Auxiliary to the Oregon Veterinary Medical Association Scholarship
$500 to a first-year student who has advanced the prestige of the College of Veterinary Medicine on the University campus.

Auxiliary to the American Veterinary Medical Association Scholarship
$200 to a fourth-year student who has advanced the prestige of the College of Veterinary Medicine on the University campus.

Don and Betty Bailey Scholarship
$500 to a fourth-year student interested in small ruminants.

Cascade Obedience Club Scholarship
As funds permit, $1,000 awards are given to Oregon resident students from Washington, Clackamas, or Multnomah counties who have an interest in small animals or small animal practice.

Roby D. Eaton Memorial Scholarship
$100 given to a third-year student interested in equine medicine and surgery.

Chintimini Kennel Club Scholarship
Two scholarships of $1000 to third-year students based on financial need and interest in canine medicine and surgery. For Oregon residents.

Frank & Amy Finch Memorial Scholarship
$500 to a fourth-year student exhibiting proficiency in equine medicine or surgery.

Jack Hardesty Memorial Scholarship
Four scholarships of $250 to first-year or third-year students with first priority to individuals with children.

Hill's Pet Products, Inc. Scholarship
$4,000; divided so as to give one student each year $1,000. Based on financial need; the fourth-year student's to be based on financial need and an interest in clinical nutrition.

Bruce Hultgren Memorial Scholarship
$100 to a first-year student who exhibits an interest in and an aptitude for veterinary pathology.

Dallen Jones Memorial Scholarship
$200 to a first-year student, with preference for persons from the Douglas County area. Selection based on character, attitude, maturity, and professional conduct.

L.M. Koger Memorial Scholarship
$150 to a first-year student based on character, attitude, maturity, and professional conduct.

Creston & Dorothea Lamont Memorial Veterinary Medicine Scholarship
$500 for a student interested in poultry as a career. Scholarship may be awarded to the same student throughout the four-year program. Priority to first-year students.

Richard & Elsie Lawton Memorial Scholarship
$1000. Awards committee to make recommendation.

Dick Magruder Memorial Scholarship
$500. Awards committee to make recommendation.

Oregon Veterinary Medical Association Scholarship
$1000 to first-year students based on character; attitude; moral and professional conduct; and contribution, interest, and dedication to the welfare of his/her classmates. For Oregon residents.

Pfizer, Inc. Scholarship
$1,000 to assist a fourth-year student.

Purina Mills, Inc., Scholarship
$200 to a fourth-year student who exhibits the greatest effort, interest, aptitude and proficiency in swine medicine.

Rogue Valley Kennel Club Scholarship
$500 scholarship based on financial need and a sincere interest in small animal practice.

Rogue Valley Veterinary Medicine Medical Association Scholarships
$400. Funds to provide assistance to a first-year and a third-year student with moving costs to and from OSU to WSU.

J.E. Salsbury Memorial Veterinary Medicine Scholarship
One scholarship at $2000, others at $1500 or $1000. For third-year students demonstrating superior scholarship, initiative, perseverance, potential for leadership, and financial need.

4-H

For more information on 4-H scholarships, contact Duane P. Johnson, State 4-H Youth Development Office, Ballard Extension 105.

Babe Coe Memorial Scholarship
Approximately $1500 to a freshman 4-H member enrolled during the current year in a 4-H project or activity. Must have completed a minimum of three years of 4-H including the current year. For Oregon residents. Also based on high school academic performance.

4-H Foundation W. Durrant Scholarship
For worthy 4-H members from Columbia County. Contact Columbia County Extension Service, St. Helens, Oregon (503) 397-3462.

Harney County 4-H Memorial Scholarship
For 4-H members from Harney County, Oregon. Contact Harney County Extension Service, Burns, Oregon, (503)573-2506.

O.M. Plummer Memorial Agricultural Honors Scholarship
For entering students, with preference for students studying animal science. Must be a 4-H member with a record of leadership, and participate in the Pacific International Junior Livestock Exposition as an exhibitor or on a 4-H judging team. Also based on academic performance.

Spitzbart Scholarship
$5500 scholarship fro students enrolling in any program at Oregon State University. Must have been a 4-H member and must have participated in the 4-H Division of the Oregon State Fair. Also based on academic performance.

Washington County Extension Scholarship
Approximately $50 with first preference for women from Washington County.

Blanche Grover Wellock Memorial Scholarship
For 4-H member from Curry County. Contact Curry County Extension Service, Gold Beach, Oregon (503) 247-6672.

Robert W. Wilcox Memorial Scholarship
$250 to graduate students with financial need. Specifically for Extension agents who wish to obtain an advanced degree and return to the Extension program to do 4-H youth development work.

ALL-CAMPUS SCHOLARSHIPS

All-campus scholarships are based on a combination of financial need, academic performance and/or a specified criteria. All major fields of study are considered. Eligibility is restricted to undergraduates who have completed fewer than 12 terms. To qualify, students must have a financial aid application processed and on file in the Financial Aid Office by March 1st. For more information, contact the Financial Aid Office, Administrative Services Building A218.

Clarence W. Agsten Memorial Scholarship
Two awards of $500-$1000.

Frank and Mabel Albright Memorial Scholarship
Tuition and books. For a freshmen who is a graduate of a Benton County high school. Citizenship and community activity also considered. Renewable for four years if 2.50 GPA maintained at OSU.

Naomi Catherine Andrews Memorial Scholarship
One or two awards of $600 for residents or non-residents.

Mary C. Barbare Memorial Scholarship
For undergraduate students.

Jack Bennett Memorial Scholarship
$300 to a graduate of a Josephine County high school. Preference given to students from Grants Pass.

Professor John Fulton
Awarded to long term female residents of Benten County, OR.

Marie Harbeck Berger Scholarship
$300-$600 for residents or non-residents with demonstrated leadership and service qualities. Entering freshmen must have a minimum GPA of 3.50, returning students a minimum GPA of 3.00.

Charles H. Bowen Jr. Memorial
$200-$600. To provide financial aid to deserving students.

Pearl Chinn Alumni Scholarship
Incoming freshman who is an Oregon resident.

James Harrison Collins Memorial Scholarship
$500-$1000 for graduates of a Columbia County high school. Must be an Oregon resident with a record of service to school and community and be in top 15 percent of high school graduating class.

Inez Darling Davis Memorial Scholarship
$200-$700 for sophomore.

U.G. Dubach Memorial Scholarship
Tuition scholarship for residents or non-residents.

Minette Phillips Espy Memorial Scholarship
Need-based scholarsh with first preference for female.

Farmers Insurance Group of Companies Scholarship
Tuition scholarship awarded annually to students majoring in business or mathematics. Must have sophomore standing or above with cumulative GPA of 2.30 or above.

Fisher Mark Scholarship
Assistance to married, undergrad with a 3.00 sophomore or above.

Eldon Frink Memorial Scholarship
$500-$1200 to juniors or seniors, with preference given to students from the southwestern rural area of Polk County. Awarded to students in Agricultural Sciences, Forestry, and Home Economics & Education on a rotating basis.

Harry E. Goheen Memorial Book Scholarship
Approximately $300 to a junior or senior majoring in math or computer sciences. First priority to under-represented minority students.

William F. Herrin Memorial Scholarship
$1000-$2000 to juniors or seniors who are Oregon residents with all schooling done at OSU. Renewable for one year. Minimum GPA of 3.00.

Harry & David Holmes Scholarship
One or two awards of $500-$1000 to graduates of a Jackson County high school. Additional application from high school required.

Elwood Keema Memorial Scholarship
For a graduate student in teacher education with financial need and a minimum GPA of 3.00.

Denabelle Linville Memorial Scholarship
$500-$1000 to graduate students, with first priority to female Oregon resident pursuing a teaching career.

Duane E. Marshall Memorial Scholarship
$500 to freshmen, with priority for graduates of Newberg High School. Separate application from high school required.

Paul McGrath Memorial Scholarship
$3000 with first preference to students from McMinnville High School (then other Yamhill County schools).

Irene McKinley Memorial Scholarship
Amount varies.

Herman & Lois Miller Memorial Scholarship
Three to five awards of $600-$2000 to students preparing to teach. Preference given to older students returning to school. Minimum GPA of 2.50.

Moss Scholarship
Undergrad female, single parent preference to Hort. 2.5. Renewable.

Grayce E. Oliver Memorial Scholarship
A number of awards of approximately $1600 to entering freshmen who are Milwaukie High School graduates. GPA of 3.00 or above in high school. Recipient must possess acceptable character and citizenship with strong potential and direction towards professional goals. Separate application from high school required. Renewable for four years.

Ruth Wight Rosmussen
Awarded to entering freshman graduates of Lebonon H.S.

George & Shirley Ray Scholarship
$500-$1000 to sophomore or junior transfer students from Central Oregon Community College. Priority for those who have attended COCC for two years. Preference for Oregon residents. Separate application from COCC required.

Elizabeth Ritchie Memorial Scholarship
$500-$1000 for Oregon high school graduates of outstanding ability, including but not limited to athletic ability.

Arizona Sawyers Memorial Scholarship
$500-$1000 to a graduate student with first priority to female Oregon resident purusing a teaching career.

Robert W. Shaw Memorial Scholarship
$500-$1000 for native-born citizens of the U.S. with excellent academic record.

Harold Gilman Smith Scholarship
$3000 per academic year, for full-time undergraduate students of american Indian/ Alaskan Native descent. Must provide official documentation of tribal enrollment and have a 3.0 GPA. contact the Indian Education Office or Financial Aid Office.

Derald D. Swift Memorial Scholarship
Approximately $1600 for students from Malheur County, Harney County, or other Eastern Oregon County. Also considered are students form Payette County, Idaho. In order of preference, scholarship based on integrity, character, citizenship, financial need, and athletic potential.

Forrest Tower Memorial Scholarship
Awarded to students with high financial need.

Mary VanKirk Memorial Scholarship
Awarded to student with high financial need.

Rueben G. & Myron M. Winslow Memorial Scholarship
To freshman and returning students. Awards of approximately $1000.

AMERICAN INDIAN/ALASKAN NATIVE

For more information, contact Cassandra Manuelito-Kerkvliet, Indian Education Coordinator, Office of Multicultural Affairs, Snell Hall 328, 737-4383.

Cropsey Native-American Emergency Scholarship
Awarded to students of Native-American descent. Contact Indian Education Office.

William Harrison Gill Memorial Education Scholarship
One or two awards of $400-$600 for students of American-Indian descent from Oregon, Washington, Idaho, California, Utah, Arizona, Nevada, New Mexico, Colorado, Wyoming, or Montana. Submit financial aid application. Contact Indian Education Office or Financial Aid Office, Administrative Services Building A218.

David W. Schacht Native-American Student Scholarship
$200 per term, including summer, for undergraduate students of American-Indian descent with tribal affiliation. Must have demonstrated ability and scholarship during high school or college. Submit financial aid application. Contact Indian Education Office or Financial Aid Office, Administrative Services Building A218.

Helen J. Smith American-Indian Scholarship
Two or three scholarships of $500-$1000 to undergraduates with preference for students from Indian high schools. Must be American-Indian. Submit financial aid application. Contact Indian Education Office or Financial Aid Office

ATHLETICS

For more information on Beaver Club scholarships for intercollegiate athletes, contact Michael L. Beachley, compliance officer, Intercollegiate Athletics, Gill 221.

Any Sport

Percy Locey Memorial Scholarship
Based on high achievement.

Reynolds Family Scholarship
Based on high achievement.

Summer Work Program
Summer work scholarship in the Department of Athletics for intercollegiate athletes.

Herb & Anita Summers Athletic Scholarship
Two scholarships with first priority to women in sports.

Madaline Swarbrick Memorial Scholarship
Based on academic performance.

Baseball

Dee Andros Baseball Scholarship
Coaches nominate candidates.

Bert Babb, Sr. Memorial Scholarship
First priority to students playing baseball.

Morrell J. Crary Memorial Scholarship
First priority to students from the Salem, Oregon area who are proficient in baseball. Coaches nominate candidates.

Mike Keck Memorial Scholarship
Coaches nominate candidates.

Spec Keene Memorial Scholarship
For an outstanding student athlete making exceptional academic progress. For current member of outstanding character on OSU's baseball team.

Kermit Roth Memorial Golden Beaver Scholarship
For students who have demonstrated athletic proficiency, indicating ability to participate successfully in OSU's intercollegiate athletic competition.

Wes Schulmerich Memorial Scholarship
For Oregon residents with a minimum GPA of 2.80. Scholarship alternates between football and baseball.

Tim Wirth Memorial Scholarship
For a freshman with integrity, high personal standards, and commitment to work toward improving and contributing as a team player. Based on baseball ability, academic interest, achievement, and leadership qualities. First preference for a Benton County high school graduate.

Basketball

Earl Baird Memorial Athletic Scholarship
Coaches nominate candidates.

Don Burkland Basketball Scholarship
Coaches nominate candidates.

Ralph Miller Scholarship
Coaches nominate candidates.

Gary & Shirley Moller Basketball Scholarship
One or more scholarships. Coaches nominate candidates.

Merle & Toni Taylor Family Scholarship
First priority for Christian student athletes at OSU. For Oregon residents who are expected to participate in intercollegiate athletics. Priority consideration given to the football and men's basketball programs. Minimum GPA of 2.80.

Paul Valenti Scholarship
Coaches nominate candidates.

William & Grace West Basketball Scholarship
Based on academic performance.

Warren Windnagle Memorial Scholarship
Based on need. For male or female on OSU basketball teams.

Crew

Dee Andros Crew Scholarship
Coaches nominate candidates.

Margaret Drlica Memorial Crew Scholarship
Preference for outstanding oarswoman.

E.A. Stevens Memorial Crew Scholarship
Scholarship for a senior, with preference for outstanding oarsman.

William & Grace West Crew Scholarship
Coaches nominate candidates.

Football

C.J. Bartlett Memorial Scholarship
One or more scholarships for freshmen. Academic performance considered.

Dave Schilling Memorial Scholarship
First priority for players from Hillsboro High School. Academic performance considered.

Wes Schulmerich Memorial Scholarship
For Oregon residents with a GPA of 2.80 and above. Scholarship alternates between football and baseball.

Phil Small Memorial Scholarship
Priority for Oregon residents. Academic achievement considered. First priority for football, then all other sports. Financial need will not outweigh other criteria.

Lon Stiner Rosebowl Scholarship
Academic performance considered.

Merle & Toni Taylor Family Scholarship
First priority for Christian student athletes at OSU. For Oregon residents who are expected to participate in intercollegiate athletics. Priority consideration given to the football and men's basketball programs. Minimum GPA of 2.80.

Gymnastics

Jim & Dorotha Barrett Scholarship
Approximately $900 to a junior, senior, or graduate student. For residents or non-residents of good character and knowledge in athletics. Financial need will not outweigh other criteria. Academic performance considered. Nominated by the Barrett Family.

Herb & Anita Summers Gymnastics Scholarship
Scholarship awarded on the basis of gymnastics ability, as well as academic interest, achievement, and leadership quality.

Patrick Wayne Valley Memorial Scholarship
To student in any major intercollegiate sport with first priority to students in gymnastics who are still working towards attainment of degree and has completed athletic ability.

Non-contact Sports

Russell Colwell Non-Contact Sports Scholarship
To benefit men's and women's golf, men's and women's track, volleyball, wrestling, softball, women's swimming, and crew. Academic performance considered.

Donnelly Golf Scholarship
To benefit student in men's or women's golf.

Giustina Golf Scholarship
For a student involved in golf.

Mel Mason Memorial Scholarship
For a student involved in golf or volleyball. Academic performance considered.

Track & Field

Mertroe Hollinger Memorial Scholarship
Recipients selected on the basis of scholastic ability, sportsmanship, and citizenship.

Wrestling

McHenry Memorial Wrestling Scholarship
Based on wrestling ability, academic interest, achievement, and leadership qualities. First priority for residents of Benton County. Second choice for other Oregon residents.

Dale Thomas Wrestling Scholarship
Based on wrestling ability, academic interest, achievement, and leadership qualities.

Wrestling Program Scholarship
Based on wrestling ability, academic interest, achievement, and leadership qualities.

FRATERNITIES & SORORITIES

Alpha Lambda Scholarship
Numerous scholarships totaling approximately $1000. For active members in good standing with the Alpha Lambda Chapter of Lambda Chi Fraternity. Selections made based on equal weighting of financial need, scholastic performance, service to the fraternity, and service to OSU. Contact Bill Deeks, Alpha Lambda Association, P.O. Box 1419, Beaverton, OR. 97075.

Dorothy & Dave Blasen Scholarship
$300 to a member of Kappa Sigma Fraternity who is active in Army ROTC. Contact Kappa Sigma Fraternity, OSU Chapter.

Vane & Fern Gibson Memorial Chi Omega Scholarship
Over $100 to a Chi Omega member of junior standing living in Eta Alpha Chapter House. Must have contributed to the betterment of Chi Omega Sorority and OSU. Contact Nancy Kniesel, Chi Omega Chapter Advisor.

Vane & Fern Gibson Memorial Phi Delta Theta Scholarship
Over $100 to a Phi Delta Theta Fraternity member of junior standing who has contributed to the betterment of the fraternity. Based on qualities of character, scholarship, leadership, and service. Must live in Chapter House in junior year. Contact Erin Haynes, Phi Delta Theta Chapter Advisor, OSU Fund, Snell Hall 517.

Hilda Jones Kappa Delta Scholarship
$500 to a member of Alpha Kappa Chapter of Kappa Delta Sorority. Based on service to Kappa Delta through leadership, fostering and promoting sisterhood, service to campus and community, scholastic achievement, and financial need. Contact Kappa Delta Scholarship Chairperson.

Lambda Chi Alpha Trust Scholarship
$300-$450 to an active member in good standing with the Alpha Lambda Chapter of Lambda Chi Alpha Fraternity. Selection based on equal weighting of financial need, scholastic performance, service to the fraternity, and service to OSU. Contact Bill Deeks, Alpha Lambda Association, P.O. Box 1419, Beaverton, OR. 97075.

Thomas W. Morrish Memorial Scholarship
Approximately $500 to members of Kappa Sigma Fraternity who display outstanding commitment and participation with emphasis on athletics and scholastic achievement. For juniors or seniors with a GPA of 3.00 or above. Contact Kappa Sigma Fraternity, OSU Chapter.

Gayle Schumacher Memorial Scholarship
First priority to "Greek" women of junior standing at OSU who show above average scholarship and leadership. Contact Judy Brazee, Office Manager, Dean of Students, Administrative Services Building A200.

Clayton Strain Memorial Scholarship
Numerous awards totaling approximately $15000 per year. For active members in good standing with the Alpha Lambda Chapter of Lambda Chi Alpha. Selection based on equal weighting of financial need, scholastic performance, service to the fraternity, and service to OSU. Contact Bill Deeks, Alpha Lambda Association, P.O. Box 1419, Beaverton, OR. 97075.

William L. Thomas Scholarship
For undergraduate student who is a member of Oregon Alpha. Recipient must live in the chapter house all three terms while receiving award and be a member in good standing. Contact Oregon Alpha Chapter of Sigma Alpha.

Don Welp Memorial Scholarship
$1400 with priority consideration given to sons and daughters of members of OSU's Alpha Theta Chapter of Phi Kappa Theta Fraternity, who graduated from OSU prior to 1975. For undergraduate or graduate students enrolled in the College of Agricultural Sciences or the College of Science majoring in Food Science & Technology or Plant Pathology. Contact Dan Farkas, key advisor, Food Science & Technology, Wiegand Hall 108.

Terry Yaguchi Memorial Scholarship
To a currently enrolled active member of Delta Lambda Chapter of Delta Tau Delta Fraternity. Academic performance and financial need considered. Contact Delta Tau Delta Fraternity, Oregon State University.

GENERAL SCHOLARSHIPS

All majors are considered for general scholarships.

Lenore Bayley Memorial Fellowship
One or more scholarships totaling approximately $2000 for graduate students based on past and current academic performance and future promise. Contact Graduate School, Administrative Services Building, Room A300.

DeLoach Work Scholarship
$350-$400 for undergraduate students. Application is to be initiated by faculty members. The work assignment must relate to the area of the students' academic training and must provide a significant learning experience. Contact Office of Academic Affairs, Administrative Services Building A624.

Herbert F. Frolander Graduate Teaching Award
$300 awarded to an outstanding graduate teaching assistant. Contact Graduate School, Administrative Services Building A300.

Lonnie B. Harris Memorial Scholarship
For minority students with financial need in the Educational Opportunities Program. Contact Educational Opportunities Program, Waldo Hall 337.

Benjamin L. Hooks Scholarship
For non-traditional, older-than-average students, preferably with children. Sophomore and above. Preference to students who have previously been clients of the Department of Social Services in Oregon. Strong preference for those who have previously been enrolled in the education and vocational training program in the Oregon State Department of Corrections. Contact president of the Corvallis/Albany Chapter of the NAACP.

Robert C. Ingalls Scholarship
For student working on the Barometer newspaper. Contact Barometer editor.

Marilyn Koski Memorial Scholarship
$5000 over four years awarded to a Crescent Valley High School graduate who has shown improvement in curricular or extra-curricular activities. Must have good citizenship. Priority given to applicant who is the first one in their family to attend college. Contact Crescent Valley High School Career Center.

Colonel Cecil M. MacGregor Endowed Scholarship at Oregon State University
For students graduating from Redmond Union High School and continuing on to OSU.

Richard A. Nixon Memorial Scholarship
$750 for Pendleton Senior High School scholar athlete graduates. Based on financial need and academic achievement. Contact Pendleton Senior High School.

Oregon Laurels Scholarships for Oregon Residents
This scholarship recognizes Oregon high school seniors with instructional tuition waivers. To qualify, a student must graduate from an Oregon high school, have a minimum GPA of 3.75 and a minimum SAT of 1000. A common application is used in conjunction with the Presidential Scholarship program. Contact New Student Programs at (503) 737-2626 for more information.

Phi Kappa Phi Scholarship
Two scholarships of $1000 to active members of junior standing in The Honor Society of Phi Kappa Phi. Based on academic achievement and potential. Contact OSU Chapter of The Honor Society of Phi Kappa Phi.

Rosemary Poole Rouse Memorial Scholarship
For entering freshmen graduates of Baker High School. Financial need considered. GPA of 3.00 or above. Contact Baker High School Guidance and Counseling Office.

Janet Schultz Memorial Scholarship
Approximately $175 to a student working on the Beaver Yearbook. Contact Frank Ragulsky, Manager, Student Media, Memorial Union East, 118.

Sue and Fred M. Shideler Journalism Scholarship
For a student working on the *Barometer* staff, serving as a publications intern, or as a political or journalism intern. Contact *Barometer* editor.

Tuthill Work Scholarship
Pays wages for workers in the Soils Department Lab and the Engineering Labs. Contact Department of Crop & Soil Science or College of Engineering.

Under-represented Minority Achievement Scholarships for Entering Freshmen (UMAS)
OSU offers at least 32 scholarships covering mandatory tuition and fees for up to five years in this program. Applicants must be U.S. citizens, residents of Oregon, and graduates of Oregon high schools (or holders of a GED) who meet regular admission consideration requirements. The awards are available to the following groups: African American, Hispanic American, or Native American. The application deadline is March 1. Contact George Gaines at (503) 737-4411.

Under-represented Minority Achievement Scholarships for Undergraduate Students with Junior Standing and Above (JMAS)
OSU offers at least 42 scholarships covering tuition for up to three years in the program. Applicants must be U.S. citizens, residents of Oregon, have 90 or more hours of college work completed, be currently enrolled at Oregon State or meet transfer admission consideration requirements. The awards are available to the following groups: African American, Hispanic American, and Native American. The application deadline is May 1. Contact George Gaines at (503) 737-4411.

Tim Wirth Memorial Scholarship
For Crescent Valley High School graduates who show good citizenship in school and community and are involved in high school athletics. Minimum high school GPA of 3.25. Contact Crescent Valley High School Career Center.

Grace Wu Memorial Scholarship
$250 for a sophomore, junior, or senior. The recipient must show totally unbiased leadership. Staff and faculty members submit names of possible candidates. Contact Erin Haynes, Director, OSU Fund, Snell Hall 517.

P.F. Yerex Memorial Graduate Fellowship
$1500 awarded to an outstanding graduate student in a science or technology field. Contact Graduate School, Administrative Services Building A300.

HATFIELD MARINE SCIENCE CENTER

For more information, contact Pam Rogers, HMSC, 2030 Marine Science Drive, Newport, OR 97365-5296.

Fred & Joan Crebbin Memorial Fellowship
For graduate students, with preference for deserving students who are involved in marine science public education program as interns, and to students whose major study emphasis is Marine Biology, particularly mammals.

Curtis & Isabella Holt Memorial Education Fund in Marine Science
For graduate or undergraduate students in marine sciences. Application by faculty advisor. Request must have definite educational output for a course, public education, or Extension, and be marine related.

Walter Jones Memorial Fellowship
To encourage graduate work in subjects which contribute to fisheries development. Candidate must have completed 12 or more hours of graduate work, and have demonstrated ability to conduct research which would contribute to fisheries development.

Lylian B. Reynolds Memorial Scholarship
For graduate students engaged in study of marine science and resident at HMSC.

Carl Schumacher Award in Marine Sciences
To encourage highly qualified applicants to enroll in marine science graduate programs at OSU. Evidence of past superior academic performance and potential for continuing superior performance at graduate level; evidence of potential for creative research; preference given to first-time graduate students.

Bill Wick Fisheries Memorial Scholarship
To support a graduate student project in marine fisheries and ocean research.

INTERNATIONAL

Financial need a factor for all international student scholarships. Unless otherwise specified, any major considered. For more information, contact the Office of International Education, Snell 444.

Sherman & Carrie Cook Scholarship
For international students likely to return to their country to work for betterment and progress in their country.

Joel R. Friend International Student Scholarship
Approximately $4000 to students from Thailand, Taiwan, and the Republic of China.

Lucy Hsu Ho Scholarship
$500 to undergraduate or graduate international student of ethnic Chinese descent. Based on leadership in student and/or community activities and organizations, and desire to serve others in candidate's future chosen field of work.

Toivo Niemi Memorial Finnish Student Scholarship
$5000-$6000 to undergraduate or graduate students from Finland, with first preference for a discipline in natural resources.

Simerville International Education Award
Approximately $100 for undergraduate or graduate U.S. or international students. Recipient must have voluntarily contributed extensively to international understanding, either through personal relationships, research and scholarship, or involvement in campus or community organizations.

Gertrude Strickland Memorial Fellowship
For international graduate students. Special consideration given to those students who do not qualify for an international student scholarship.

Hugh & Helen Wood Nepalese Scholarship
$3000-$5000 to students from Nepal. Recipients must agree to become a "public servant" in Nepal engaged in an occupation designed to contribute to the welfare and development of Nepal. Must intend to return and serve Nepal for five years after graduation. Minimum GPA of 3.50.

PRESIDENTIAL SCHOLARSHIPS

Presidential Scholarships are merit based scholarships for undergraduate students who are Oregon high school graduates. Considerations include leadership activities, participation in special programs for outstanding students, and involvement in school and community activities. Scholarships are renewable for four years. Must have a minimum high school GPA of 3.75 plus 1100 composite SAT score. Financial need not considered. Number of scholarships and amounts vary according to payout of endowment. For more information on Presidential Scholarships, contact Erin Haynes, Director, OSU Fund, Snell Hall 517.

A-Dec, Inc. Presidential Scholarship
First preference for students from Newberg; second, for students from Yamhill County; third, for all other Oregon residents.

Donald & Margaret Bailey Presidential Scholarship

Eric Boedtker Memorial Presidential Scholarship

Nancy Chandler Memorial Presidential Scholarship
Preference to students in the College of Home Economics & Education.

Virginia Chiles Memorial Presidential Scholarship

Ada A. Chipman Memorial Presidential Scholarship

M. Dale Chipman Memorial Presidential Scholarship
First priority to students in the College of Agricultural Sciences majoring in Crop & Soil Science.

Susan Christensen Memorial Presidential Scholarship
First consideration to women in the College of Engineering.

Sid Drew Memorial Engineering Presidential Scholarship
First consideration to students in the College of Engineering.

Russell & Myrta Ebbert Memorial Presidential Scholarship

Ray & Corky Grewe Presidential Scholarship

Fritz Hartung Memorial Presidential Scholarship
First priority to students in the College of Agricultural Sciences or the College of Veterinary Medicine.

Grace Hensley Memorial Presidential Scholarship

Robert MacVicar Presidential Scholarship

Malheur/Harney County Presidential Scholarship
First consideration to Oregon students from Harney and Malheur counties.

Byram & Millicent Mayfield Memorial Presidential Scholarship
First consideration to students studying pharmacy.

Thomas & Margaret Meehan Presidential Scholarship
First preference for two-thirds of scholarships awarded to students in the College of Liberal Arts and one-third to students in the College of Science.

Meissners Presidential Scholarship

Alice E. Morris Memorial Presidential Scholarship

Oliphant Presidential Scholarship

Charles Arthur Olson Memorial Scholarship

P. D. Ott Memorial Presidential Scholarship

Florence Payton Memorial Presidential Scholarship

Milosh & Jeanne Popovich Presidential Scholarship
First preference to students in engineering or English

Proppe Presidential Scholarship

Realty Group Presidential Scholarship

Robert Reisner Memorial Presidential Scholarship

Thomas & Anne Reynolds Presidential Scholarship

William Ruegg Memorial Presidential Scholarship

Herb & Anita Summers Presidential Scholarship
First priority to students in the College of Agricultural Sciences.

Forrest Tower Memorial Presidential Scholarship

Lester S. and Dollie Waid Tubbs Presidential Scholarship

Terry Watters Memorial Presidential Scholarship

ROTC

Air Force ROTC

Lt. James L. Badley Memorial Northwest Conclave/Arnold Air Society Award
Approximately $500 based entirely on excellent character of students. Contact Air Force ROTC, Arnold Air Society Squadron, James L. Bradley Squadron, McAlexander Fieldhouse 308.

Capt Robert A. Brett, Jr. Student Assistance Fund
A $500 award availab le to a sophomore, junior or senior AFROTC cadet based on leadership, academic performance and financial need. Students must have a cumulative GPA of 2.5 and a 3.0 in Air Force Studies classes. Contact the Air Force Studies Department at 503-737-3291.

94th Bomb Group's Halm Scholarship
Students eligible for this $750 scholarship must be an AFROTC junior. It is awarded on the basis of the person's proven academic ability, professional commitment, extracurricular activities and moral criteria. Contact the Air Force Studies Department at 503-737-3291.

American Legion Scholarship, Post 10
This $200 scholarship is awarded by the American Legion Post 10 of Corvallis. It is awarded to any AFROTC student based on excellent character of the student. Contact the Air Force Studies Department at 503-737-3291.

National Competition Scholarships
Air Force ROTC offers 2-, 3-, and 4-year national competition merit scholarships. Scholarships pay tuition, fees, books, and $150 stipend each school month for the term of the scholarship. Three- and 4-year scholarships are awarded to high school seniors; 2- and 3-year scholarships are available for college freshmen and sophomores. High school students interested in applying should consult their school counselors or call the Air Force Studies Department by the end of the junior year or early in the senior year. All others should contact the Aerospace Studies Department at 503-737-3291.

Professional Officer Course Scholarships
All Air Force ROTC cadets not awarded merit scholarships may qualify for $2000 per year towards books and tuition in their junior and senior years. Contact the Air Force Studies Department at 503-737-3291 for more details.

Military Science ROTC

Military Science Scholarship
For MS III and MS IV cadets attending OSU or WOSC. Minimum 2.50 overall GPA, with at least a 3.00 GPA in Military Science. Financial need considered. Contact LTC (Ret) Mike Rainbolt, College of Business Academic Adviser, 737-3716.

Any Major Scholarship
Students must pass a physical exam, maintain a grade point average of at least 2.00, and the student must graduate before turning 25. Open to any major.

Dorothy & Dave Blasen Scholarship
For an undergraduate or graduate student who is a member of Kappa Sigma Fraternity and active in Army ROTC. Contact Kappa Sigma Fraternity, OSU Chapter.

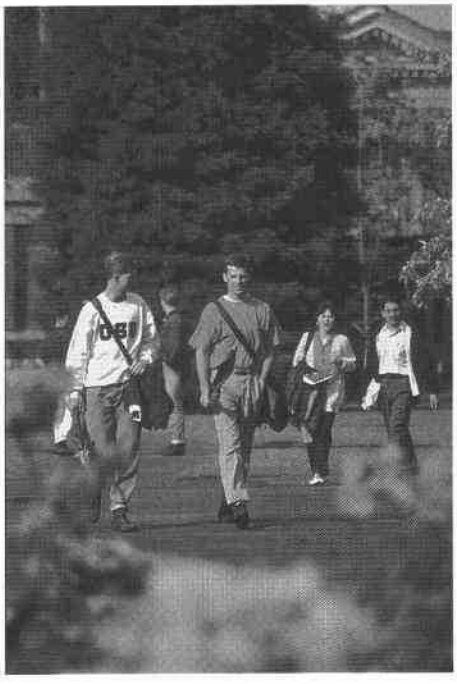
Naval Science ROTC

NROTC Oregon State University Alumni Scholarship Award
To benefit students enrolled in the NROTC program at OSU. Financial need is the primary consideration for selection, but outstanding academic and aptitude performance as well as future potential is also considered.

National Competition Scholarship
Army ROTC offers 2-, 3-, and 4-year national competition merit scholarships. Each pays full tuition, a book allowance of $150 per term, laboratory and incidental fees, a book allowance of $150 per term, laboratory and incidental fees, and $100 subsistence each school month for the term of the scholarship. The four-year scholarships are awarded to selected high school seniors or to recent high school graduates. High school students interested in applying should consult their school counselors or call the Department of Military Science by the end of the junior year or early in the senior year.

Darrell Tipples Memorial Scholarship
For junior or senior, not military salaried, who is committed to fulfillment of a military contract. Contact Captain David K. Hough, 737-5608.

Open Scholarships
Three, two, or guaranteed reserve forces on campus scholarships are available to selected University freshmen and sophomores, whether or not they are enrolled in ROTC courses. These scholarships have the same benefits as listed above. Full information on Army scholarships may be obtained by contacting the Department of Military Science at (503) 737-3511.



Honor and Recognition Societies

ORGANIZATION	MEN/WOMEN	NATIONALLY	DATE ESTABLISHED AT OSU	DATE ESTABLISHED TYPE OR FIELD OF INTEREST	ADVISER
General Honor Societies					
Alpha Lambda Delta	Both	1924	1933	Freshmen scholarship	Roger Penn, 7-3657
Blue Key	Both	1924	1934	Senior leadership	Yvonne Sebastian, 7-6370
Cardinal Honors	Both	1932	1979	Junior leadership	Kerrie George, 7-2626
Mortar Board	Both	1918	1933	Senior leadership	Kerrie George, 7-2626
Phi Eta Sigma	Both	1923	1949	Freshman scholarship	Jonathan King, 7-4601
Phi Kappa Phi	Both	1897	1924	Scholarship	John Arthur, 7-3136
Sigma Xi	Both	1886	1937	Science research	William Warnes, 7-7016
Alpha Epsilon	Both	1963	1975	Agricultural Engineering	Inactive
Alpha Pi Mu	Both	1949	1969	Industrial Engineering	Logen Logendran, 7-5239
Beta Alpha Psi	Both	1919	1959	Accounting	Mary Alice Seville, 7-6060
Beta Gamma Sigma	Both	1913	1963	Business	Ron Miller, 7-3520
Epsilon Pi Tau	Both	1930	1931	Vocational/Industrial Engineering	Inactive
Eta Kappa Nu	Both	1904	1921	Electrical Engineering	Steve Goodwick, 7-2970
Kappa Delta Pi	Both	1911	1928	Education	Inactive
Kappa Tau Alpha	Both	1910	1976	Journalism	Inactive
Omicron Delta Upsilon	Both	1915	1979	Economics	Martha Farundorf, 7-1477
Omicron Nu	Both	1912	1919	Home Economics	Geraldine Olson, 7-1070
Phi Alpha Theta	Both	1921	1980	History	Lisa Sarasohn, 7-1271
Phi Sigma Alpha	Both	1920	1978	Political Science	Jim Foster, 7-2811
Pi Delta Phi	Both	1906	1962	French	Inactive
Pi Tau Sigma	Both	1916	1941	Mechanical Engineering	Gordan Reistad, 7-3441
Rho Chi	Both	1908	1922	Pharmacy	Keith Parrott, 7-5794
Sigma Delta Pi	Both	1919	1970	Spanish	Inactive
Sigma Pi Sigma	Both	1921	1934	Physics	Albert Stetz, 7-1698
Sigma Tau Delta	Both	1924	1981	English	Brenna Weller, 7-1643
Tau Beta Pi	Both	1885	1924	Engineering	Tom Miller, Karen Helt, Alan Huster, 7-3322
Xi Sigma Pi	Both	1908	1921	Forestry	Bill Atkinson, 7-4952
Professional Fraternities					
Alpha Zeta	Both	1897	1918	Agriculture	Jim Thompson, 7-1908
Eta Sigma Gamma	Both	1967	1979	Health Science	Ana Harding, 7-3832
Kappa Psi	Both	1879	1911	Pharmacy	Inactive
Lambda Kappa Sigma	Women	1913	1930	Pharmacy	Jane Aldrich, 7-5776
Phi Chi Theta	Both	1924	1924	Business	Inactive
Phi Delta Chi	Both	1893	1982	Pharmacy	GH Constantive, 7-5783
Women in Comm.	Both	1909	1925	Speech	Trischa Knapp, 7-5392
Zeta Phi Eta	Women	1893	1967	Journalism	Inactive
Recognition Societies					
Angel Flight	Both	1957	1961	Air Force	Inactive
Arnold Air Society	Both	1947	1951	Air Force	Cpt. Chris Harris, 7-6285
Beaver Believers	Both	.....	1959	Athletic greeters	Carol Blazevich, 7-7363
Iota Sigma Pi	Women	1916	1960	Chemistry	Inactive
Order of Omega	Both	1967	1976	Greeks	Bill Brennan, 7-3660
Phi Lambda Upsilon	Both	1899	1928	Chemistry, Biochemistry, and Chemical Engineering	Christine Pastorek, 7-6732
Phi Sigma	Both	1915	1933	Biology	Inactive
Scabbard and Blade	Men	1904	1920	Military	Cpt. Jeffrey Cunningham 7-6902
Other Societies					
Society of Amer Mil Engrs	Both	1924	1980	Military	Richard Watson, 7-5611
Swords of Honor	Both	.....	1980	Military	Inactive
Talons	Women	.....	1933	Service	Melanie Marshall, 7-4691
Thanes	Men	1918	1936	Service	Natalie Dollar, 7-5386

Housing and Residence Hall Programs

The Department of University Housing and Dining Services provides a diverse selection of housing and dining alternatives—University-owned student cooperatives, residence halls, and student family housing—all of which offer a variety of programs and services.

Introduction

Through the Department of University Housing, students can make arrangements for meals and accommodations, consult with residential life staff, bring suggestions for improvements, and receive assistance on their concerns and interests. Emphasis is upon providing comfortable, safe, reasonably priced living accommodations and programs which satisfy residents' desires for both privacy and community. University Housing's main goals are to help students succeed academically, become active citizens of their communities, and enrich and enjoy their University experience.

Oregon State University recognizes the impact the living environment has upon student life. This environment, whether on or off campus, is an important part of the student's education experience. The University is committed to providing all students in the residential setting an integrated program for social, cultural, and educational development beyond the classroom.

Students are not required to live in University housing, but they may find it easier to make friends and adjust to University life if they live on campus for a term or two.

Cooperative Houses

The eight cooperative houses at Oregon State University provide small-group living experiences for approximately 350 students. House capacities vary from 40 to 60. Student residents are responsible for developing their internal governmental organizations. Incoming students receive help from returning cooperative members in adjusting to the University and to the unique, dynamic atmosphere of the cooperative. Cooperative members reduce their board-and-room costs by performing work duties of three to five hours per week in the houses.

Oregon State University owns and operates six cooperative houses: Azalea House, Oxford House, and Reed Lodge for women; and Avery Lodge and Heckart Lodge for men. Dixon Lodge is for upperclass men and women.

Beaver Lodge and Varsity House are independently owned and accommodate men. All cooperatives are members of the Intercooperative Council (ICC).

Information and application forms may be obtained from the Department of University Housing and Dining Services or from the individual houses.

Residence Halls

Through its 10 residence halls and the College Inn, the University offers a variety of living environments including special program halls, designated quiet floors, coeducational facilities, and a graduate student program.

Bloss Hall and the College Inn are reserved for upperclass and transfer students and students who have been out of high school for at least one year. West International House offers a cultural diversity program for U.S. and international students. Residents in Engineering program has been established in Wilson Hall and Finley features a Wellness program. Students interested in the College Inn, which is located at the north edge of campus, should write directly to College Inn, 155 N.W. Kings Blvd., Corvallis, OR 97330.

Most student rooms are designed for double occupancy. Single rooms as well as "double-as-single" rooms are available in each hall at special rates.

For more detailed descriptions of residence halls and the rules and regulations that apply, please see the Residence Hall Handbook.

Residence Hall and Cooperative Reservations

Students submit a contract and application fee to make reservations for residence halls and cooperatives. Both one term and academic year contracts are available to all students. Contracts are available from the Department of University Housing and Dining Services (503) 737-4771.

Tom Scheuermann
Director

Murray Stopherd
Associate Director

Terri Tower
Assistant Director

Paulette Ratchford
Assistant Director

Residence Hall Rates

NOTE: The figures listed below are room and board rates for 1994-95. Figures for the 1995-96 academic year were not available at the time of publication. When established, the new rates will be available through the Department of University Housing and Dining Services.

Residence Hall	Regular Double	Design Single	Double as Single
Standard	$3,686	$4,148	$4,442
West/Cauthorn	3,776	4,238	4,532
Hawley Graduate Program	4,642		

Rates listed for all halls are for room and standard meal plan (approximately 15 meals per week). Other meal plan options are available. West, Cauthorn, and Hawley rates include vacation break periods for those residents with academic year contracts.

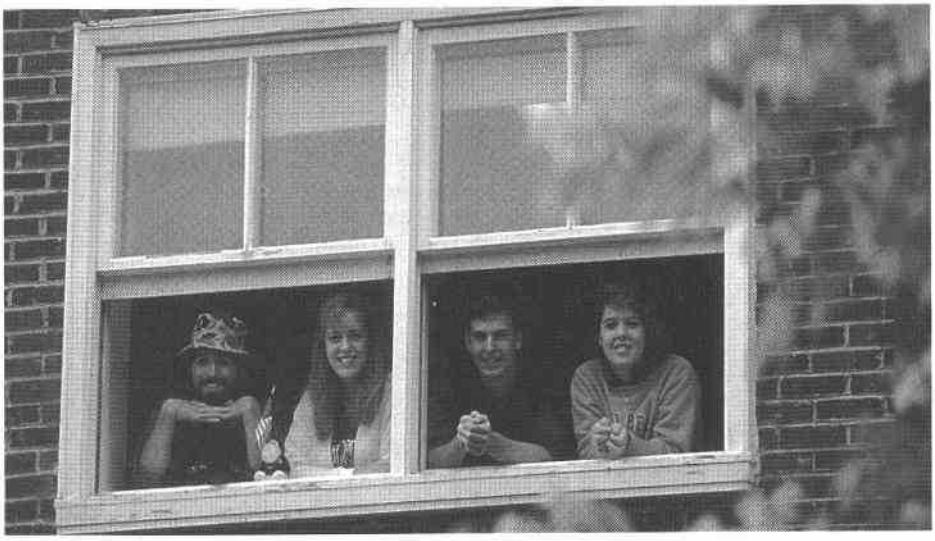
All Oregon State University residence halls and dining facilities are built and operated entirely with income from resident students and summer conferences and camps. No state tax funds are used.

Housing for Graduate Students

Housing for graduate students is available in Hawley Hall. Graduate students may also choose the other residence halls or cooperative houses as a housing option. Students in Hawley may choose the Hawley Charge Plan, which allows them to pay only for actual meals eaten.

University Housing for Student Families (All Terms)

Oregon State University maintains 94 unfurnished apartments in Orchard Court for student families. Rentals start at approximately $235 a month with water, garbage, and TV cable service furnished.



Approximately 30 unfurnished, miscellaneous house rentals in the community are also available. Students should apply to the Department of University Housing and Dining Services. The wait list for Student Family Housing is generally 1-3 years.

Housing in Summer Session

Summer Session housing is available in one or two residence halls. A summer meal plan is required for all students in the summer session hall(s).

Hawley Graduate Program residents may extend their contracts for summer session and remain in their Hawley rooms. No meal plan is required.

Off-Campus Housing

Current bulletin board listings of a variety of rentals available in Corvallis and surrounding communities are located in the Memorial Union lower concourse & the Administration Building second floor. A copy of the "Renters' Guide" may be obtained upon request from Student Activities, MU East, Corvallis, OR 97331.

Fraternities and Sororities

The 27 fraternities and 17 sororities at Oregon State University offer men and women the opportunity to choose a small living group experience within the total University-recognized housing program.

Fraternities and sororities for the most part are private, nonprofit organizations whose chapter houses are located within a mile radius of campus. Four sororities & two fraternities do not live in a chapter house. Board and room rates approximate those of University-owned residence halls. Extra costs include initial affiliation expenses, social fees, and, in some instances, building fund charges.

Membership in the Greek letter societies is by invitation and is based upon mutual choice. "Rush" (the process of member selection) for all groups is sponsored by Interfraternity (men's) and Panhellenic (women's) Councils immediately before the beginning of fall term classes and informally throughout the academic year.

Fraternity pledges can expect to live in the chapter houses provided they haven't made prior, binding contractual agreements to live elsewhere. Materials concerning fraternities and rush are sent to all men admitted to Oregon State University. Specific questions concerning rush registration should be directed to Interfraternity Council (IFC), A 200, Administrative Services Building (503) 737-5432.

Information about sororities and rush is automatically sent to admitted women. If a woman who plans to attend OSU does not receive a rush booklet she may request one from Panhellenic Council, A200, Administrative Services Building. (503/737-5646) **Note: We prefer registrations for formal rush be received by September 1. Please call if you miss the deadline.**

Multicultural Affairs

Phyllis S. Lee
Director

Cassandra Manuelito-Kerkvliet
Indian Education Coordinator

The Office of Multicultural Affairs assists the University in promoting cultural diversity and awareness throughout the campus community. Its programs, services, and activities promote ethnic and cultural identity within a multicultural environment, and encourage and support cooperative relationships among ethnic groups and between those groups and the mainstream University population.

The staff provides consulting and resource services to all academic and support units, student organizations, and University administration as well as communities represented in the student body on issues and concerns related to cultural diversity.

In addition to programming and services which focus on recruitment, retention, and achievements of African American, Asian American, Hispanic American and Native American students and faculty, OMA's collaborative and cooperative efforts and activities involve all members of the campus community. Students are invited to visit the office, located in Snell 330, for more details about activities, services and programs.

The Indian Education Program is a component of the Office of Multicultural Affairs, providing support programs and services ot American Indian and Alaska Native students. The staff works collaboratively with academic administrators and advisers to provide appropriate assistance for successful educational experiences, with particular emphasis on retention and graduation.

Counseling Center

Rebecca A. Sanderson
Director

Leslie G. Dunnington
Assistant Director

The primary mission of the Counseling Center is to aid students in the development of skills for establishing and maintaining effective and satisfying personal and social relationships, to assist students in formulating and implementing their educational and career plans, and to facilitate students' self-understanding and self-acceptance.

The Counseling Center staff assists students with concerns such as:

- Becoming more proficient in life skills such as choosing between alternatives, effective interpersonal communication, and enhancing potentials;
- Overcoming conflicts in relationships;
- Coping with crises and learning how to resolve problems; and
- Overcoming problems resulting from trauma, personal history, or situational crisis through evaluation and appropriate counseling or referral.

Any Oregon State University student is eligible for services. The Counseling Center provides brief interventions that assist students in problem resolution, skill building, and mental health support in order to maintain academic progress. Client concerns that involve more intensive care, certain specialization, or hospitalization may be referred to other mental health providers in the community.

The Counseling Center is staffed by professional counselors and psychologists who are especially trained to work with university students. Counseling is a confidential service. Anything said to a counselor, the fact that a student used the service, or any test results are not disclosed to other persons or agencies within the limitations of professional ethical standards.

Students may receive up to five individual sessions without charge each year. A nominal fee is charged for individual counseling sessions beyond the fifth. Additional fees are charged for specialized services such as testing.

The Counseling Center also houses two other programs. The University Exploratory Studies Program is an academic advising program for lower division students who are having difficulty deciding on a major. The National Testing Program administers such national tests as the ACT, SAT, GRE, MCAT, TOEFL and PRAXIS. Registration information for these national tests is available in the Counseling Center lobby.

Educational Opportunities Program

Lawrence Griggs
Director

Oregon State University's Educational Opportunities Program (EOP) is designed to recruit to the University and assist in the retention of minority, disadvantaged, and disabled students who have traditionally been denied equal access to higher education. EOP serves those who may or may not meet the current University admission requirements but are recognized as having the potential to successfully complete a college degree program.

EOP recruits within Oregon communities with concentrations of ethnic minority and non-traditional students. Recruited and referred students are assisted in gaining admission to the University.

After arrival on campus, the particular needs of the individual student are identified from placement tests, academic records, and information obtained from the student. An academic plan of tutoring, counseling, and advising is developed which determines the nature of the student's participation in EOP. The plan is subject to continual reexamination and may be revised at any time by the student and staff together.

United States citizens or permanent residents interested in participating in the program may write to the Educational Opportunities Program, OSU, Waldo Hall 337, Corvallis, OR 97331-6405.

Special Services Project

Lita J. Verts
Director

Special Services Project (SSP) is a federally sponsored academic assistance program for those from low-income backgrounds, whose parents did not graduate from a college or university, or who are physically handicapped. SSP provides counseling, tutoring, and access to basic-skills building classes. Students have access to a learning center and a learning laboratory. Alternative testing for program students with documented learning disabilities is also provided. The program also sponsors cultural enrichment activities.

United States citizens or permanent residents may inquire about the program at Waldo Hall, Room 337.

Veterans' Services and Veterans' Referral Center

The Veterans' Referral Center is an organization of student veterans serving other student veterans. The center provides referral information relating to the specific needs of the veteran community. Special attention is paid to VA benefits, personal finances, food stamps, part-time employment, readjustment to civilian and academic life, academic policies affecting veterans, and community relations. Presenting veterans' needs and problems to such institutions as the Associated Students and the Veterans Administration is also an integral function of the Veterans' Referral Center.

Veterans' Clerk

The veterans' clerk serves veterans by certifying their attendance at Oregon State University. All veterans, whether new, returning, or transfer students, who expect to receive benefits from the Veterans Administration must notify the veterans' clerk in the Registrar's Office. The amount of benefits varies with the number of credits taken. Details are available from the veterans' clerk.

The veterans' clerk also administers the progress standards for students who are receiving VA benefits. See Progress Standards for Veteran Students for more information on these standards.

State Educational Aid

The state of Oregon has an educational aid program available to Oregon veterans who meet eligibility requirements. The state benefit may not be received for training for which the veteran is currently receiving the federal GI Bill. Information about this aid program may be obtained from the Department of Veterans' Affairs, Education Section, General Services Building, Salem, OR 97310, (503) 378-6840.

Enrollment Services

The Department of Enrollment Services eases students' transition to the University through services provided by the Office of Admission and Orientation and the Office of the Registrar.

The Office of Admission and Orientation provides prospective students with information about OSU, assists with application and admission procedures, sponsors open house and orientation programs, and hosts campus visitors.

New undergraduate students participate in the Summer Orientation and Advising Programs (SOAP). The SOAP program provides orientation to the University, academic advising, and an early opportunity to register for classes. Four two-day sessions for freshmen and two one-day sessions for transfer students are offered in June and July. Additional orientation sessions are held immediately preceding the beginning of fall, winter, and spring terms. Detailed information about these programs is sent to all admitted undergraduate students well in advance of the term they plan to enroll.

The Office of the Registrar produces the *Schedule of Classes* each term and assists students with course registration. The telephone registration system provides a fast, easy way for students to register for classes. The office also maintains student academic records, provides enrollment certifications and transcripts, and assists students with information about degree progress and graduation.

Learning and Resource Centers

Scattered across campus are learning centers to help students develop general study skills, increase their knowledge of a particular field, or prepare for specific course assignments. Most offer specialized library resources and self-paced learning materials; some offer tutoring, workshops, and access to equipment.

The Center for Writing and Learning provides a variety of instructional services for students, including a Writing Center, Study Skills Program, and Conversant Program. The Writing Center offers students free help with any writing project at any stage of the writing process. The Study Skills Program offers a non-credit sixteen-hour class, How to Succeed in College, each term. Students can also sign up for free conferences with the study skills instructor. Finally, the Conversant Program provides non-native English students an opportunity to talk informally with fluent English-speaking students on a one-to-one basis.

The Mathematical Sciences Learning Center provides assistance in all lower-division mathematics courses and in selected statistics courses. Help is available on a drop-in basis during both weekday and weekend hours. Study materials, reference texts, and microcomputers are available. Independent study sections of some courses are also available.

The University Learning Center and Language Laboratory, located in Kidder Hall, Room 28, is operated by the Communication Media Center. The center is available for students to study materials placed in it by their instructors. It was recently remodeled and has 72 audio carrels for language and other audio learning, and 36 other carrels with the capability of small group and independent video instruction, computer assisted instruction, playing video discs, slide-tapes, and interactive video instruction.

Other colleges, departments, or programs offering learning and resource centers include animal science, business, chemistry, the Counseling Center, botany and plant pathology, education, the Educational Opportunities Program, forestry, geography, health, home economics, foreign languages, music, political science, and philosophy.

Office of the Dean of Students

J. Roger Penn
Dean of Student

Nancy M. Vanderpool
Assistant Dean

William N. Oye
Coordinator, Student Conduct & Mediation

Diane M. Belair
Coordinator, Support Srvices

The Office of the Dean of Students has the responsibility of providing for and promoting the general welfare of all OSU students. Staff members coordinate numerous programs and provide personalized assistance and advising to students, parents, and faculty.

Staff members advise living groups and student organizations, aid students experiencing emergencies, and coordinate the Minority Scholar Program.

The staff works with students experiencing conduct or behavior problems, coordinates services for disabled students, provides assistance to older students and commuter students, administers the National Student Exchange program, oversees the OSU Child Care Center and coordinates co-curricular offerings.

The Office of the Dean of Students makes available to the university community data regarding student growth and development as well as data on student demographics and provides consultation to faculty, parents, and community members on a wide range of issues and concerns.

Career Planning and Placement Center

Shirley Gregory
Director

Diane Dungan
Head of Cooperative Education, Adviser

Margaret Manoogian-O'Dell
Adviser

Karen Piepmeier
Adviser & Coordinator, International Coop. Education

The Career Planning and Placement Center provides a full array of career services and resources for undergraduates, graduates, and alumni.

Placement Services
(undergraduates, graduate students, and alumni)
Each year, more than 350 employers interview students and alumni in the OSU Career Planning and Placement Center. In addition to interview services, the center maintains student and alumni placement files; provides individual advising on careers and job placement; and presents sessions on writing resumes, interviewing techniques, job search strategies, co-op internships, on-campus interviewing, and, in conjunction with Liberal Studies, special academic courses. Up-to-date information on the job market is provided, and more than 850 binders of company information are available for student use. Last year, the center received notices of more than 17,000 job vacancies which were listed in the twice-weekly newsletter, Job File, and/or posted in the center and academic departments. Typewriters are available for preparation of materials.

Registration in the center includes Resume Expert, a national database matching student resume's to employers openings responding with requested qualifications. Also available is a computerized employment data bank.

Cooperative Education Internships
(sophomores, juniors, seniors, and graduate students)
Cooperative education internships enable students to enhance their knowledge, personal development, and professional preparation. Co-op internships blend academic study with productive employment in business, industry, government, or social service agencies both in the United States & Internationally. Co-op draws on a variety of resources and returns benefits to the student, to the employer, to the community, and to the University. Annually, over 4,000 co-op internships in more than 900 businesses and agencies throughout Oregon, the nation, and the world are received by the center.

Developing placements. Field placements are directly related to the student's career and educational goals and are most often jointly supervised by a faculty coordinator and the placement site supervisor. Placements may be full or part time. Students may earn from 3 to 16 credits through courses numbered 410 or 510. Work periods alternate with class work between the sophomore and senior years or during graduate studies. Students should contact the Career Planning and Placement Center

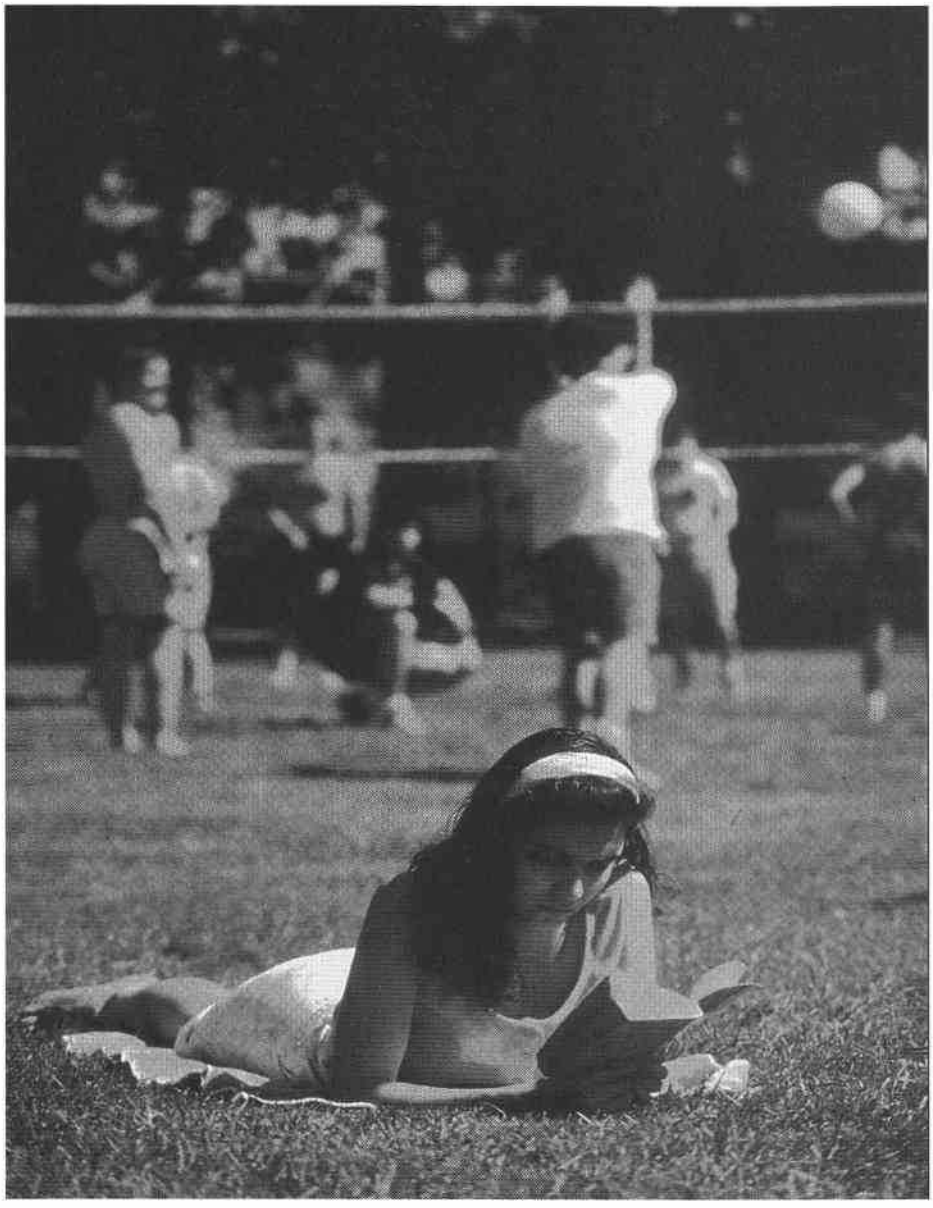
or the faculty adviser in their academic department for information regarding participation in these programs.

Computer Facilities

Students at Oregon State have access to a wide variety of computer resources, from microcomputers to supercomputers, throughout the University. University Computing Services (UCS) operates four mainframe systems for academic use. There are four general access microcomputer facilities available to students at no charge. The microcomputer systems are networked so that they can act as workstations to access campus mainframes and other facilities nationally and internationally. The College of Business facility contains 89 Leading Edge and Hewlett-Packard Vectra systems; the Computer Science facility contains 40 Macintosh systems and nine Hewlett-Packard 150 systems; the Milne facility contains 20 IBM XT, 18 IBM PS2/30, and 18 Apple Macintosh systems; and the Kerr Library facility houses 66 Macintosh SE systems and 33 IBM PS2 systems. This last facility contains laser printers and is open 24 hours per day, seven days a week during the regular academic year.

In addition, many individual colleges, schools, and departments at OSU have their own computer facilities for use by students and faculty.

With thousands of individual computers and mainframe computer terminals located all over the campus, OSU students and faculty don't have to look far for the computer resources they need.



Women's Center

The Women's Center provides personalized assistance and referral services primarily to women students. A wide range of program offerings encourage academic achievement, leadership development, and the consideration of current issues of importance to women and men in the academic community.

The center, which is located in Benton Annex between Benton Hall and the Pharmacy Building, provides a study lounge, meeting rooms, and an extensive library on women's issues.

Ongoing programs include a speaker series, conferences and workshops, discussion sessions, film series, and peer assistance and referral. Coordination and support are provided through the Office of the Dean of Students.

Services for Students with Disabilities

Tracy L. Bentley
Director

Diane M. Belair
Coordinator, Support Srvices

Through the Office of the Dean of Students, the University offers a program of services for students with disabilities.

Note-takers, interpreters for the deaf, reader help, and visual-aid equipment ("Visualtek" and "Optacon") for low vision and legally blind students are among the services available to students with disabilities at OSU. Also offered are help with registration, housing arrangements, and other special needs.

These and other services are described in Services for Students with Disabilities, a brochure available from the Office of the Dean of Students. The brochure includes information about people to contact for assistance and a brief description of available services.

For more information about any of these services, contact the Office of the Dean of Students, Room A200, Administrative Services Building (737-3661 or T.D.D. 737-3666).

NATIONAL STUDENT EXCHANGE PROGRAM

WILLIAM OYE
Coordinator

Through the National Student Exchange (NSE) academically qualified students are given the opportunity to spend up to one academic year at another school while paying in-state tuition rates. Grades and credits earned during the exchange become a part of each student's OSU transcript.

Over 100 colleges and universities across the country currently participate in the National Student Exchange program. While on exchange, students have the opportunity to experience a different learning environment, to broaden social and cultural awareness, and to live in another part of the United States. OSU students who have gone on exchange often describe the opportunity as the highlight of their college career and one of the most meaningful times of their lives.

To qualify, a student must be a) an Oregon resident; b) a full-time student in good standing with a 2.50 cumulative grade-point average at the time of application and during the quarter prior to exchange; and c) an undergraduate who has earned at least 45 hours of credit at the time the exchange begins. Each year applications are available beginning December 1 and are due March 1 in the Office of the Dean of Students.

CHILD CARE SERVICES

NANCY VANDERPOOL
Assistant Dean

The Child Care Center at OSU is located at 11th & Adams and is a full-day child care center for children of students, staff and faculty. There are 152 full-time spaces for infants through Kindergarten. Child care may be purchased in segments of half-time and flex-time in addition to full-time. The center is operated by Kinder-Care-At-Work, Inc. Some subsidy for students is available as well as financial assistance for staff & faculty. Further information may be obtained by calling the center (737-4641) or the Dean of Students' Office (737-3661).

Also, two pre-school classes are available at the OSU Child Development Center. Information regarding other child care services in the area, family contact/ emergency, etc., is available in the Dean of Students' Office.

ENGLISH LANGUAGE INSTITUTE

EVE CHAMBERS SANCHEZ
Director

General Information
The primary function of the English Language Institute is to help provide students with the broad range of language, academic, and cultural skills necessary for competent study at an American college or university. The institute offers intensive ESL instruction in a variety of multilevel courses: reading/writing, listening/speaking, integrated skills, pronunciation and grammar. The ELI is supported wholly by student tuition. Most students provide their own funding; however, some are sponsored by international organizations or foreign governments.

The academic experience is supplemented by social, cultural, and recreational activities. The American conversant program furnishes an opportunity for at least one hour a week of conversation with native speakers, both University students and members of the community. Students at the English Language Institute have the same privileges as regularly enrolled American students in the use of campus recreational facilities, library, bookstore, and student health and counseling services.

Conditional admission to OSU
Foreign students who are academically admissible may be granted conditional admission to OSU if they have a TOEFL score from 500 to 549. Conditionally admitted students are tested by the ELI upon their arrival on campus and a recommendation is made as to their course of study. In most cases these students can study part time at OSU and part time at the ELI.

Diagnostic testing
The ELI conducts the on-campus testing of English language proficiency for those foreign students who have been conditionally admitted to OSU. (See Admission of Foreign Students.) Based on this language assessment, the ELI recommends English language course work appropriate to the individual. The ELI also administers the SPEAK test, a test of oral skills, to foreign teaching assistants.

Special programs
The Division of Special Programs of the English Language Institute operates on the basis of proposals submitted to it by foreign educational missions, embassies, and international organizations. Unlike the ELI's ongoing core curriculum in general language skills development, curricula developed by the Division of Special Programs serve the specific needs of sponsored participants.

WICHE STUDENT EXCHANGE PROGRAM

Western Undergraduate Exchange Program (WUE)
The Western Undergraduate Exchange (WUE) program offers the opportunity for students in 12 participating states to enroll in designated two-year and four-year academic majors in selected institutions at reduced tuition levels.

States participating in the Western Undergraduate Exchange are: Alaska, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah and Wyoming.

Programs open to WUE eligible students new to OSU, on a space available basis, include:

College of Agriculture
B.S. in Animal Science (Poultry Option)
B.S. in Bioresource Research
B.S. in Food Science and Technology

College of Engineering
B.S. in Nuclear Engineering
Pre-Nuclear Engineering
B.S. in Radiation Health Physics

College of Forestry
B.S. in Forest Engineering
B.S. in Forest Management
B.S. in Forest Products
B.S. in Forest Recreation Resources
B.S. in Natural Resources

College of Health and Human Performance
B.S. in Environmental Health and Safety
B.S. in Exercise and Sport Science
B.S. in Health Care Administration
B.S. in Health Promotion and Education

College of Home Economics and Education
B.S. in Apparel Design
B.S. in Human Development and Family Sciences (Family Finance Option) (Home Economics Communication Option)
B.S. in Nutrition and Food Management (Options in: Dietetics, Food Systems Management, Foods in Business, and Nutrition Science)

College of Science
B.S. in Environmental Sciences
Additional information is available from the Office of Admissions.

Western Regional Graduate Program (WRGP)
Residents of Alaska, Arizona, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming are eligible to enroll at resident rates of tuition in distinctive graduate programs. There is no requirement that students meet financial aid criteria.

Graduate programs are distinctive in the sense that they are uncommon and, through a regional review process are found to be of high quality. Programs are nominated by their institutions, reviewed by other graduate institutions in the participating states, and selected by the WRGP Advisory Council, a policy body that represents all participating states.

Programs open to WRGP eligible students new to OSU include:
Family Resource Management (Ph.D.)
Human Development and Family Studies (Ph.D.)
Marine Resource Management (M.A., M.S.)
Nutrition and Food Management (Ph.D.)
Oceanography-Biological (M.A., M.S., Ph.D.)
Oceanography-Chemical, Geological, and Physical (M.A., M.S., Ph.D.)
Operations Research (M.A., M.S.)
Poultry Science (M.S., Ph.D.)
Toxicology (M.S., Ph.D.)

Interested students should apply for admission and for WRGP tuition status directly to the program director. Applicants must identify themselves as "WICHE WRGP" applicants. Additional information about this program and a list of contact persons for the graduate programs listed above are available from the Graduate School Office.

Professional Student Exchange Program (PSEP)

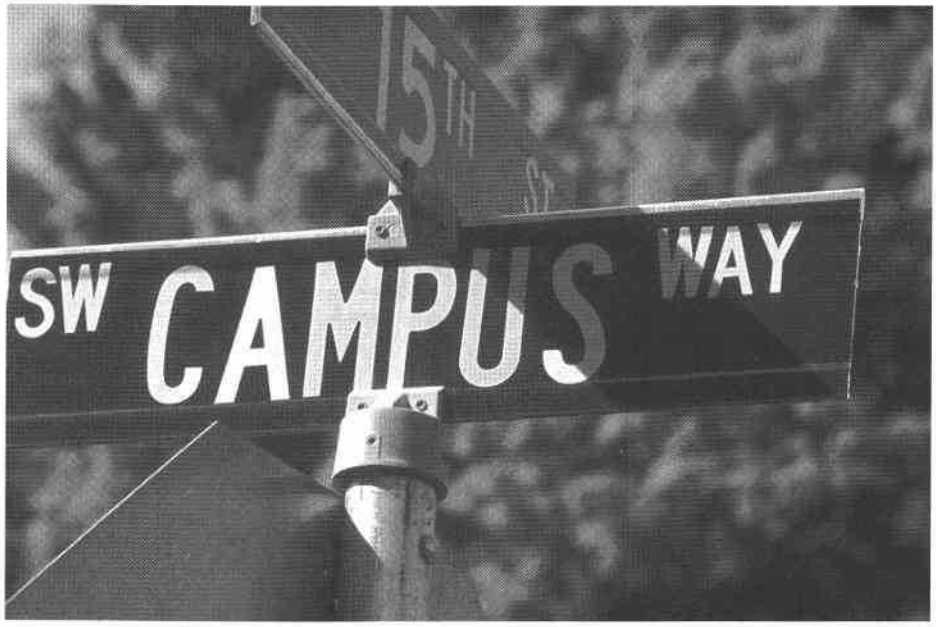
The Professional Student Exchange Program enables students in 13 western states (Alaska, Arizona, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, Utah, Washington, and Wyoming) to enroll in professional programs not available in their home state. The fields of study in this program are architecture, dentistry, graduate library studies, graduate nursing education, law, maritime technology, medicine, occupational therapy, optometry, osteopathic medicine, pharmacy, physical therapy, physician assistant, podiatry, and veterinary medicine.

The Oregon State System of Higher Education participation in WICHE enables qualified Oregon resident students to apply for training at designated institutions (most in other states) in the following fields: graduate library studies, occupational therapy, optometry, osteopathic medicine, physical therapy, podiatry, and public health-nutrition. OSU provides opportunities for students from participating states to major in pharmacy and veterinary medicine.

In most programs, WICHE students receive preference in admission and pay resident tuition at state-supported institutions (or reduced tuition at private institutions). Students apply to the certifying office in their home state for certification in fields in which the state supports its residents through the Professional Student Exchange Program. The student then applies for admission to the participating university of their choice. Students from Oregon must make application as Oregon residents prior to October 15 of the year preceding the academic year of anticipated enrollment.

WICHE certification does not guarantee admission. The WICHE Professional Student Exchange Program applies only to the professional years of schooling; pre-professional study is not included. This is not a scholarship program, but an extension of the educational opportunities that each state offers its residents.

Additional information and forms for application and certification for Oregon resident students may be obtained by writing to: Certifying Officer for Oregon, WICHE Student Exchange Program, P.O. Box 3175, Eugene, OR 97403-0175. Interested nonresident student applicants should contact the Certifying Officer in their home state.



STUDENT HEALTH CENTER

JAYNE ACKERMAN, M.D.
Director

SUSAN LONGERBEAM
Associate Director

Student Health Services provides programs to meet the medical and health needs of OSU Students. Health promotion and education services reflect the college health orientation of Student Health Services. Individual and group tailored programs are available in the following areas: nutrition, fitness, stress management, substance abuse, eating disorders, sexual health and other topics as needed.

Disease prevention and wellness programming are integrated with clinical medical care. Outpatient clinic services are available in general medicine, mental health, gynecology and sexual health, allergy, sports medicine, physical therapy, and travel medicine. A self care clinic exists for evaluation of colds and associated respiratory illnesses. Health Services also provides pharmacy, x-ray, and laboratory services. Inpatient care is available on an as needed basis during the week. Outpatient services are open Monday through Friday during posted hours. In addition, Saturday and Sunday urgent care clinics are available.

Sudents interested in health care can become further involved with the health center as peer educators (HOPE), and as Student Health Advisory Group members. Please call 737-3106 with inquiries.

Sudent Health Services are accessible to all OSU registered students who have paid the student health fee. Confidential care is provided by physicians, nurse practitioners, and other health care professionals. Students are encouraged to become established with a primary care provider early in their university career. Most outpatient visits, including mental health visits and appointments with health educators, are currently covered by the health fee. User fees apply for ancillary services such as lab, x-ray, and physical therapy (expenses incurred at community medical facilities outside of the health center are the responsibility of the student). Check the coverage provided by the Student Insurance Policy (see below.)

Immunization and Medical History Requirement

Students are encourage to satisfy all immunization requirements before arriving at OSU. Proof of immunity is currently required for Measles, Mumps, and Rubella. In addition, most international students are required to have a tuberculin test upon arrival at OSU.

ASOSU Health Insurance

Students are urged to ensure their financial security with health insurance. The Associated Students of OSU sponsors a group plan for students and their families. The plan is coordinated with Student Health Services: covered expenses at the health center are at 100%. There are no preexisting condition limitations, and no deductibles. Inpatient expenses at the local hospital (Good Samaritan) are covered at 90%. More information and enrollment forms can be obtained at the Student Health Services Insurance Office, 737-7568.

Information Services

Our goal is to create a total quality, team-based, integrated Information Services organization with fluid boundaries so that we are able to meet the current needs of our customers as well as respond to strategic new opportunities.

JOY HUGHES
Associate Provost for Information Services

Created in 1994, this new area studied the current organization of the departments that comprise Information Services (University Libraries, the Communication and Media Center, Telecommunications, and University Computing Center) and recommend an integrated structure for Information Services (IS) that would enhance efficiency and services.

This process, which involved the University community, is now complete and reorganization is underway to create a total quality, team-based, integrated organization with fluid boundaries to be able to meet the current needs of customers as well as to respond to strategic new opportunities.

By the end of this academic year, Information Service's voice, data, and video networking staffs will be integrated into one network services department.

User services functions currently spread across all four departments will be realigned into teams housed in one user-services department. Among the teams will be the integrated help desk team, the instruction and training team, and the information access team. IS administrative support functions, such as finance and personnel, will also be integrated.

OREGON STATE UNIVERSITY LIBRARIES

MELVIN R. GEORGE
The Delpha and Donald Campbell University Librarian

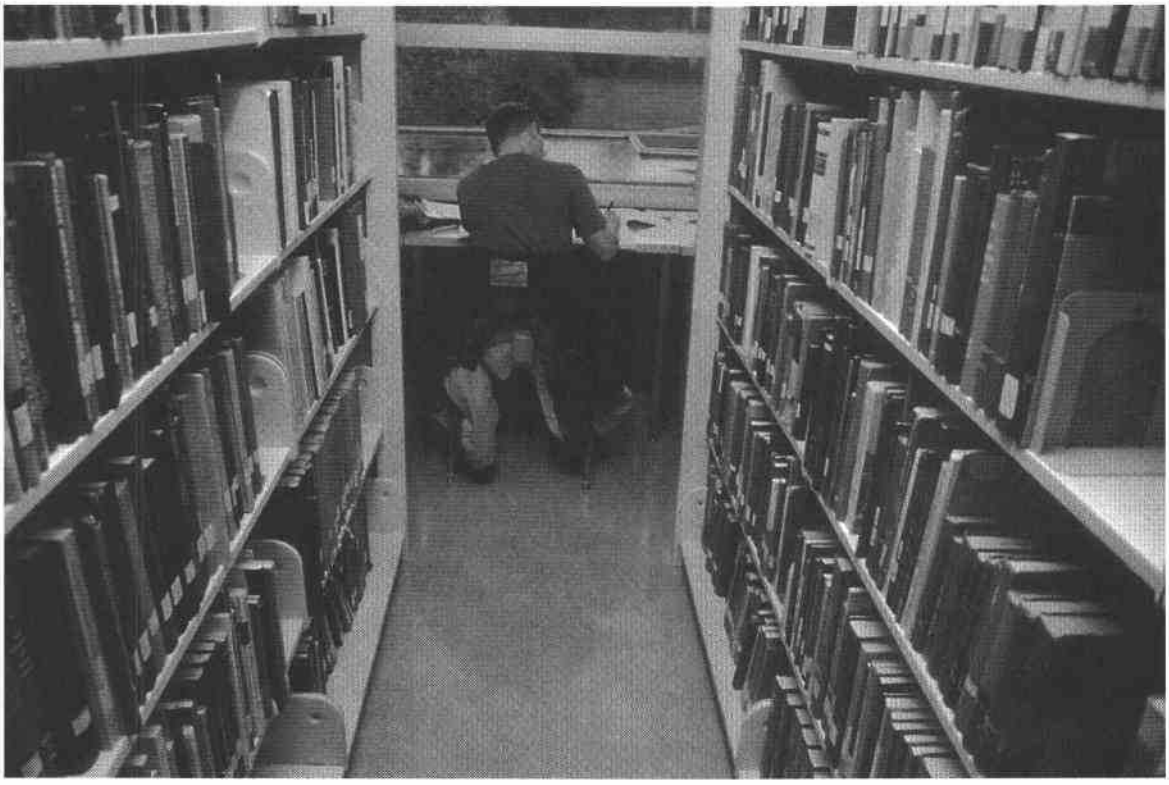
The University's instructional and research programs are supported by libraries which offer the most modern electronic services, as well as many unique collections, galleries and museums which enhance and support the learning process.

The William Jasper Kerr Library is a six-story building containing more than 1,750,000 volumes, 340,000 government publications, and 1,500,000 microform pieces. Most materials are on open shelves directly available to faculty and students.

Located on the first floor are newspapers, microforms and microform readers, government publications, the Map Room, and the UCS student computer labs.

The library offers a full range of reference and information services. Librarians are available at the reference and information desk on the second floor to assist library users in identifying and accessing information on all subjects. Students, faculty and staff are encouraged to make appointments ahead of time, through the reference/information desk, for help with extensive research projects. Separate service units are available on the first floor for the government publications, maps, and microform collections. In addition, members of the library faculty are available to work with other faculty in preparing course related instructional programs, for guidance and help in searching databases, to arrange interlibrary loans, and to provide services for regional businesses and county Extension and Experiment Stations across the state.

Automation. The OSU libraries are fully automated. The library online catalog, known as OASIS, is available through public



terminals on each floor of the library and to students and faculty in their offices and laboratories through the campus electronic network. Others can use modem dial-up access through the campus LAN. Non-print holdings are being added to OASIS in cooperation with the Communication Media Center. In addition to OASIS, CD-ROM databases are also available for searching in the library and through the campus LAN. The library continues to mediate searches of off-campus databases through its Library Information Retrieval Service (LIRS). The library also maintains a section of the University gopher which structures access to other libraries' catalogs and to information files. Inquiries about automated access to the library should be addressed to anyone at the reference/ information desk.

Collections. All library collections are under the direction of subject specialists who closely coordinate their efforts with teaching and research needs of the University. Subjects in which special strength has been developed are textiles, nutrition, mathematics, horticulture, oceanography, agriculture, forestry, entomology, and marine biology. Collections of some distinction are being developed in food technology, chemistry, plant pathology, and mycology. Almost 18,000 serials are currently received, of which 7,000 are periodicals. Bound serials are a major portion of the library's holdings. The library, with over 170,000 maps, has one of the more comprehensive map collections in the Northwest.

Special Collections contains the papers of Linus Pauling, internationally acclaimed scientist and the only person to have won two unshared Nobel prizes. The collection includes all of Pauling's personal and scientific papers, notebooks, and correspondence from 1916 to the present: more than 125,000 items comprising some 130 linear feet. There are also books, medals, research models, memorabilia, and more than 100 films. These papers reflect the variety and breadth of Linus Pauling's scholarly interest and his profound influence on the development of 20th-century chemistry and biology.

Also in Special Collections is the Atomic Energy Collection, one of the more important research collections on the subject in the United States. The collection consists of nearly 3,000 items, including the first published account of the discovery of radioactivity in 1896 by Henri Becquerel, the hearings of Robert Oppenheimer, and formerly secret reports. It also features cultural aspects of the atomic age.

Kerr Library is a U.S. Government depository library as well as a depository for official publications of the state of Oregon. Publications from industrial, business, and international organizations and institutions are also received.

The Mark O. Hatfield Marine Science Center, OSU's Marine Lab, houses the Marilyn Potts Guin Library. Material in that library is included in OASIS and is available to library users. The collection covers many aspects of marine science with particular shrengths in marine mammals, marine fish, and agriculture.

Borrowing privileges are extended to the university community and to others by permission. Through a reciprocal agreement, state system libraries honor each other's student and faculty identification cards for circulating materials.

Over 5,000,000 volumes in the libraries of the state institutions of higher education are available to faculty, staff members, and students through interlibrary loan. In addition, books are borrowed from and lent to other libraries in the Pacific Northwest and throughout the nation and world. Membership in the Center for Research Libraries provides access to expensive and rare research materials.

Communication Media Center

Jon Root
Director

The Communication Media Center (CMC), an Information Services department, is OSU's centralized instructional media service. The primary focus of the CMC is to provide resident faculty with a broad range of instructional media resources to strengthen instructional processes and thereby enhance student achievement through the use of current instructional technology methods and materials in the classroom. The CMC supports the development of instructional lessons using multimedia, television, and other types of media; the production of print and projection media including graphic, photographic, and transparent instructional materials; classroom support through the development of multimedia capable enhanced classroom andthe distribution and operation of media (A-V and TV) equipment; the repair of electronic media equipment; the scheduling and rental of video and film programs; and the distribution of videotaped programs via the Corvallis community cable system and a campus closed-circuit system. A faculty development lab is operated by CMC to facilitate faculty member's development of multimedia materials. A computer graphic arts service is available for outputting high quality computer generated color slides and overhead transparencies. "AV Online," a computer-based directory of media programs can be accessed at CMC to assist faculty in locating desired instructional materials.

The Communication Media Center, through telecommunications systems, provides distance delivery of live classes to remote locations in the state and elsewhere in the country. Four classrooms have been designed specifically for this purpose. The CMC also has satellite down-link receiving equipment for teleconferencing and receiving instructional programs. CMC produces satellite teleconferences for OSU departments, for state and national distribution. Technical support and course development assistance for the use of the Oregon Ed-Net telecommunication system is provided by CMC.

The CMC also operates the University Learning Center. Instructional departments are encouraged to deposit audio-visual self-instructional materials for student use in the University Learning Center. The University's

video library is housed in the University Learning Center.

In addition to the above services, consultation, seminars, and workshops are available featuring current information, methods, and techniques concerning the different types of communication media. This service includes presentations about preparation of instructional materials, purchase of media equipment, methods of presentation, design of classrooms and buildings, design of instructional research proposals as they relate to media use and production, use of Oregon Ed-Net and distance education, and other media-related topics.

The Communication Media Center administers the Photographic Service located in Weniger Hall and the University Graphic Art Service in Kidder Hall for noninstructional photography and graphic arts requirements. Television production, electronic equipment maintenance and repair, and electronic media equipment rental are also available for research, administration, public relations, and other noninstructional activities. There is a charge for noninstructional service.

Telecommunication Services

Todd Stark
Director

The Telecommunication Services department provides all telephone and telephone related services to the OSU campus community. The Telecommunication Services offices and switchroom are located in the basement of the Administrative Services Building.

Voice service is provided for OSU with an AT&T Definity Generic 2.2 PBX. This system provides a vast array of features, and works with two AUDIX voice mail systems. The Definity system currently has more than 8,500 lines working of which 92% are analog lines and 8% are digital lines. Trunking consists of almost 600 trunks, over 300 tie lines, and many other services including T-1 service to nine remote groups, AT&T Software Defined Network for long distance service, Switched 56 trunks for video conferencing and a 24 port video bridge. The OSU switch is the hub of the Oregon State System of Higher Education telecommunications network, linking together all eight of the OSSHE institutions and the Hatfield Marine Science Center.

Telecommunication Services provides telephone and voice mail services to all departments on campus, as well as the dorms and residential co-ops. Students may also subscribe to long distance services and custom calling features, as well as cable TV in the dorms. Other services provided to the campus community include pagers, cellular phones, FAX and Telex services. Information is provided through the campus operators as well as the Staff Directory.

All telephone work is done by Telecommunication Services staff working with Departmental Telephone Coordinators in each campus department. Repair service calls are handled through the OSU Help Desk and the OSSHE Help Desk which both provide 24 hour a day service for emergencies.

The Telecommunication Services department is involved in many campus-wide projects including wiring the data network for all the dorms and co-ops, supporting the transport mechanism for the NERO project for the College of Engineering and the Computer Science Department, access to the NIIT superhighway for the College of Oceanic and Atmospheric Sciences, T-1 service for NorthwestNet Internet access, and Frame Relay services for OSSHENET Administration, the Financial Information System (FIS), the Student Information System (SIS), and OSU Extension Service and Agricultural Experiment Stations.

University Computing Services

Tony White
Interim Director

University Computing Services (UCS) provides general computing and network services for the campus. UCS supports academic and administrative computing, consulting, and installation and maintenance service for a variety of computers.

The central computers at UCS are two Digital Corp. 7000/620 AXP Open/VMS machines which support administrative computing, and a Digital 2100 AXP OSF/1 host for academic use. A fiber-based campus network provides digital communication among various departmental and college computing facilities.

Other services offered by UCS include optical mark scanning for use in data collection and test scoring; high-speed impact and laser printing; maintenance and installation for a variety of personal computer systems and workstations; facility management of departmental computing systems; information about and support of supercomputing access; and support for statistical processing systems.

UCS operates concentrations of personal computers. Three classroom configurations are located in Milne Computer Center. One large facility is in Kerr Library that is open 24 hours a day, seven days a week during the regular academic year. An additional lab is located in Sackett Hall.

In addition to computational facilities, University Computing Services provides technical consulting regarding use and acquisition of supported computing systems and software. Instructional materials have been prepared to assist students, faculty, and others to gain an understanding of computers and network services.

Summer Session/Extended Education

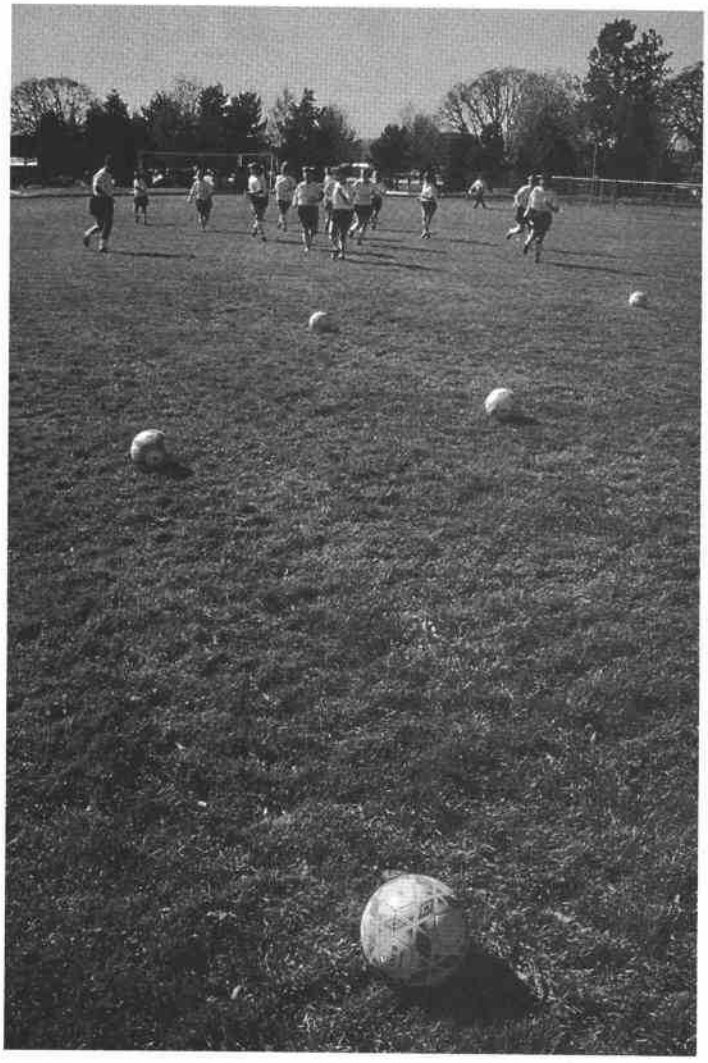
DEBORAH J. BIRD
Coordinator of Summer Session

SUMMER SESSION

OSU's Summer Session is a great way to begin, continue, or advance your education through more than 400 courses in 70 departments from agriculture to zoology. Courses range in length from two days to 11 weeks, with most courses running the eight weeks. Many departments also offer independent study projects, e.g. research, reading and conference, thesis, internship, etc.

The typical full-time summer course load for undergraduates is 12 credits; for graduates, 9 credits. Additional credits may be taken with the dean's approval.

Anyone can register for Summer Session classes because there are no admission requirements–you don't even have to apply. Students who have been academically suspended from the University are ineligible to attend Summer Session. Students who wish to be admitted to begin their degree course work during Summer Session must apply according to Admission's deadlines. For details contact Admissions at (503) 737-4411.



Non-resident students enjoy considerable tuition savings because there are no out-of-state fees during summer. Residents and non-residents pay the same tuition.

The Summer Session Bulletin, published each spring, contains current information on summer courses and schedule, registration procedures, tuition, housing, services and facilities, etc. For a free copy of the Summer Session Bulletin, contact the Summer Session Office (503) 737-2052 or stop by Snell Hall 327.

EXTENDED EDUCATION

Continuing Higher Education (CHE) at OSU provides a variety of extended and campus-based educational programs. Credit and noncredit courses, seminars, and workshops are offered throughout Oregon. An extended degree program is offered in Bend, Astoria, Newport, Coos Bay, and Hood River. An OSU Evening/Weekend program in Liberal Studies provides options on campus for students unable to attend daytime classes. CHE also coordinates televised courses in cooperation with the OSU Communication Media Center.

The Individualized Directed Learning Program (IDL) provides independent study courses for undergraduates while they are away from campus. Approximately 50 IDL courses are taught by OSU faculty.

Noncredit programs include precollege algebra courses for students needing additional instruction before entering college level mathematics. CHE also provides a range of conference and consulting services, including specialized credit and noncredit programs in business, industry, and other educational organizations. CHE noncredit programming is coordinated closely with OSU Extension, CHE's partner in Extended Education.

Credits earned through Continuing Higher Education are generally applicable toward OSU undergraduate and graduate degree programs. Students should consult their academic adviser concerning specific academic requirements. For more information about available programs and services, please contact the Office of Extended Education, Continuing Higher Education, 327 Snell Hall.

International Education

The Office of International Education (OIE) provides the leadership for Oregon State University's involvement in a wide range of international activities: the exchange of students and faculty, cooperative research and learning experiences around the world, international curriculum development, and the development of global perspectives and understanding among nations and peoples. The OIE offers logistical and administrative support for the University's international activities.

JOHN VAN DE WATER
Dean

INTERNATIONAL STUDENT AND SCHOLAR PROGRAMS

The OIE provides a wide range of programs and services for the international students and scholars on the OSU campus. At present there are more than 1400 students and 200 scholars from 92 countries at Oregon State University. OIE also sponsors educational and cultural programs for the University and Corvallis community.

The Office of International Education provides special assistance to international students. The staff offers an orientation program for new students; provides liaison with University, community, and international sponsoring offices; advises on immigration and other governmental regulations, medical insurance coverage, and cultural and personal matters; helps with financial certifications for the transfer of funds from other countries; and advises on the University's policy of provisional admission because of English deficiency. The office conducts workshops of interest to international students on such issues as practical training, American culture, re-entry, as well as workshops for the community on cross-cultural awareness and concerns.

The OIE also provides leadership for a wide variety of cross-cultural activities to enrich the experience of international students on campus and in the community. Among the cooperating organizations are Crossroads International (a community organization), West International Hall (an OSU residence hall for international and American students), and the International Students of Oregon State University (ISOSU—a student organization). Crossroads International, with members from the Corvallis community, provides home visits for new international students, Friendship Home contacts, conversation groups, partners for students and their spouses, and the Crossroads Conversation School. In addition, International Cultural Service Program (ICSP) provides tuition remission scholarships to a select number of international students who provide cultural and educational service in the mid-Willamette Valley area. These "cultural ambassadors" visit classes, clubs, service organizations, churches, nursing homes, & businesses to share information about their countries and cultures.

Study Abroad and Exchange Programs

OSU students may broaden their education by taking part in study abroad programs. All of the programs listed below allow qualified students from a wide variety of disciplines to earn academic credit from Oregon State University while pursuing their studies abroad. Not only do students earn OSU credit, but they can apply their financial aid to help cover the costs.

More information about each of the following programs can be obtained in the Office of International Education, Snell Hall, Fourth Floor (737-3006).

Australia, Bathurst. Students of all majors may study for a year at Charles Sturt University-Mitchell in Bathurst, three hours inland from Sydney.

Australia, Sydney. Undergraduate business majors can spend three terms at the University of Technology in Sydney.

Canada, Vancouver. College of Agricultural Sciences students, as well as students from some other disciplines, can spend a year at the University of British Columbia.

China, Beijing. The Fall semester program in China, at the Central Institute of Nationalities in Beijing, combines intensive language study with courses in Chinese minority cultures. A 3-week study tour to several minority regions is also included. There is no language prerequisite.

Denmark, Aarhus. College of Business students may earn their international business certificate by studying fall term in Aarhus, Denmark. Each year, approximately 20 students are exchanged.

Denmark, Copenhagen. M.B.A. students may spend fall semester at the Copenhagen Business School.

Ecuador, Quito. Students may study in Ecuador for the fall term, spring semester (winter/spring terms), or for the full year. Students live with a host family while studying language and culture. Regular university courses may be taken, depending on Spanish language ability. A minimum of two years of college-level Spanish is required.

Ecuador, Quito. (Summer) Students interested in improving their Spanish and learning more about the history and culture of Ecuador may participate in a five-week intensive study/travel seminar in Quito during the summer.

England, Lancaster. College of Science students may study for a year at the University of Lancaster in England.

England, London. Historic London is the setting for this term-long program, which emphasizes the humanities and social sciences. Field trips are integrated into the academic work to provide a balanced educational experience. Students live with British families.

England, Nottingham. Engineering students can spend a year at the University of Nottingham and take courses equivalent to OSU engineering degree requirements while experiencing the British culture and educational system.

England, Sussex. Students from the Colleges of Science, Engineering, and Liberal Arts can spend a year at the University of Sussex near Brighton, England.

France, Avignon. Students of all majors may study in Avignon fall, winter, or spring term. Students study language and culture and take weekly excursions in the Provence region. A family homestay is part of the program.

France, Lyon. Students of all majors may study for a year in Lyon, the second largest city in France. Depending on their language ability, students have the opportunity either to study French language and culture or take courses in virtually every academic area offered by OSU. A minimum of two years of college-level French is required.

France, Poitiers. This one-year academic program is for students (of all majors) who have studied at least two years of college-level French. Most students are enrolled in the Institute for Foreigners at the University of Poitiers, where they study French language and literature. Students with sufficient academic preparation may enroll in regular University of Poitiers classes. Some students are able to live with French families.

Germany, Baden-Württemberg. Students in this year-long program may study at any one of the universities in the state of Baden-Württemberg, including Freiburg, Heidelberg, Hohenheim, Karlsruhe, Konstanz, Mannheim, Stuttgart, Tübingen, or Ulm. Instruction is in German; applicants must have had at least two years of college-level German before beginning their studies in Germany.

Germany, Cologne. Students of all majors may study Spring term in Cologne. In addition to German language, students take German culture courses taught in English. Students live with German families. Two terms of college German is a prerequisite.

Germany, Tübingen. A fifteen-week intensive German language program is available to qualified students who have completed two terms of first-year, college-level German. Students who complete the language intensive program can earn up to 21 credits in German language and culture.

Hungary, Szeged. The Hungary program, offered in English, provides insight into another culture and the dramatic changes in the politics of Europe and the world. Language and non-western culture requirements can be fulfilled on this program. There is no language prerequisite, and students of all majors can participate.

Italy, Siena. Students of all majors can spend fall, winter, or spring term in Italy taking courses in Italian language, humanities, and social sciences. Excursions to cities such as Florence, Pisa, and Rome are included.

Japan, Tokyo. At Waseda University in Tokyo, students have an opportunity to study the history, culture, language, and economic conditions of Japan while living with a Japanese family. Instruction is in English. One year of college-level Japanese is required.

Japan, Tokyo. Aoyama Gakuin University's School of International Politics, Economics, and Business is the center of this program that integrates American and Japanese students. Instruction is in English. At least one year of college-level Japanese is required.

Korea, Seoul. The programs in Korea take advantage of the international divisions of the two universities, Yonsei and Ewha, where students enroll in language courses and study Asian history, economics, and culture in English. There is no language prerequisite.

Mexico, Puebla. This program at the University of the Americas offers students the opportunity to take courses in Spanish with Mexican students. Participants reside in dormitories with Mexican roommates or with host families. A minimum of two years of college-level Spanish is required.

Netherlands, Rotterdam. Graphic Arts students may study graphic design for 3-weeks during the summer.

New Zealand, Christchurch. Through the New Zealand exchange program, juniors and seniors in agriculture or forest recreation may study at Lincoln University (February-December).

Norway, Kristiansand. Business students may complete business courses for a term in Norway. Classes are taught in English.

Russia/Newly Independent States. This year-long program offers students the unique opportunity to study in any one of 14 republics of the former Soviet Union. Students take classes from university course listings and must take language instruction in Russian or in the local language. Three years of Russian is a prerequisite for students studying Russian-speaking states, two years for those studying in non-Russian-speaking states..

Scotland, Aberdeen. Art majors can study art for a year at the Robert Gordon's Institute of Technology in Aberdeen, Scotland.

Thailand, Bangkok. OSU students can study in Bangkok for a full semester in Thailand's prestigious Chulalogkorn University. Participants take courses in English in a variety of subject areas while studying Thai language.

Memorial Union Programs and Student Activities

WILLIAM EDWARDS
Director, Memorial Union and Educational Activities

MIKE HENTHORNE
Director of Operations

DOROTHY MATTHEWS
Manager MU Craft Center

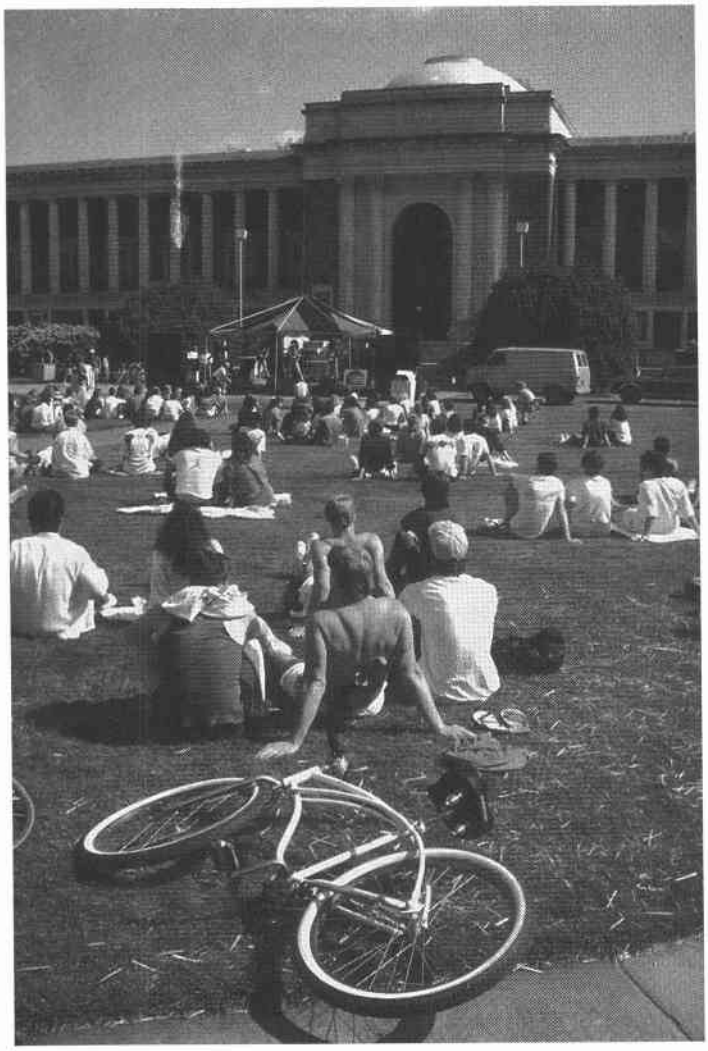
MEMORIAL UNION AND MEMORIAL UNION EAST

The Memorial Union, located in the heart of the campus, is the community center of the University. It provides services, facilities, and programs to meet the varied social, recreational, and cultural needs of OSU students, faculty, staff, alumni, and campus guests.

The building provides a complete food service including cafeteria, snack bars, and banquet facilities; a bookstore; recreation area including billiards and bowling; a music lounge; music practice rooms; ballroom; post office; art gallery; lounges; and meeting rooms of all types.

The Memorial Union East contains an activity center for the use of all student organizations. It provides a communication center for student broadcast and publications media, food-service facilities, meeting rooms, and a craft center.

The president of the Memorial Union is a student; other students share actively in its management and in organizing the social, recreational, and cultural programs.



The Memorial Union buildings stand as constant reminders of this nation's struggle for peace and as living memorials to Oregon Staters who have given their lives in the service of their country.

MU CRAFT CENTER

The Memorial Union Craft Center, located on the ground floor of the MU East is one of only two such centers in Oregon. It is a dynamic, user-supported arts and crafts studio welcoming all adults and encouraging beginners as well as experienced craftspersons. The Craft Center is open 7 days a week during the regular academic year. The Center offers open studio workspace, classes, workshops, a Gift Gallery and button service.

The facility includes a fully-equipped ceramics studio, black and white photography darkrooms, woodshop, jewelry lab, stained glass area, mounting and matting area, and lots of room to work. Power and hand tools are available for use in all the craft areas. Other equipment available to members include a copy camera, sewing machine, opaque projector, and a craft books library. The Craft Center also operates a promotional button-making business and a Gift Gallery of fine, handcrafted gifts.

Each term, more than 20 non-credit classes and workshops are offered. Beginner to advanced classes, taught by local artists, focus on non-competitive learning. Open studio memberships and limited-use day passes are also available for those with experience interested in just using the Center's tools, studio areas, and equipment for projects and exploration. Catalogs of offerings can be located each term around campus, at the Center or by calling 737-2937.

The Craft Center is a hands-on studio with a low key, friendly, and casual environment, and a great place to take a creative time out from the whirlwind of life.

STUDENT GOVERNMENT

The Associated Students of Oregon State University (ASOSU) is the campus-wide student government organization. In recent years ASOSU has become increasingly active in the policy making and operation of the University through student participation on some 50 University committees.

Councils representing both men's and women's living groups have important roles in student self-government. They include Panhellenic Council, Residence Hall Council, Interfraternity Council, Council of Independent Students, and the Inter-Cooperative Council.

STUDENT PROGRAMMING

The University experience includes many extracurricular activities. Located in the Memorial Union Program Office, the Memorial Union Program Council strives to achieve many of these opportunities by

FRANK RAGULSKY
Director Student Media

THOMAS KIRSCH
Director Recreational Sports

YVONNE SEBASTIAN
Activities Coordinator

presenting social, educational and recreational programs for students, faculty, staff, alumni, and guests of the University. The Program Council provides a broad range of programs intended to enhance the quality of life in the university community. This is achieved through many traditional events such as "Mom's Weekend," "Dad's Weekend," and the "Women's Leadership Conference." MUPC also programs a variety of events such as forums, musical events, and movies. In addition, the Program Council offers many programs relating to current events and programs designed to query individual beliefs in cultural backgrounds.

Art and Music

Exhibits, lectures, concerts, and recitals sponsored by the departments of Art and Music, Encore, Memorial Union Program Council, and student musical and art organizations play a central part in the cultural life of the community. Under the patronage of the Memorial Union Program Council, exhibitions in the Memorial Union stimulate interest in architecture, painting, sculpture, and related arts. They offer students knowledge of their cultural heritage and an awareness of contemporary art movements. Student and faculty art exhibits are shown in various galleries throughout the year (see "Library, Museums, Galleries, and Collections").

Membership in the student musical organizations is open to all students after consultation with the directors concerned. OSU groups are members of the American Symphony Orchestra League and the American Choral Foundation. Students in these activities earn regular credit. The Corvallis-OSU Symphony, University band organizations, the University Choir, Madrigal Singers, and the Choralaires present several concerts annually on the campus.

The Corvallis and OSU Music Association and the Friends of Chamber Music bring artists of international fame to the campus for concerts and recitals. Advanced music students and faculty also give public recitals during the year. Several dance recitals are given each year under the auspices of the College Health and Human Performance and other organizations.

Forensics and Theatre

OSU's nationally recognized forensics program invites all undergraduates to participate in speech activities. Continuing a 60 year tradition at Oregon State, the forensics team involves members from all majors and schools on campus. Each year, students compete in state, regional and national intercollegiate tournaments. Events include parliamentary (limited preparation) debate, individual public speaking formats such as informative, persuasive, and afterdinner as well as a range of oral interpretation categories involving prose, poetry, and drama.

University Theatre, continuing a tradition of over a hundred years of public performances in Corvallis, offers all students involvement in the theatre creative process. Each season four mainstage and numerous studio and classroom productions give student actors, designers and technicians ample opportunity to develop as theatre artists and craftspeople. In addition to class and production activities, students and faculty actively participate in regional and national festivals and conventions including Northwest Drama/American College Theatre Festival, Irene Ryan Scholarship Competitions, and United States Institute of Theatre Technology.

Student Media

The Daily Barometer

Oregon State University's student newspaper is distributed throughout the campus and community each weekday during the school year and once a week in the summer. Its student editors determine news and editorial content and direct the staff in reporting, writing, and editing assignments. Offices are located on the first floor of MU East (Snell Hall).

Beaver Yearbook

The yearbook reviews the people and events which make the academic year memorable. It is under the direction of student editors who determine its policy and content.

The yearbook may be ordered for $22.00 when paying fees during registration and is available for pickup at the Student Activities Center in the fall. They must be picked up within 90 days from the time distribution begins. Yearbook fees are refundable in full during the first two weeks of the term in which payment is made. Thereafter, no refunds will be made on cancelled orders. Students who will not be on campus when the yearbooks are distributed may pay a mailing and handling fee at the Student Activities Center.

KVBR FM Radio

Oregon State University's on-campus radio station gives students an opportunity to gain experience in live radio broadcasting. Featuring high quality public affairs programming and alternative music, the station can be found on the dial at 88.7 FM. Offices are located on the second floor of MU East (Snell Hall) (503) 737-6323.

KBVR TV

A fully equipped television studio, editing facility and remote gear afford practical training in television production. Programming includes a wide variety of locally produced shows plus the nightly news, live music programs, live coverage of OSU sporting events, game shows, comedy, movies, public affairs interviews and documentaries. KVBR TV can be seen on cable channel 99 in Corvallis, Albany and Philomath 4 nights a week from 7 p.m. to 12 p.m. Offices are located on the second floor of MU East (Snell Hall) (503) 737-6323.

Prism

The *Prism* literary magazine is published once yearly by volunteer students at Oregon State University. *Prism* welcomes contributions from the OSU community in the form of photography, art, poetry, short stories and music. Magazines are distributed during Spring term and will be announced in *The Daily Barometer*. Contact the Student Media Office for more information.

Lectures

Frequent public lectures by faculty members, visiting scholars, and persons prominent in national affairs supplement the regular curriculum. Campus sponsors of lectures include the Committee on Convocations and Lectures, Y-Round Table, Associated Students, Memorial Union Program Council, Sigma Xi, and others.

The Experimental College

Established in 1968, the Experimental College offers a wide range of courses to anyone in the community interested in an alternative learning experience—students, faculty, staff, and Corvallis and area residents. Volunteers teach the courses, after submitting course proposals by the middle of the term prior to teaching. Each term, more than 30 courses are listed in the catalog, and more than 2,000 people enroll.

Class content, which is limited only by the imaginations and interests of the participants, includes aerobics, beer making, cooking, crafts, massage and yoga, and recreation courses. Classes are noncredit and nongraded. A $2 student and $4 for faculty, staff and general public registration fee helps pay registration costs and material fees cover direct materials used (teachers are not paid).

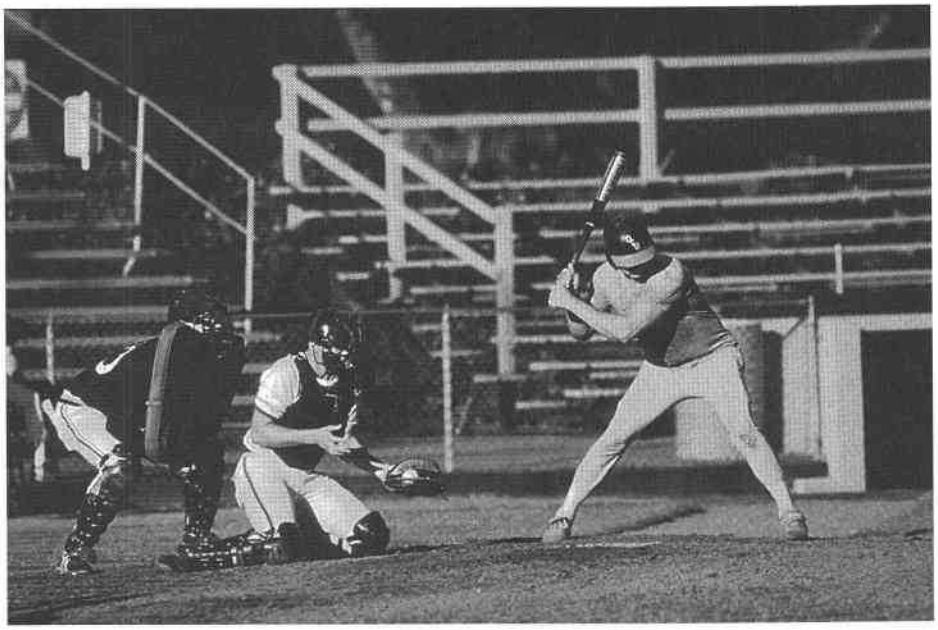
Participants are also encouraged to attend films, guest lectures, and special programs sponsored by the Experimental College. Northwest Excursions, patterned after the Trips and Tours programs, is run through the Experimental College and offers low-cost educational trips to participants. For more information about this student-administered program, contact the director of the Experimental College at 737-4683.

The Experimental College offers job opportunities to students interested in public relations, accounting, scheduling, and management. Volunteers move up into paid positions.

Ethnic Cultural Centers

Oregon State University operates four ethnic cultural centers: the Asian Cultural Center, the Black Cultural Center, the Hispanic Cultural Center, and the Native American Longhouse. The centers offer various academic, cultural, recreational, and social events. Each center is located in a separate facility; and all are open to the public.

The cultural centers bring together minority students and faculty with different interests and provide an opportunity for interaction of people from the University



and local communities. The programs each center offers promote a greater awareness and understanding of lifestyles, problems, history, and cultural contributions of ethnic groups.

OSU's cultural centers are part of the Memorial Union Activities Program. The centers are governed by separate advisory boards composed of students, faculty, and administrators.

ATHLETICS

Oregon State University conducts athletic programs under the auspices of the NCAA for both men and women. Men's programs compete as a member of the Pacific-10 Conference in football, baseball, basketball, wrestling, crew, soccer, and golf. The women's programs also compete in the Pacific-10 Conference and include volleyball, basketball, gymnastics, swimming and diving, softball, crew, soccer, and golf.

RECREATIONAL SPORTS

Student-fee-funded recreational sports programs and facilities at Oregon State University are coordinated and administered by the Board of Recreational Sports.

The Department of Recreational Sports and the College of Health and Human Performance administer the following facilities available for recreational sports activities:

Recreational Sports facilities: Dixon Recreation Center, Stevens Natatorium, Outdoor Recreation Center, McAlexander Fieldhouse, Indoor Climbing Center, Peavy Sports Fields, and Tennis Pavilion and Courts.

College of Health and Human Performance facilities: Langton Hall, Women's Gym, intramural track, intramural playing fields, and golf practice areas.

Recreational Sports program opportunities at Oregon State University include:

Informal recreation: Dixon Recreation Center offers self-directed, as well as organized activities for all students, faculty, staff, and affiliates in aerobic fitness, conditioning, wallyball, basketball, racquetball, volleyball, squash, weight training, tennis, handball, table tennis, general exercise, and badminton.

Stevens Natatorium includes an 8-lane, 25-yard fitness pool, a deep water pool; and a spa with adjoining sun deck. Full-service locker rooms, equipment issue area, and a first aid station are also available. This facility accommodates recreational and fitness swimming, aqua conditioning, aquatic fitness classes, springboard diving, and the weekend Family Swim Program.

Sport clubs: Intercollegiate competition for students in bowling, cycling, equestrian events, fencing, lacrosse, rifle, pistol, roller hockey, rugby, sailing, skiing, squash, tennis, triathlon, ultimate disc, volleyball, and water polo.

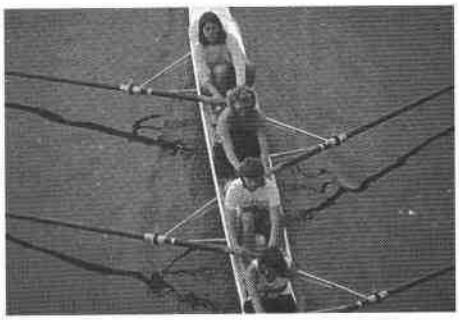
Outdoor recreation: An outdoor resource library; map file; equipment rental service; noncredit instruction in such activities as mountain and rock climbing, cross country skiing, bicycle maintenance, white water rafting, kayaking, and backpacking; and trip-planning assistance for backpacking, camping, rock climbing, canoeing, rafting, kayaking, and skiing.

The Indoor Climbing Center provides 4,000 square feet of climbing surface for climbers of all abilities. State-of-the-art features include a stemming corner and a chimney climb, overhangs, pockets, a lead arch, a crack wall, and a climbing route which leads across the ceiling. Other features are hangboards, a low-angling wall for beginners, rappeling stations, an "international bouldering wall", and facility rental opportunities.

Fitness Programs: Noncredit instructional fitness and sport skills classes in activities such as aerobic dance, step aerobics, conditioning, weight training, HYDRO-FIT© aqua conditioning, fencing, and martial arts.

Individual fitness incentive programs such as "A Point To Be Fit," one-on-one fitness assessments, and special events round out the fitness program offerings.

Intramural Sports: offers over 30 individual, dual, and team sports including flag football, volleyball, swimming, water polo, basketball, softball, soccer, track, golf, triathlon, 5K runs, bike races, bowling, skeet, billiards, tennis, racquetball, badminton, wrestling, free throw contest, three point shoot-out, and others.



Museums, Galleries, Collections

The educational resources of the University include museums, galleries, collections, and exhibits of cultural and scientific materials. Research, teaching, and extension functions are combined in these collections, which serve both the institution and the general public.

Over the years, various departments of the University have become repositories for extensive holdings of manuscripts; rare books; prints, paintings, and other art objects; costumes; textiles; historic artifacts; archaeological material; fossils; preserved plants and animals; wood products; and marine material. These collections serve many of the same functions as a library or make possible the identification of materials whose age, name, or significance is unknown.

The Natural History Museum and the Mark O. Hatfield Marine Science Center at Newport aim to acquaint the public with our cultural heritage, history, fauna, flora, and the distinctive features of Oregon. Most other collections serve primarily research and teaching functions and may be viewed by prior appointment with their curators. Permanent collections and museums include:

The Natural History Collection (Beatty/Blaustein, Curator) includes 550 mounts of birds and mammals in the J. C. Braly Collection. A collection of specimen skins on the fifth floor is used mainly for teaching. Location: Cordley Hall II.

The University Archives (Michael Holland, Archivist) is the official repository for University records. Holdings include departmental records; University publications; more than 170,000 photographs; the personal papers of OSU faculty, alumni, and affiliated organizations; and a large collection of memorabilia including programs, posters, brochures, and clippings. Location: Administrative Services Building.

The Public Wing of the OSU Marine Science Center at Newport includes 20 aquariums which accommodate about 50 species of marine fishes and 60 identified species of invertebrates. Displays present a spectrum of marine subjects, including the earth's crust, coastal geology, tides, oceanic circulation, estuaries, archeology, marine mammals, and the marine resources of Oregon.

The Department of Apparel, Interiors, Housing and Merchandising (E. Pedersen, Collection Manager) houses a collection of more than 1,000 historic and ethnic textiles and costumes. Among the earliest textiles in the collection are those from Coptic Egypt and Pre-Columbian Peru. A collection of more than 300 historic American and European costumes dates from 1805 to the present. Location: Milam Hall.

The Archaeological Collection (D. R. Brauner, B. Roth, Curators) consists of material specimens, artifacts, field notes, drawings, sketches, and photographs accumulated in archaeological investigations. Several thousand items of primary archaeological documentation comprise this collection. Location: Waldo Hall.

The Neumann Collection (R. L. Hall, Curator), a gift from Holm W. Neumann, Ph.D., M.D., includes several hundred human bones and fossil casts, anthropometric equipment, and approximately 5,000 volumes on anthropological history, theory, and methodology. Location: Waldo Hall.

The Archive for the History of Science and Technology (P. L. Farber, Curator) is part of the research resources in the history of science program. The collection consists of manuscripts, books, notebooks, and correspondence of researchers in science, agriculture, forestry, and engineering. The collection particularly emphasizes documents concerning these fields in the Pacific Northwest. Location: Special Collections, Kerr Library.

The Systematic Entomology Laboratory (J. D. Lattin, Curator) contains approximately 2,700,000 insects and mites, chiefly from the Pacific Northwest. The collection is especially strong in Hymenoptera, Coleoptera, Lepidoptera, Homoptera, Diptera, and Hemiptera. Of special interest are the collections of beetles of the Pacific Northwest, sphecoid wasps of the world, bees, butterflies and skippers, mites associated with scarabs, marine mites, leaf hoppers, plant bugs, litter arthropods, forest insects, and aquatic insects. Location: Cordley Hall.

The Fisheries and Wildlife Bird and Mammal Collections (J. A. Crawford, Curator of Birds; B. E. Coblentz, Curator of Mammals) include more than 9,000 specimens of birds and 7,500 specimens of mammals, as well as the Braly Ornithological Collection; Overton Dowell, Jr., Bird Collection and field notes; Alex Walker Ornithological Collection and Library; Oregon Game Commission Collection; and Grace McCormac French ornithological notes and literature. Location: Nash Hall.

The Forest Products Collection (B.L. Gartner, Curator) contains approximately 2,500 species of wood, primarily from North and South America, Southeast Asia, and Africa.

The Department of Art Slide Collection (J. Northam, Curator) contains 70,000 slides of paintings, sculpture, architecture, crafts, graphic design, and general design from prehistoric times to the present. The collection is primarily for use by faculty in their classes. Location: Fairbanks Hall.

The Fine Arts Collection (D. Russell, Curator), consists of medieval illuminated manuscript pages, older European and Japanese prints, 20th-century paintings, prints, mosaics, sculpture, and crafts. Selection from the collection are exhibited occasionally in the Fairbanks and Giustina Galleries.

The Geological Collections (S. H. Bloomer, Director) include minerals, rocks, and fossils. The W. D. Wilkinson and Walter Lidstrom Memorial Mineral collections (E. M. Taylor, Curator) contain several hundred rare and fine specimens. Over 5,000 fossil specimens of Paleozoic, Mesozoic, and Cenozoic marine invertebrates comprise the outstanding John H. Howard and Earl L. Packard collections in Paleontology (E.J. Moore, Curator). The Silurian Devonian Brachiopod Collection (A. J. Boucot, Curator), consisting of about one million specimens, is the most comprehensive of this type in the world with representation in some depth from every region in the world. This collection is the property of the U.S. Museum of Natural History, Washington, D.C. Location: Wilkinson Hall.

The Herbarium (A. I. Liston, Director) contains over 350,000 named specimens of seed plants, ferns, mosses, algae, and fungi. Emphasis is on collections from western North America. The herbarium is the repository for the Morton E. Peck Herbarium of Willamette University, a research collection of Oregon flora consisting of more than 30,000 sheets, and the former University of Oregon herbarium. The mycological collections (J. Spatafora, Curator), consist of approximately 50,000 dried specimens of fungi and lichens, supplemented by microscope slides and a culture collection. These collections include the H. C. Gilbert Myxomycete Collection and the Forest Service Pathology Herbarium. Location: Cordley Hall.

The Ichthyological and Herpetological Collection (D. Markle and R. M. Storm, Curators) contains more than 12,000 cataloged lots of fish representing 180,000 specimens and 45 nominal type specimens. In addition, there are about 260,000 uncataloged specimens available for study. The collection emphasizes fishes of the Pacific Northwest, but specimens from many parts of the world are held. A small frozen tissue collection has been started. The herpetological section contains more than 10,000 specimens, mostly from western North America. Use of the collection is restricted to qualified students and investigators. Location: Nash Hall.

The McDonald Collection (Clifford S. Mead, Head of Special Collections) consists of rare books. Fine examples of typography, works of famous illustrators, numerous fine bindings, and several first editions are represented in the collection. Location: Kerr Library.

The Memorial Union Gallery (W. C. Edwards, Director) includes collections of landscapes and marine paintings by the late William Henry Price and Leo Fairbanks. A permanent collection displays American Indian portraits by Carrie M. Gilbert and prints by Gordon Gilkey. Throughout the year numerous temporary exhibits of cultural and social interest are displayed in the main concourse of the Union.

Fairbanks Art Gallery (D. Russell, Director) exhibits monthly shows of contemporary art by local, regional, and national artists. On occasion, the gallery's exhibits are drawn from the Department of Art's collection. Location: Fairbanks Hall.

The History of Atomic Energy Collection (C. Mead, Head of Special Collections) consists of nearly 3,000 items, including the first published account of the discovery of radioactivity in 1896, writings on the Manhattan project, the hearings of Robert Oppenheimer, and formerly secret report of the effects of the atom bomb. It also features cultural aspects of the atomic age.

Giustina Gallery (D. Russell, Director) features art by outstanding regional and national artists. Exhibits are rotated approximately every month with a show by senior art majors featured every spring. There also is a permanent exhibit of "Art about Agriculture" hanging in the conference wing. Location: LaSells Stewart Center. Hours: M-Friday, 8:00 am-5:00 pm and during evenings and weekends of special events.

Alumni Association

Donald Wirth
Director of Alumni Relations

The purpose of the alumni association is to promote the interests and ideals of Oregon State University. Annual and life memberships are available to all graduates, former students and friends of Oregon State. The association publishes the *Oregon Stater* newspaper for all alumni, organizes alumni gatherings and class reunions, and maintains current address records and biographical data on all alumni.

The alumni association is governed by a board of directors of 62 members representing various geographical districts, all degree-granting colleges, the Golden Jubilee Association, and the student body.

Oregon State University Foundation and University Development Office

John Evey
Director of Development

John Irving
Director of OSU Foundation

The Oregon State University Foundation and the OSU Office of Development work together to aid and promote Oregon State's teaching, research, and service activities.

The OSU Foundation, incorporated as a nonprofit corporation on October 15, 1947, fills the need for a legally sound, inclusive, charitable agency apart from but working in close coordination with the University. The Foundation receives gifts of cash, securities, and real and personal property, as well as deferred gifts such as bequests, life insurance, and life income agreements, to support the University's many programs.

The Office of Development builds relationships with individuals, corporations, and foundations, to encourage them to support the University with contributions of both time and financial resources. It includes fund raisers housed in the colleges and in units such as the library. The staff works with the campus community to maximize private financial support through the Foundation to benefit the University.

Department of News and Communication Services

Mark Floyd
Interim Director

All University news moves to off-campus media through the Department of News and Communication Services, which maintains close ties with the newspapers, wire services, radio and television stations, and professional publications of the state, region, and nation. The department also produces *OSU This Week*, the staff newsletter, published weekly during the school year.

University Publications

Jeffrey B. Grass
Director

The Office of University Publications writes, edits, and designs the official publications of Oregon State University, including catalogs, books, posters, brochures, and programs. University departments that need publications are invited to contact the office for free editing, graphic design, and production coordination service.

Oregon State University Press

Jeffrey B. Grass
Director

The Oregon State University Press—one of only four university presses in the Pacific Northwest—is a publisher of scholarly and regional books. The Press, founded in 1961, publishes books in the areas of natural resource management, history, and literature, with a special emphasis on books of particular importance to Oregon and the Pacific Northwest.

Community and Government Relations

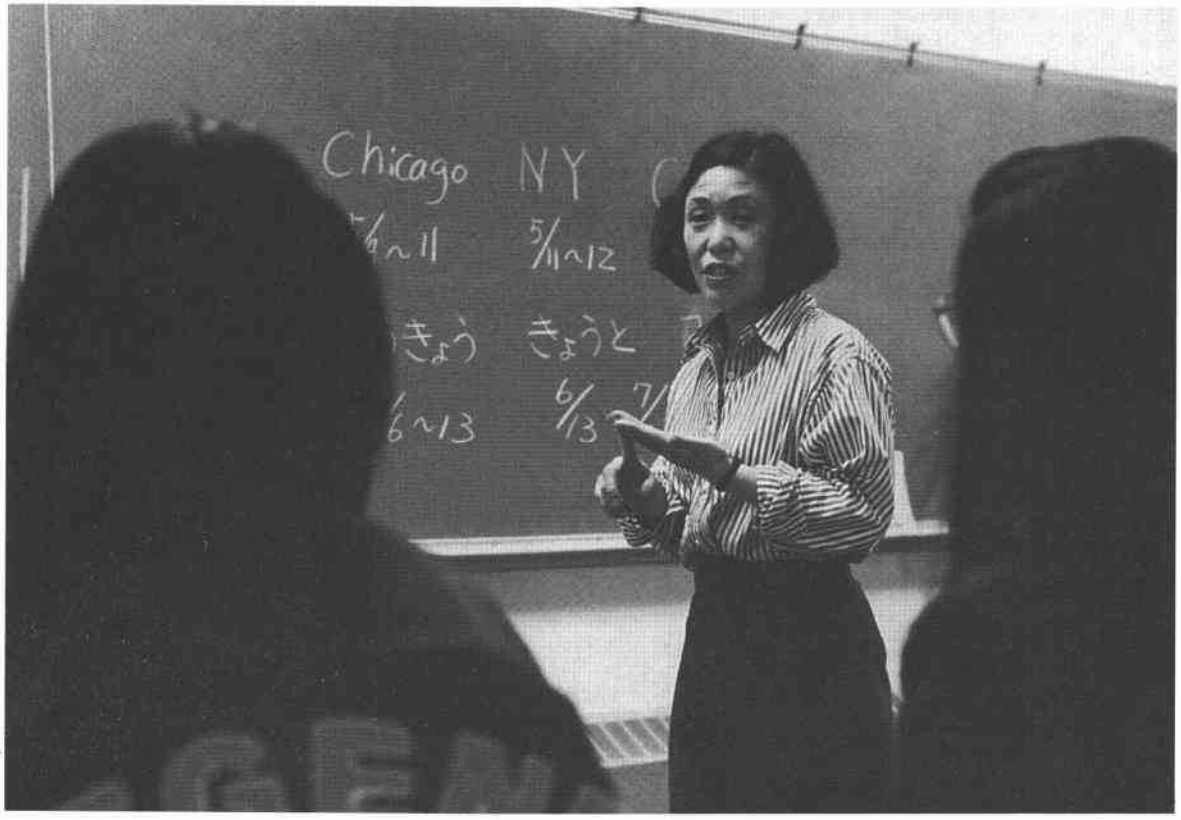
Kevin McCann
Director

Statewide and local community information and assistance, as well as local and state government relationships are coordinated through this office in University Relations. Legislative information and service are provided to the University, including assistance in making presentations to legislators and legislative committees.Community and government relations work is done cooperatively with the public affairs office of the Oregon State System of Higher Education and with other Oregon colleges and universities.

University Marketing Conferences and Special Events

Sylvia L. Moore
Director

The Office of University Marketing, Conferences and Special Events administers the LaSells Stewart Center for Conferences and Performing Arts as well as the OSU Portland Center. It coordinates meetings and conferences both on and off campus for OSU faculty and staff as well as for non-profit and private sector groups. It also is responsible for scheduling of University facilities for non-academic use and the maintenance of the University master calendar.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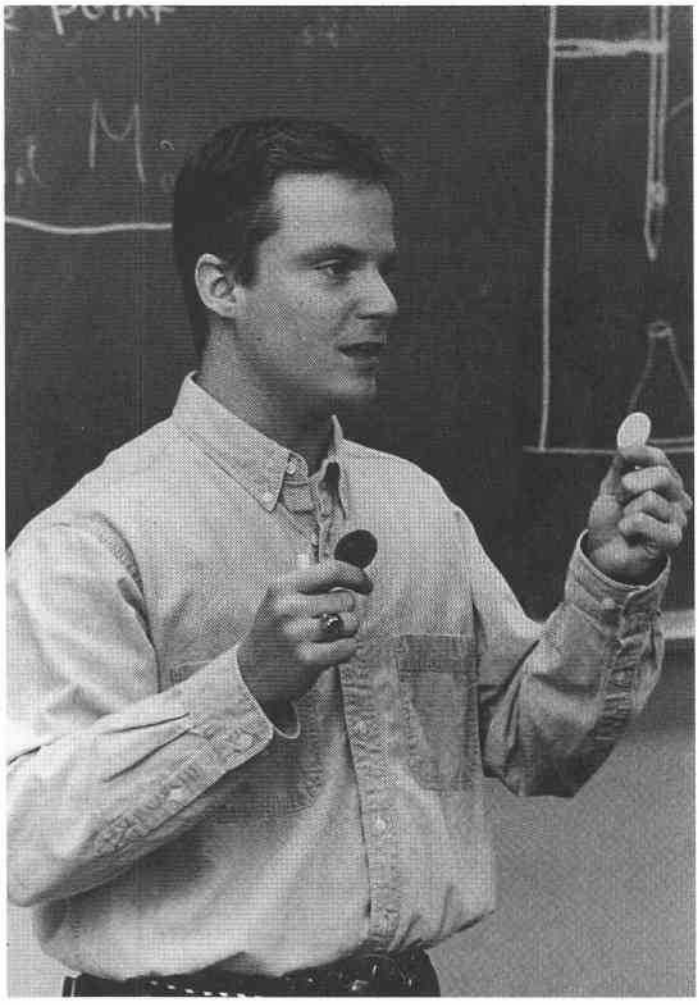
Students who complete the requirements of the Honors College receive OSU's most prestigious academic recognition: an Honors Baccalaureate Degree (B.A., B.F.A., or B.S.) in their major jointly awarded by the Honors College and the college in which their major is located.

The University Honors College provides challenging curricula, personal attention, and enhanced learning experiences both in general education and in the area of the student's primary academic interest. The Honors College offers courses consisting of small groups taught by OSU's finest faculty, who are specifically selected for their undergraduate teaching abilities. Through seminars, colloquia, and mentorships, students enjoy the benefits of a small college within a large, diverse, and comprehensive university.

ADMISSION

Admission is competitive and selective–only about 3% of entering students are invited to join the Honors College. The Honors College students are exceptionally able, highly motivated, and intellectually curious. Admission decisions are based on grade-point averages, SAT or ACT scores, and an essay that reveals the student's background, interests, and academic motivations as well as abilities that may not be obvious from other measures.



Application of entering freshmen for admission to the Honors College in Fall term should be submitted to the Honors College by February 1. Applicants must also have completed an application for admission to OSU by that time. Admission decisions are made by March 31. A smaller number of second-round admission decisions may be made after that date, but to assure priority consideration, admission applications should be submitted as early as possible.

An upper division program is available for transfer students or for students already enrolled at OSU. Such students should contact the Honors College office for information.

MAJORS AND DEGREES

Students enrolled in the Honors College can pursue any one of OSU's wide range of undergraduate majors. Students who complete the requirements of the Honors college receive OSU's most prestigious undergraduate academic recognition: an Honors Baccalaureate Degree in their major, jointly awarded by the Honors College and the college in which their major is located.

DEGREE REQUIREMENTS

Because the Honors degree is a singe, jointly awarded degree, there are no additional credit-hour requirements beyond the total required by the college of the student's major. In addition to completing the requirements of their undergraduate major and the requirements of the Baccalaureate Core, students in the Honors College must satisfy the following requirements:

First and second years (15)

- Honors writing course (3)
- Honors Baccalaureate Core courses (12)

THIRD AND FOURTH YEARS (15)

(at least 12 must be upper division)

- Honors colloquia (4)
- Honors electives (6-9)
- Introduction to thesis or project (1)
- Thesis or project (3-6)

A student who completes the full 30 credits of Honors College courses will graduate as an Honors Scholar. A student who completes only the 15 credits of third- and fourth-year courses will be designated as an Honors Associate.

Honors writing and Baccalaureate Core courses may be used to satisfy the requirements of both the Honors College an the Baccalaureate Core. For students in majors that require a senior thesis or project, the Honors College thesis or project will often satisfy that requirement as well.

Office of Academic Affairs
Oregon State University
Corvallis, OR
97331-2128
(503) 737-0729

The College of Liberal Arts offers major programs in the arts, humanities, and social sciences that are at the very core of human knowledge and whose existence make OSU a true University. Students can earn degrees in 12 departments and two interdisciplinary programs and certificates of specialized training in six other fields. The college is also home to two pre-law programs —one in political science (emphasizing a traditional approach), the other in philosophy (stressing logic, ethics, and the philosophy of law).

Students work in an atmosphere that is conducive to achieving their personal goals. The college provides the opportunity for professionalism, whether one is painting a picture, playing a musical instrument, acting in a play, writing a short story or conducting an individual research project in history or psychology. A high-tech language laboratory is available for student use. Students are involved in activities that enrich the cultural life of OSU, Corvallis, and the entire mid-Willamette Valley.

Students get individual attention and the chance to know their professors, many of whom are also academic advisers. As a result, there is less of the impersonal feeling often found at large universities. In fact, the OSU College of Liberal Arts is very much like a small liberal arts college within the walls of a large university.

The list of accomplishments of the college and its faculty is endless. The main point is simple. The OSU College of Liberal Arts is an ideal place to begin a life's journey into learning.

Majors

The College of Liberal Arts offers major programs leading to the Bachelor of Arts (B.A.) or Bachelor of Science (B.S.) degree in the following:

American Studies
Anthropology
Art
Economics
English (B.A. only)
French (B.A. only)
German (B.A. only)
History
Liberal Studies
Music
Philosophy
Political Science
Psychology
Sociology
Spanish (B.A. only)
Speech Communication

The Bachelor of Fine Arts (B.F.A.) degree is offered in applied visual arts by the Department of Art. B.F.A. degree requirements differ from those in other College of Liberal Arts programs. Students in the B.F.A. degree program must complete the baccalaureate core and a minimum of 105 credits in art.

International Degree

College of Liberal Arts majors can earn a second degree in international studies concurrently. See the Interdisciplinary Studies section of this catalog for more information.

Graduate Study in Liberal Arts

M.A. in Applied Anthropology

The M.A. in Applied Anthropology provides advanced education in anthropology that will prepare students to practice their skills in occupations in both public and private sectors at the local, national, and international levels. This course of study integrates anthropological theory and practice within a specific concentration chosen by the student.

An area of concentration can be chosen from one of the following: business anthropology with an Asian focus, cultural resource management, historic archaeology, language and cross-cultural communication, health and culture, and natural resources and communities.

Electives will be drawn from University-wide graduate-level courses which complement core courses and courses chosen in one of the six concentrations.

All students will take a core program of 9 credits. Students must take 12 credits within their particular concentration including at least 3 credits of anthropological methods courses which relate to their particular concentration. From 9 to 15 elective credits form the third part of the program; they may be taken either in a single department or in more than one department if they have an integrated focus. At least 9 of these credits will be taken in a minor field. Candidates must also demonstrate proficiency in a foreign or field language. Following the course work, students will spend one quarter on an internship. Afterwards the student will begin researching and writing a thesis.

M.A. and M.S. in Scientific and Technical Communication

A one-year program designed to train people in scientific and technical communication and to help communication majors in business, industry, government, and educational institutions. Courses in this interdisciplinary program come chiefly from the Departments of English and Speech Communication.

Requirements

- 45 graduate credits and thesis or program-oriented paper
- 30 of those graduate credits in the major, 15 graduate credits from either a technical area, a communication specialty area, or an education area
- An internship with an organization that communicates technical or scientific information.

M.A., M.S., and Ph.D. in Economics

A graduate program in economics that is a unique blend of the talents and resources of three departments: Economics, Agricultural and Resource Economics, and Forest Management. This combination provides students with an excellent and diverse

Footnotes for this section on page 109.

Social Science
Hall 207
Oregon State
University
Corvallis, OR
97331-6202
(503) 737-2511

Administration

Kay F. Schaffer
Dean

Sara Ellen Malueg
Associate Dean

Jerry O'Connor
Assistant Dean, Student Services; Director of Liberal Studies

Carolyn Maresh
Director of Administration

Jeff Hale
Director of Development

Pat Rogerson
Academic Adviser, Teacher Credentials Specialist

Polly Gross
Academic Adviser, Outreach Specialist

program and trains them to analyze the economic problems of this increasingly complex society. The doctorate and master's degrees are offered by these departments and students are prepared for careers in both the public and private sectors.

Master of Science Core Program
Microeconomic Theory (9)
Macroeconomic Theory (4)
Econometrics (7)
Mathematics (3)
Electives or Departmental Requirements (13)
Thesis (9)
Minimum credits, thesis option (45)

Doctor of Philosophy Core Program
Microeconomic Theory (12)
Macroeconomic Theory (4)
Mathematical Statistics (3)
Econometrics (3)
Electives and Departmental Requirements: At least three years of full-time work beyond the bachelor's degree is required.
Thesis: Course and thesis requirements in addition to the core program requirements are determined by the student's committee.

MASTER OF ARTS IN INTERDISCIPLINARY STUDIES (MAIS)

A one-year program designed for students who want to attain broad and advanced knowledge from three fields of study. It is common for more than one field to be in the College of Liberal Arts. All three fields may be in liberal arts.

Subject areas participating in the MAIS degree are anthropology, art, economics, English, foreign languages & literatures, history, museum studies, music, philosophy, political science, psychology, sociology, speech communication, and women studies.

Requirements

- a minimum of 9 credits in each of three fields of study, at least 12 credits in the College of Liberal Arts
- no more than 21 credits (excluding thesis or project credits) in any one field unless the total exceeds 45 credits
- a foreign language is required only if it is one of the three fields of study
- a thesis or program-oriented paper
- a final oral examination

MINORS

Students throughout the University may elect minor programs in anthropology, art, Chinese, communication, economics, English, French, German, history, Japanese, music, philosophy, political science, psychology, Russian, sociology, Spanish, theater arts, and writing.

The College of Liberal Arts also offers many courses in the arts, humanities, and social sciences that are of value to all students and are basic to a liberal education. Such courses help individual students in their personal development and enrichment through a deeper understanding of themselves and appreciation of human cultural development.

ACADEMIC ADVISING

The College of Liberal Arts and Oregon State University want you and every student to succeed. This requires that students understand and meet the academic requirements set by the college and University. They are encouraged to "take charge" of their academic career and meet with an adviser. That individual will assist students in course selection, listen to academic concerns, explain program options, and outline academic progress. Wise students will consult with the head adviser's office at least once a year and their departmental adviser every term. Advisers are valuable resources.

B.A./B.S. REQUIREMENTS

In addition to the University's baccalaureate core, College of Liberal Arts students must fulfill the following requirements:

B.A. candidate[1]
One course in each of these areas:[2]
Humanities (3)
Fine arts (3)
Social sciences (3)
Nonwestern culture (3)[3]
One additional course in one of the preceding four areas (3)
Foreign language through second year (24)
TOTAL (30-42)

B.S. candidate
One course in each of these areas:[2]
Humanities (3)
Fine arts (3)
Social Sciences (3)
Nonwestern Culture (3)
One additional course in one of the preceding four areas (3)
Computer science and quantitative studies (12)
TOTAL (30)

Definition of Academic Divisions for Area Studies Requirement:
1) Humanities (H)—critical examination of influential traditions and ideas as defined by major scholarly works: English; film; foreign language, literature, and culture; history; philosophy; and women studies.

2) Fine Arts (FA)—participation in or appreciation of creative expression in different forms: art; creative writing (including poetry, fiction, drama); the dance; music; theatre (including performance, studio, history, appreciation, theory).

3) Social Science (SS)—scientific investigation and theory pertaining to human individuals, social groups, institutions, and ideologies: anthropology, economics, political science, psychology, sociology and approved geography courses.

4) Nonwestern Culture (NC)—study in any of the areas below focusing outside of western culture: cultures of Africa, Asia, Russia, South America, Central America-Caribbean, Middle East, the Pacific, Native North Americans.

Separate courses for separate requirements rule: The purpose of these requirements is to encourage exploration and broad study—to encourage students to take more rather than fewer courses in areas outside their major field. Students are required to satisfy three sets of requirements: University baccalaureate core requirements, CLA requirements, and major program requirements. No student may use a single course to satisfy requirements in more than one set. Departments may add further restrictions, such as prohibiting majors from using courses taken within their department and not counted towards their major to satisfy either University or CLA requirements.

Courses taken to satisfy the University baccalaureate core requirements or the College of Liberal Arts requirements may also be used to satisfy requirements for a minor or a second major.

The sciences, social sciences, and professional courses requirement for the B.S. degree is considered a CLA requirement, even though the courses are to be specified by the major department. Thus, courses taken to satisfy this requirement will not be counted in the major.

Exceptions and Deviations
Transfer students from outside OSU: students will complete all upper division work in both the baccalaureate core and the CLA requirements, and will complete a total of at least 81 credits (including the upper division work) in general studies comparable to the combined baccalaureate core and CLA requirements. Transfer courses from community colleges may count only for lower-division credits.

CLA students and OSU students transferring into CLA: students who seek a deviation from the standard list of approved courses must, with approval from their academic adviser, petition the college's Curriculum Committee. It is expected that approval of such petitions will be extremely rare.

Meeting Requirements
To help students meet specific requirements of the University Baccalaureate Core (BC) and the distribution requirements of the College of Liberal Arts, the college suggests the following curriculum for the first two years. Students are advised to seek help in course selection from their assigned departmental adviser or the College of Liberal Arts Advising Office in Social Science Hall.

Freshman Year
Writing I (3)
Mathematics (3)
Humanities (3)
Fine arts (3)
Social science (3)
First year foreign language (B.A. candidates only) (12)
Physical science (lab) (4)
Biological science (lab) (4)
Fitness (3)
Electives (8)

Sophomore Year
Writing II (3)
Western culture (3)
Non-western culture (3)
Second year foreign language (B.A. candidates only) (12)
One additional course in two of the following: humanities, fine arts, social science or non-western culture (6)
Additional course work treating of science, global issues, or professional skills (12)
Electives (7)

Upper Class Years
It is expected that upper class students will focus on their major program of studies. They must complete an additional writing intensive course (WIC) in their major area and enough electives to complete the minimal requirements of 180 credits. Sixty (60) credits must be upper division. Students opting for the liberal studies program must include one WIC course in one of the disciplines used to fulfill major requirements.

CAUTION: Students who matriculated to Oregon State University prior to fall term 1990 may elect to meet the requirements of the BC or the requirements of the old norm. They should examine this option with the Director of Advising who will evaluate their records accordingly.

Teacher Training

Students interested in teaching at the elementary or secondary levels in music and English should consider the College of Liberal Arts. The Liberal Studies pre-education program with its combination of courses in two or more departments may be ideal for elementary school teachers. Detailed information on courses is available from the College of Liberal Arts Advising Office.

Students wishing to become high school social studies teachers may complete their undergraduate preparation at OSU, gaining the knowledge from outstanding social scientists. The teacher credentials specialist will assist with their preparation for the National Teachers Examination and application to graduate programs.

Certificate Programs

Certificate programs in Latin American Affairs, Peace Studies, Russian Studies, Twentieth Century Studies, and Women Studies are offered to all students and may be taken concurrently with any major degree program.

Prelaw Preparation

OSU provides opportunities for a complete and rigorous prelaw education, sending undergraduates on to some of the finest law schools in the nation.

Law is one of the few professional schools that does not require a particular set of courses as a prerequisite for admission. Thus, prelaw students may major in any subject. They are advised to supplement the courses in the major with a diverse selection of courses that offer depth, rigor, and skill in three areas: conciseness and clarity of statement in writing and speaking; a keen sense of logic and the ability to reason with abstract, ambiguous facts; and insight into the institutions and values of society.

Accordingly, the College of Liberal Arts offers many different ways to prepare for law school, rather than a single prelaw program. Students who plan to go to law school should contact the head adviser of their college to obtain information about prelaw preparation options on campus.

Program on Gerontology

Administered through the College of Home Economics, the Program on Gerontology involves seven colleges and 14 departments throughout the University, including the College of Liberal Arts. Through course work in these departments, the program offers a multi-disciplinary perspective on aging and prepares students for careers in programs on aging, or for work with the elderly as a specialty within another professional area. Undergraduate students may earn a certificate in gerontology; graduate students an integrated minor. For more information, contact the director of the Department of Human Development and Family Studies, College of Home Economics.

AMERICAN STUDIES

David Robinson, Director
Moreland Hall 224
Oregon State University
Corvallis, OR 97331-5302
(503) 737-1641

Undergraduate Major

American Studies (B.A., B.S.)
Options
Ethnic Studies
Women Studies

American Studies is an interdisciplinary program which offers students the opportunity to earn the B.A. or B.S. degree through the interdisciplinary study of American culture, society, values, and institutions. Rather than having courses for the major restricted to a single department or field, the student in consultation with the American Studies director, selects relevant courses from three or more fields in the College of Liberal Arts that have the United States as their principal subject matter. The program is particularly appropriate for students who wish to combine the approaches of several disciplines to the study of the United States. An option in Ethnic Studies or Women Studies may also be included in the major, upon completion of the University's prescribed requirements for options within a major. The American Studies degree can also be combined with study in certificate programs such as Peace Studies, Twentieth-Century Studies, and Women Studies.

B.S. candidates must complete 12 credits of computer science and quantitative studies.

Major Curriculum (45)

Required Courses
ENG 253, ENG 254, ENG 255. Srvy of Am Lit (9)
HST 201, HST 202, HST 203. Hist of the U.S. (9)
AMS 311 or AMS 407. Am Studies Seminar (3)
Upper division credits from at least three departments in courses pertinent to a study of American culture, society, values, and institutions (24)

Courses

Upper Division

AMS 311. TOPICS IN AMERICAN STUDIES (3). Selected topics, changed annually, which investigate American ideas, regions, events, or periods. Fulfills the requirement for an integrated course in the major. May be repeated as topics vary. Open to nonmajors.

AMS 405. READING AND CONFERENCE (1-16). Independent, individual studies supervised by the director, members of the American Studies Board, or assigned professors, as arranged by the student and the director.

AMS 406. PROJECTS (1). Studies of American culture and society centered around topical events or cultural programs of current interest in American Studies.

AMS 407. SEMINAR (3). Close examination of selected topics in American culture and society. Fulfills the requirement for an integrated course in the major. For seniors or advanced students. May be repeated for credit as topics vary.

AMS 410. AMERICAN STUDIES INTERNSHIP (1-6). Supervised and evaluated work in a variety of professional fields to enhance students career preparation; arranged at the initiative of the student one semester in advance.

Graduate

AMS 507. SEMINAR (3). Close examination of selected topics in American culture and society. Fulfills the requirement for an integrated course in the major. For seniors or advanced students. May be repeated for credit as topics vary.

ANTHROPOLOGY

John A. Young, Chair
Waldo Hall 238
Oregon State University
Corvallis, OR 97331-6403
(503) 737-4515

Faculty
Professors Bonnichsen, Hall, Smith, Young; *Associate Professor* Brauner, Rosenberger; *Assistant Professors* Gross, Roth

Undergraduate Major

Anthropology (B.A., B.S.)
Options
Archaeology/Physical Anthropology
Cultural Anthropology
General Anthropology

Minor

Anthropology

Graduate Major

Applied Anthropology (M.A.)

The Department of Anthropology offers courses to meet the needs of students interested in a comprehensive understanding of human societies and cultures past and present. Prehistoric, historic, ethnographic, and linguistic study provides the basis for understanding how a variety of societies solve common problems. The anthropology curriculum provides a cross-cultural perspective, a sound basis for later professional or graduate education.

An anthropology degree enables students to pursue a broad range of jobs requiring a liberal arts background; for example, education, human and governmental services, law, business, media, and medicine. It prepares them especially well for work situations that emphasize cross-cultural awareness, international contacts and management of cultural resources.

Anthropology bridges sciences and the humanities and develops critical thinking, communication skills, facility with group processes, and the ability to work independently. It can help students succeed in an increasingly interconnected and complex world. The department also participates in the M.A.I.S. degree program.

CURRICULUM

Major Requirements

Majors develop a broad anthropological background. The program features three options: archaeology/physical anthropology, cultural anthropology, and general anthropology.

A departmental adviser works with students to determine the option and courses needed to meet the interest of the student and complete the program. The curriculum accommodates upper division and transfer students. Requirements take two years to complete.

A grade of C- or better is required for all courses used to complete major requirements. Such courses cannot be taken S/U. Major requirements are listed below.

MAJOR PROGRAMS WITH OPTION REQUIREMENTS

ARCHAEOLOGY/PHYSICAL OPTION

Background (12)

ANTH 100. Intro to Arch & Phys Anthro (3,4) or *ANTH 330. Evolution of People, Technology, and Society (3)
ANTH 110. Intro to Cultural Anthropology (3)
ANTH 210. Comparative Cultures (3)
ANTH 230. Time Travelers (3)
ANTH 240. From Ape to Angel (3)

Core (12)

ANTH 350. Language, Culture and Society (3)
ANTH 370. Family, Gender & Generation (3)
ANTH 431. Archaeology Meth and Theory (3)
ANTH 441. Primate and Human Paleontology (3)

Advanced (28)

Select 7 credits from the following:
ANTH 380. Cultures in Conflict (3)
ANTH 411-420. World Cultures (4)
Any course in the 460s, 470s or 480s
Select 9 credits from the following:
ANTH 430. Topics in Archaeology (1-3)
ANTH 432. The Archaeology of Domestication and Urbanization (3)
ANTH 433. First Americans, Last Frontiers (3)
ANTH 434. The Amer Period of Innovation (3)
ANTH 435. Cultural Res: Policy & Proced (3)
ANTH 436. Northwest Prehistory (3)
Select 6 credits from the following:
ANTH 340. Natural History of the Primates (3)
ANTH 440. Topics in Physical Anthropology (1-3)
ANTH 442. Human Biology (3)
Select 6-10 credits from the following:
ANTH 438. Archaeology Field School (10)
ANTH 443. Human Osteology Lab (2)
ANTH 444. Quant Methods in Phys Anthro (2)
ANTH 445. Human Biology Lab (2)
ANTH 497. Archaeological Field Methods (1-3)

Total Required Credits (52)

CULTURAL ANTHROPOLOGY OPTION

Background (6)

ANTH 100. Intro to Arch & Phys Anthro (3-4) or *ANTH 330. Evolution of People, Technology, and Society (3)
ANTH 110. Intro to Cultural Anthropology (3)
ANTH 210. Comparative Cultures (3)

Core (12)

ANTH 230. Time Travelers (3)
ANTH 240. From Ape to Angel (3)
ANTH 350. Language, Culture, and Society (3)
ANTH 370. Family, Gender & Generation (3)

Advanced (31)

Select 8 credits from the following:
ANTH 411-420. World Cultures (4)
Select 17 credits from the following:
ANTH 380. Cultures in Conflict (3)
Any course in the 460s, 470s, 480s, or 490-496
Select 6 credits from the following:
ANTH 450. Topics in Linguistics (3)
ANTH 451. Sociolinguistics (3)
ANTH 452. Popular Narr and Verbal Art (3)
ANTH 487. Language in Global Context (3)

Total Required Credits (49)

GENERAL ANTHROPOLOGY OPTION

Background (6)

ANTH 100. Intro to Arch & Phys Anthro (3-4) or *ANTH 330. Evolution of People, Technology, and Society (3)
ANTH 110. Intro to Cultural Anthropology (3)
ANTH 210. Comparative Cultures (3)

Core (12)

ANTH 230. Time Travelers (3)
ANTH 240. From Ape to Angel (3)
ANTH 350. Language, Culture, and Society (3)
ANTH 370. Family, Gender & Generation (3)

Advanced (32)

Select 4 credits from the following:
ANTH 411-420. World Cultures (4)
Select 11 credits from the following:
ANTH 380. Cultures in Conflict (3)
Any course in the 460s, 470s, 480s, or 490-496
Select 6 credits from the following:
ANTH 430. Topics in Archeology (1-3)
ANTH 432. The Archaeology of Domestication and Urbanization (3)
ANTH 433. First Americans, Last Frontiers (3)
ANTH 434. Amer Period of Innovation (3)
Select 8 credits from the following:
ANTH 340. Natural History of the Primates (3)
ANTH 440. Topics in Physical Anth (1-3)
ANTH 441. Primate and Human Paleontology (3)
ANTH 442. Human Biology (3)
Select 3 credits from the following:
ANTH 450. Topics in Linguistics (3)
ANTH 451. Sociolinguistics (3)
ANTH 452. Popular Narr and Verbal Art (3)
ANTH 487. Language in Global Context (3)

Total Required Credits (50)

Candidates for the B.S. degree must complete an additional 12 credits of approved science, social science, or professional courses. Check the department for a list of approved courses.

MINOR

A grade of C- or better is required for all courses used to complete minor requirements. Such courses cannot be taken S/U.

Background (6)

Select 6 credits from the following:
ANTH 100. Intro to Arch & Phys Anthro (3,4) or *ANTH 330. Evolution of People, Technology, and Society (3)
ANTH 110. Intro to Cultural Anth (3)
ANTH 210. Comparative Cultures (3)
ANTH 230. Time Travelers (3)
ANTH 240. From Ape to Angel (3)

Core (at least 6)

Select 6 to 12 credits from the following:
ANTH 340. Natural History of the Primates (3)
ANTH 350. Language, Culture, and Society (3)
ANTH 370. Family, Gender & Generation (3)
ANTH 431. Archeology Meth and Theory (3)

Advanced (9-15)

ANTH 311-320. Peoples of the World (3)
ANTH 411-420. World Cultures (4)
ANTH 380. Cultures in Conflict (3)
Any 3-credit course from 430s through 480s
ANTH 435. Cultural Res: Policy & Procedures (3)
ANTH 443. Human Osteology Lab (2)
ANTH 444. Quant Methods in Phys Anthro (2)

Total Required Credits (27)

GRADUATE PROGRAM

Master of Arts in Applied Anthropology

The Master of Arts in Applied Anthropology is designed for students who want to combine practical skills with a broad understanding of cross-cultural and social factors. The program will prepare students for positions at the local, national and international levels. Seven concentrations are available to the students: Business Anthropology with an Asian Focus, Health and Culture, Language and Cross-Cultural

Communication, Natural Resources and Communities, Cultural Resource Management, First American Studies, Historic Archeology. Each area of concentration combines class work, internship, and thesis into a unique program which enables students to apply knowledge and skills to problem solving outside academia.

All students take a core program of 9 credits in anthropology. Students must take 12 credits within their concentration; 3 credits of anthropological methods courses which relate to their particular concentration; 9-15 electives in a single department or in more than one department, if they have an integrated focus; at least 9 of those credits will be taken in a minor field related to the concentration in anthropology. Following the course work, students will spend one quarter on an internship off campus earning 6-12 credits. Following the internship, their thesis work will be implemented. Candidates must also have documented proficiency in a foreign language at the second-year level .

M.A.I.S. Degree

The department also participates in the Master of Arts in Interdisciplinary Studies (M.A.I.S.) degree program. In other advanced degree programs, anthropology may be used as a minor. See Graduate School for details.

COURSES

Lower Division

ANTH 100. AN INTRODUCTION TO ARCHAELOGY AND PHYSICAL ANTHROPOLOGY (3/4). An introduction to human biological and cultural development including anthropological approaches to primate studies and human biological and cultural development, including anthropological approaches to primate studies and human prehistory, from the first archaeological traces through the advent of agriculture and urbanization. Four credits includes recitation. (SS)

ANTH 105. ANTHROPOLOGY TODAY (3). Evaluation of contemporary human issues from an anthropological perspective with anthropological subdisciplines applied to problem solving in modern society. (SS)

ANTH 110. INTRODUCTION TO CULTURAL ANTHROPOLOGY (3). Investigates cultural adaptation and change in different environmental and historical contexts. Compares the means by which cultures solve common human problems. Shows similarities and differences throughout the world in systems of values, family, religion, economics, and politics. Students are asked to consider future cultural conditions. Uses a video format. (SS)

ANTH 199. SPECIAL STUDIES (1-3).

ANTH 210. COMPARATIVE CULTURES (3). Compares the cultures originating in Asia, Africa, and precolonial Australia, Oceania, and North and South America. Introduces method and theory for comparative cultural analysis from historical, ethnographic, and indigenous viewpoints. Considers the contribution and influences of minority and ethnic groups on the mainstream culture in nation states. Summarizes the characteristics of cultures in the major world culture areas.

ANTH 215. HISPANIC CULTURES OF THE UNITED STATES (3). A study of the various groups that comprise the U.S. Chicano population, including their history in the United States, immigration to the United States, culture, and ethnic identities; exploration of acculturation and assimilation issues; political and economic trends.

ANTH 230. TIME TRAVELERS (3). Introduction to the historical developments of modern archaeology. The often romanticized public image of archaeology will be contrasted with scientific reality. The nature of archaeological data, modern field methods, analytical techniques, and theoretical background will be reviewed in order to illustrate how the unwritten record of human cultural behavior is deciphered. (SS)

ANTH 240. FROM APE TO ANGEL (3). An investigation of the origin of modern people (Homo sapiens) in a historical context; review of key discoveries and current research on the relationships between humans and other primates; exploration of contrasting views of humanity. (SS)

Upper Division

ANTH 311. *PEOPLES OF THE WORLD—NORTH AMERICA (3). (NC) Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Cannot be taken if student is taking or has completed the 400-level course in the same geographical area. PREREQ: Completion of ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 312. *PEOPLES OF THE WORLD—EUROPE (3). (NC) Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Cannot be taken if student is taking or has completed the 400-level course in the same geographical area. PREREQ: Completion of ANTH 110 or ANTH 210 or completion of social processes and institutions requirement. (Bacc Core Course)

ANTH 313. PEOPLES OF THE WORLD—LATIN AMERICA (3). (NC) Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Cannot be taken if student is taking or has completed the 400-level course in the same geographical area. PREREQ: Completion of ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 314. *PEOPLES OF THE WORLD—MIDDLE EAST (3). (NC) Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Cannot be taken if student is taking or has completed the 400-level course in the same geographical area. PREREQ: Completion of ANTH 102 or ANTH 202 or completion of social processes and institutions requirement.

ANTH 315. *PEOPLES OF THE WORLD—AFRICA (3). (NC) Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Cannot be taken if student is taking or has completed the 400-level course in the same geographical area. PREREQ: Completion of ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 316. *PEOPLES OF THE WORLD—SOUTH AND SOUTHEAST ASIA (3). (NC) Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Cannot be taken if student is taking or has completed the 400-level course in the same geographical area. PREREQ: Completion of ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 317. *PEOPLES OF THE WORLD—PACIFIC (3). (NC) Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Cannot be taken if student is taking or has completed the 400-level course in the same geographical area. PREREQ: Completion of ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 318. *PEOPLES OF THE WORLD—CHINA (3). (NC) Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Cannot be taken if student is taking or has completed the 400-level course in the same geographical area. PREREQ: Completion of ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 319. *PEOPLES OF THE WORLD—JAPAN AND KOREA (3). (NC) Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Cannot be taken if student is taking or has completed the 400-level course in the same geographical area. PREREQ: Completion of ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 320. PEOPLES OF THE WORLD—TOPICS (3). (NC) Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Cannot be taken if student is taking or has completed the 400-level course in the same geographical area. PREREQ: Completion of ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 330. *EVOLUTION OF PEOPLE, TECHNOLOGY, AND SOCIETY (3). Overview of the evolution and prehistory of the human species, including the development and interaction of human biology, technology, and society. PREREQ: Sophomore standing. (Bacc Core Course). (NC)

ANTH 340. NATURAL HISTORY OF THE PRIMATES (3). An introduction to primate studies in the context of evolutionary theory as it affects the study of Homo sapiens; emphasis upon primate behavior, sociobiological theory, conservation, ecology, fieldwork, and application of research with primates to Homo sapiens. PREREQ: Completion of biological science requirement or ANTH 100 or ANTH 240. (SS)

ANTH 350. LANGUAGE, CULTURE AND SOCIETY (3). An examination of the communicative functions of language and the role of language in the construction of social relations. Covers the origins, structure, and diversity of language. Explores the relationships between language and thought and the use of linguistic models in the study of culture. PREREQ: 3 credits of social science. (SS)

ANTH 370. ^FAMILY, GENDER, AND GENERATION (3). A cross-cultural approach to understanding social roles as determined by stages in the life-cycle, gender, and kinship relations. Examines the cultural meaning of ceremonies and rituals marking transitions in the life-cycle that transform social identity. Reviews theory and explanations given for different social structures. Offers broad perspectives on issues such as birthing, child abuse, delinquency, generation gap, gender inequality, marriage and divorce, aging, treatment of the aged, and coping with death. PREREQ: ANTH 110 or completion of social processes and institutions requirement. (SS)

ANTH 380. *CULTURES IN CONFLICT (3). Communication and commerce draw East and West, industrial and pre-industrial, state and stateless societies together. Beliefs and values clash and complement one another. Explores the processes of intercultural contact, cross-cultural interaction, and the consequences of global penetration of European-American culture. Evaluates theoretical explanations for cultural persistence and change. PREREQ: ANTH 110 or completion of non-Western cultures requirement. (SS)

ANTH 401/ANTH S01. RESEARCH (1-6).

ANTH 402/ANTH 502. INDEPENDENT STUDY (1-6).

ANTH 403/ANTH S03. THESIS (3-6).

ANTH 405/ANTH S05. READING AND CONFERENCE (1-6).

ANTH 406/ANTH S06. PROJECTS (1-6).

ANTH 407/ANTH S07. SEMINAR (1-3).

ANTH 408/ANTH S08. WORKSHOP (1-6).

ANTH 410/ANTH S10. INTERNSHIP (1-16). Opportunities for students at junior and first-term senior class levels to take advantage of off-campus work experiences during regular term sessions for academic credit. Allows students to broaden and deepen their understanding and appreciation of the value of their academic activity. Internship is supervised and evaluated by individual faculty members. PREREQ: 6 credits of anthropology.

ANTH 411/ANTH 511. WORLD CULTURES—NORTH AMERICA (4). In-depth study of world cultures. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Includes three hours of lecture and one hour of seminar. Cannot be taken if student is taking or has completed the 300-level course in the same geographical area. PREREQ: 9 credits of social science including 3 credits of anthropology, or graduate standing.

ANTH 412/ANTH 512. *WORLD CULTURES—EUROPE (4). In-depth study of world cultures. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Includes three hours of lecture and one hour of seminar. Cannot be taken if student is taking or has completed the 300-level course in the same geographical area. PREREQ: 9 credits of social science including 3 credits of anthropology, or graduate standing. (Bacc Core Course)

ANTH 413/ANTH 513. WORLD CULTURES—LATIN AMERICA (4). In-depth study of world cultures. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Includes three hours of lecture and one hour of seminar. Cannot be taken if student is taking or has completed the 300-level course in the same geographical area. PREREQ: 9 credits of social science including 3 credits of anthropology, or graduate standing.

ANTH 414/ANTH 514. WORLD CULTURES—MIDDLE EAST (4). In-depth study of world cultures. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Includes three hours of lecture and one hour of seminar. Cannot be taken if student is taking or has completed the 300-level course in the same geographical area. PREREQ: 9 credits of social science including 3 credits of anthropology, or graduate standing.

ANTH 415/ANTH 515. WORLD CULTURES—AFRICA (4). In-depth study of world cultures. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Includes three hours of lecture and one hour of seminar. Cannot be taken if student is taking or has completed the 300-level course in the same geographical area. PREREQ: 9 credits of social science including 3 credits of anthropology, or graduate standing.

ANTH 416/ANTH 516. WORLD CULTURES—SOUTH AND SOUTHEAST ASIA (4). In-depth study of world cultures. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Includes three hours of lecture and one hour of seminar. Cannot be taken if student is taking or has completed the 300-level course in the same geographical area. PREREQ: 9 credits of social science including 3 credits of anthropology, or graduate standing.

ANTH 417/ANTH 517. WORLD CULTURES—PACIFIC (4). In-depth study of world cultures. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Includes three hours of lecture and one hour of seminar. Cannot be taken if student is taking or has completed the 300-level course in the same geographical area. PREREQ: 9 credits of social science including 3 credits of anthropology, or graduate standing.

ANTH 418/ANTH 518. WORLD CULTURES—CHINA (4). In-depth study of world cultures. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Includes three hours of lecture and one hour of seminar. Cannot be taken if student is taking or has completed the 300-level course in the same geographical area. PREREQ: 9 credits of social science including 3 credits of anthropology, or graduate standing.

ANTH 419/ANTH 519. WORLD CULTURES—JAPAN AND KOREA (4). In-depth study of world cultures. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Includes three hours of lecture and one hour of seminar. Cannot be taken if student is taking or has completed the 300-level course in the same geographical area. PREREQ: 9 credits of social science including 3 credits of anthropology, or graduate standing.

ANTH 420/ANTH S20. WORLD CULTURES—TOPICS (4). Graded P/N. In-depth study of world cultures. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Includes three hours of lecture and one hour of seminar. Cannot be taken if student is taking or has completed the 300-level course in the same geographical area. PREREQ: 9 credits of social science including 3 credits of anthropology, or graduate standing.

ANTH 430/ANTH S30. TOPICS IN ARCHAEOLOGY (1-3). Recent advances in archaeology and their application to special fields of study. Topics vary from term to term but include archaeological theory, historic sites archaeology, zooarchaeology, issues in cultural resource management. PREREQ: ANTH 100, ANTH 230 or equivalent.

ANTH 431/ANTH 531. ARCHAEOLOGY METHOD AND THEORY (3). Historical development of archaeological field techniques and theoretical concepts with an emphasis on modern method and theory in North American archaeology. PREREQ: ANTH 230 or equivalent.

ANTH 432/ANTH 532. *THE ARCHAEOLOGY OF DOMESTICATION AND URBANIZATION (3). Reviews the development of culture in the Old and New Worlds with special emphasis placed on the when, where, and how of early domestication of plants and animals. Examines the process of urbanization. PREREQ: 6 credits of anthropology.

ANTH 433. FIRST AMERICANS, LAST FRONTIERS (3). The initial human occupation of the Western Hemisphere is explored with particular emphasis on northeast Siberian cultural progenitors, routes and timing of entry into the Americas, population dispersal theory, the paleoenvironmental record, and human cultural responses to the conditions of the last frontier prior to 8000 years ago. PREREQ: 6 credits of anthropology.

ANTH 434. THE AMERICAN PERIOD OF INNOVATION (3). The development of regional hunting and gathering adaptive strategies in North America from 8000 B.P. to the historic period are examined against a backdrop of changing climate, natural disasters, population growth, and human invention. PREREQ: ANTH 433 or 6 credits of anthropology.

ANTH 435/ANTH 535. CULTURAL RESOURCES: POLICY AND PROCEDURES (3). Description and analysis of requirements and demands of cultural resource management. Historical development of cultural resource laws and appropriate field techniques and strategies to implement legislation. PREREQ: Anth 230, ANTH 431, or consent of instructor.

ANTH 436/ANTH 536. NORTHWEST PREHISTORY (3). Materials and theories relating to prehistoric aboriginal cultures of the Northwest. Evaluation of different theories on the origins and adaptations of prehistoric populations ecological zones with the Northwest; comparisons of the cultural development through prehistoric times of the Columbia Plateau, intermontane and coastal zones of Oregon, Washington, and British Columbia. Special emphasis on the theories of origin, subsequent development of prehistoric cultures in the Northwest, and the present circumstances of archaeology in the Northwest. PREREQ: 6 credits of anthropology.

ANTH 437/ANTH 537. FIRST AMERICAN STUDIES AND ICE-AGE ENVIRONMENTS (3). Dynamics of environmental change and cultural development during late Ice-Age times; paleoclimatology, glaciology, oceanography, geology, paleontology, palynology, physical anthropology, the archaeology; overview of modeling the dynamics and linkages between the earth's subsystems and the development and spread of modern humans. PREREQ: 6 credits of anthropology or consent of instructor.

ANTH 438/ANTH 538. ARCHAEOLOGY FIELD SCHOOL (1-10). Practical skills, archaeological methods and techniques including use of equipment, site surveying and mapping techniques, site excavation strategies, record keeping, field cataloging, report writing, and field camp management. PREREQ: 6 credits of anthropology.

ANTH 440/ANTH 540. TOPICS IN PHYSICAL ANTHROPOLOGY (1-3). Recent advances in physical anthropology and their applications to special fields of study. Topics vary from term to term but include human adaptability, skeletal biology, dental anthropology, theory of evolution. PREREQ: ANTH 240 or ANTH 340, or general biology or equivalent.

ANTH 441/ANTH 541. PRIMATE AND HUMAN PALEONTOLOGY (3). The evolutionary history of the primate order as it is represented by fossils of the Paleocene through the Holocene. Special attention given to development of the Hominoids in the Miocene, the Australopithecines in the Pliocene, and members of the genus Homo in the Pleistocene. PREREQ: ANTH 240 or ANTH 340 or general biology or equivalent.

ANTH 442/ANTH 542. HUMAN BIOLOGY (3). Description and evaluation of the biological heterogeneity of human populations. Traits of known and unknown inheritance, evolutionary theory, anthropological genetics. Racial, populational, and clinal methods as applied to contemporary peoples. PREREQ: ANTH 240 or ANTH 340 or general biolory or equivalent.

ANTH 443/ANTH 543. HUMAN OSTEOLOGY LAB (2). Identification and analysis of human skeletal materials in an archaeological context. PREREQ: ANTH 100 or ANTH 240.

ANTH 445/ANTH 545. HUMAN BIOLOGY LAB (2). Laboratory exercises in human biology and serology. PREREQ: ANTH 100.

ANTH 450/ANTH 550. TOPICS IN LINGUISTIC ANTHROPOLOGY (1-3). Recent advances in the study of culture and communication and their application to special fields of knowledge. Topics vary from term to term but include ethnography of communication, language socialization, quantitative approaches to the study of language, semiotics, cross-cultural semantics and artificial intelligence. PREREQ: 3 credits of linguistic anthropology.

ANTH 451/ANTH 551. *SOCIOLINGUISTICS (3). The study of language in social context including the relationships between language and age, gender, personality, religion, ethnicity and social class. Examines pidgins, creoles, dialects, genres and the processes of language change. PREREQ: ANTH 350 or graduate standing. (Bacc Core Course)

ANTH 452/ANTH 552. POPULAR NARRATIVE AND VERBAL ART (3). The study of folklore/popular culture in its social and historical context. Examines content, structure, communicative potential, and performative aspects of various forms of oral and written expression. Includes familiarization with the analysis of myths, legends, tall tales, proverbs, riddles, and play languages. PREREQ: ANTH 350 or graduate standing.

ANTH 460/ANTH 560. TOPICS IN COMPARATIVE CULTURES (1-3). Recent advances in the study of comparative cultures and their application to special fields of study. Topics vary from term to term but include cultural futures, urban industrial cultures, early state systems, pastoralists, horticulturalists, and foragers. PREREQ: 3 credits of social science.

ANTH 462/ANTH 562. *MINORITY CULTURES OF CHINA (3). Compares non-Han minority cultures in China in terms of subsistence patterns, population, language, social organization, religion, change and modernization. Includes Tibetans, Mongolians, Manchu and lesser known groups having Buddhist, Islamic and Animistic traditions. Subsistence types range from hunter-gatherers to horticulturalists, pastoralists, agriculturalists and merchants. PREREQ: 3 credits of social science. (Bacc Core Course)

ANTH 470/ANTH 570. TOPICS IN CULTURAL ANTHROPOLOGY (1-3). Covers recent advances in cultural anthropology and their applications to the field. Topics vary from term to term but include human ecology, ethnobotany, ethnomusicology, autoethnography, the anthropology of law, the anthropology of international business, economic anthropology, religion and folklore, and women in cross-cultural perspective. PREREQ: 3 credits of social science.

ANTH 471/ANTH 571. ECONOMIC ORGANIZATION AND CULTURE (3). Consideration of theories and case studies concerning the interaction of economic pursuits with social relations and cultural meanings in industrial and developing societies. PREREQ: 3 credits of social science.

ANTH 472/ANTH 572. CONTEMPORARY INDIAN ISSUES (3). Examines the background of Indian treaties and reservations with discussions of present issues such as health care, education, the Indian Child Welfare Act, fishing rights, and religious freedom. Issues are discussed in class with considerable class participation and some role playing. PREREQ: 3 credits of social science.

ANTH 473/ANTH 573. CULTURE, GENDER AND SELF (3). Investigates the interrelation of psychological and sociocultural levels of experience, with emphasis on the area of gender. Explores how culture shapes the individuals world, especially according to a person's sex, and also how the individual manipulates culture. Considers culture as an element in studies of personality, emotions, and cognition. Case studies and theoretical interpretations of major contributors to this field will be discussed. PREREQ: 3 credits of social science.

ANTH 480/ANTH 580. TOPICS IN APPLIED ANTHROPOLOGY (1-3). Recent advances in applied anthropology and their application to special fields of study. Topics vary from term to term but include social impact assessment, risk analysis, rural development, cross-cultural communication, anthropology of education, nutritional anthropology and health. PREREQ: 3 credits of social science.

ANTH 481/ANTH 581. *NATURAL RESOURCES AND COMMUNITY VALUES (3). Investigates relations between resource-based communities and centers of political power where ideology and policy about resource use are molded. Issues are considered from a temporal and comparative perspective. Integrates concepts from social science, economics, and ecology. PREREQ: 3 credits of social science. (Bacc Core Course)

ANTH 482/ANTH 582. WORLD FOOD AND DEVELOPMENT (3). Examines the ideological and theoretical bases of world assistance programs and their effects on different sectors and classes, including women. Causes of world hunger in terms of agronomic, mainstream economic and radical economic paradigms are developed and contrasted. PREREQ: Senior standing.

ANTH 483/ANTH 583. *MEDICAL ANTHROPOLOGY (3). An overview of anthropological studies of the health of human communities from a biological and behavioral perspective. Topics include prehistory of disease, cultural perspectives on causation of disease and approaches to healing; anthropological approach to international health issues; and case studies. PREREQ: Upper division standing. (Bacc Core Course)

ANTH 484/ANTH 584. *WEALTH AND POVERTY (3). Summarizes the distribution of wealth observed cross-culturally and through time. Determines the relation between wealth distribution and economic productivity. Shows the impact of industrialization and economic wealth distribution in Western civilization and cross-culturally. Evaluates how cultural practices affect wealth distribution in Western and non-Western societies. PREREQ: 3 credits of social science. (Bacc Core Course)

ANTH 485/ANTH 585. USES OF ANTHROPOLOGY (3). Examines the practical applications of anthropological knowledge in historical and contemporary contexts. Focuses on planned social change and roles of anthropologists in interdisciplinary research and nonacademic settings such as international business, industrial relations, economic and technological development, education, legal institutions, environmental change, minority relations, health care, and cultural preservation. Emphasizes relevance to public policy and ethical issues associated with applications of anthropological knowledge. PREREQ: 3 credits of social science.

ANTH 486/ANTH 586. CROSS-CULTURAL ALCOHOL USE AND ALCOHOLISM (3). Students will examine and contrast the way in which alcohol is used in various cultural and ethnic groups within the United States and worldwide. Medical concepts of alcohol abuse and alcoholism will be studied and interpreted within contemporary society. Ethnographic observations of alcohol use will be completed and the ethnographic approach to the study of alcohol problems in different cultural settings will be discussed. PREREQ: 3 credits of social science.

ANTH 487/ANTH 587. *LANGUAGE IN GLOBAL CONTEXT (3). Deals with practical uses of linguistics in the global political arena. Explores use of official vs. unofficial languages, language standardization, the preservation of dying languages; problems in learning first- and second- languages, and the relevance of linguistic knowledge to education and cross-cultural communication. PREREQ: ANTH 350 or some knowledge of linguistic structure or graduate standing.

ANTH 488/ANTH 588. *BUSINESS AND ASIAN CULTURE (3). Examines the mutual influence of business organization and culture in Asia. Starts with the premise that a business organization contains a set of values. These values are analyzed as to their effect on society in general and some Asian societies in particular, including Japan, China, Korea, India, and Indonesia. A second area of investigation is the influence of Asian societies on the organization and practice of Western businesses both in Asia and the West. PREREQ: 3 credits of social science. (Bacc Core Course)

ANTH 490/ANTH 590. TOPICS IN METHODOLOGY (1-3). Recent advances in methodology and their application to special fields of study. Topics vary from term to term but include computer modeling, faunal analyses, genealogical method, survey research. PREREQ: 6 credits anthropology or graduate standing.

ANTH 491/ANTH 591. ETHNOGRAPHIC METHODS (1-3). Cultural descriptions are produced through systematic observation, elicitation, and analysis to achieve proximity to the insiders point of view. Covers techniques of interviewing, validating, and interpreting cultural data. Allows students to practice what they have learned. PREREQ: 6 credits of anthropology or graduate standing.

ANTH 493/ANTH 593. STATISTICAL APPLICATIONS IN ANTHROPOLOGY (1-3). Develops the skills necessary to use statistical software to analyze and interpret numerical data. Covers descriptive statistics, correlation, and multivariate statistical procedures. Evaluates the adequacy of data for parametric and nonparametric statistical tests. PREREQ: 6 credits of anthropology or graduate standing.

ANTH 494/ANTH 594. LINGUISTIC TRANSCRIPTION (1-3). A training and practicum in the elicitation, transcriptions and analysis of language. PREREQ: ANTH 350 or graduate standing.

ANTH 496/ANTH 596. VISUAL ANTHROPOLOGY (1-3). Examines the use of photography and film for ethnographic description and analysis of culture. Students are encouraged to pursue individual projects. PREREQ: 6 credits of anthropology or graduate standing.

ANTH 497/ANTH 597. ARCHAEOLOGICAL FIELD METHODS (1-3). Archaeological field strategies emphasizing reconnaissance and survey. Application of field equipment and project management. PREREQ: ANTH 431.

ANTH 498/ANTH 598. ORAL TRADITIONS (1-3). Method of examining unwritten culture preserved in speech, including local history, folklore, and songs passed from one generation to another. May include the use of life history, genealogy, and other means of collecting information. Attention is given to ethics, legal issues, and the process of transcription. PREREQ: ANTH 350 and ANTH 452 (can be taken concurrently) or graduate standing.

ANTH 595. ANTHROPOLOGICAL RESEARCH DESIGN (3). Critical examination of research design and methodology in anthropology; analysis of methods and procedures of research in the subfields of anthropology. PREREQ: 9 credits of upper division social science, including at least one 400-level anthropology course.

ART

David Hardesty, Chair
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Faculty

Professors Branch, Brown, Chappell, Hardesty, Morandi, Munro, Sayre, Wiprud; *Associate Professors* Folts, Jordon, Loeb; *Assistant Professors* Chovanec,Hiratsuka, Marks, Pilliod; *Senior Research Assistant* Russell

Undergraduate Majors

Art (B.A., B.S.)
Applied Visual Arts (B.F.A.)
Options
Art History
Fine Arts
Graphic Design
Photography

Minor

Visual Arts

The Department of Art offers extensive course work in fine art, graphic design, Photography, and art history. Study in these areas leads to the Bachelor of Fine Arts (B.F.A.) degree, the Bachelor of Arts (B.A.) degree, or the Bachelor of Science (B.S.) degree.

The curriculum provides an awareness and understanding of the historical and contemporary significance of art as a unique feature of society.

Major programs offer the opportunity for professional artistic development while incorporating subjects that lead to a liberal education. These major programs prepare the student for a range of vocational opportunities or later graduate study. Possible vocational areas and fields of graduate study include graphic design, advertising, communications, photography, fine art, and art history. As an enrichment for our students, the department sponsors exhibitions, lectures, workshops, and other events related to the visual arts.

Candidates for the B.S. or B.F.A. degrees may have an emphasis in fine art, graphic design or photography. Candidates for the B.A. degree may have an emphasis in those studio areas or art history.

The B.F.A. is a preprofessional degree requiring a minimum of 103 credits in the visual arts. College of Liberal Arts requirements for the B.F.A. differ from other degree programs. (See B.F.A. in Applied Visual Arts.)

To minor in the visual arts, students must complete 33 hours of studio courses.

The Department of Art is a participant in the Master of Arts in Interdisciplinary Studies (M.A.I.S.) degree program.

DEPARTMENTAL REQUIREMENTS

ART CORE CURRICULUM—24 CREDITS

ART 115. Design I (4)
ART 117. Design II (4)
ART 131. Drawing I (4)
ART 204, ART 205, ART 206. Art History (9)
ART 231. Drawing II (3) or
ART 234. Drawing II/Figure (3)

NOTE: The core curriculum studio courses must be completed before taking upper division art courses for a major program. In addition, it is strongly suggested that students take HST 101, HST 102, and HST 103, History of Western Civilization, prior to taking ART 204, ART 205, and ART 206. Art majors may not elect to take required art courses on an S-U graded basis.

FINE ARTS (B.A., B.S.) (63)

Candidates for the B.A. or B.S. degree in Fine Arts must build a studio concentration in either Printmaking, Painting, or Sculpture. A studio concentration is a minimum of 24 credits (lower and upper division) in one studio area.

Lower Division (33)
Core curriculum (24)
ART 253. Ceramic Sculpture I (3) or ART 291. Sculpture I (3)
Select 6 credits from the following: ART 241, ART 281, ART 222, ART 223.

Upper Division (30)
Art history (300/400-level) (at least one course must be at the 400-level) (12)
Fine Arts electives (300-level) (9)
Fine Arts electives (400-level) (9)

GRAPHIC DESIGN (B.A., B.S.) (63)

Lower Division (30)
Art core curriculum (24)
ART 222. Graphic Design I (3)
ART 223. Graphic Design/Typography (3)

Upper Division (33)
AART 320, ART 321. Graphic Design II (6)
ART 322, ART 323. Graphic Design/Typography II (6)
ART 367. History of Design (3)
Art History (300/400-level) (6)
ART 420, ART 421, ART 422. Graphic Design III (12)

PHOTOGRAPHY (B.A., B.S.) (63)

Lower Division (30)
Art core curriculum (24)
ART 241. Photography I (3)
ART 243. Photography II (3)

Upper Division (33)
ART 341. Photographic Techniques (3)
ART 342. Photographic Aesthetics (3)
ART 343. The View Camera (3)
ART 346. Photo Illustration (3)
ART 441. Portfolio (3)
ART 446. Documentary Photography (3)
Photography studio electives (300/400-level) (3)
Art history (300/400-level) (12)

ART HISTORY (B.A.) (50)

Lower Division (23)
ART 115. Design I (4)
ART 131. Drawing I (4)
ART 204, ART 205, ART 206. Art History (9)
ART 207. Indigenous Art of the Americas (3)
Art studio electives (3)

Upper Division (27)
ART 469. Meth and Theories of Art History (3)
Art history (300-level) (15)
Art history (400-level) (9)

NOTE: Art History majors must successfully complete at least one term of a third-year foreign language.

B.F.A. DEGREE

A minimum 3.00 grade point average must be maintained in all art courses used to meet B.F.A. requirements.

FINE ARTS (B.F.A.) (103)
Lower Division (36)
Art Core curriculum (24)
ART 231. Drawing II (3) or ART 234. Drawing II/Figure (3) (whichever was not used to satisfy the Art core requirements)
ART 241. Photography I (3) or ART 253. Ceramic Sculpture (3)
ART 281. Painting I (3)
ART 291. Sculpture I (3)

Upper Division (67)
ART 331. Drawing III/Concepts (3)
ART 334. Drawing III/Figure (3)
ART 375, ART 376, ART 377. Printmaking (9)
ART 381, ART 382X, ART 383X. Painting II (3)
300-level painting (6)
ART 391, ART 392X, ART 393X. Sculpture II (3)
300-level sculpture (6)
Art history (300/400-level) (3 hours may be ART 207) (12)
400-level studio block (22)

NOTE: the 400-level studio block may be any combination of painting, printmaking, sculpture, or drawing for five credits each, including B.F.A. critique groups.

GRAPHIC DESIGN (B.F.A.) (103)
Lower Division (39)
Core curriculum (24)
ART 222. Graphic Design I (3)
ART 223. Graphic Design/Typography (3)
ART 231. Drawing II (3) or ART 234. Drawing II/Figure (3) (whichever was not used to satisfy the Art core requirements)
Art studio electives (200-level) (6)

Upper Division (64)
ART 320, ART 321. Graphic Design II (6)
ART 322, ART 323. Graphic Design/Typography II (6)
ART 367. History of Design (3)
ART 406. Art Adviser Review (1)
ART 420, ART 421, ART 422. Graphic Design III (15)
ART 427. Graphic Design/Senior Portfolio (3-5)
Art history (300/400-level) (3 hours may be ART 207) (9)
Art studio electives (300/400-level) (19-21)

PHOTOGRAPHY (B.F.A.) (103)
Lower Division (39)
Art Core curriculum (24)
ART 241. Photography I (3)
ART 243. Photography II (3)
Art studio electives (200-level) (9)

Upper Division (64)
ART 341. Photographic Techniques (3)
ART 342. Photographic Aesthetics (3)
ART 343. The View Camera (3)
ART 346. Photo Illustration (3)
ART 406. Art Adviser Review (1)
ART 441. Portfolio (15)
ART 446. Documentary Photography (6)
Art history (300/400-level) (3 hours may be ART 207) (12)
Art studio electives (300/400-level) (18)

VISUAL ARTS MINOR (33)
ART 115. Design I (4)
ART 117. Design II (4)
ART 131. Drawing I (4)
ART 231. Drawing II (3)
ART 234. Drawing II/Figure (3)
Art studio courses (200-level) (3)
Art studio courses (300-/400-level) (12)

NOTE: Art minors may not elect to take required art courses on an S-U graded basis.

COURSES

Lower Division

ART 101. INTRODUCTION TO THE VISUAL ARTS (4). An introductory lecture course using visual materials with emphasis on methods and motivations that generate the visual experience, both past and present. (FA)

ART 115. DESIGN I (4). Introductory studio course that introduces the visual language, the elements of design, and the principles of organization. Emphasizes skills, concepts, and problem solving in the areas of color and two-demensional design. (FA)

ART 117. DESIGN II (4). Studio course following ART 115 that examines three-dimensional design elements and their organization and color theories. Emphasizes innovative problem solving and the use of varied media. Gives students a sound conceptual foundation to apply to more advance media-oriented courses. PREREQ: ART 115.

ART 131. DRAWING (4). Introductory studio course in drawing techniques with emphasis on developing skills in perception and visual organization. (FA)

ART 199. SPECIAL STUDIES (1-16). Departmental consent required for 5 credits.

ART 204. INTRODUCTION TO ART HISTORY — WESTERN (3). A historical survey to architectue, painting, sculpture, and crafts, from prehistory to the present, with emphasis on the development of Western art. Recommended that sequence be taken in order (H).

ART 205. INTRODUCTION TO ART HISTORY — WESTERN (3). A historical survey of architecture, painting, sculpture, and crafts, from prehistory to the present, with emphasis on the development of Western art. Recommended that sequence be taken in order. (H)

ART 206. INTRODUCTION TO ART HISTORY — WESTERN (3). A historical survey of architecture, painting, sculpture, and crafts, from prehistory to the present, with emphasis on the development of Western art. Recommended that the sequence be taken in order. (H)

ART 207. INDIGENOUS ART OF THE AMERICAS (3). A historical survey of native arts of South, Central, and North America, including architectue, painting, sculpture, ceramics, textiles, basketry, and beadwork, from prehistory to present. (NC)

ART 222. GRAPHIC DESIGN I (3). Introductory studio course in principles and processes of graphic design comunication. PREREQ: ART 131, ART 115.

ART 223. GRAPHIC DESIGN/TYPOGRAPHY (3). Introductory studio course in the development and use of the letterform as applied to typography. Emphasis on rendering techniques and on the exploration of type as graphic element. PREREQ: ART 131, ART 115.

ART 231. DRAWING II (3). Studio course in drawing with emphasis on exploration and structuring of visual relationships. PREREQ: ART 131.

ART 234. DRAWING II/FIGURE (3). Drawing from the life model with emphasis on skill building and conceptual awareness as well as anatomical consideration. PREREQ: ART 131.

ART 241. PHOTOGRAPHY I (3). Introductory studio course in photography with creative expression and innovative possibilities stressed. Includes problems in visual theory; demonstrations and lectures on both the technical and historical growth of the medium. Student must supply suitable 35mm camera. (FA)

ART 243. PHOTOGRAPHY II (3). Introduction to 35mm color photography. Color balance, color negative and positive processes. Elements of lighting. Introduction to the photo essay. Student must supply suitable 35 mm camera. PREREQ: ART 241.

ART 253. CERAMIC SCULPTURE I (3). Studio course in basic materials and techniques of sculpture with emphasis on design concepts; a foundation for further three-dimensional work in the visual arts.

ART 281. PAINTING I (3). Introductory studio course with emphasis on basic materials and techniques in painting. PREREQ: ART 131. Course offered 3 credit per term, 2 terms. (FA)

ART 284. PAINTING I/WATERCOLOR (3). Introductory studio course with emphasis on basis materials and techniques in watercolor painting. PREREQ: ART 131. (FA)

ART 291. SCULPTURE I (3). Studio course in basic materials and approaches used in sculpture; a foundation for futher three-dimensional work. Course offered 3 credits per term, 2 terms. (FA)

Upper Division

ART 301. ^WRITING IN ART AND DESIGN (3). Seminar examining the context of art, design, or art history through readings and critical writing within an area of specialization. (Writing Intensive Course) PREREQ: Junior standing.

ART 320. GRAPHIC DESIGN II (3). Intermediate course in graphic design. Emphasis on understanding principles of visual organization and on exploring the development of concepts for solving visual communication problems. Required for graphic design majors. PREREQ: Core curriculum; ART 222, ART 223.

ART 321. GRAPHIC DESIGN II (3). Intermediate course in graphic design. Emphasis on understanding principles of visual organization and on exploring the development of concepts for solving visual communicaiton problems. Required for graphic design majors. PREREQ: ART 320.

ART 322. GRAPHIC DESIGN/TYPOGRAPHY II (3). Intermediate studio course exploring the principles of typographic design. Course work stresses the use of type as a tool of communication through both experimental and applied problems. PREREQ: Core curriculum; ART 222, ART 223.

ART 323. GRAPHIC DESIGN/TYPOGRAPHY II (3). Intermediate studio course exploring the principles of typographic design. Course work stresses the use of type as a tool of communication through both experimental and applied problems. PREREQ: Core curriculum; ART 322.

ART 331. DRAWING III (3). Creative development and expression of visual concepts through the use of drawing media; emphasis on defining and directing creative development. PREREQ: Core curriculum; ART 231. Course offered 3 credits per term, 3 terms.

ART 334. DRAWING III/FIGURE (3). Studio course in drawing from the life model; emphasis on developing skills and understanding of the human form. PREREQ: Core curriculum; ART 234. Course offered 3 credits per term, 3 terms.

ART 341. PHOTOGRAPHIC TECHNIQUES (3). Demonstration of the zone system, photographic chemistry, and archival processes. PREREQ: Core curriculum; ART 243.

ART 342. PHOTOGRAPHIC AESTHETICS (3). Critique sessions on technical and aesthetic aspects of the medium. PREREQ: ART 341.

ART 343. THE VIEW CAMERA (3). Operation of the techniques of using the vies camera. PREREQ: Core curriculum; ART 243.

ART 346. PHOTO ILLUSTRATION I (3). Studio lighting. The 4x5 view camera. Sheet film. Black and white and color illustration. PREREQ: Core curriculum; ART 243.

ART 353. CERAMIC SCULPTURE II (3). Intermediate studio course with a continued emphasis on individual problem solving as related to sculpture. PREREQ: Core curriculum; ART 253. Course offered 3 credits per term, 3 terms.

ART 354. CERAMICS II/GLAZING (3). Intermediate studio course in various aspects of glazing, decorative techniques, and practical application of glaze concepts and technology. PREREQ: Core curriculum; ART 253.

ART 360. HISTORY OF ART (3). Early Renaissance art. Lecture course on the principle stylistic manifestations of European architecture, painting, and sculpture from the late Middle Ages to 1750. PREREQ: ART 204, ART 205, ART 206.

ART 361. HISTORY OF ART (3). High Renaissance art and mannerism. Lecture course on the principle stylistic manifestations of European architecture, painting, and sculpture from the late Middle Ages to 1750. PREREQ: ART 204, ART 205, ART 206.

ART 362. HISTORY OF ART (3). Lecture course on the principle stylistic manifestations of European architecture, painting, and sculpture from the late Middle Ages to 1750. Northern Renaissance art. PREREQ: ART 204, ART 205, ART 206. Need not be taken in order. Courses offered every other year.

ART 363. HISTORY OF ART (3). Baroque art. Lecture course on the principle stylistic manifestations of European architecture, painting, and sculpture from the late Middle Ages to 1750. PREREQ: ART 204, ART 205, ART 206.

ART 364. HISTORY OF ART (3). Late eighteenth-century neoclassicism and the nineteenth century. Lecture course covering the principle movements and trends in architecture, painting, and sculpture in Europe and America since 1750. PREREQ: ART 204, ART 205, ART 206.

ART 365. HISTORY OF ART (3). Twentieth-century art from 1900 to 1945. Lecture course covering the principle movements and trends in architecture, painting, and sculpture in Europe and America since 1750. PREREQ: ART 204, ART 205, ART 206.

ART 366. HISTORY OF ART (3). Art since 1945. Lecture course covering the principle movements and trends in architecture, painting, and sculpture in Europe and America since 1750. PREREQ: ART 204, ART 205, ART 206.

ART 367. HISTORY OF DESIGN (3). A survey of the impact of technology on the visual qualities of graphic, advertising, fashion, architecture, and industrial design from the Victorian Arts and Crafts Movement to the computer age.

ART 371. CREATIVE ART PROJECTS (3). Advanced studio work on approved projects in drawing, painting, sculpture, graphic arts, ceramics, metal design, and fabric design. Upper division standing, one year lower division work in the selected medium, and approval of instructor required. Course offered 3 credits per term, 3 terms. Departmental consent required for 5 credits.

ART 375. PRINTING/RELIEF (3). Studio course in relief printmaking with emphasis on woodcut; may include other relief proceses. PREREQ: Core curriculum.

ART 376. PRINTMAKING/INTAGLIO (3). Studio course in intaglio printmaking. Emphasis on etching, aquatint, and soft ground; may include other intaglio printmaking. PREREQ: Core curriculum.

ART 377. PRINTMAKING/LITHOGRAPHY (3). Studio course in most aspects of stone and metal plate lithography. PREREQ: Core curriculum.

ART 381. PAINTING II (3). Intermediate studio course with emphasis on contemporary directions in painting, including figurative painting, abstraction, and nonobjective work. PREREQ: Core curriculum; ART 281. Course offered 3 credits per term, 3 terms.

ART 384. PAINTING II/WATERCOLOR (3). Intermediate studio course in painting with aqueous materials. Emphasis on media and composition. PREREQ: Core curriculum; ART 284. Course offered 3 credits per term, 3 terms.

ART 391. SCULPTURE II (3). Intermediate studio course with emphasis on developing greater skills and technical knowledge in moldmaking, welding, carving, plaster or metal casting. PREREQ: Core curriculum; ART 291. Course offered 3 credits per term, 3 terms.

ART 401/ART 501. RESEARCH (1-16). PREREQ: Department approval required.

ART 402/ART 502. INDEPENDENT STUDY (1-16). PREREQ: Department approval required.

ART 403/ART 503. THESIS (1-16). PREREQ: Department approval required.

ART 405/ART 505. READING AND CONFERENCE (1-16). PREREQ: Department approval required.

ART 406/ART 506. PROJECTS (1-16). PREREQ: Department approval required. Section 1, Adviser Review; 1 credit.

ART 407/ART 507. SEMINAR (1-16). PREREQ: Department approval required.

ART 408/ART 508. WORKSHOP (1-16). Departmental consent required for 5 credits.

ART 410/ART 510. INTERNSHIP (1-12). A one-quarter residency with an appropriate, approved agency or organization where a student may receive practical experience related to the objectives of the Department of Art. The intern observes and produces; the work is supervised and evaluated, both by the agency and the art faculty. May be repeated for a maximum of 15 credits. PREREQ: Department approval required.

ART 420/ART 520. GRAPHIC DESIGN III (3-5). Advanced problems in exploraton and development of concepts of solving visual communication problems. PREREQ: ART 228, ART 321, ART 323.

ART 421/ART 521. GRAPHIC DESIGN III (3-5). Advanced problems in exploration and development of concepts for solving visual communication problems. PREREQ: ART 228, ART 321, ART 323.

ART 422/ART 522. GRAPHIC DESIGN III (3-5). Advanced problems in exploration and development of concepts for solving visual communication problems. PREREQ: ART 228, ART 321, ART 323.

ART 423/ART 523. GRAPHIC DESIGN/INFORMATION DESIGN (3-5). Advanced problems in the design of systems used for the visual communication of complex information such as instructional materials, maps, charts, and diagrams. PREREQ: ART 228, ART 320, ART 323. Not offered every year.

ART 425/ART 525. GRAPHIC DESIGN/PACKAGING DESIGN (3-5). Advanced problems in the design and application of graphic elements to packaging. PREREQ: ART 228, ART 321, ART 323. Not offered every year.

ART 427/ART 527. GRAPHIC DESIGN/SENIOR PORTFOLIO (3-5). Portfolio development, resume writing, matting of artwork for presentation purposes, letters of reference. PREREQ: 4 hours 400-level graphic design.

ART 429/ART 529. GRAPHIC DESIGN STUDIO (3). Provides experience working with clients on actual projects in a professional environment. PREREQ: ART 222, ART 223, ART 228. May be repeated to a maximum of 18 credits. PREREQ: Department approval required.

ART 431/ART 531. DRAWING IV (3-5). Development of an individual approach to the varied aspects of drawing, emphasis on exploration of traditional and contemporary techniques and styles. PREREQ: 9 credits of ART 331. Course offered 3-5 credits per term; maximum 15 credits.

ART 434/ART 534. DRAWING IV/FIGURE (3-5). Development of an individual approach to the varied aspects of figure drawing; emphasis on exploration of traditional and contemporary techniques and styles. PREREQ: 9 credits of ART 334. Course offered 3-5 credits per term; maximum 15 credits. Departmental consent required for 5 credits.

ART 441/ART 541. PHOTOGRAPHY III (3-5). 2 Using the camera as a tool to sharpen aesthetic and visual perception. PREREQ: ART 341,ART 342,ART 343.

ART 445/ART 545. PHOTO ILLUSTRATION II (3). Advanced projects in studio illustration. PREREQ: ART 346.

ART 446/ART 546. DOCUMENTARY PHOTOGRAPHY (3). An intensive shooting course in 35mm photography designed to develop skill in telling stories using pictures. Single picture and multiple picture stories. PREREQ: 12 credits of photography, portfolio review, and permission. May be repeated for a maximum of 9 credits.

ART 453/ART 553. CERAMIC SCULPTURE III (3-5). Advanced studio course for the development of individual approaches to the varied aspects of sculpture. PREREQ: 9 Credits ART 353. Course offered 3-5 credits per term; maximum 15 credits.

ART 460/ART 560. HISTORY OF AMERICAN ART (3). Specialized study of the visual arts in the United States focusing on such issues as landscape, mass culture, and American responses to European culture. Art and ideas from the colonial period to 1900. PREREQ: 9 credits of art history, American literature, or American history. Not offered every year.

ART 461/ART 561. HISTORY OF AMERICAN ART (3). Specialized study of the visual arts in the United States focusing on such issues as landscape, mass culture, and American responses to European culture. American modernism since 1900. PREREQ: 9 credits of art history, American literature, or American history. Not offered every year.

ART 462/ART 562. DIRECTIONS AND ISSUES IN CONTEMPORARY ART (3). Specialized study of current trends, developments, and critical issues, including the study of new media such as video and photography, as they manifest themselves in the contemporary art world. PREREQ: 9 credits of art history, or permission of instructor. Not offered every year.

ART 463/ART 563. TOPICS IN RENAISSANCE AND BAROQUE ART (3). Specialized study of selected areas of special interest, including such topics as Michelangelo, Leonardo da Vinci, Bernini, and art in the Medicis Florence. Subject matter may vary year to year. PREREQ: 9 credits of art history, or permission of instructor. Not offered every year.

ART 464/ART 564. TOPICS IN RENAISSANCE AND BAROQUE ART (3). Specialized study of selected areas of special interest, including such topics as Michelangelo, Leonardo da Vinci, Bernini, and art in the Medicis Florence. Subject matter may vary year to year. PREREQ: 9 credits of art history, or permission of instructor. Not offered every year.

ART 465/ART 565. NATIVE AMERICAN ART (3). Courses covering the principle media, styles, and cultural influences in Native American arts from prehistory to the present. Two-dimensional Northwest Coast art. Not offered every year. (NC)

ART 467/ART 567. NATIVE AMERICAN ART (3). Courses covering the principle media, styles, and cultural influences in Native American arts from prehistory to the present. Plains art. Not offered every year. (NC)

ART 469/ART 569. METHODS AND THEORY OF ART HISTORY (3). Seminar designed to improve writing and library skills, develop interdisciplinary approaches, and explore art historical theory from Plato to the present. PREREQ: 9 credits of art history, or permission of instructor.

ART 475/ART 575. PRINTMAKING STUDIO (3-5). Studio workshop in relief, intaglio, lithographic, and silkscreen media on an individual project basis. PREREQ: 9 credits of 300-level printmaking. Course offered 3-5 credits per term; maximum 15 credits.

ART 481/ART 581. PAINTING III (3-5). Development of individual interests and directions in painting. PREREQ: 9 credits of 300-level painting. Course offered 3-5 credits per term; maximum 15 credits.

ART 484/ART 584. PAINTING III/WATERCOLOR (3-5). Development of individual interests and directions in watercolor. PREREQ: 3 credits of ART 384. course offered 3-5 credits per term; maximum 15 credits.

ART 491/ART 591. SCULPTURE III (3-5). Development of individual interests and directions in sculpture. PREREQ: 9 credits of 300-level sculpture. Course offered 3-5 credits per term; maximum 15 credits.

ART 495/ART 595. EXHIBITION DESIGN (2). Participatory experience in art gallery exhibition design. Working in Fairbanks and Guistina Galleries, specialized study of visual organization and technical methods of placement in the gallery environment. Includes visual design, lighting, and technical installation. Course offered 2 credits per term, maximum 6 credits.

ECONOMICS

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Ballard Extension 303
Oregon State University
Corvallis, OR 97331-3612
(503) 737-2321

Faculty
Professors Farrell, McMullen, V. Tremblay, Vars; *Associate Professors* Chao, Fraundorf, Kerkvliet, O'Sullivan; *Assistant Professors* Baek, Connolly, Martins, Ohno, C. Tremblay

Undergraduate Major

Economics (B.A.,B.S.)

Minor

Economics

Graduate Major

Economics (M.A., M.S., Ph.D.)
Graduate Areas of Concentration
Economics of Growth and Change
Industry Studies (Agriculture, Forestry, Marine)
National Resources and Environmental Economics

Economics is a social science that studies how individuals and societies choose to allocate scarce resources among competing ends. There are two major subdivisions of economics: microeconomics and macroeconomics. Microeconomics studies the economic behavior of consumers, producers, and industries and is the basis of many applied fields in economics such as industrial organization, transportation economics, labor economics, resource economics, urban-regional economics, public finance, and international trade. Macroeconomics examines the aggregate economic behavior of such variables as inflation, unemployment, and growth. It applies to such fields as monetary economics, fiscal policy, business cycles, and international finance.

UNDERGRADUATE PROGRAM

The Department of Economics offers an undergraduate program leading to the B.A. or B.S. degree and provides minor programs to complement majors in other disciplines. Economics is an excellent choice for students who seek:

- to enter law school or graduate programs in economics, business, public administration or other social sciences.
- to prepare for careers in business or public management.
- to become wiser consumers and more valuable citizens.

The study of economics provides a framework for logical thought that can be used to address a wide variety of practical problems and situations. It can provide uncommon insights into society itself. Indeed, people holding degrees in economics are increasingly sought for positions of responsibility and authority in government, business, and industry. A major in economics is useful preparation for various careers and for graduate study in many fields, primarily because it does not lead simply to the accumulation of facts but rather develops analytical skills that can be used in many ways.

The department invites undergraduate students to combine a serious study of economics with the study of another discipline, through the CLA Liberal Studies Program, earning concurrent degrees, or enrolling in a minor program to complement studies in their major discipline. The minor requirements are listed below.

Below lists a recommended program of study for an undergraduate degree in economics. Students are strongly encouraged to take calculus and statistics by the end of their sophomore year and intermediate microeconomic theory, intermediate macroeconomic theory, statistics, and econometrics by the end of their junior year.

Freshman Year and Sophomore Year
Calculus (MTH 111 and MTH 241 or MTH 251)
Principles of Economics (EC 201-202)
Economics Electives

Sophomore or Junior Year
Microeconomic Theory (EC 311-312)
Macroeconomic Theory (EC 315-316)
Economics Electives
Statistics (ST 351 or 451)

Junior or Senior Year
Economic Research, WIC Course (EC 328)
Econometrics (EC 325 or 425)
Economics Electives

Students interested in graduate study in economics should take three or more courses in calculus and additional courses in matrix algebra and statistics. Early counsel with an adviser is also recommended.

MAJOR PROGRAM (49)

EC 201, EC 202. Principles of Economics (6)
MTH 241 or 251. Calculus (4)
EC 311, EC 312. Microeconomic Theory (6)
EC 315, EC 316. Macroeconomic Theory (6)
ST 351. Introduction to Statistical Methods (4)
EC 325. Introduction to Econometric Methods (3)
EC 328. Introduction to Economic Research, WIC Course (3)
Additional approved economics courses at the 200-level or above. (17)
Notes: All students must receive a grade of C (2.0) or better in all upper division required courses and must maintain an overall grade point average (GPA) of 2.0 or above in all economics courses. MTH 241 is a prerequisite for EC 311; EC 311 and ST 351 are prerequisites for EC 325.

MINOR PROGRAM (27)

Students minoring in economics must complete a minimum of 27 credits at the 200 level or above with a GPA of at least a 2.00 in these courses. Students wanting a transcript-visible minor must (1) meet with the Economics Department minor adviser and (2) declare the minor on the appropriate form in their major college.

The minor consists of (1) Principles of Economics - EC 201, EC 202 (6 credits), (2) courses that fulfill one of the areas below (6-15 credits) and (3) approved electives (6-15 credits).

ECONOMIC THEORY

Required Courses
EC 311 and EC 312. Microeconomic Theory
EC 315 and EC 316. Macroeconomic Theory
EC 325. Introduction to Econometric Methods

MICROECONOMIC THEORY

Required Courses
EC 311 and EC 312. Microeconomic Theory

Elective Courses (6 credits minimum)
EC 480. Labor Economics
EC 460. Industrial Organization
EC 465. Transportation Economics
EC 440. International Trade
EC 495. Health Economics

MACROECONOMIC THEORY

Required Courses
EC 315 and EC 316. Macroeconomic Theory

Elective Courses (6 credits minimum)
EC 330 and EC 331. Money and Banking Theory
EC 441. International Finance

GENERAL

A minimum of two courses from one of the following subspecialty areas:

International Economics
EC 340. International Economics
EC 440 and EC 441. International Trade and Finance
EC 455 and EC 456. Economic Development
EC 457. Survey of Latin America

Labor Economics
EC 480. Economics of Labor Unions
EC 481. Labor Economics
EC 482. Labor Legislation

Urban and Regional Economics
EC 490. Regional Economics
EC 491. Urban Economics

Economic History, Philosophy, and Institutions
EC 319. Economic History
EC 318. Unorthodox Economics
EC 418. History of Economic Thought
EC 420 and EC 421. Comparative Economic Systems
EC 422. Soviet Economics

Pre-Law
EC 311 and 312. Microeconomic Theory
EC 482. Labor Legislation
EC 435. The Public Economy
EC 460. Industrial Organization
EC 465. Transportation Economics

GRADUATE PROGRAM

The Department of Economics offers the M.A., M.S., and Ph.D. degrees, as well as courses applicable toward graduate degrees in forest resources and agricultural and resource economics. The department also participates in the graduate program in Interdisciplinary Studies (M.A.I.S.). The graduate program in economics emphasizes a strong foundation in economic theory and econometrics. An additional area of specialization is the economics of growth and change, an area of study that gives students the opportunity to study international economics, industrial organization and technological change, human capital, urban-regional economics, and resource economics.

Admission Requirements
For admission, an applicant must have at least a "B" average in the last two years of undergraduate study. Graduate Record Examination (verbal, quantitative, and analytical) results must be submitted. The undergraduate major need not be economics, but an appropriate background in economic theory, calculus, linear algebra, and statistics is recommended. Provisional admission is granted in special circumstances, for example, to applicants with a limited economics or mathematics background.

Master's Degree
The master's degree requirement includes courses in economic theory (EC 511, EC 512, EC 513, EC 515, EC 516) and econometrics (EC 525, EC 526), a specialty field of study in economics, and additional elective courses in order to meet the 45 graduate credit requirement. Students must maintain a minimum grade point (GPA) average of 3.00 in all graduate work and in all graduate credits in economics. Well-prepared students should be able to complete the master's program within two years.

Doctor of Philosophy Degree
The Ph.D. degree in economics has four main requirements.

1. Satisfactorily complete the graduate core courses in economic theory (EC 511, EC 512, EC 513, EC 611, EC 612, EC 613, EC 515, EC 516, EC 615) and in econometrics (EC 525, EC 526, EC 607, EC 625, EC 626) and pass comprehensive examinations on this core material.

2. Satisfactorily complete at least one major field of study in economics and pass a comprehensive field examination.

3. Submit and orally defend an acceptable dissertation proposal.

4. Complete 108 (approved) graduate credits and an acceptable dissertation.

Students must maintain a minimum GPA of 3.00 in all graduate work and in all graduate credits in economics. Once all core and field examinations have been passed, the student is guided by his or her dissertation committee. A student with the recommended background can complete the doctoral program in four years, but many students take five years.

A more detailed description of the economics graduate degree requirements in the department's pamphlet, *Graduate Study in Economics,* which may be obtained from the department office.

Financial Assistance and Application Information
A number of graduate teaching assistantships are awarded each year to incoming and continuing graduate students. Applications for assistantships should be completed by March 1. For additional information, please contact:

The Director of Graduate Studies
Department of Economics
Ballard Extension Hall 303
Oregon State University
Corvallis, Oregon 97331-3612

COURSES

Lower Division

EC 201. *INTRODUCTION TO MICROECONOMICS (3). Introduction to microeconomic principles including the study of price theory, economic scarcity, consumer behavior, production costs, theory of the firm, market structure, and income distribution. Other selected topics may include market failure, international economics, and public finance. PREREQ: MTH 111 or equivalent. (Bacc Core Course)

EC 202. *INTRODUCTION TO MACROECONOMICS (3). Introduction to macroeconomic principles indluding the study of the theories of output determination, consumption, investment, inflation, unemployment, and fiscal and monetary policy. Other topics may include the study of the international balance of payments, growth and development, and urban and regional problems. PREREQ: MTH 111 or equivalent. (Bacc Core Course)

EC 203. APPLICATION TO ECONOMIC ISSUES (3). Applications of economic principles to selected U.S. and world economic problems such as growth, instability, poverty, pollution, trade imbalance. PREREQ: EC 201, EC 202.

Upper Division

EC 311. INTERMEDIATE MICROECONOMIC THEORY (3). An examination of the theories of consumer behavior and demand, production, cost, the firm, supply, and competitive and monopoly market structures. PREREQ: EC 201, EC 202, and MTH 241 or MTH 251. CROSSLISTED AS AREC 311.

EC 312. INTERMEDIATE MICROECONOMIC THEORY II (3). An examination of the theories of imperfect competition, input markets, general equilibrium, and welfare economics. PREREQ: EC 311. CROSSLISTED AS AREC 312.

EC 315. INTERMEDIATE MACROECONOMIC THEORY (3). An examination of macroeconomic aggregates, income determination, aggregate demand and supply. Basic macroeconomic models will be discussed such as Keynesian, Classical, Monetarist, and New Classical. PREREQ: EC 201, EC 202.

EC 316. INTERMEDIATE MACROECONOMIC THEORY II (3). An examination of individual sectors of the macro economy, including theories of consumption, investment, money demand and money supply; introduction to economic growth, open economy macroeconomics, and monetary and fiscal policy issues. PREREQ: EC 315.

EC 318. UNORTHODOX ECONOMICS (3). Critical survey of contemporary reformist and radical economics; scope and method, applied topics. PREREQ: EC 201, EC 202.

EC 319. *ECONOMIC HISTORY AND DEVELOPMENT OF THE UNITED STATES (3). Traces U. S. economic development from European origins to present with particular emphasis on relationships between economics, technological, and institutional factors and on developing understanding of contemporary economic issues. (Bacc Core Course)

EC 325. INTRODUCTION TO ECONOMETRIC METHODS (3). Introduction to the application of statistics to economics. Elementary sampling theory, statistical inference, and simple and multiple regression analysis. Economic applications and data analysis are emphasized. PREREQ: ST 351, EC 311.

EC 328. INTRODUCTION TO ECONOMIC RESEARCH (3). Basic methods of economic research such as concepts and models; data sources, collection, and presentation; hypothesis formulation and testing; policy analysis. Written assignments apply methods. PREREQ: EC 201, EC 202. Intermediate economic theory is recommended. (Writing Intensive Course)

EC 329. INTRODUCTION TO MATHEMATICAL ECONOMICS (3). Mathematical methods of economic analysis. Theory of economic structure and optimization developed through calculus and linear algebra, dynamic systems analyzed through integral calculus and difference and differential equations. The mathematical tools are developed in conjunction with their application to economic problems. Some acquaintance with calculus recommended. PREREQ: EC 201, EC 202, and MTH 241 or MTH 251.

EC 330. MONEY AND BANKING I (3). Nature and functions of money; functions and operations of depository institutions; the money market; central banking and monetary policy. PREREQ: EC 201, EC 202.

EC 331. MONEY AND BANKING II (3). Nature and functions of money; functions and operations of depository institutions; the money market; central banking and monetary policy. PREREQ: EC 330.

EC 340. INTERNATIONAL ECONOMICS (3). An overview of international economics with an emphasis on current events and applications, including classical and modern trade theory and the study of trade and exchange-rate policies. PREREQ: EC 201, EC 202.

EC 352. ENVIRONMENTAL ECONOMICS AND POLICY (3). Analysis of the interrelationships among economic activity, government policies, and the environment; benefits and costs of ecnomic growth; economics of environmental quality and the social costs of pollution. Three to five case studies, selected by the instructor, introduce students to the way economists analyze environmental policies. PREREQ: EC 201. CROSS LISTED as AREC 352.

EC 401. RESEARCH (1-16). PREREQ: Departmental approval

EC 402. INDEPENDENT STUDY (1-16). PREREQ: Departmental approval

EC 403. THESIS (1-16). PREREQ: Departmental approval

EC 405. READING AND CONFERENCE (1-16). PREREQ: Departmental approval

EC 406. PROJECTS (1-16). PREREQ: Departmental approval

EC 407. SEMINAR (1-16). PREREQ: Departmental approval

EC 408. WORKSHOP (1-16). PREREQ: Departmental approval

EC 410. INTERNSHIP (1-16). PREREQ: Departmental approval, EC 518.

EC 418/EC 518. HISTORY OF ECONOMIC THOUGHT (3). Major schools of economic theory and thought in historical context; classical and neo-classical contributions, precursors, and critics. PREREQ: EC 311, EC 315, EC 519.

EC 419/EC 519. U S ECONOMIC HISTORY (3). Economic development of the United States from colonial times to the present. PREREQ: EC 201, 202.

EC 420/EC 520. COMPARATIVE ECONOMICS SYSTEMS: IDEOLOGY, THEORY, AND POLICY (3). Ideologies and economic models of capitalism and socialism. PREREQ: EC 201, EC 202.

EC 421/EC 521. COMPARATIVE ECONOMICS SYSTEMS: CASES AND ISSUES (3). Comparative economic performance and other issues in contemporary socialism and capitalism. PREREQ: EC 201, EC 202.

EC 422/EC 522. SOVIET ECONOMICS (3). Soviet economic history and structure, economic calculation and performance, money and finance, trends and prospects. PREREQ: EC 201, EC 202.

EC 435/EC 535. THE PUBLIC ECONOMY (3). Composition and growth of government spending; theory of public expenditure; analysis of public expenditure programs; benefit-cost analysis; theory and practice of taxation; analysis of local, state, and federal taxes; government borrowing and fees; current issues in tax and expenditure policy. PREREQ: EC 311.

EC 439/EC 539. PUBLIC POLICY ANALYSIS (3). Theory of public problems and decision making. Evaluation of public policy strategies, selected public programs and individual pulic projects considering the full range of efficiency and equity effects. Direct and indirect impacts of policy, strength of implicit incentives, administrative feasibility, and problems of policy implementation. PREREQ: EC 435, EC 311, or equivalent.

EC 440/EC 540. INTERNATIONAL TRADE THEORY AND POLICY (3). Classical and neo-classical theories of trade; commercial policies including tariffs, quotas, and other trade barriers. PREREQ: EC 311.

EC 441/EC 541. INTERNATIONAL FINANCE THEORY AND POLICY (3). Theories and policies of exchange rate regimes; fixed, floating and managed floats; internal and external trade and capital balances; international capital flows and institutions. PREREQ: EC 315.

EC 455/EC 555. ECONOMIC DEVELOPMENT I (3). History, theories and policies for economic development in the Third World of underdeveloped countries. PREREQ: EC 201, EC 202.

EC 456/EC 556. ECONOMIC DEVELOPMENT II (3). History, theories, and policies for economic development in the Third World of underdeveloped countries. PREREQ: EC 455/EC 555.

EC 457/EC 557. ECONOMIC SURVEY OF LATIN AMERICA (3). Evolution of economic systems in Latin America, contemporary organizational forms, institutional economic relations. PREREQ: EC 201, EC 202.

EC 460/EC 560. INDUSTRIAL ORGANIZATION THEORY AND POLICY (3). The study of the causes and effects of firm and market structures, conduct, and performance; U. S. antitrust and other laws regulating business behavior. PREREQ: EC 311.

EC 465/EC 565. TRANSPORTATION ECONOMICS (3). Demand, supply, and pricing for transport facilities, (airports, ports) right of way (highways, waterways), including optimal user fees, congestion tolls, and second best pricing schemes. Theories of economic regulation and evaluation of experience in the transport sector. PREREQ: EC 311.

EC 477. ECONOMICS, POLITICS, AND GOVERNMENT (3). Why and how governments tax, spend, subsidize, regulate, and deregulate; applications of economic and public choice theory. PREREQ: EC 201, EC 202. CROSSLISTED as AREC 477, PS 477.

EC 480/EC 580. LABOR ECONOMICS (3). Individual and business choices as determinants of wages and working conditions; human capital theory and the education and training of workers; discrimination and other sources of wage differentials; unemployment and public policy toward labor markets. PREREQ: EC 311.

EC 481/EC 581. ECONOMICS OF LABOR UNIONS (3). Economic analysis of the formation, growth, and operation of unions in the U. S.; theory and practice of collective bargaining; effects of unions on the U. S. economy. PREREQ: EC 201, EC 202.

EC 482/EC 582. LABOR LEGISLATION (3). History, content, and effects of laws affecting union and/or non-union labor markets; nature and impact of important court decisions; procedures and standards of court system, Department of Labor, NLRB, EEOC, and OSHA. PREREQ: EC 201, EC 202.

EC 490/EC 590. REGIONAL ECONOMICS (3). Analysis of regional economies—survey of macro models including economic base, input-output and econometric; location theory; and economic development policy. PREREQ: EC 201, EC 202.

EC 491/EC 591. URBAN ECONOMICS (3). The urban economy—historical developments; size and spatial distribution of urban places; externalities and public goods; public sector organization; public finance; and contemporary urban issues. PREREQ: EC 311.

EC 495/EC 595. HEALTH ECONOMICS (3). Economic foundations of health and medical care providers; efficiency in health delivery systems; methods of financing health care; health insurance; economic evaluation of government policies, regulations, and health services. PREREQ: EC 201, EC 202.

Graduate

EC 501. RESEARCH (1-16). PREREQ: Departmental approval

EC 502. INDEPENDENT STUDY (1-16). PREREQ: Departmental approval

EC 503. THESIS (1-16). PREREQ: Departmental approval

EC 505. READING AND CONFERENCE (1-16). PREREQ: Departmental approval

EC 506. PROJECTS (1-16). PREREQ: Departmental approval

EC 507. SEMINAR (1-16). PREREQ: Departmental approval

EC 511. OPTIMIZATION IN ECONOMICS (3). Matrix algebra; application of derivatives, differentials, and the implicit function theorem to comparative statics; unconstrained optimization of functions with single and multiple variables; constrained optimizationl. PREREQ: EC 312, MTH 251. CROSSLISTED AS AREC 511.

EC 512. MICROECONOMIC THEORY I (3). Economic theories of consumer behavior and demand, production, cost, the firm, supply, and competitive and monopoly market structures. PREREQ: EC 511. CROSSLISTED AS AREC 512.

EC 513. MICROECONOMIC THEORY II (3). Economic theories of imperfect competition, input markets, general equilibrium and welfare economics. PREREQ: EC 512. CROSSLISTED AS AREC 513.

EC 515. MACROECONOMIC THEORY I (3). Determination of income, employment, and prices in Classical, Keynesian, Monetarist, and New Classical Macroeconomic models. Theories of consumption, investment, money demand, and money supply. Monetary and fiscal policies and the role of expectations. PREREQ: EC 316 or equivalent.

EC 516. MACROECONOMIC THEORY II (3). Open economy macroeconomics, introduction to growth theory, inflation and unemployment, budget deficits and interest rates, monetary and fiscal policies. PREREQ: EC 515.

EC 525. ECONOMETRIC METHODS (3). The use of multiple regression under generalized assumptions, specification problems, an introduction to simulataneous equation estimation, the classical linear model using matrices. Emphasis on the analysis of data and communication of findings. PREREQ: EC 325 and EC 511 or consent of instructor. CROSSLISTED as AREC 525.

EC 526. APPLIED ECONOMETRICS (3). Model building, hypothesis testing, and appropriate estimation procedures including generalized least squares, seemingly unrelated regressions, simultaneous equations, maximum likelihood, and limited dependent variables. Emphasis on applications and interpretation of results. PREREQ: EC 511 and EC 525. CROSSLISTED AS AREC 526.

EC 550. THE ECONOMICS OF GROWTH AND CHANGE (3). Seminar on the causes and consequences of economic growth and change. Emphasis on the impact that international trade, economic systems, and investments in human capital and new technologies have on regional, national, and world economic growth and change, using evolutionary, institutional, and neo-classical approaches. PREREQ: EC 312 and EC 316.

EC 601. RESEARCH (1-16). PREREQ: Departmental approval

EC 602. INDEPENDENT STUDY (1-16). PREREQ: Departmental approval

EC 603. THESIS (1-16). PREREQ: Departmental approval

EC 605. READING AND CONFERENCE (1-16). PREREQ: Departmental approval

EC 606. PROJECTS (1-16). PREREQ: Departmental approval

EC 607. SEMINAR (1-16). PREREQ: Departmental approval

EC 611. ADVANCED MICROECONOMIC THEORY: PRODUCTION AND CONSUMPTION (3). A rigorous development of the theory of production and consumption behavior, with emphasis on duality. PREREQ: EC 513, MTH 254. CROSSLISTED AS AREC 611.

EC 612. ADVANCED MICROECONOMIC THEORY: OUTPUT AND INPUT MARKETS (3). Competitive, monopoly, and imperfectly competitive input and output market structures; game theory. PREREQ: EC 611. CROSSLISTED AS AREC 612.

EC 613. ADVANCED MICROECONOMIC THEORY: GENERAL EQUILIBRIUM AND WELFARE (3). A rigorous treatment of general equilibrium and welfare theory; risk, uncertainty, and imperfect information; social choice theory. PREREQ: EC 612. CROSSLISTED as AREC 613.

EC 615. ADVANCED MACROECONOMIC THEORY (3). Seminar on advanced macroeconomic issues which include the analysis of open economy macroeconomic models and the application of time series techniques to macroeconomic issues and problems. PREREQ: EC 516.

EC 617. RESEARCH METHODOLOGY (3). Examination of what constitutes reliable knowledge in economics; philosophy of science and economic research; quantitative techniques and empirical investigation. PREREQ: Completion of one academic year of graduate work in economics or a related field. CROSSLISTED AS AREC 617.

EC 625. ADVANCED ECONOMETRICS I (3). Statistical foundations of econometrics; the general linear statistical model with autocorrelation and heteroscedasticity; maximum likelihood estimation; hypothesis testing; multicollinearity; errors in variables; asymptotic distribution theory. PREREQ: EC 526, ST 522. CROSSLISTED AS AREC 625.

EC 626. ADVANCED ECONOMETRICS II (3). Systems of equations; seemingly unrelated regression models; identification and estimation of simultaneous equation models; time series analysis; distributed lag models; forecasting and model evaluation. PREREQ: EC 625. CROSSLISTED AS AREC 626.

EC 640. INTERNATIONAL TRADE AND ECONOMIC GROWTH (3). Issues of international trade in the contemporary world, including protection with perfect and imperfect competition, political economy of protection and mutilateral trade negotiations, international factor movements, economic integration, and international debt. Analysis of endogenous innovation and growth on world trade. PREREQ: EC 513, EC 526, and EC 540.

EC 641. INTERNATIONAL FINANCE AND ECONOMIC GROWTH (3). Theoretical and empirical analysis of international financial markets with emphasis on relationships between government policies and exchange rates; theories, policies and evidences of exchange rate regimes, exchange rate determination, exchange rate volatility, and market efficiency; effects of fiscal and monetary policies on international transactions and economic growth. PREREQ: EC 516, EC 526, AND EC 541.

EC 660. INDUSTRIAL ORGANIZATION AND TECHNOLOGICAL CHANGE (3). Examination of traditional and new theories of industrial organization including causes and consequences of technological change and the study of firm and market organization, behavior, and performance. PREREQ: EC 513, EC 526, AND EC 560.

EC 680. HUMAN CAPITAL AND ECONOMIC GROWTH (3). An examination of the determinants and effects of individual and social investment in education, training, and health. The course then looks at human capital's influence on the rate of economic growth and its role in both hindering and facilitating economic change. PREREQ: EC 513, EC 526, AND EC 580.

ENGLISH

R. Schwartz, Chair
Moreland Hall 238
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(503) 737-3244

Faculty

Professors Ede, Frank, Oriard, Robinson, Schwartz, Weaver; *Associate Professors* Ahearn, Anderson, Campbell, Copek, Daniels, Daugherty, Glenn, Johnson, Kesler, Lewis, Rice, Wess; *Assistant Professors* Barbour, Birnbaum, Collins, Cornell, Gourdine, Havazelet, Helle, Sandor; *Instructors* Lawler, Leeson, Weller

Undergraduate Major

English (B.A.)

Minors

English
Writing

Graduate Major

English (M.A.)

Scientific and Technical Communication (M.A., M.S.)

Language Arts Education (M.A.T.)

The Department of English offers instruction in literature and writing to students in all disciplines who seek the cultural and intellectual values of the humanities and the broadening influence of humanistic studies. In addition, the department provides a program of courses for those interested in the English major or a minor in literature or writing, especially those who plan to teach English in the elementary or secondary schools, who plan to pursue graduate work in English, or both.

Major Program

Undergraduate English majors must satisfy university language requirements for the B.A. degree; complete:

a) two (2) of the following sequences: Survey of English Literature (ENG 204, ENG 205, ENG 206), Survey of American Literature (ENG 253, ENG 254, ENG 255), and Literature of Western Civilization (ENG 207, ENG 208, ENG 209);

b) one course in Shakespeare (ENG 201, ENG 202, ENG 203);

c) two methods courses (ENG 300 and ENG 345);

d) a total of 27 credits in upper-division courses in the department, including at least 9 credits in literature before 1800 and at least 9 credits in literature after 1800.

Minor Programs

The minor in English allows students to concentrate in the area of the liberal arts and develop the reading and writing skills often demanded by employers. Students taking a minor in English choose from among three areas: general English studies, English literature, and American literature. The minor requires 27 credits of course work, of which at least 12 credits must be upper division. Some may be applied toward the University's general education requirements.

The minor in Writing requires a total of 27 credits to be taken as 9 credits from WR 199, WR 214, WR 222, WR 224, WR 241, WR 323, WR 324, WR 327, or WR 341; 9 credits from WR 406, WR 407, WR 411, WR 416, WR 420, WR 424, WR 441, WR 493, WR 495; and 9 credits from upper division literature writing electives.

Graduate Program

The Department offers a Master of Arts degree in English literature, with emphases in English and American literatures, composition and rhetoric, cultural studies, and creative writing. Detailed information on the graduate faculty and program is available from the English Department.

The department offers Master of Science and Master of Arts degrees in Scientific and Technical Communication. (See Scientific and Technical Communication in the College of Liberal Arts section of this catalog.) The department also participates in the Master of Arts in Interdisciplinary Studies (M.A.I.S.) degree program; see Graduate School.

Language Arts Education

The Department of English, in cooperation with the Professional Teacher Education Program, offers a Master of Arts in Teaching leading to Oregon certification in language arts (grades 5-12). The program combines course work in education, field experience, and subject area course work on cultural and critical literacy. For complete program information on course work to be completed, the student should contact the adviser, Professor Anita Helle.

Courses

■ LANGUAGE ARTS EDUCATION

ENED 507. TEACHING SEMINAR (1).

ENED 509. PRACTICUM IN LANGUAGE ARTS (1-3). A structured experience for the in-service teacher to develop materials, techniques, and strategies for action research in the secondary classroom. PREREQ: Admission to M.A.T. program; teaching experience.

ENED 510. PROFESSIONAL INTERNSHIP: ENGLISH (15). Full- and part-time field experience which enables the intern to integrate subject area and pedagogical knowledge, as well as demonstrate specific teaching competencies through presentation of work samples and assessment by OSU supervisors. PREREQ: Admission to M.A.T. Program.

■ LITERATURE

Lower Division

ENG 104, ENG 105, ENG 106. *INTRODUCTION TO LITERATURE (3,3,3). Study of the major genres of literature for greater understanding and enjoyment. ENG 104: Fiction. ENG 105: Drama. ENG 106: Poetry. Need not be taken in order. (Bacc Core Course). (H)

ENG 110. *INTRODUCTION TO FILM STUDIES (3). Introduction to the methods, criticism, and theory of cinema art. Two lectures and separate screenings each week. Film fee will be required. (Bacc Core Course). (H)

ENG 125. *FILM COMEDY (3). Film as comic art form and social document. Two lectures and separate screenings each week. Film fee will be required. (Bacc Core Course). (H)

ENG 199. SPECIAL STUDIES (1-16).

ENG 201, ENG 202, ENG 203. *SHAKESPEARE (3,3,3). The major plays chronologically. Need not be taken in order. (Bacc Core Course). (H)

ENG 204, ENG 205, ENG 206. *SURVEY OF ENGLISH LITERATURE (3,3,3). English literature presented in chronological sequences. ENG 204: Beowulf to Milton. ENG 205: Milton to Coleridge. ENG 206: Byron to the present. Need not be taken in order. (Bacc Core Course). (H)

ENG 207, ENG 208, ENG 209. *LITERATURE OF WESTERN CIVILIZATION (3,3,3). The great plays, poems and fiction of western civilization. ENG 207: The Classic World: Greek, Hebrew, Roman, and Christian to St. Augustine. ENG 208: The Renaissance to the Age of Reason: Dante to Voltaire. ENG 209: The Romantic Revolt: Goethe to the present. Need not be taken in order. (Bacc Core Course). (H)

ENG 210, ENG 211, ENG 212, ENG 213. *LITERATURE OF NONEUROPEAN CIVILIZATION (3,3,3,3). Representative works of poetry, prose, and drama from cultures outside Western Civilization. ENG 210: Literature of Asia. ENG 211: Literature of Africa-works of traditional, colonial, and post-colonial origin. ENG 212: Literature of the Americas (excluding the U.S. and Canada)-works of Hispanic and Afro- Caribbean origin. ENG 213: Literature of the Middle East-representative works of poetry, prose, and drama. Need not be taken in order. Complete sequence not offered every year. (Bacc Core Course). (H)

ENG 215. *CLASSICAL MYTHOLOGY (3). Greek and Roman mythology, its allusions, continuing influences. Not offered every year. (Bacc Core Course). (H)

ENG 245. *THE NEW AMERICAN CINEMA (3). A formalist, ideological, and commercial investigation into contemporary American cinema. Three hours of lecture and separate screenings each week. Film fee required. Not offered every year. (Bacc Core Course).

ENG 253, ENG 254, ENG 255. *SURVEY OF AMERICAN LITERATURE (3,3,3). Readings from American literature presented in chronological sequence, with emphasis on major writers. ENG 253: Colonial to Romantic: Beginning through Emerson, Thoreau, Hawthorne and Melville. ENG 254: Romantic to 1914: Whitman through Dreiser and Wharton. ENG 255: World War I to the present. Need not be taken in order. (Bacc Core Course). (H)

ENG 260. *LITERATURE OF AMERICAN MINORITIES (3). Study of the literature of one or more American minorities: North American Indian, Black, Chicano/ Chicana, Asian, Middle Eastern, Gay and Lesbian. PREREQ: Sophomore standing. May be repeated. Not offered every year. (Bacc Core Course). (H)

ENG 263. GREAT BOOKS (3). Selected great books of the world. Not offered every year. (H)

ENG 265. *FILMS FOR THE FUTURE (3). An interdisciplinary study of film, literary, and philosophical visions of the future. Three hours of lecture and separate screenings each week. Film fee required. Not offered every year. (Bacc Core Course). (H)

ENG 275. *THE BIBLE AS LITERATURE (3). Biblical structure, literary types, ideas, influences. Not offered every year. (Bacc Core Course). (H)

ENG 280. SELECTED TOPICS IN LITERATURE & SOCIETY (3). The study of literature in its social context. Topics change each term. Not offered every year.

ENG 285. SELECTED TOPICS IN FILM STUDIES (3). Thematic approach to film study. Topics change each term. Lectures and separate screenings each week. Film fee will be required. Not offered every year.

Upper Division

Courses numbered 500 and above may be taken for graduate credit.

ENG 300. LIBRARY SKILLS FOR LITERARY STUDY (1). Introduction to library resources for the study of literature. PREREQ: Sophomore standing. Required for English majors.

ENG 317, ENG 318, ENG 319. *THE AMERICAN NOVEL (3,3,3). Chronological survey of the novel in America from the late 18th century to the present. ENG 317: Beginnings to Chopin. ENG 318: Modernist Period: Dreiser to Faulkner. ENG 319: Post-World War II: Mailer to the present. Need not be taken in order. (Bacc Core Course). (H)

ENG 320. AMERICAN DRAMA (3). Selected American plays, concentrating on the twentieth century. Not offered every year. (H)

ENG 345. METHODS AND MATERIALS OF LITERARY CRITICISM (3). Critical analysis and evaluation of literary texts, based on the principles of literary judgment. PREREQ: Junior standing. Required for English majors. (H)

ENG 360. *NATIVE AMERICAN LITERATURE (3). An introduction to the prose and poetry written by Native Americans of the North American continent. (Bacc Core Course) (H) (NC)

ENG 362. *WOMEN'S VOICES IN AMERICAN LITERERATURE (3). Study of the relation between women's literature and American culture: home, family, regionalism, progress and reform, personal experience. (Bacc Core Course). (H)

ENG 374. *MODERN SHORT STORY (3). Survey of the short story from the nineteenth century to the present. (Bacc Core Course). (H)

ENG 401/ENG 501. RESEARCH (1-16). PREREQ: Department approval required.

ENG 402/ENG 502. INDEPENDENT STUDY (1-16). PREREQ: Department approval required.

ENG 403/ENG 503. THESIS (1-16). PREREQ: Department approval required.

ENG 405/ENG 505. READING AND CONFERENCE (1-16). PREREQ: Department approval required.

ENG 406/ENG 506. PROJECTS (1-16). PREREQ: Department approval required.

ENG 407/ENG 507. ^SEMINAR (1-16). (Writing Intensive Course.)

ENG 410. INTERNSHIP IN ENGLISH (1-16). Provides upper-division English majors with supervised, on-the-job work experience, accompanying academic readings. PREREQ: Junior standing in English; 12 credits of literature; 6 credits of writing beyond WR 121.Department approval required. Graded P/N

ENG 411/ENG 511, ENG 412/512, ENG 413/513. DEVELOPMENT OF THE DRAMA (3,3,3). Reading and analyzing plays. ENG 411: Classical (Greek and Roman). ENG 412: Renaissance and Neoclassical. ENG 413: Romantic and Modern. PREREQ: Sophomore standing; 9 credits of literature. Need not be taken in order. (H)

ENG 414/ENG 514. *CRITICISM, CULTURE, AND WORLD COMMUNITY (3). Reading and analysis of international critical theory and methods, with emphasis on postmodern literary and popular culture and its effects on communities. (Bacc Core Course)

ENG 415/ENG 515. *INDUSTRIALISM AND THE ENGLISH NOVEL (3). Studies in the development of the English novel within a context of changes in society brought on by first the industrial revolution and later the technological revolution. (Bacc Core Course)

ENG 416/ENG 516. *POWER AND REPRESENTATION (3). Critical analysis of works by colonized peoples, women, and ethnic minorities, with a focus on the issue of representation. (Bacc Core Course)

ENG 417/ENG 517, ENG 418/ENG 518, ENG 419/ ENG 519. THE ENGLISH NOVEL (3,3,3). Selected English novels from Defoe to present. ENG 417: Defoe through Scott. ENG 418: The Victorian novel. ENG 419: Twentieth Century. PREREQ: Sophomore standing; 6 credits in English at level 200 or above. Complete sequence not offered every year. Need not be taken in order. (H)

ENG 424/ENG 524. EARLY ROMANTIC LITERATURE (3). Romantic-period writings, with emphasis on Blake, Coleridge, and Wordsworth. (H)

ENG 425/ENG 525. MEDIEVAL ENGLISH LITERATURE (3). Chiefly the study of late 14th century poetry in Middle English. Usually the focus is on the Gawain poet and on Chaucer's early works, but earlier or later medieval writers (such as Boethius, the Beowulf poet, or Malory) may be included.

ENG 426/ENG 526. THE AGE OF CHAUCER (3). Study of Chaucer's major works, especially of the Canterbury Tales, in their historical, cultural, and poetic context. (H)

ENG 428/ENG 528. LITERATURE OF THE EARLY RENAISSANCE (3). Literature of the 16th century from early writers of poetry, prose and drama such as Skelton, More, Wyatt, and Surrey. (H)

ENG 429/ENG 529. LITERATURE OF THE ELIZABETHAN AGE (3). Literature of the late 16th and early 17th centuries from writers such as Sidney, Marlowe, and Spenser (excluding Shakespeare). (H)

ENG 430/ENG 530. METAPHYSICAL AND CAVALIER POETS (3). Major poetry of Donne and Jonson, and such followers as Herbert, Marvell, Herrick, and Lovelace. (H)

ENG 431/ENG 531. ^JOHN MILTON (3). Major poetry of John Milton, with special attention to Paradise Lost. Not offered every year. (H) (Writing Intensive Course)

ENG 432/ENG 532. RESTORATION AND AUGUSTAN LITERATURE (3). Selected writings of Dryden, Pope, Swift, and their contemporaries. Not offered every year. (H)

ENG 433/ENG 533. THE AGE OF JOHNSON (3). Selected writings of Samuel Johnson and his contemporaries. Not offered every year. (H)

ENG 434/ENG 534. LATER ROMANTIC LITERATURE (3). Romantic-period writing, with emphasis on Keats, Byron, and Shelley. Not offered every year. (H)

ENG 436/ENG 536. THE AGE OF DICKENS (3). Fiction, poetry, and nonfiction prose of such writers as Dickens, Bronte, Carlyle, and Tennyson. Not offered every year. (H)

ENG 437/ENG 537. THE AGE OF REALISM AND SYMBOLISM (3). Writings of such authors as G. Eliot, Hardy, Swinburne, and Wilde. Not offered every year. (H)

ENG 438/ENG 538. THE MODERNIST MOVEMENT IN LITERATURE (3). English, Irish, and American literature from the turn of the century to World War I, including Conrad, James, Joyce, and Yeats. Not offered every year. (H)

ENG 439/ENG 539. THE "WASTE LAND" AND AFTER (3). English and American writers from World War I to the present, including Waugh, Hemingway, T.S. Eliot, Lawrence, and Fitzgerald. Not offered every year. (H)

ENG 440/ENG 540, ENG 442/542. LITERATURE OF THE IRISH RENAISSANCE (3). ENG 440: James Joyce. ENG 442: Yeats. Need not be taken in order. Not offered every year. (H)

ENG 454/ENG 554. MAJOR AUTHORS (3). Advanced study of major English and/or American authors. Subjects change from term to term; see Schedule of Classes. May be repeated for a maximum of 9 credits. Not offered every year. (H)

ENG 455/ENG 555, ENG 456/ENG 556, ENG 457/ ENG 557. ^CONTINENTAL EUROPEAN LITERATURE (3,3,3). Major continental European works in translation, chiefly French, German, and Russian. ENG 455: 1789-1914. ENG 456: 1914-1939. ENG 457: 1940 to the present. Need not be taken in order. Not offered every year.(Writing Intensive Course) (H)

ENG 488/ENG 588. LITERATURE FOR TEACHERS (3). A review of approaches to literature; for students who plan to teach English. Critical reading and analysis of literature appropriate for secondary schools.

ENG 490/ENG 590. DEVELOPMENT OF THE ENGLISH LANGUAGE (3). A historical study of the English language from Anglo-Saxon times to the present. (H)

ENG 491/ENG 591. THE STRUCTURE OF ENGLISH (3). New analytic and descriptive methods applied to English grammar. PREREQ: Senior standing. (H)

ENG 495/ENG 595. LANGUAGE, TECHNOLOGY, AND CULTURE (3). Explores relationship between literacy, technology, and thought.

ENG 498/ENG 598. WOMEN AND LITERATURE (3). Study of the relations between women and literature, including such issues as images of women in literature, women writers, and the effects of gender on language. (Bacc Core Course). (H)

■ STUDIES COURSES

Upper Division Courses

ENG 435/ENG 535. STUDIES IN SHAKESPEARE (3). Shakespeare's works from a variety of critical and scholarly perspectives. May be repeated for a maximum of 9 credits. PREREQ: At least one quarter of Shakespeare. Not offered every term.

ENG 445/ENG 545. ^STUDIES IN NONFICTION (3). Particular essayists and journalists, movements, problems, conventions, and types of nonfiction writing in English. Topics change from term to term: see Schedule of Classes. May be repeated for a maximum of 9 credits. Not offered every year. (Writing Intensive Course)

ENG 450/ENG 550. STUDIES IN SHORT FICTION (3). Particular writers, movements, and types of short fiction. Topics change from term to term: see Schedule of Classes. May be repeated for a maximum of 9 credits. Not offered every year. 4

ENG 452/ENG 552. ^STUDIES IN FILM (3). Particular cinematographers, movements, types, conventions, or problems in film. Topics change from term to term; see Schedule of Classes. Lectures and separate screenings each week. A film fee will be required. May be repeated for a maximum of 9 credits. Not offered every year. (Writing Intensive Course)

ENG 460/ENG 560. STUDIES IN DRAMA (3). Particular dramatists, movements, conventions, and types of world drama. Topics change from term to term; see Schedule of Classes. May be repeated for a maximum of 9 credits. Not offered every term.

ENG 465/ENG 565. STUDIES IN THE NOVEL (3). Particular novelists, movements, conventions, and types of the novel throughout its history. Topics change from term to term; see Schedule of Classes. May be repeated for a maximum of 9 credits. Not offered every term.

ENG 470/ENG 570. ^STUDIES IN POETRY (3). Particular poets, movements, problems, conventions, and types of poetry in English or English translation. Topics change from term to term; see Schedule of Classes. May be repeated for a maximum of 9 credits. Not offered every term. (Writing Intensive Course)

ENG 475/ENG 575. STUDIES IN CRITICISM (3). Particular critics, critical movements, issues, and histories of criticism. Topics change from term to term; see Schedule of Classes. May be repeated for a maximum of 9 credits. Not offered every year.

ENG 480/ENG 580. ^STUDIES IN LITERATURE, CULTURE & SOCIETY (3). Study of literature in its relationship to society and culture; study of literary culture. Topics change from term to term; see Schedule of Classes. May be repeated for a maximum of 9 credits. Not offered every term. (Writing Intensive Course)

ENG 485/ENG 585. STUDIES IN AMERICAN LITERATURE (3). Special topics in American literary history. Organized around movements, regions, themes, or major authors. Topics change from term to term; see Schedule of Classes. May be repeated for a maximum of 9 credits. Not offered every term.

ENG 486/ENG 586. STUDIES IN BRITISH LITERATURE (3). Particular British writers, movements, conventions, genres, and problems. Topics change from term to term; see Schedule of Classes. May be repeated for a maximum of 9 credits. Not offered every year.

■ WRITING

Lower Division

WR 112/WR 113. STANDARD WRITTEN ENGLISH (3,3). Vocabulary building, reading, writing, speaking, and comprehension of spoken discourse, adapted to needs of individual. Need not be taken in order. For further information contact the English Department, the English Language Institute, or the Educational Opportunities Program. Does not satisfy WR 121 or Humanities requirements.

WR 115. INTRODUCTION TO EXPOSITORY WRITING (3). Introduction to rhetorical concepts and writing strategies necessary for university level written composition. Includes substantial discussion of grammar, punctuation, and usage conventions of Standard Written English. Does not satisfy WR 121 requirement. May be repeated for credit for a maximum of 6 credits.

WR 121. *ENGLISH COMPOSITION (3). Introduction to critical thinking, the writing process, and the forms of expository writing. Intensive writing practice, with an emphasis on revision. The term in which the student takes the course is determined alphabetically; see Schedule of Classes. PREREQ: Students scoring below 36 on the Test of Standard Written English are strongly advised to take WR 115 before enrolling in WR 121. Consult English Department for further information. Required of all students. (Bacc Core Course)

WR 199. SPECIAL STUDIES (1-16).

WR 214. *WRITING IN BUSINESS (3). Continued practice in writing with an emphasis on the rhetorical and critical thinking demands of writers in business and industry. PREREQ: WR 121. (Bacc Core Course)

WR 222. *ENGLISH COMPOSITION (3). Continued practice in expository writing with an emphasis on argumentation and research. PREREQ: WR 121. (Bacc Core Course)

WR 224. *INTRODUCTION TO FICTION WRITING (3). Discussion workshop. Student work examined in context of contemporary published work. PREREQ: WR 121. (Bacc Core Course) (FA)

WR 230. EFFECTIVE WRITING (3). Systematic review of traditional grammar, usage, and punctuation. PREREQ: WR 121.

WR 241. *INTRODUCTION TO POETRY WRITING (3). Discussion workshop. Rudiments of mechanics and some background in development of modern poetry. PREREQ: WR 121. (Bacc Core Course) (FA)

Upper Division

Courses numbered 500 and above may be taken for graduate credit.

WR 323. *ENGLISH COMPOSITION (3). Continued practice in writing with an emphasis on the elements of style: diction, tone, precision and economy, emphasis, figurative language. PREREQ: WR 121. (Bacc Core Course)

WR 324. *SHORT STORY WRITING (3). Study and writing of the short story. PREREQ: WR 224 or consent. May be repeated to form a 9-credit sequence. (Bacc Core Course) (FA)

WR 327. *TECHNICAL WRITING (3). Continued practice in writing with an emphasis on the rhetorical and critical thinking demands of writers in scientific and technological fields. PREREQ: WR 121. (Bacc Core Course)

WR 330. UNDERSTANDING GRAMMAR (3). Advanced study of traditional grammatical forms and conventional grammatical terms, with emphasis on the assumptions underlying the structure of traditional grammar. PREREQ: WR 121.

WR 341. *POETRY WRITING (3). Study and writing of verse. PREREQ: WR 241 or consent. (Bacc Core Course)

WR 401/WR 501. RESEARCH (1-16). PREREQ: Departmental approval.

WR 402/WR 502. INDEPENDENT STUDY (1-16). PREREQ: Departmental approval.

WR 403/WR 503. THESIS (TBA) (1-16). PREREQ: Departmental approval.

WR 404/WR 504. WRITING AND CONFERENCE (1-16). PREREQ: Departmental approval.

WR 405/WR 505. READING AND CONFERENCE (1-16). PREREQ: Departmental approval.

WR 406/WR 506. PROJECTS (1-16). PREREQ: Departmental approval.

WR 407/WR 507. SEMINAR (TBA) (1-16). PREREQ: Departmental approval.

WR 408/WR 508. WORKSHOP (1-16). PREREQ: Departmental approval.

WR 411/WR 511. ^WRITING FOR TEACHERS (3). Advanced composition in the context of current rhetoric and composition theory. For students expecting to teach English. PREREQ: Upper-division standing. (Writing Intensive Course)

WR 414/WR 414. ADVERTISING AND PUBLIC RELATIONS WRITING (3). Writing news releases, annual reports, brochures, newsletters, and other PR materials. Writing advertising copy. PREREQ: WR 214, upper division standing.

WR 416/WR 516. ADVANCED COMPOSITION (3). The development of style and voice in both the personal and the academic essay. PREREQ: upper-division standing. May be repeated to form a 9-credit sequence.

WR 420/WR 520. STUDIES IN WRITING (3). Selected topics in rhetoric and composition. PREREQ: upper-division standing. May be repeated to form a 9-credit sequence.

WR 424/WR 524. ADVANCED FICTION WRITING (3). Advanced fiction workshop with an emphasis on developing longer pieces. PREREQ: Six credits WR 324 or consent. May be repeated to form a 9-credit sequence.

WR 441/WR 541. ADVANCED POETRY WRITING (3). Advanced poetry workshop. PREREQ: WR 341 or consent. May be repeated to form a 9-credit sequence. (FA)

WR 448/WR 548. MAGAZINE ARTICLE WRITING (3). Writing the magazine article. Analyzing markets and writing query and cover letters, marketing manuscripts to magazines. Interviewing and researching. PREREQ: Upper- division standing.

WR 449/WR 549. CRITICAL REVIEWING (3). Writing critical reviews of books, television programs, movies, plays, and restaurants for newspapers and magazines. The role of criticism in popular culture. PREREQ: Upper- division standing.

WR 462/WR 562. SCIENCE WRITING (3). Reporting and writing about science and technology. Interviewing scientists and interpreting scientific information. PREREQ: Upper division standing. May be repeated to form a 9-credit sequence. CROSSLISTED as STC 562.

WR 493/WR 593. ^THE RHETORICAL TRADITION AND THE TEACHING OF WRITING (3). Major past and contemporary theories of written communication, their historical context, and their impact on writing and the teaching of writing. PREREQ: upper-division standing. (Writing Intensive Course)

WR 495/WR 595. ^LITERATURE, COMPOSITION, AND LITERACY (3). Historical, theoretical, and practical relationships between literature and composition; literacy as an idea, problem, issue. PREREQ: upper-division standing. (Writing Intensive Course)

WR 512. CURRENT COMPOSITION THEORY (3). Current rhetoric and composition theory and its applications for teachers and writers.

WR 517. TEACHING PRACTICUM: ENGLISH COMPOSITION (1). Required practicum for graduate students teaching English Composition.

WR 518. TEACHING PRACTICUM: WRITING IN BUSINESS (1). Required practicum for graduate students teaching Writing in Business.

WR 519. TEACHING PRACTICUM: TECHNICAL WRITING (1). Required practicum for graduate students teaching Technical Writing.

WR 521. TEACHING PRACTICUM: FICTION WRITING (1). Required practicum for graduate students teaching fiction writing.

FOREIGN LANGUAGES AND LITERATURES

Ray Verzasconi, Chair
Kidder Hall 210
Oregon State University
Corvallis, OR 97331-4603
(503) 737-2146

Faculty
Professors Carroll, Malueg, Verzasconi; *Associate Professors* Dilson, Garcia, Kiekel, King, Krause, Stehr, Wood, Yu; *Assistant Professor* Farber; *Senior Instructors* Hart, McCullough, Nakajima, Samuel

Undergraduate Majors

French (B.A.)
German (B.A.)
Spanish (B.A.)

Minors

Chinese
French
German
Japanese
Russian
Spanish

The Department of Foreign Languages & Literatures offers major programs leading to the B.A. degree in French, German, and Spanish and minor programs in Chinese, French, German, Japanese, Russian, and Spanish for undergraduate students with majors in other disciplines. The major and minor programs provide students with the opportunity to develop basic language skills and to gain an understanding of and an appreciation for the foreign literature and culture.

Proficiency in a foreign language and knowledge of a foreign culture can enhance career possibilities in fields that range from business, library work, and government service to park service, oceanography, agriculture, and forestry. Students often find it possible to combine languages with another major such as banking, tourism, fashion, and professional training to prepare for an exciting, internationally oriented career.

Study of a language other than English can help students to improve communication skills in English, to become more linguistically aware, to develop analytical skills, and to communicate on an equal basis with non-English-speaking people. Through language courses, students can gain a global perspective, more fully understand different cultures and value systems, and enhance their general knowledge of world development.

An undergraduate academic major (French, German, or Spanish) is required as a prerequisite to the Fifth-Year Teacher Education Program designed to prepare future teachers.

The department cooperates with other institutions of the State System of Higher Education and with other Northwest institutions of higher education in administering overseas study centers at Beijing and Fujian, China; Quito, Ecuador; Avignon, Lyon, and Poitiers, France; Baden-Wurttemberg and Cologne, West Germany; Szeged, Hungary; Tokyo, Japan; Seoul, Korea; and Puebla, Mexico. See International Education and Foreign Study Programs.

DEPARTMENTAL REQUIREMENTS

Lower division courses are prerequisite to the major and minor programs. Students with previous training or experience in the language are advised to take the departmental placement examination in Chinese, French, German, Japanese, Russian, or Spanish in order to determine where to start their language study at the University.

To be admitted to a major or minor program in the department, a student must have attained appropriate proficiency (as defined by the language section faculty) and have completed at least 9 credits of upper-division course work in residence at OSU, with a minimum 2.0 GPA in each upper-division language course completed as of the time of application for admission.

Students in a major program must complete a minimum number of upper-division language courses at OSU in Corvallis, including at least 9 credits of upper-division course work in the language during the senior year. Students in either a major or minor program must demonstrate proficiency (as defined by the language section faculty) in the four language skills and culture during the senior year. They must also have earned a minimum GPA of 2.0 in each of the courses being used to satisfy major or minor degree requirements.

Foreign language majors must fulfill the CLA requirement for the B.A. degree by successfully completing the second-year sequence in a second foreign language.

Prior to graduation with a language major, students must participate or have participated in an approved study program or in an approved work experience in a country where the language is spoken, or must fulfill this requirement as the language section faculty prescribes, for example, by spending at least 12 contact hours per semester in conversational practice with an approved conversant.

Further information regarding limitations on credits applied to the major and minor is available from language section advisers.

B.A. DEGREE PROGRAMS

The minimum upper division course requirements in each major are as follows. Additional requirements are available from departmental advisers and the departmental office.

French (45)
FR 311, FR 312, FR 313. Third-Year French (9)
FR 340. Intro to French Literary Studies (3)
FR 331, FR 332, FR 333. French Culture[7] (9)
FR 351. Pronunciation & Phonetics (3)
FR 411. Fourth-Year French[7] (3)
Upper division French electives, to be approved by the major adviser and to include a minimum of 6 credits at the 400 level (18)

German (45)
GER 331, GER 332. German Culture (6)
GER 341, GER 342, GER 343. Survey of German Literature (9)
Upper division electives in German and related fields, to be approved by the major adviser and to include a minimum of 9 credits in German courses at the 400 level (30)

Spanish (45)
SPAN 331, SPAN 332, SPAN 333. The Culture of Spain[8] (9) and/or
SPAN 336, SPAN 337, SPAN 338. Latin American Culture[8] (9)
SPAN 350. Phonetics and Pronunciation (3)
SPAN 351. Hispanic Linguistics[8] (3)
Upper division Spanish electives, to be approved by the major adviser and to include a minimum of 9 credits at the 400 level (30)

MINOR PROGRAMS

Chinese (30)
CHN 211, CHN 212, CHN 213. Second-Year Chinese (12)
CHN 311, CHN 312, CHN 313. Third-Year Chinese (9)
CHN 333. Modern Chinese Culture (3)
Upper division Chinese electives, to be approved by the minor adviser (6)

French (30)
FR 211, FR 212, FR 213. Second-Year French (12)
FR 311, FR 312, FR 313. Third-Year French (9)
FR 333. French Culture (3)
Upper division French electives, to be approved by the minor adviser (6)

German (30)
GER 211, GER 212, GER 213. Second-Year German (12)
Nine credits from GER 311, GER 312, GER 313, GER 317, GER 318 (9)
Nine credits from GER 331, GER 332, GER 341, GER 342, GER 343 (9)

Japanese (30)
JPN 211, JPN 212, JPN 213. Second-Year Japanese (12)
JPN 311, JPN 312, JPN 313. Third-Year Japanese (9)
JPN 333. Modern Japanese Culture (3)
Upper division Japanese electives, to be approved by the minor adviser (6)

Russian (30)
RUS 211, RUS 212, RUS 213. Second-Year Russian (12)
RUS 311, RUS 312, RUS 313. Third-Year Russian (9)
RUS 333. Modern Russian Culture (3)
Upper division Russian electives, to be approved by the minor adviser (6)

Spanish (30)
SPAN 211, SPAN 212, SPAN 213. Second-Year Spanish (12)
SPAN 311. Third-Year Spanish (3)
SPAN 317. Directed Reading in Spanish (3)

SPAN 331, SPAN 332, SPAN 333. The Culture of Spain (6) and/or
SPAN 336, SPAN 337, SPAN 338. Latin American Culture (6)
Upper division Spanish electives, to be approved by the minor adviser (6)

INTERDEPARTMENTAL PROGRAMS

The department participates in the Latin American Affairs and Russian Studies Certificate programs and offers areas of concentration for the Liberal Studies major. See Latin American Affairs, Liberal Studies, and Russian Studies.

The University Learning Center in Kidder Hall provides opportunity for supplemental practice and drill. Collateral video and audio tapes as well as limited computer programs are available both for class use and for individual study.

Courses at the 500-level may be taken as part of a graduate minor in another department or as one of three fields acceptable for the Master of Arts in Interdisciplinary Studies (M.A.I.S.) degree program. See Graduate School.

COURSES

■ CHINESE

Lower Division

CHN 111, CHN 112, CHN 113. FIRST-YEAR CHINESE (4,4,4). Essentials of colloquial Mandarin with emphasis on conversation, reading, and writing. Designed for students with no prior training in Chinese. Native and/or bilingual speakers of Chinese will not receive credit for CHN 111,CHN 112,CHN 113. Must be taken in order. Lec/rec.

CHN 199. SPECIAL STUDIES (1-16). May be repeated for credit when topic varies. See *Schedule of Classes* for current offerings and prerequisites. Not offered every year.

CHN 211/CHN 212, CHN 213. SECOND-YEAR CHINESE (4,4,4). Further development of listening comprehension, speaking, reading, and writing skills. Emphasis on conversational fluency and increased vocabulary. Native and/or bilingual speakers of Chinese will not receive credit for CHN 211,CHN 212,CHN 213. Completion of CHN 213 with grade of C– or better satisfies B.A. requirement in foreign languages. PREREQ: CHN 113 or placement. Must be taken in order. Lec/Rec.

CHN 299. SPECIAL STUDIES (1-16). May be repeated for credit when topic varies. See *Schedule of Classes* for current offerings and prerequisites. Not offered every year.

Upper Division

CHN 311, CHN 312, CHN 313. THIRD-YEAR CHINESE (3,3,3). Study of more complicated grammatical patterns, writing of compositions, extensive practice in speaking, some reading of Chinese materials. PREREQ: CHN 213 or placement, and departmental authorization. Must be taken in order. May not be offered every year. Lec/Rec.

CHN 329. SPECIAL TOPICS IN LANGUAGE, CULTURE, AND/OR LITERATURE (1-16). May be repeated for credit when topic varies. See *Schedule of Classes* for current offerings and prerequisites. Not offered every year. (H)

CHN 331, CHN 332, CHN 333. *CHINESE CULTURE (3,3,3). Introduction to basic features of Chinese culture from ancient times to the present. CHN 331: The Classical and Medieval Periods—17th Century B.C. to 14th Century A.D.; CHN 332: The late Imperial Period—15th Century to early 20th Century; CHN 333: 20th Century.Topics include history, philosophy, religion, literature and the arts, science and technology, political and economic systems, and everyday life. Taught in English. Open to all students. PREREQ: Sophomore standing. Need not be taken in order. May not be offered every year.

CHN 379. PROCTOR EXPERIENCE (1-2). Supervised practicum for advanced students, with assignments as proctor or tutor in lower-division Chinese courses. May be repeated for credit. No credit may be used to satisfy requirements for a minor in Chinese. PREREQ: Completion of third-year Chinese with a minimum 3.0 GPA in that sequence and prior authorization from supervisor. Graded P/N.

CHN 402/CHN 502. INDEPENDENT STUDY (1-16). PREREQ: Department approval required.

CHN 405/CHN 505. READING AND CONFERENCE (1-16). PREREQ: Department approval required.

CHN 411, CHN 412, CHN 413. FOURTH-YEAR CHINESE (3,3,3). This course is designed to enable the student to make the transition from textbook Chinese to reading, writing, and speaking Chinese in the real world. Course work includes reading of modern and contemporary literature, newspaper articles and business Chinese, writing of compositions and conversation. Students will be exposed to both simplified and complex characters. PREREQ: CHN 313 or placement, and departmental authorization. Must be taken in order. Not offered every year.

■ FRENCH

FR 111, FR 112, FR 113. FIRST-YEAR FRENCH (4,4,4). Pronunciation, grammar, reading, writing, listening comprehension, speaking, conversation. Designed specifically for students with no prior training in French. Native and/or bilingual speakers of French will not receive credit for FR 111, FR 112, FR 113. Must be taken in order. Lec/rec.

FR 199. SPECIAL STUDIES (TBA). Translation, pronunciation, reading, vocabulary-building, etc. Supplements basic sequences FR 111, FR 112, FR 113. May be repeated for credit when topic varies.

FR 211, FR 212, FR 213. SECOND-YEAR FRENCH (4,4,4). Continued development of basic language skills, pronunciation, and vocabulary acquisition; introduction to extensive reading. Completion of FR 213 with grade of C- or better satisfies B.A. requirement in foreign languages. PREREQ: FR 113 or placement. Native and/or bilingual speakers of French may not receive credit for FR 211, FR 212, FR 213. Must be taken in order. Lec/rec.

FR 299. SPECIAL STUDIES (1-16). Translation, pronunciation, reading, vocabulary-building, etc. Supplements basic sequence FR 211,FR 212,FR 213. May not be offered every year. May be repeated for credit when topic varies. See *Schedule of Classes* for current offerings and prerequisites.

Upper Division

FR 311, FR 312, FR 313. THIRD-YEAR FRENCH (3,3,3). A language-use course; primary emphasis on developing oral and written proficiency; extensive practice in speaking and writing. Grammar review; vocabulary study; written assignments including original compositions. Conducted in French. PREREQ: FR 213 and departmental authorization. Must be taken in order.

FR 315. FRENCH FOR BUSINESS (3). An introduction to the French business world and business language. Development of business vocabulary; discussion; practice in writing resumes, business letters and business reports. Conducted in French. May not be offered every year. PREREQ: FR 213 or placement.

FR 331, FR 332, FR 333. ^FRENCH CULTURE AND SOCIETY SINCE THE REVOLUTION (3,3,3). Cultural life of the French people from Napoleon to the present. Conducted in French. PREREQ: Completion of 3 credits of 300-level French or placement for FR 331, FR 332; completion of 6 credits of 300-level French or placement for FR 333. Need not be taken in order. (Writing Intensive Course) (H)

FR 339. FRENCH: FRANCOPHONE STUDIES (3). Elective; not offered every year. May be repeated for credit when topic varies.

FR 340. INTRODUCTION TO FRENCH LITERARY STUDIES (3). Concepts and vocabulary fundamental to the study of French literature; general view of the main currents of French literary history; introduction to French versification; techniques of literary analysis; practice in literary analysis and in writing about literature; explication de texte. Conducted in French. Must be completed prior to FR 341,FR 342,FR 343. PREREQ: FR 213 or placement. (H)

FR 341, FR 342, FR 343. FRENCH LITERATURE SINCE THE REVOLUTION (3,3,3). Literary life of the French people from Napoleon to the present. Conducted in French. PREREQ: FR 340. Need not be taken in order. (H)

FR 349. SELECTED TOPICS IN FRANCOPHONE LITERATURE (3). Literary works, themes, movements, or authors from French-speaking areas of the world. Conducted in French. Not offered every year. May be repeated for credit when topic varies. See *Schedule of Classes* for current topics and prerequisites.

FR 351. FRENCH PRONUNCIATION AND PHONETICS (3). Intensive study of French pronunciation and diction. Close phonetic analysis of French sounds, intonation, and tone patterns. In-class drills; language laboratory assignments. PREREQ: FR 213 or placement.

FR 379. PROCTOR EXPERIENCE (1-2). Supervised practicum for advanced students. Assignments as proctors or tutors in lower-division French courses. No more than 2 credits may be used to satisfy degree requirements for a major in French; may not be used to satisfy requirements for a minor in French. PREREQ: Completion of 12 upper-division credits in French, including FR 311,FR 312,FR 313 and FR 351, with a minimum 3.0 GPA and prior authorization from supervisor. Graded P/N.

FR 401/FR 501. RESEARCH (1-16). PREREQ: Department approval required.

FR 402/FR 502. INDEPENDENT STUDY (1-16). PREREQ: Department approval required.

FR 403/FR 503. THESIS (1-16). PREREQ: Department approval required.

FR 405/FR 505. READING AND CONFERENCE (1-16). PREREQ: Department approval required.

FR 407. SEMINAR (1-16). PREREQ: Department approval required.

FR 411/FR 511, FR 412/FR 512, FR 413/FR 513. FOURTH-YEAR FRENCH (3,3,3). A language-use course; primary emphasis on developing oral and written proficiency; extensive practice in speaking and writing. Grammar review; vocabulary study; analysis of writing styles and techniques; oral reports and original presentations in French; original compositions. Conducted in French. PREREQ: FR 313 and departmental authorization.

FR 439/FR 539. FRENCH: FRANCOPHONE STUDIES (3). Variable topics in language, culture, or literature. May be repeated for credit when topic varies. Conducted in French. Not offered every year. See *Schedule of Classes* for current topics and prerequisites.

FR 451/FR 551. FRENCH PRONUNCIATION AND PHONETICS (3). Continued intensive study of French pronunciation and diction, including units on speech levels (poetry, song, and formal presentations) and accents of France and the francophone world. In-class drills; language laboratory assignments. PREREQ: FR 351. May not be offered every year.

■ GERMAN

Lower Division

GER 111, GER 112, GER 113. FIRST-YEAR GERMAN (4,4,4). Development of basic writing, reading, listening, and speaking skills; includes cultural component. Designed solely for students with no prior training in German. Native or bilingual speakers of German will not receive credit for GER 111,GER 112, or GER 113. Must be taken in order.

GER 117, GER 118, GER 119. FIRST-YEAR GERMAN CONVERSATION (2,2,2). Pronunciation drills, practice in listening comprehension and speaking in small groups with tutors. Concurrent enrollment in GER 111,GER 112,GER 113 strongly recommended. May not be taken in place of GER 111,GER 112,GER 113 to fulfill language requirements. For first-year German students only.

GER 199. SPECIAL STUDIES (1-16). May be repeated for credit when topic varies. See *Schedule of Classes* for current offerings and prerequisites. Not offered every year.

GER 211, GER 212, GER 213. SECOND-YEAR GERMAN (4,4,4). Continuing development of writing, reading, listening, and speaking skills; cultural component. Completion of Second-Year German or equivalent with a GPA of 2.50 or higher serves as a prerequisite for upper-division courses. Completion of GER 213 with grade of C- or better satisfies B.A. requirement in foreign languages. Native or bilingual speakers of German will not receive credit for GER 211,GER 212, or GER 213. PREREQ: GER 113 or placement. Must be taken in order.

GER 217, GER 218, GER 219. SECOND-YEAR GERMAN CONVERSATION (2,2,2). Pronunciation drills, practice in listening comprehension and speaking in small groups with tutors. Concurrent enrollment in GER 211,GER 212,GER 213 strongly recommended. May not be taken in place of GER 211,GER 212,GER 213 to fulfill language requirements. For students at second-year level only. PREREQ: One year of college German. Need not be taken in order.

GER 299. SPECIAL STUDIES (1-16). May be repeated for credit when topic varies. See *Schedule of Classes* for current offerings and prerequisites. Not offered every year.

Upper Division

GER 311, GER 312, GER 313. THIRD-YEAR GERMAN (3). Focus on development of German writing, speaking, and listening skills. Conducted in German. Both courses required of German majors and minors. PREREQ: GER 213 and departmental authorization. Must be taken in order.

GER 319. SELECTED TOPICS IN GERMAN LANGUAGE (3,3,3). Focus on development of German language skills and/or history of the language. Conducted in German. May be repeated for credit when topic varies. See *Schedule of Classes* for current offerings and prerequisites. Not offered every year. Lec/rec.

GER 329. SELECTED TOPICS IN LITERATURE AND/OR CULTURE (3). Taught In English. May be repeated for credit when topics vary. See *Schedule of Classes* for current offerings. Cannot be counted for credit toward German major or minor. PREREQ: Sophomore standing. Not offered every year.

GER 331/GER 332. *GERMAN CULTURE (3,3). Aspects of history, politics, art, music, literature, and everyday life in German-speaking countries. Attention to development of German language skills. Conducted in German. PREREQ: GER 213.

GER 339. SELECTED TOPICS IN GERMAN CULTURE (3). Focus on specific aspects of German culture. Attention to development of German language skills. Conducted in German. May be repeated for credit when topics vary. See *Schedule of Classes* for current offerings. PREREQ: Completion of 9 credits from GER 311,GER 312,GER 313,GER 317,GER 318. Not offered every year.

GER 341, GER 342, GER 343. SURVEY OF GERMAN LITERATURE (3,3,3). Major works and literary theories of German literature in their cultural context. Attention to development of German language skills with special emphasis on reading and discussion. Conducted in German. PREREQ: 213 or placement. (H)

GER 349. SELECTED TOPICS IN GERMAN LITERATURE (3). Attention to development of German language skills. Conducted in German. May be repeated for credit when topics vary. See Schedule of Classes for current offerings. PREREQ: GER 213 or placement. Not offered every year.

GER 351. GERMAN PRONUNCIATION AND PHONETICS (3). Analysis of the fundamentals of the German sound system, including pronunciation, phonology, phonetic and contrastive analysis of sounds; phonemes, intonation, and tone patterns. Required of students working toward a teaching certificate in German. PREREQ: GER 213 or placement. Not offered every year.

GER 379. PROCTOR EXPERIENCE (1-2). Supervised practicum for advanced students, with assignments as proctors or tutors in lower-division German language courses. May be repeated for credit. No more than 2 credits may be used to satisfy degree requirements for a major in German; no credit may be used to satisfy requirements for a minor in German. PREREQ: Completion of 12 upper-division hours in German, including GER 311,GER 312,GER 313 with a minimum 3.00 GPA, and prior authorization of supervisor. Graded P/N

GER 401/GER 501. RESEARCH (1-16). PREREQ: Department approval required.

GER 402/GER 502. INDEPENDENT STUDY (1-16). PREREQ: Department approval required.

GER 403/GER 503. THESIS (1-16). PREREQ: Department approval required.

GER 405/GER 505. READING AND CONFERENCE (1-16). PREREQ: Department approval required.

GER 407/GER 507. SEMINAR (1-16). PREREQ: Departmental approval required.

GER 411/GER 511, GER 412/GER 512, GER 413/GER 513. ^FOURTH-YEAR GERMAN (3,3,3). Focus on development of German writing, speaking, and listening skills. Conducted in German. PREREQ: GER 313 and departmental authorization.

GER 419/GER 519. SELECTED TOPICS IN GERMAN LANGUAGE (3). Conducted in German. May be repeated for credit when topic varies. See Schedule of Classes for current offerings. PREREQ: GER 313. Not offered every year.

GER 439/GER 539. SELECTED TOPICS IN GERMAN CULTURE (3). May be repeated for credit when topic varies. Conducted in German. PREREQ: 9 upper-division credits in German.

GER 449/GER 549. SELECTED TOPICS IN GERMAN LITERATURE (3). May be repeated for credit when topic varies. Conducted in German. PREREQ: 9 upper-division credits in German.

■ ITALIAN

Lower Division

IT 111, IT 112, IT 113. FIRST-YEAR ITALIAN (4,4,4). Development of listening comprehension, speaking, reading, and writing skills. Designed for students with no previous training in Italian. Native speakers of Italian will not receive credit for IT 111,IT 112,IT 113. Must be taken in order. Not offered every year.

IT 199. SPECIAL STUDIES (1). May be repeated for credit when topic varies. See *Schedule of Classes* for current offerings and prerequisites. Not offered every year.

IT 211, IT 212, IT 213. SECOND-YEAR ITALIAN (4,4,4). Further development of listening comprehension, speaking, reading, and writing skills. Native speakers of Italian will not receive credit for IT 211,IT 212,IT 213. Completion of IT 213 with a grade of C- or better satisfies B.A. requirement in foreign languages. PREREQ: IT 113 or placement. Must be taken in order. Not offered every year.

IT 299. SPECIAL STUDIES (1-16). May be repeated for credit when topic varies. See *Schedule of Classes* for current offerings and prerequisites. Not offered every year.

IT 405/IT 505. READING AND CONFERENCE (1-16). PREREQ: Department approval required.

■ JAPANESE

Lower Division

JPN 111, JPN 112, JPN 113. FIRST-YEAR JAPANESE (4,4,4). Designed to help students develop an understanding of basic language structures and to acquire the ability to use languages appropriately in a variety of practical, every-day social contexts. Primary focus is on verbal and non-verbal communication skills. Native and/or bilingual speakers of Japanese will not receive credit for JPN 111, JPN 112, JPN 113. Must be taken in order. Lec/rec.

JPN 199. SPECIAL STUDIES (1-16). May be repeated for credit when topic varies. See *Schedule of Classes* for current offerings and prerequisites. Not offered every year.

JPN 211, JPN 212, JPN 213. SECOND-YEAR JAPANESE (4,4,4). Continued development of basic oral communication skills as required in a variety of social contexts. Initial development of reading skills. Native and/or bilingual speakers of Japanese will not receive credit for JPN 211, JPN 212, JPN 213. Completion of JPN 213 with a grade of C- or better satisfies B.A. requirement in foreign languages. PREREQ: JPN 113 or placement. Must be taken in order. Lec/rec.

JPN 299. SPECIAL STUDIES (1-16). May be repeated for credit when topic varies. See *Schedule of Classes* for current offerings and prerequisites. Not offered every year.

Upper Division

JPN 311, JPN 312, JPN 313. THIRD-YEAR JAPANESE (3,3,3). Continued development of oral communication skills as required in a variety of social contexts. Further development of reading skills. PREREQ: JPN 213 or placement and departmental authorization. Lec/rec.

JPN 329. SPECIAL TOPICS IN LANGUAGE, CULTURE (1-16). May be repeated when topics vary. See Schedule of Classes for current offerings and prerequisites. Not offered every year.

JPN 331, JPN 332, JPN 333. JAPANESE CULTURE (3,3,3). JPN 331 and JPN 332: An introductory survey of Japanese history, arts, literature, society, and traditions from the ancient to the mid-19th century. JPN 333: A survey of Japan from the mid-19th century to the present in areas including arts, literature, business, education, society, politics, and foreign relations. Taught in English. PREREQ: sophomore standing. Need not be taken in order. May not be offered every year.

JPN 379. PROCTOR EXPERIENCE (1-2). Supervised practicum for advanced students, with assignment as proctor or tutor in lower-division Japanese courses. May be repeated for credit. No credit may be used to satisfy requirements for a minor in Japanese. PREREQ: Completion of third-year Japanese with a minimum 3.00 GPA in that sequence and prior authorization from supervisor. Graded P/N

JPN 402/JPN 502. INDEPENDENT STUDY (1-16). PREREQ: Department approval required.

JPN 405/JPN 505. READING AND CONFERENCE (1,3,3). PREREQ: Department approval required.

JPN 411, JPN 412, JPN 413. FOURTH-YEAR JAPANESE (3,3,3). Further development of conversational, reading, and writing skills. Readings include excerpts from contemporary essays, short stories, novels, plays, and newspaper articles. PREREQ: JPN 313 or placement, and departmental authorization. Must be taken in order. Not offered every year.

■ LATIN

Lower Division

LAT 299. SPECIAL STUDIES (1-16).

■ RUSSIAN

Lower Division

RUS 111, RUS 112, RUS 113. FIRST-YEAR RUSSIAN (4,4,4). Pronunciation, intonation, grammar, reading, writing, listening comprehension and conversation. Designed for students with no prior training in Russian. Native and/or bilingual speakers of Russian will not receive credit for RUS 111,RUS 112,RUS 113. Must be taken in order.

RUS 199. SPECIAL STUDIES (1-16). May be repeated for credit when topic varies. See *Schedule of Classes* for current offerings and prerequisites. Not offered every year.

RUS 211, RUS 212, RUS 213. SECOND-YEAR RUSSIAN (4,4,4). Further development of listening comprehension, speaking, reading, and writing skills. Native and/or bilingual speakers of Russian will not receive credit for RUS 211,RUS 212,RUS 213. Completion of RUS 213 with a grade of C- or better satisfies B.A. requirement in foreign languages. PREREQ: RUS 113 or placement. Must be taken in order.

RUS 299. SPECIAL STUDIES (1-16). May be repeated for credit when topic varies. See *Schedule of Classes* for current offerings and prerequisites. Not offered every year.

Upper Division

RUS 311, RUS 312, RUS 313. THIRD-YEAR RUSSIAN (3). Extensive practice in writing, reading, and speaking: refinement of grammar and pronunciation. PREREQ: RUS 213 and departmental authorization. Must be taken in order. Not offered every year.

RUS 329. SPECIAL TOPICS IN LANGUAGE, CULTURE AND/OR LITERATURE (1-16). May be repeated when topic varies. See *Schedule of Classes* for current offerings and prerequisites. Not offered every year.

RUS 331, RUS 332, RUS 333. *RUSSIAN CULTURE (3,3,3). Introduction to basic features of Russian culture originating in the past and continuing into the present. Aspects of history, politics, economics, geography, art, music, literature, and everyday life. Compares Russian culture with Western European and American culture. RUS 331: Old Russia; RUS 332: 19th Century; RUS 333: 20th Century. Taught in English. PREREQ: sophomore standing. Need not be taken in order.

RUS 379. PROCTOR EXPERIENCE (1). Supervised practicum for advanced students or native speakers, with assignment as proctor or tutor in lower-division Russian language courses. May be repeated for credit. No credits may be used to satisfy requirements for a minor in Russian or for a Russian Studies certificate. PREREQ: completion of Third-Year Russian with a minimum 3.00 GPA and prior authorization from supervisor. Graded P/N

RUS 402/RUS 502. INDEPENDENT STUDY (1-16). Department approval required.

RUS 405/RUS 505. READING AND CONFERENCE (1-16). PREREQ: Department approval required.

RUS 407/RUS 507. SEMINAR (1-16). PREREQ: Department approval required.

RUS 411, RUS 412, RUS 413. FOURTH-YEAR RUSSIAN (3,3,3). Emphasis on developing writing, speaking, and listening skills for proficiency progressing from textbook Russian to real-life Russian. Includes vocabulary study and some grammar review. Conducted in Russian. PREREQ: RUS 313 and departmental authorization.

■ SPANISH

Lower Division

SPAN 111, SPAN 112, SPAN 113. FIRST-YEAR SPANISH (4,4,4). Three class meetings and two recitations per week. Development of listening comprehension, speaking, reading, and writing skills. Must be taken in order. Native speakers and bilingual speakers may not receive credit for Span 111,SPAN 112,SPAN 113. Students with previous study of Spanish are admitted only by departmental authorization. Lec/rec.

SPAN 199. SPECIAL STUDIES (1-16).

SPAN 211, SPAN 212, SPAN 213. SECOND-YEAR SPANISH (4,4,4). Three class meetings and two recitations per week. Further development of listening comprehension, speaking, reading, and writing skills. Must be taken in order. Native speakers may not receive credit for SPAN 211,SPAN 212,SPAN 213. Completion of SPAN 213 with a grade of C– or better satisfies B.A. requirement for foreign languages. PREREQ: SPAN 113 or placement.

SPAN 299. SPECIAL STUDIES (1-16).

Upper Division

SPAN 301. SPANISH CONVERSATION (1). Two recitations per week. Emphasis on retention and development of speaking and listening comprehension skills. May be repeated for up to 4 credits. No more than 2 credits may be used to satisfy requirements for the major or minor. Bilingual and native speakers may not receive credit for SPAN 301. PREREQ: SPAN 213 or placement.

SPAN 311, SPAN 312, SPAN 313. THIRD-YEAR SPANISH (3,3,3). Three class meetings and one recitation per week. Further development of listening comprehension, speaking, and writing skills. Must be taken in order. PREREQ: SPAN 213 or placement and departmental authorization.

SPAN 317, SPAN 318. DIRECTED READING IN SPANISH (3,3). Further development of reading and writing skills through reading and study of selected modern literary works of Spain and Spanish America. Must be taken in order. PREREQ: SPAN 213 or placement.

SPAN 323. SELECTED TOPICS IN LUSO-HISPANIC LITERATURE (3). May be repeated for credit when topic varies. May be used for Spanish major or minor only with departmental authorization. See *Schedule of Classes* for current terms offering. PREREQ: Completion of 9 credits of any literature or junior or senior standing.

SPAN 331, SPAN 332, SPAN 333. THE CULTURES OF SPAIN AND PORTUGAL (3,3,3). Historical development of the cultures and societies of the Iberian peninsula. Taught in Spanish. PREREQ: Completion of 9 hours from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318. (H)

SPAN 336, SPAN 337, SPAN 338. LATIN AMERICAN CULTURE (3,3,3). Historical development of the cultures and societies of Latin America, with an emphasis on Spanish- and Portuguese-speaking peoples. Taught in Spanish. PREREQ: Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318. (H)

SPAN 344. SELECTED TOPICS IN LITERATURE (3). Taught in Spanish. May be repeated for credit when topic varies. See *Schedule of Classes* for current term's offering. PREREQ: Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318.

SPAN 350. PHONETICS AND PRONUNCIATION (3). PREREQ: SPAN 113 or SPAN 115.

SPAN 351. HISPANIC LINGUISTICS (3). Scientific approach to the structure of the Spanish language: syntax, phonology, word formation, dialectal differences. Taught in Spanish. Recommended for teacher certification. PREREQ: SPAN 350.

SPAN 379. PROCTOR EXPERIENCE (1). Supervised practicum for advanced students, with assignments as proctors or tutors in lower-division Spanish language courses. May be repeated for credit. No more than 2 credits may be used to satisfy degree requirements for a major in Spanish; no credit may be used to satisfy requirements for a minor in Spanish. PREREQ: completion of 21 upper-division credits in Spanish with a minimum 3.00 GPA. Graded P/N.

SPAN 401/SPAN 501. RESEARCH (1-16). Department approval required.

SPAN 402/SPAN 502. INDEPENDENT STUDY (1-16). Department approval required.

SPAN 403/SPAN 503. THESIS (1-16). Department approval required.

SPAN 405/SPAN 505. READING AND CONFERENCE (1-16). Department approval required.

SPAN 407/SPAN 407. SEMINAR (1-16). Department approval required.

SPAN 411/SPAN 511, SPAN 412/SPAN 512, SPAN 413/ SPAN 513. FOURTH-YEAR SPANISH (3,3,3). Three class meetings and one recitation per week. Further development of listening comprehension, speaking, and writing skills. Must be taken in order. PREREQ: SPAN 313 or placement, and departmental authorization.

SPAN 438/SPAN 538. ^SELECTED TOPICS IN LUSO-HISPANIC CULTURE (3). Contemporary aspects of the cultures of Spain, Portugal, or Latin America with a cross-cultural perspective. Topics and language of instruction vary. Not offered every year. See *Schedule of Classes* for current term's offering. May be repeated for credit when topic varies. PREREQ: Completion of 6 credits from SPAN 331, SPAN 332, SPAN 333, SPAN 336, SPAN 337, SPAN 338. (Writing Intensive Course)

SPAN 444/SPAN 544. SELECTED TOPICS IN THE LITERATURE OF LATIN AMERICA (3). Representative Spanish prose, poetry, and drama, with an emphasis on the 19th and 20th centuries. Taught in Spanish. Not offered every year. May be repeated for credit when topic varies. PREREQ: Completion of 21 upper-division credits in Spanish.

SPAN 445SPAN 545. SELECTED TOPICS IN THE LITERATURE OF LATIN AMERICA(3). Representative prose, poetry, and drama of Spanish America and/or Brazil, with an emphasis on the mid-19th century to the present. Topics and language of instruction may vary. Not offered every year. See Schedule of Classes for current terms offering. May be repeated for credit when topic varies. PREREQ: completion of 21 upper-division hours in Spanish.

SPAN 461/SPAN 561, SPAN 462/SPAN 562, SPAN 463/SPAN 562. FIFTH-YEAR SPANISH (3,3,3). Continued development of listening comprehension, speaking, and writing skills. Introduction to debate and platform speaking in Spanish, and to specialized interests of students, e.g., methods and philosophies of interpretation and translation, business Spanish, creative writing. Must be taken in order. PREREQ: SPAN 413 or placement, and departmental authorization.

■ LINGUISTICS

Lower Division

LING 199. SPECIAL STUDIES (1-16). May be repeated when topic varies. See *Schedule of Classes* for current offerings and prerequisites. Not offered every year.

Upper Division

LING 359. SELECTED TOPICS IN LINGUISTICS (1). May be repeated for credit when topic varies. See Schedule of Classes for current offerings and prerequisites. Not offered every year.

LING 401/LING 501. RESEARCH (1-16). PREREQ: Department approval required.

LING 402/LING 502. INDEPENDENT STUDY (1-16). PREREQ: Department approval required.

LING 403/LING 503. THESIS (1-16). PREREQ: Department approval required.

LING 405/LING 505. READING AND CONFERENCE (1-16). PREREQ: Department approval required.

LING 407/LING 507. SEMINAR (1-16). PREREQ: Department approval required.

LING 451/LING 551. GENERAL LINGUISTICS (3). Language systems; comparative philology; historical, descriptive, and structural linguistics; semantics; phonetics and phonemics.PREREQ: 9 credits upper-division foreign language training or equivalent. Not offered every year.

■ INTERNSHP

FLL 410/FLL 510. FOREIGN LANGUAGE INTERNSHIP (1-12). Opportunities for juniors and seniors to apply skills in foreign language and knowledge of foreign culture at selected government, industry, or business placement sites. Allows students to prepare for transition from academic world to work world. Interns are supervised and evaluated by employer and faculty coordinator. PREREQ: Completion of 90 credits with 2.75 GPA or higher; completion of the third-year language course in one foreign language with 3.00 GPA or better, with at least 3 terms of study in the OSU Department of Foreign Languages and Literatures.

■ OREGON STUDY CENTERS IN CHINA

Beijing and Fujian, China

CHN 188. CHINESE STUDIES, CHINESE STUDY CENTERS (1-12). May be repeated when topic varies. Section 1: Topics, Chinese language; Section 2: Practical work (exercises).

CHN 288. CHINESE STUDIES, CHINESE STUDY CENTERS (1-12). May be repeated when topic varies. Section 1: Topics, Chinese language; Section 2: Practical work (exercises); Section 3: Topics, Chinese arts and letters; Section 4: Topics, China and Chinese society.

CHN 388. CHINESE STUDIES, CHINESE STUDY CENTERS (1-12). May be repeated when topic varies. Section 1: Topics, Chinese language; Section 2: Practical work (exercises); Section 3: Topics, Chinese arts and letters; Section 4: Topics, China and Chinese society.

CHN 488/CHN 588. CHINESE STUDIES, CHINESE STUDY CENTERS (1-12). May be repeated when topic varies. Section 1: Topics, Chinese language; Section 2: Practical work (exercises); Section 3: Topics, Chinese arts and letters; Section 4: Topics, China and Chinese society.

■ OREGON STUDY CENTERS IN FRANCE

Poitiers and Lyon, France

FR 288. FRENCH STUDIES, FRENCH STUDY CENTERS (1-12). May be repeated when topic varies. Section 1: Topics, French language; Section 2: Practical work (exercises); Section 3: Topics, French arts and letters; Section 4: Topics, France and French society.

FR 388. FRENCH STUDIES, FRENCH STUDY CENTERS (1-12). May be repeated when topic varies. Section 1: Topics, French language; Section 2: Practical work (exercises); Section 3: Topics, French arts and letters; Section 4: Topics, France and French society.

FR 488/FR 588. FRENCH STUDIES, FRENCH STUDY CENTERS (1-12). May be repeated when topic varies. Section 1: Topics, French language; Section 2: Practical work (exercises); Section 3: Topics, French arts and letters; Section 4: Topics, France and French society.

■ OREGON STUDY CENTER IN GERMANY

Baden-Wurttemburg, Germany

GER 188. GERMAN STUDIES, GERMAN STUDY CENT (1). May be repeated when topic varies. Section 1: Topics, German language; Section 2: Practical work (exercises).

GER 288. GERMAN STUDIES, GERMAN STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, German language; Section 2: Practical work (exercises); Section 3: Topics, German arts and letters; Section 4: Topics, Germany and German society.

GER 388. GERMAN STUDIES, GERMAN STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, German language; Section 2: Practical work (exercises); Section 3: Topics, German arts and letters; Section 4: Topics, Germany and German society.

GER 488. GERMAN STUDIES, GERMAN STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, German language; Section 2: Practical work (exercises); Section 3: Topics, German arts and letters; Section 4: Topics, Germany and German society.

■ OREGON STUDY PROGRAMS IN HISPANIC COUNTRIES

Quito, Ecuador

SPAN 188. HISPANIC STUDIES, HISPANIC STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Hispanic language; Section 2: Practical work (exercises); Section 3: Topics, Hispanic arts and letters; Section 4: Topics, Hispanic society.

SPAN 288. HISPANIC STUDIES, HISPANIC STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Hispanic language; Section 2: Practical work (exercises); Section 3: Topics, Hispanic arts and letters; Section 4: Topics, Hispanic society.

SPAN 388. HISPANIC STUDIES, HISPANIC STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Hispanic language; Section 2: Practical work (exercises); Section 3: Topics, Hispanic arts and letters; Section 4: Topics, Hispanic society.

SPAN 488/SPAN 588. HISPANIC STUDIES, HISPANIC STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Hispanic language; Section 2: Practical work (exercises); Section 3: Topics, Hispanic arts and letters; Section 4: Topics, Hispanic society.

■ OREGON STUDY CENTER IN HUNGARY

Szeged, Hungary

HNGR 188. HUNGARIAN STUDIES, HUNGARIAN STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Hungarian language; Section 2: Practical work (exercises).

HNGR 288. HUNGARIAN STUDIES, HUNGARIAN STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Hungarian language; Section 2: Practical work (exercises); Section 3: Topics, Hungarian arts and letters; Section 4: Topics, Hungary and Hungarian society.

Upper Division

HNGR 388. HUNGARIAN STUDIES, HUNGARIAN STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Hungarian language; Section 2: Practical work (exercises); Section 3: Topics, Hungarian arts and letters; Section 4: Topics, Hungary and Hungarian society.

■ OREGON STUDY CENTER IN ITALY

Siena, Italy

IT 188. ITALIAN STUDIES, ITALIAN STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Italian language; Section 2: Practical work (exercises).

IT 288. ITALIAN STUDIES, ITALIAN STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Italian language; Section 2: Practical work (exercises); Section 3: Topics, Italian arts and letters; Section 4: Topics, Italy and Italian society.

IT 388. ITALIAN STUDIES, ITALIAN STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Italian language; Section 2: Practical work (exercises); Section 3: Topics, Italian arts and letters; Section 4: Topics, Italy and Italian society.

■ OREGON STUDY CENTER IN JAPAN

Tokyo, Japan

JPN 188. JAPANESE STUDIES, JAPANESE STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Japanese language; Section 2: Practical work (exercises).

JPN 288. JAPANESE STUDIES, JAPANESE STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Japanese language; Section 2: Practical work (exercises); Section 3: Topics, Japanese arts and letters; Section 4: Topics, Japan and Japanese society.

JPN 388. JAPANESE STUDIES, JAPANESE STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Japanese language; Section 2: Practical work (exercises); Section 3: Topics, Japanese arts and letters; Section 4: Topics, Japan and Japanese society.

JPN 488. JAPANESE STUDIES, JAPANESE STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Japanese language; Section 2: Practical work (exercises); Section 3: Topics, Japanese arts and letters; Section 4: Topics, Japan and Japanese society.

■ OREGON STUDY CENTER IN KOREA

Seoul, Korea

KOR 188. KOREAN STUDIES, KOREAN STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Korean language; Section 2: Practical work (exercises).

KOR 288. KOREAN STUDIES, KOREAN STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Korean language; Section 2: Practical work (exercises); Section 3: Topics, Korean arts and letters; Section 4: Topics, Korea and Korean society.

Upper Division

KOR 388. KOREAN STUDIES, KOREAN STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Korean language; Section 2: Practical work (exercises); Section 3: Topics, Korean arts and letters; Section 4: Topics, Korea and Korean society.

KOR 488/KOR 588. KOREAN STUDIES, KOREAN STUDY CENTER (1-12). May be repeated when topic varies. Section 1: Topics, Korean language; Section 2: Practical work (exercises); Section 3: Topics, Korean arts and letters; Section 4: Topics, Korea and Korean society.

■ OREGON STUDY CENTER IN RUSSIA

RUS 188. RUSSIAN STUDIES, RUSSIAN STUDY CENTER (1-12). Section 1: Topics, Russian language; Section 2: Practical work (exercises). May be repeated when topic varies.

RUS 288. RUSSIAN STUDIES, RUSSIAN STUDY CENTER (1-12). Section 1: Topics, Russian language; Section 2: Practical work (exercises); Section 3: Topics, Russian arts and letters; Section 4: Topics, Soviet Union and Soviet society. May be repeated when topic varies.

RUS 388. RUSSIAN STUDIES (1-12). May be repeated when topic varies. **RUS 388 Section 1:** Topics, Russian language; **RUS 388 Section 2:** Practical work (exercises); **RUS 388 Section 3:** Topics, Russian arts and letters; **RUS 388 Section 4:** Topics, Soviet Union and Soviet society.

RUS 488/RUS 588. RUSSIAN STUDIES (1-12). May be repeated when topic varies. **RUS 488 Section 1/ RUS 588 Section 1:** Topics, Russian language; **RUS 488 Section 2/RUS 588 Section 2:** Practical work (exercises); **RUS 488 Section 3/RUS 588 Section 3:** Topics, Russian arts and letters; **RUS 488 Section 4/RUS 588 Section 4:** Topics, Soviet Union and Soviet society.

■ VARIOUS OVERSEAS STUDY CENTERS

LING 388. LINGUISTIC STUDIES, VARIOUS STUDY CENTERS (1-12). May be repeated when topic varies. Section 1: Topics, General Linguistics; Section 2: Topics, Synchronic (Descriptive) Linguistics: Section 3: Topics, Diachronic (Historical) Linguistics: Section 4: Applied Linguistics, e.g., Phonology, Morphology, Syntax, Practicum; Section 5: TESOL (Teaching English to Speakers of Other Languages).

LING 488/LING 588. LINGUISTIC STUDIES, VARIOUS STUDY CENTERS (1-12). May be repeated when topic varies. Section 1: Topics, General Linguistics; Section 2: Topics, Synchronic (Descriptive) Linguistics; Section 3: Topics, Diachronic (Historical) Linguistics; Section 4: Applied Linguistics, e.g., Phonology, Morphology, Syntax, Practicum; Section 5: TESOL (Teaching English to Speakers of Other Languages).

HISTORY

Paul Farber, Chair
Milam 306B
Oregon State University
Corvallis, OR 97331-5104
(503) 737-3421

FACULTY

Professors Farber, Ferngren, King, Kopperman, M. Nye, R. Nye, Robbins, Trow, Wax; *Associate Professors* Beatty, Carson, Husband, LaFrance, Morris, Sarasohn; *Assistant Professors* Ip, Katz, Rupert

Undergraduate Major

History (B.A., B.S.)

Minor

History

The Department of History offers major programs leading to the B.A. and B.S. degrees. Courses provide fundamental background for the social sciences and humanities and are of special value to students of government, education, law, science, journalism, and business. History majors go on to careers in teaching and jobs requiring a liberal arts background. Students are urged to complete the B.A. degree requirements. Their programs will be worked out with their advisers.

B.A. candidates must have proficiency at the second-year level of a foreign language. B.S. candidates must complete an additional 12 credits of approved science, social science, or professional courses. See adviser for list of approved courses.

The department also offers a minor program for undergraduates with majors in other fields. Students electing a minor in history choose one of three areas, each requiring 27 credits: U.S. history; European history; or non-European, non-U.S. history.

History also may be used as a major or a minor in the Master of Arts in Interdisciplinary Studies (M.A.I.S.) degree program or as a minor in other graduate programs.

DEPARTMENTAL REQUIREMENTS

Minimum total credits (50)
Minimum upper division credits (32)

Courses that must be included in the 50-credits:

HST 101, HST 102, HST 103. History of Western Civilization (or equivalent courses approved by adviser) (9)
U.S. history (upper div courses may be used) (9)
Courses in a non-European, non-U.S. history area (8)
HST 407. Seminar (5)
HST 420. Historiography (4)
History electives (15)

INTERDEPARTMENTAL PROGRAMS

The Department of History administers the Science, Technology, and Society Certificate Program.

Science, Technology, and Society

The Science, Technology, and Society Certificate program combines topics in the history, philosophy, and sociology of science and technology with science policy studies, environmental studies, and anthropology. The thrust of the program is in understanding science and technology as a process, an institution, and a component of culture.

Requirements

To complete the curriculum, students are required to take 30 credits consisting of 9 credits of a general core and 21 credits or approved electives.

COURSES

■ HISTORY

Lower Division

HST 101, HST 102, HST 103. *HISTORY OF WESTERN CIVILIZATION (3,3,3). Provides an awareness and understanding of the western cultural heritage. Stresses the major ideas and developments that have been of primary importance in shaping the western tradition. HST 101: The Ancient World to 1000 A.D. HST 102: 1000 to 1789. HST 103: 1789 to the present. Need not be taken in sequence. (Bacc Core Course) (H)

HST 199. SPECIAL STUDIES (1-16).

HST 201, HST 202, HST 203. *HISTORY OF THE UNITED STATES (3,3,3). Provides an overview of the development of the U.S. from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. HST 201: Pre-Columbian and colonial origins to 1820. HST 202: 1820-1920. HST 203: 1920 to present. Need not be taken in sequence. (Bacc Core Course) (H)

Upper Division

HST 309. COLLOQUIUM (3).

HST 315. THE EUROPEAN MILITARY, 1400-1815 (4). Major aspects of European military history, 1400-1815, notable developments in weaponry and strategy, the social history of the military, impact of war on the civilian front, and pacifism and antimilitarism. Not offered every year.

HST 316. THE AMERICAN MILITARY, 1607-1865 (4). Major aspects of American military history, 1607-1865, notable developments in weaponry and strategy, the social history of the military, impact of war on the civilian front, and pacifism and antimilitarism. Not offered every year.

HST 317. *WHY WAR: A HISTORICAL PERSPECTIV (4). An inquiry into the origins of mass violence. Theory and case studies are used to suggest possible causes of international war, civil war, revolution, and genocide. Not offered every year. (Bacc Core Course)

HST 320. *ANCIENT NEAR EAST (4). A detailed survey of the peoples and cultures of the ancient Near East, including Assyria, Babylon, Egypt, Israel, Mesopotamia, and Persia, from the earliest recorded beginnings of civilization to about 500 B.C. Particular attention is given to the art, religion, law and literature of these civilizations. Not offered every year. (Bacc Core Course)

HST 321. GREECE (4). The history of the Greek city-states and the civilization they produced; the archaeological discovery of early Greece; the development of the polis; Sparta, Athenian democracy, the Persian and Peloponnesian Wars; Greek private life and religion.

HST 322. ROMAN REPUBLIC (3). The rise of Rome from a city-state to a Mediterranean power; Romes wars with Carthage; the establishment of the Principate; the rise of Christianity; the decline and fall of the Roman Empire; Romes contribution to western civilization and her permanent influence in art, religion, law, and politics.

HST 323. ROMAN EMPIRE (3). Roman history from 31 B.C. to A.D. 493. The establishment of the Principate, Roman social and private life, the rise of Christianity, the decline and fall of the Western Empire, Rome's contibutions to arts, religion, and law.

HST 327, HST 328. HISTORY OF MEDIEVAL EUROPE (4,4). Cultural, political, and economic history of the European Middle Ages from the fall of the Roman Empire in the West to the Renaissance. HT 327: 284 A.D. to 1000. HST 328: 1000 to 1400. Need not be taken in sequence. Not offered every year.

HST 331, HST 332, HST 333. EARLY MODERN EUROPE (3,3,3). Political, social, intellectual, and cultural history of Europe from about 1400 to 1789. HST 331: The Renaissance. HST 332: The Reformation. HST 333: The scientific revolution, absolute monarchy, and the Enlightenment. Need not be taken in sequence. Not offered every year.

HST 335, HST 336, HST 337. EUROPE SINCE THE FRENCH REVOLUTIO (4,4,4). Political, economic, social, and intellectual developments since the French Revolution. HST 333: 1789 to 1850. HST336: 1850 to 1914. HST 337: 1914 to the present. Need not be taken in sequence. Not offered every year.

HST 342. *CHRISTIANITY IN RUSSIA (3). An interdisciplinary investigation of the cultural ramifications of Christianity in Russia, with special emphasis on the contemporary dimensions of the subject. Topics include religion in daily life, church and state, Christianity and art, law and legal consciousness, and the impact of religion on gender and ethnicity. (Bacc Core Course)

HST 350, HST 351. *MODERN LATIN AMERICA (4,4). History of the development of Latin America emphasizing the issues of imperialism, economic dependency, social stratification, political instability, and nationalism within an international context. HST 350: 1492 to 1850. HST 351: 1850 to the present. Need not be taken in sequence. (Bacc Core Course) (NC)

HST 362, HST 363. WOMEN IN UNITED STATES HISTORY (3,3). Women in the United States—their roles in and contribution to American political, economic, social, cultural, and intellectual life. Course sequence pays particular attention to the diversity of American women's backgrounds and experiences. HST 362: 1620-1890. HST 363: 1890 to the present.

HST 364, HST 365. HISTORY OF BLACK AMERICANS (4,4). The forces and personalities that have shaped the history of Black Americans in the United States. HST 364: African beginnings to the close of Reconstruction. HST 365: Close of Reconstruction to the present. Need not be taken in sequence. Not offered every year.

HST 366, HST 376. HISTORY OF THE AMERICAN INDIAN (3,3). A study of the American Indian north of Mexico from before European contact to the present HST 366: The indigenous population prior to European contact; initial alterations in and continued disruption of Indian society and culture; Indian-white conflict; emergence of U.S. government Indian policy to 1848. HST 367: Evolution of U.S.-Indian policy after 1848; consequences of forced assimilation; Indian Reorganization Act and Termination policies; growth of Pan-Indianism and the Red Power movement. Not offered every year.

HST 381, HST 382. *HISTORY OF AFRICA (4,4). History of Africa from earliest times to present, including origins of human society, slave trade, European imperialism and African nationalism. HST 381: Africa through the nineteenth century. Need not be taken in sequence. HST 382: Twentieth-Century Africa. (Bacc Core Course) (NC)

HST 387/HST 388. *ISLAMIC CIVILIZATION (4,4). Political, social, and religious developments from 600 to the present. HST 387: Early history and the formation of Islamic society to the Mongol invasion. HST 388: The expansion of Islamic, Turkic and Asian dynasties, impact of Western imperialism and modern Islamic world. Need not be taken in sequence. (Bacc Core Course)

HST 391, HST 392. *EAST ASIA (4,4). History and culture of China, Japan, and Korea. HST 391: Prehistory to Western encounters in the middle of the nineteenth century, with emphasis on the literary, philosophical, and artistic heritage of this region. Need not be taken in sequence. HST 392:From the the present, with emphasis on modern political movements and economic development. (Bacc Core Course) (NC)

HST 401/HST 501. RESEARCH (1-16). Department approval required.

HST 402. INDEPENDENT STUDY (1-16). Department approval required.

HST 403/HST 503. THESIS (1-16). Department approval required.

HST 405/HST 505. READING AND CONFERENCE (1-16). Department approval required.

HST 406. PROJECTS (1-16). Department approval required.

HST 407/HST 507. ^SEMINAR (5). (Writing Intensive Course)

HST 410/HST 510. HISTORY INTERNSHIP (1-12). Supervised work of a historical nature with historical societies, archives, museums, or other public or private organizations. May be repeated for a maximum of 12 credits, but no more than 6 credits may be used to satisfy the history major requirement of 45 credits.

HST 415/HST 515. SELECTED TOPICS (4). Selected topics of special or current interest not covered in other courses.

HST 420/HST 520. HISTORIOGRAPHY (4). How history has been, and is being, written. Topics include the major historians, philosophy of history, types and uses of historical evidence, and fields of historical investigation. Intended to provide a critical awareness of factors that influence the writing of history. PREREQ: 9 credits of history or upper division standing.

HST 421/HST 521. HELLENISTIC GREECE (4). History of the Greek world from the end of the Peloponnesian War to the Roman conquest of Greece; the careers of Alexander the Great and his successors; the art, literature, science, religion, and philosophy of the post-classical or Hellenistic world. PREREQ: HST 101 or upper division standing. Not offered every year.

HST 430/HST 530, HST 431/HST 531, HST 432/ HST 532. ENGLISH HISTORY (4,4,4). The major political, cultural, economic, social, and religious developments that have shaped the history of England and, through that, of America and much of the world — England to 1485. HST 431/HST 531: Tudor-Stuart England, 1485-1688. HST 432/HST 532: England since 1688. Need not be taken in sequence. Not offered every year.

HST 435/HST 535, HST 536/ HST 536. HISTORY OF MODERN GERMANY (4,4). Political, economic, social and intellectual developments from 1815 through the imperial, Weimar, and Nazi eras to the present — 1815 to 1914. HST 436/ HST 536: 1914 to the present. Need not be taken in sequence. Not offered every year.

HST 439/HST 539. READINGS IN EUROPEAN HISTORY (3-5). Supervised readings designed to allow students to explore in depth key issues in European history.

HST 440/HST 540, HST 441/ HST 541. HISTORY OF RUSSIA (4,4). Political, economic, social, and cultural developments from the origins of the Russian state through the Gorbachev regime — Russian history, 862 to 1917. HST 441/HST 541: 1917 to present. PREREQ: HST 101, HST 102, HST 103 or upper division standing. Need not be taken in sequence.

HST 445/HST 545. SOCIETY IN MODERN RUSSIA (4). Development of Russian/Soviet society since 1861, focusing on issues of gender, urbanization, literacy, the family, the evolution of legal consciousness, life at the workplace, education, and the general social ramifications of the end of serfdom and industrialization. PREREQ: HST 101,HST 102,HST 103 or upper division standing. Not offered every year.

HST 449/HST 549. READINGS IN RUSSIAN HISTORY (3-5). Supervised readings designed to allow students to explore in depth key issues in Russian history.

HST 452/HST 552. MODERN MEXICO (4). History of Mexico since 1810—economic, political, and social change and relations with the United States. PREREQ: HST 350 or HST 351 or upper division standing. Not offered every year.

HST 456/HST 556. PROBLEMS IN LATIN AMERICAN HISTOR (4). A focused examination of the origins and development of selective institutions and problems important to understanding the region, such as church, the military, labor, political instability, economic stagnation, and social stratification. PREREQ: HST 350 or HST 351 or upper division standing. Not offered every year.

HST 459/HST 559. READINGS IN LATIN AMERICAN HISTOR (3-5). Supervised readings designed to allow the student to explore in depth key issues in Latin American history.

HST 460/HST 560, HST 461/ HST 561, HST 462/ HST 562. AMERICAN THOUGHT AND CULTURE (3,3,3). An examination of the main currents of American thought and culture, emphasizing ideas and concepts which have influenced the development and growth of American institutions and values from the colonial period to the present. PREREQ: HST 201,HST 202,HST 203 or upper division standing. Need not be taken in sequence. Not offered every year.

HST 463/HST 563. RELIGION IN AMERICAN PUBLIC LIFE (3). Major aspects of the influence of religion in the unfolding of American public life, examining over time significant religious controversies, the church-state relationship, and the involvement of religious groups in political activities; also reviewing the impact of religion on such social issues as racism, feminism, and utopianism. PREREQ: HST 201,HST 202,HST 203 or upper division standing. Not offered every year.

HST 464/HST 564, HST 465/HST 565. AMERICAN DIPLOMATIC HISTORY (4,4). American diplomatic relations from the nations founding to 1898. HST 465/HST 565: American diplomatic relations from 1898 to the present. PREREQ: HST 201,HST 202,HST 203 or upper division standing. Need not be taken in sequence. Not offered every year.

HST 466/HST 566. UNITED STATES-LATIN AMERICAN RELATIONS (4). Analysis of United States-Latin American relations since 1776 treating issues of conflict and convergence: trade and investment, security, revolution, immigration, and nationalism. PREREQ: HST 350 or HST 351 or upper-division standing. Not offered every year.

HST 467/HST 567, HST 468/HST 568. HISTORY OF THE AMERICAN WEST (4,4). Important themes in the transformation of western America from the preindustrial world of native Americans to the colonization and domination of the region by the expanding United States to 1900. HST 468/HST 568: 1990 to the present. PREREQ: HST 201, HST 202, HST 203 or upper division standing. Need not be taken in sequence. Not offered every year.

HST 469/HST 569. HISTORY OF THE PACIFIC NORTHWEST (3). The demographic, ecological, and cultural transformation of Oregon, Washington, and Idaho from Indian times to the present. PREREQ: HST 201, HST 202, HST 203 or upper division standing.

HST 471/HST 571, HST 472/HST 572. COLONIAL AMERICA (4,4). Economic, political, social, religious, and intellectual development of colonial North America from the English background to 1763. HST 471/HST 571: To 1689. HST 472/HST 572: 1689 to 1763. PREREQ: HST 201 or upper division standing. Need not be taken in sequence.

HST 473/HST 573. THE ERA OF THE AMERICAN REVOLUTIO (4). The American Revolution, the drafting of the Constitution, and the launching of the new nation, 1763 to 1789. PREREQ: HST 201 or upper-division standing.

HST 474/HST 574. JEFFERSONIAN AND JACKSONIAN DEMOC (4). American political, economic, religious, and social development during the early and middle national era with emphasis on the formation and growth of political parties, territorial expansion and western settlement, and the beginnings of sectional conflict. PREREQ: HST 201,HST 202 or upper-division standing. Not offered every year.

HST 475/HST 575. CIVIL WAR AND RECONSTRUCTION (4). Origins of the war, nature of the war, and the critical postwar era, 1830s to 1880s, with special attention to the changing historiography of the period. PREREQ: HST 202 or upper-division standing. Not offered every year.

HST 477/HST 577. THE PROGRESSIVE AND NEW DEAL ERAS (4). Twentieth-century U.S. history from 1900 to 1939, with emphasis on political and economic developments; attention given to diplomatic, cultural, and social change. PREREQ: HST 203. Not offered every year.

HST 478/HST 578. CONTEMPORARY UNITED STATES (4). Developments since 1939 which have promoted fundamental shifts in American life, in particular those which have sparked questioning of the meaning and direction of that life in a world in revolutionary transition. PREREQ: HST 203 or upper-division standing. Not offered every year.

HST 479/HST 579. READINGS IN UNITED STATES HISTORY (3-5). Supervised readings designed to allow students to explore in depth, key issues in United States history.

HST 481/HST 581. ENVIRONMENTAL HISTORY OF THE UNIT (4). A study of human interaction with the environment and the transformation of the landscape and ecology of North America from the Indian period to the present, with special attention to the progressive alterations induced by the modernizing world of agriculture, industry, urbanism, and their relation to the market system in the United States. REC: HST 201, HST 202, HST 203. HST 481 PREREQ: Upper-division standing.

HST 485/HST 585. *POLITICS AND RELIGION IN THE MODERN MIDDLE EAST (3). The role of religious and secular ideologies in the politics of the 20th Century Middle East. Topics include the impact of liberal and naturalist thought, the Iranian revolution, radical Islamist movements, and Zionism. PREREQ: Upper division standing or permission of instructor. (Bacc Core Course)

HST 489/HST 589. READINGS IN AFRICAN AND MIDDLE EA (3-5). Supervised readings designed to allow students to explore in depth, key issues in African and Middle Eastern history.

HST 495/HST 595. CHINA IN THE TWENTIETH CENTURY (4). Treats the decline of the Confucian tradition, shifts in the economy, and metamorphoses of the political system. Attention is given to Chinas attempt to balance her Communistic revolutionary legacies with her current modemizing goals. PREREQ: HST 391, HST 392 or upper-division standing. Not offered every year.

HST 499/HST 599. READINGS IN ASIAN HISTORY (3-5). Supervised readings designed to allow students to explore in depth key issues in Asian history.

■ HISTORY OF SCIENCE

Upper Division

HSTS 401/HSTS 501. RESEARCH (1). Department approval required.

HSTS 403/HSTS 503. THESIS (1-16). PREREQ: Graduate standing; departmental approval.

HSTS 405/HSTS 505. READING AND CONFERENCE (1). Department approval required.

HSTS 407/HSTS 507. SEMINAR (1-16).

HSTS 411/HSTS 511, HST 412/HST 512, HSY 413/HST 513. *HISTORY OF SCIENCE (3,3,3). This course stresses the interaction of scientific ideas with their social and cultural context. Scientific thought from ancient civilizations to post-Roman era. HST 412/HST 512: Origin of modern science in the 16th and 17th centuries. HST 413/HST 513: Development of modern science in the 18th and 19th centuries and to the presnt. PREREQ: Upper division standing; at least one science sequence.

HSTS 415/HSTS 515. *^THEORY OF EVOLUTION AND FOUNDAT (3). Origin and development of Darwins theory of evolution. Reception of theory and history of evolution to the present. PREREQ: Upper-division standing. (Bacc Core Course) (Writing Intensive Course)

HSTS 416/HSTS 516. *^SCIENCE AND THE EMERGENCE OF MO (3). The interaction of science, technology, politics, and economics are examined by focusing on the period 1789-1848 as a case study. PREREQ: Upper-division standing. (Bacc Core Course) (Writing Intensive Course)

HSTS 417/HSTS 517. *^HISTORY OF MEDICINE (3). History of medical theory and the changing role of the physician; internal development of medicine as a discipline as well as a profession; relationship of medicines development to general changes in science and culture. PREREQ: Upper division standing. (Bacc Core Course) (Writing Intensive Course)

HSTS 418/HSTS 518. *^SCIENCE AND SOCIETY (3). Science and Utopia. PREREQ: One year of college science. Need not be taken in order. (Bacc Core Course) (Writing Intensive Course)

HSTS 421/HSTS 521. *TECHNOLOGY AND CHANGE (3). Current views of technology and associated cultural changes and the contexts in which these developed; the changing role of technology in modern industrial society, especially in the United States; recent efforts to predict and control technological developments and the social and cultural consequences. PREREQ: Upper-division standing. Bacc Core Course)

LATIN AMERICAN AFFAIRS

Robert Kiekel, Director
Kidder Hall 224
Oregon State University
Corvallis, OR 97331-4603
(503) 737-3940

Certificate Program

Latin American Affairs

Students earning a certificate in Latin American affairs will have gained a broad knowledge and understanding of the history and current situation in Latin America. The program allows students with majors in any discipline to complement their professional studies; certificates are awarded concurrently with the undergraduate or graduate degree.

Course work is drawn from several departments, primarily in the College of Liberal Arts. Interested students should contact the program director early in their academic careers in order to plan their schedules.

CERTIFICATE CURRICULUM

The course of study consists of a minimum of 30 credits, 14 credits of required core courses, and 16 credits of appropriate electives. In addition, the student must have proficiency in Spanish or Portuguese, equivalent to that attained by the end of the second-year sequence, or by placement scores.

REQUIRED COURSES

HST 350,HST 351. Modern Lat Amer Hist (8)
SPAN 336, or SPAN 337, or SPAN 338. (3)
A seminar on Latin America through any of the participating departments (3)

ELECTIVE COURSES

A minimum of 16 credits from a least two of the following eight areas:
ANTH 313. Peoples of the World—Lat Amer (3)
ANTH 413. World Cultures—Latin America (4)
AREC 431. International Ag Development (3)
GEOG 328. Geography of Latin America (3)
EC 451. Economic Survey of Latin America (3)
PS 344. Latin American Politics (4)
SOC 437. Minority Groups and Issues (4)
SPAN 438. Sel Topics in Luso-Hispanic Cult (3)
SPAN 445. Sel Topics in the Lit of Lat Amer (3)
Appropriate open-ended courses (402, 405, 407) through participating departments, as well as transfer credits, may also be used to satisfy requirements.

LIBERAL STUDIES

Jerry O'Connor, Director
Social Science Hall 213
Oregon State University
Corvallis, OR 97331-6202
(503) 737-0561
Pat Rogerson, Adviser

Undergraduate Major

Liberal Studies (B.A., B.S.)
Options
Pre-M.A.T. for Elementary Education

A major in liberal studies leading to a B.A. or a B.S. degree is available for students whose academic and career interests suggest greater curricular breadth and flexibility than is available in other major programs.

Candidates for a Liberal Studies degree must complete the following:

- University Baccalaureate Core
- College of Liberal Arts core requirements
- A program of 45-60 credits that is thematic in nature and developed from two or more departments within the College of Liberal Arts.
- At least 27 credits must be upper division.
- The program must be approved in advance by the director.
- At least one Writing Intensive Course with a grade of C or better.

PRE-M.A.T.

A Pre-M.A.T. for Elementary Education Option is available for students who plan to enter the M.A.T. (Master of Arts in Teaching) elementary education program.

Candidates for the Pre-M.A.T. Option must complete the following:

PRE-PROFESSIONAL CORE (99-105)

(This fulfills the Baccalaureate Core)
Writing I, II, III/Speech (9)
MTH 211, MTH 212, MTH 213, MTH 391 (12)
Science (Bacc Core plus 2 additional from approved list) (18-20)
HST 203 plus 2 others from Western Culture (9)
Cultural Diversity (3)
HHP 231 (3)
PSY 201, PSY 202 (6)
GEO 105, GEO 106 (6)
Literature (9)
Contemporary Global Issues (3)
Science, Technology and Society (3)
HDFS 311, HDFS 313, or PSY 350 (3-6)
ED 309, ED 313 (6)

COLLEGE OF LIBERAL ARTS CORE (18)

ONE SPECIALIZATION (45)

Behavior Science Specialization

PSY 27 upper division (including WIC)
SOC 204, 205, 206, 312, 340, 450

Fine Arts Specialization

Individually designed with either Art or Music emphasis. See Pre-M.A.T. adviser.

Language Arts Specialization

ENG 104, ENG 105, ENG 106 (9)
One of:
ENG 201, ENG 202, or ENG 203 (3)
WIC and Upper Division ENG (21)
WR 224, 324, 411 (9)
TA 121

Social Science Specialization

ANTH 380
EC 201, 319

PS 101 or PS 102, and PS 203 (8)
HST (from Core)
Upper Division HST (18)
WIC (ANTH 370)

Hispanic Studies Specialization
SPAN 311, 312, 313 (9)
SPAN 317, 318 (6)
SPAN 336, 337, 338 (9)
SPAN 350, 351 (6)
ANTH 215, 313 or 313A (3)
GEOG 328 or PS 345 (3)
HST 350, 351 OR Teaching Experience in Mexico (6-8)
WIC (SPAN 438) (3)

American Minorities Studies
ANTH 110, 215, 311, 313 or 313A (12)
ART 207 (3)
ENG 211, 212, 260, 360 (12)
HST 364, 365, 366, 367, 467, 468 (18)
WIC (ANTH 370) (3)

Spanish
Strongly recommended

COURSES

Lower Division

LS 114. CAREER DECISION MAKING (2). Designed for undergraduates who wish to explore career choices. Enables students to (a) examine the self in regard to theories of vocational choice: (b) participate in self-assessment through testing; (c) examine various occupations, disciplines, and lifestyles; and (d) develop decision-making skills.

LS 199. SPECIAL STUDIES (1).

LS 201. *NEWS WRITING (3). Introduction to newspaper style. Introduction to reporting. PREREQ: Grade of B or higher in WR 121; 30 wpm typing speed. May not be offered every year.

Upper Division

LS 300. LEGAL EDUCATION AND LEGAL CAREERS (2). Team-taught preparation for undergraduates interested in attending law school. Course selection, practical advice, workshops, and field trips. Open to sophomores and juniors with a 3.0 gpa. or higher.

LS 306. PROJECTS (3). 306A: Student Counselor Orientation; and 306B: Peer Counseling.

LS 307. SEMINAR (1).

LS 314. PREPARATION FOR JOB SEARCH (1). Designed for sophomore and junior students who wish to explore the career preparation process. Enables students to prepare materials and to develop awareness of skills needed before, during, and after a job search.

LS 402. INDEPENDENT STUDY (1).

LS 403. THESIS (1).

LS 405. READING AND CONFERENCE (1).

LS 406. PROJECTS (1). May be repeated for a maximum of 12 credits.

LS 407/LS 507. SEMINAR (1). Graduate credit must not exceed 9 credits.

LS 408. WORKSHOP (1).

LS 409. PRACTICUM (1).

LS 410. INTERNSHIP (1-12). Section 2: Restricted to students enrolled in off-campus programs in Astoria, Bend, Coos Bay, Hood River, and Newport. Not available to students in residence in the Corvallis campus. PREREQ: Senior standing, and 15 credits of residence work completed. Maximum of 12 credits. P/N grading.

MUSIC

Marlan Carlson, Chair
Benton Hall 101
Oregon State University
Corvallis, OR 97331-2502
(503) 737-4061

Faculty
Professors M. Carlson, Douglass, Eiseman; *Associate Professors* Coolen, Jeffers, McCabe, Olson; *Senior Instructors* A. Carlson, Krueger

Undergraduate Major

Music (B.A., B.S.)
Options
Choral Conducting
Instrumental Conducting
Instrumental Performance
Piano Performance
Vocal Performance
Composition
Music History

Minor

Music (for nonmajors)

Graduate Major

Master of Arts in Teaching (M.A.T.)
Master of Arts in Interdisciplinary Studies (M.A.I.S.)

Teaching Certification

Music Education (M.A.T.)
Basic and Standard Certification through M.A.T.
Course work leading to Standard Certification for Music Educators who hold a valid Basic Teaching Certificate

The Department of Music offers programs leading to the B.A. or B.S. degree for music majors, a variety of general education courses for students with little or no background in music, and opportunities for qualified students to perform in bands, choirs, and the symphony orchestra. Students wishing a greater curricular choice may wish to combine music study with courses in another department in the College of Liberal Arts for a liberal studies major.

The Department of Music offers graduate courses in music education, conducting, performance, and special projects. Graduate students may pursue the Master of Arts in Interdisciplinary Studies (MAIS) in a broad range of fields or the Master of Arts in Teaching (MAT). OSU's graduate programs in music have been approved by Oregon's Teacher Standards and Practices Commission for individuals who hold basic teaching licenses in music and who seek standard licensure in music. With careful planning it is possible to earn a master's degree en route to standard licensure.

Performance instruction at the intermediate and advanced levels is available with instructor consent. Students should contact the department office for application procedures and fee schedules.

Scholarships are available for music majors and for outstanding performers. Auditions and interviews take place in February, March, and April each year. Selection is based on musical and academic achievement.

The Music Learning Center in Benton Hall has a large collection of phonograph records, scores, and compact disks, as well as listening facilities, and electronic and computerized learning aids. Books on music and some printed music are also housed in Kerr Library.

Career possibilities in music include teaching in the schools or privately, performing in orchestras or ensembles, music librarianship, arts management, music business, and recording engineering.

MAJOR PROGRAM IN MUSIC

Transfer students must demonstrate competency in the areas of music history, music theory, aural skills, and piano skills. Placement examinations in each of these areas must be completed by Wednesday of the first week of classes. Descriptions of the content of these examinations and a list of procedures are available from the Music Office.

Departmental degree requirements are 66 credits, of which 24 must be upper division. Note: CLA allows only 12 credits of MUP courses to be applied toward a degree.

Required Core Classes for ALL options:
MUS 121, MUS 122, MUS 123. Literature and Materials of Music (9)
MUS 124, MUS 125, MUS 126. L&M Lab (3)
MUS 134, Mus 135, Mus 136. Aural Skills (3)
MUS 221, MUS 222, MUS 223. Literature and Materials of Music II (9)
MUS 234, Mus 325, MUS 326. Aural Skills II (3)
Mus 235, MUS 236. Music History (9)
Lower Division Studio or Performance Ensemble or Accompanying (6)
TOTAL: 42

CHORAL CONDUCTING OPTION

Upper Division Requirements
MUP 390-MUP 396. Studio Instruction (3)
MUP 490-MUP 496. Studio Instruction (2)
MUS 340 or MUS 341. Performance Organizations (5)
MUS 315. Introduction to Conducting (2)
MUS 316, MUS 317. Choral Conducting I, II (4)
MUED 372, MUED 373. Singers Diction I and II (4)
MUED 477/MUED 577. Classroom Instrumental Techniques (2)
MUED 478/MUED 578. Techniques for the Vocal Instructor (2)
Junior/Senior Full Recital/Project (0)
TOTAL: 24

INSTRUMENTAL CONDUCTING OPTION
MUED 277, 001-007. Instrumental Techniques (6)

Upper Division Requirements
MUP 390-MUP 396. Studio Instruction (3)
MUP 490-496. Studio Instruction (2)
MUS 350, MUS 351 or MUS 360. Performance Organizations (5)

MUS 315. Introduction to Conducting (2)
MUS 318, MUS 319. Instrumental Conducting I, II (4)
MUED 478/MUED 578. Techniques for the Vocal Instructor (2)
Junior/Senior Full Recital/Project (0)
TOTAL (24)

MUSIC HISTORY AND COMPOSITION OPTIONS

Upper Division Requirements

MUP 390-MUP 396. Studio Instruction (3)
MUS 340-MUS 369. Performance Org (3)
MUP 490-MUP 496. Studio Instruction (0)
MUS 423. Lit and Materials of Music III (3)
Upper division eLectives (from MUS 421, MUS 422, MUS 441-445) (12)
MUS 403. Senior Thesis/Composition (including public presentation) (3)
TOTAL (24)

INSTRUMENTAL PERFORMANCE OPTION

Upper Division Requirements

MUP 390-MUP 396. Studio Instruction (3)
MUP 490-MUP 496. Studio Instruction (3)
MUS 340-MUS 369. Performance Org (6)
Upper division electives from MUS 421-423, MUS 441-444 (12)
Junior Half Recital (0)
Senior Full Recital (0)
TOTAL (24)

PIANO PERFORMANCE OPTION

Upper Division Requirements

MUP 390. Studio Inst (Upper Division) (3)
MUP 490. Studio Inst (Upper Division) (3)
MUS 363. Accompanying (6)
Upper division electives (from MUS 421-423, MUS 441-444) (12)
Junior Half Recital (0)
Senior Full Recital (0)
TOTAL (24)

VOCAL PERFORMANCE OPTION

Upper Division Requirements

MUP 391 Studio Instruction (3)
MUS 340, 341. Performance Organizations (3)
MUP 491. Studio Instruction (3)
MUED 372. Singer's Diction I (2)
MUED 373. Singer's Diction II (2)
MUED 478/578. Techniques for the vocal Instructor (2)
Electives MUS 421-423. MUS 441-444 (9)
Junior Half Recital (0)
Senior Full Recital (0)
Total (24)

MINOR PROGRAM

Students majoring in other disciplines may elect a minor in music.

MUS 121, MUS 122, MUS 123. Literature and Materials of Music I (9)
Electives in Music (6)
Upper division electives in Music from the following (12):
MUP 390-596.
MUED 473, MUED 474, MUED 478, MUED 477
MUS 340, MUS 350, MUS 357, MUS 360, MUS 363 (6 credits maximum)
MUS 324, MUS 325, MUS 326
MUS 421-423, MUS 441-444
PH 331
TOTAL (27)

GRADUATE STUDY IN MUSIC (MAT OR MAIS)

Departmental procedure and criteria:
The music advisor reviews transcripts, interviews the prospective student, and arranges an appropriate audition. Students selecting conducting or history as an emphasis will demonstrate competence in those areas. Student is accepted and notified in writing.

Requirement to enter M.A.T. Program in Music Education:

- Demonstrate competence in piano proficiency and vocal proficiency
- A 3.0 GPA in music courses
- A minimum score of 610 on the NTE Specialty in Music Test in Music Education is rquired
- Evidence of practicum experience equal to 90-120 clock hours in school music program (MUED 413 or equivalent)
- Instrumental education students: demonstrate knowledge of teaching methods in brass, winds, strings, percussion (MUED 277 or equivalent)
- Choral education students: demonstrated competence in vocal pedagogy (MUED 478/ MUED 578 or equivalent)
- Requirements for admission to OSU MAT program: (consult the School of Education for application form and deadlines)
- Bachelor's degree and Graduate School acceptance
- 3.0 GPA in last 90 graded quarter credits
- Verification of successful experience working with youth
- Passing scores on the NTE Core Battery: General Knowledge (654) and Communication Skills (659)
- Positive answers to "good conduct" questions as required by Oregon Teacher Standards and Practices commission
- Resume, two letter of recommendation, and essay of professional goals.

Recommended Pre-MAT courses:
ED 309 Field Practicum (3)
ED 411 Educational Psychology (3)
MUED 413 Theory and Practicum (4)
MUED 407 Seminar (1)

Master of Arts in Teaching (Music)
Professional Core
COUN 525 Fundamentals of Counseling (3)
*ED 416/516 Students/Teachers; Schools/ Communities (6)
Internship
MUED 510 Internship (15)
MUED 507 Seminar: Internship (3)
Teaching Speciality
*MUED 4/573 Elementary Methods I (3)
*MUED 4/574 Elementary Methods II (3)
MUED 579 Choir/Repertoire or MUED 575 Instrumental Ens (3)
MUED 591 Foundations of Music I (3)
MUED 592 Foundations of Music II (3)
MUED 593 Music Technology (3)
MUS 516 or 518 Advanced Conducting (3)
Contracted electives (9)
Final Oral Exam (0)
NTE Professional Knowledge test (0)
(661 minimum)
TOTAL (63)
*offered in summer only

MASTER OF ARTS IN INTERDISCIPLINARY STUDIES (MAIS)

See graduate catalog for description of MAIS degree. (Minimum 9 credits in each of three areas and maximum of 21, with 12 credits minimum in College of Liberal Arts.)For holders of Basic License in music who wish to pursue Standard licensure, a sample program might be:

Area One: MUED courses (573-579)
Area Two: ED courses
Area Three: Any graduate major or minor, including MUS courses.

Passing scores on NTE exam in Professional Knowledge and the Music Education Specialty Area are required for licensure. The MAIS requires a research project/thesis and an oral exam.

COURSES

■ MUSIC

Lower Division

MUS 101. *MUSIC APPRECIATION (3). Dealing primarily with the western classical tradition, the course focuses on developing perceptive listening skills through the study of musical forms and styles. For nonmajors. (FA) (Bacc Core Course)

MUS 102. *SOUND AND SILENCE: MUSIC IN HUMA (3). Survey of the uses of music in the human life cycle, examining the function of music in different cultures, periods, and styles. Interdisciplinary presentations, guest lecturers, videos, and live performances. For nonmajors. (Bacc Core Course) (FA)

MUS 103. *GREAT COMPOSERS (3). The life and works of one or more significant composers including Bach, Haydn, Mozart, Beethoven, and others. Course may be repeated for credit. (See Schedule of Classes for composers being offered.) For nonmajors. (Bacc Core Course) (FA)

MUS 107. *FOLK MUSIC OF NORTH AMERICA (3). Examines the definitions,concepts, and social contexts of North American folk music traditions. Topics include the major non-Western traditions of Native Americans, Afro-Americans, and Hispanic Americans, as well as the Anglo-American folk tradition. For nonmajors. (Bacc Core Course) (FA)

MUS 108. *MUSIC CULTURES OF THE WORLD (3). Survey of the World's music with attention to musical styles and cultural contexts. Included are Oceania, Indonesia, Africa, Asia, Latin America. (See Schedule of Classes for subject being offered.) For nonmajors. (Bacc Core Course)

MUS 109. *INTRODUCTION TO JAZZ (3). A listener's approach to the development of jazz through its various styles. For nonmajors. (FA)

MUS 111, MUS 112, MUS 113. FUNDAMENTALS OF MUSIC THEORY (3,3,3). Basic course in the theoretical aspects of music. To be taken in sequence. For nonmajors.

MUS 121, MUS 122, MUS 123. LITERATURE AND MATERIALS OF MUSIC (3,3,3). An integrated, team-taught approach to the study of Western art music, including repertory, melodic, harmonic, and rhythmic components, formal organization, and composition. Recitation included. PREREQ: Entrance exam. To be taken in sequence.

MUS 124. KEYBOARD HARMONY LAB (1). Scales, all major and harmonic form of minor, interval drill. Music majors must take course concurrently with MUS 121.

MUS 125. SCORE READING LAB (1). Transpose scores, harmonic idioms, harmonic progressions. Music majors must take concurrently with MUS 122.

MUS 126. ORCHESTRAL LITERATURE AND HARMONI/LAB (1). CD ROM harmonize melody with secondary functions, harmonic idioms. Music majors must take course concurrently with MUS 123.

MUS 134, MUS 135, MUS 136. AURAL SKILLS I (1,1,1). Aural comprehension of the basic melodic, rhythmic, and harmonic elements of music. To be taken in sequence. COREQ: MUS 121.

MUS 137. JAZZ IMPROVISATION (1). Freshman level course. PREREQ: Department approval required.

MUS 140. OREGON STATE CHOIR (1). A select ensemble of 45-55 mixed voices. Performances each term. Annual tours. PREREQ: Department approval required. (FA)

MUS 141. UNIVERSITY SINGERS (1). An ensemble of 40-60 members. Performances each term. PREREQ: Department approval required.

MUS 142. VOCAL JAZZ ENSEMBLE (1). A small ensemble with special emphasis given to music in the jazz/swing idiom. PREREQ: Department approval required.

MUS 144. MADRIGAL SINGERS (1). A small ensemble with emphasis on Renaissance vocal music and contemporary vocal music written in a madrigal style. PREREQ: Department approval required.

MUS 145. VOCAL ENSEMBLE: MISCELLANEOUS (1). Various small vocal chamber music ensembles. (See Schedule of Classes.) Performance each term. PREREQ: Department approval required.

MUS 150. SYMPHONIC BAND (1). A select ensemble of approximately 80 wind and percussion players. Performance each term. (FA)

MUS 151. CONCERT BAND (1). Wind and percussion ensemble of approximately 70 players. Performance each term. Open to all students.

MUS 153. MARCHING BAND (1). A marching and playing unit of more than 160 musicians. Performs for home football games; one trip each year to an off-campus game.

MUS 154. BASKETBALL BAND (1). An ensemble of approximately 50 players. Performs for home games.

MUS 157. SMALL JAZZ ENSEMBLE (1). Concentration on current jazz styles. Performance each term.

MUS 158. LARGE JAZZ ENSEMBLE (1). Concentration on current jazz styles. Performance each term.

MUS 160. UNIVERSITY SYMPHONY ORCHESTRA (1). An ensemble of 65-80 players. Performance of orchestral repertoire from the eighteenth, nineteenth, and twentieth centuries. Performance each term. PREREQ: Department approval required. (FA)

MUS 163. ACCOMPANYING (1). Piano accompanying and chamber music skills, studio experience and weekly performance class. COREQ: MUS 190 or MUS 290. PREREQ: Department approval required.

MUS 164. CHAMBER ENSEMBLE: STRINGS (1). PREREQ: Department approval required

MUS 165. CHAMBER ENSEMBLE: WOODWINDS (1). PREREQ: Department approval required.

MUS 166. CHAMBER ENSEMBLE: BRASS (1). PREREQ: Department approval required.

MUS 167. CHAMBER ENSEMBLE: PERCUSSION (1). PREREQ: Department approval required.

MUS 168. CHAMBER ENSEMBLE: MISCELLANEOUS (1). PREREQ: Department approval required.

MUS 169. OPERA WORKSHOP (1). PREREQ: Department approval required. (See Schedule of Classes for term offered.)

MUS 177 GROUP LESSONS: PIANO (1). Beginning Piano I. Elementary instruction in piano skills for non-majors.

MUS 178 GROUP LESSONS: PIANO (1). Beginning Piano II. Continuation of MUS 177, piano for non-majors. To be taken in sequence or with permission of instructor.

MUS 179 GROUP LESSONS: PIANO (1). Beginning piano III. continuation of MUS 177, MUS 178. Piano for non-majors. To be taken in sequence or with permission of instructor.

MUS 180. GROUP LESSONS: PIANO (1). (Basic Levels - A,B,C). Elementary group instruction in piano skills and basic theory. Must be taken in sequence. PREREQ: Department approval required.

MUS 181. GROUP LESSONS: PIANO (1). (Intermediate Levels - A,B.). Group instruction in piano skills. (See Schedule of Classes for section offered.) PREREQ: Department approval required.

MUS 182. GROUP LESSONS: PIANO REPERTOIRE (1). Group instruction in intermediate level repertoire. PREREQ: Department approval required.

MUS 183. SMALL GROUP LESSONS: VOICE (1). Taught concurrently with MUS 185.

MUS 184. GROUP LESSONS: ORCHESTRAL INSTRUM (1). PREREQ: Department approval required.

MUS 185. VOICE CLASS (1). Students improve and strengthen voice as solo instrument. PREREQ: Department approval required.

MUS 199. SPECIAL STUDIES (1). (Freshman level). PREREQ: Department approval required.

MUS 221, MUS 222, MUS 223. LITERATURE AND MATERIALS OF MUSIC (3,3,3). Advanced harmony, techniques of analysis, musical form, composition. Continued study of the repertory of Western music through the mid-twentieth century. Keyboard skills integrated into course. Three lectures and one keyboard lab weekly. PREREQ: MUS 123 or department approval required. To be taken in sequence.

MUS 234, MUS 235, MUS 236. AURAL SKILLS II (1,1,1). Sight-singing; melodic and harmonic dictation. PREREQ: MUS 123 and MUS 136 or department approval required. To be taken in sequence.

MUS 299. SPECIAL STUDIES (1). (Sophomore level). PREREQ: Department approval.

Upper Division

MUS 315. INTRODUCTION TO CONDUCTING (2). Basic terminology, beat patterns, and baton technique. Introduction to score preparation. Philosophy and history of conducting are also addressed. PREREQ: MUS 223, MUS 236, piano proficiency exam.

MUS 316. CHORAL CONDUCTING (2). Continuation of MUS 315. Hand gesture technique, score reading, and score preparation of literature from all major historical periods. Focus upon principles of developing choral excellence. Includes conducting practica with a campus ensemble. PREREQ: MUS 315. To be taken in sequence.

MUS 318. INSTRUMENTAL CONDUCTING (2). Continuation of MUS 315, including types of instrumental groups, seating arrangements, score preparation, and instrumental transposition and ranges. Advanced baton technique. PREREQ: MUS 315. To be taken in sequence.

MUS 324, MUS 325, MUS 326. ^HISTORY OF WESTERN MUSIC (3,3,3). Chronological survey of the Euro-American traditions in music to be taken in sequence. PREREQ: MUS 123; MUS 223 recommended. (Writing Intensive Course)

MUS 337. JAZZ IMPROVISATION (1). Instrumental and vocal improvisation including composition and arranging techniques. PREREQ: Two years college-level MUS 137 experience or equivalent.

MUS 338. JAZZ COMPOSITION/ARRANGING (3). Jazz composition utilizing techniques from five jazz composers. Performance. PREREQ: Department approval required.

MUS 340. OREGON STATE CHOIR (1). A select ensemble of 45-55 mixed voices. Performances each term. Annual tours. Students must have two years college-level experience or equivalent. PREREQ: Department approval required.

MUS 341. UNIVERSITY SINGERS (1). An ensemble of 40-60 members. Performances each term. Students must have two years college-level choir experience or equivalent. PREREQ: Department approval required.

MUS 342. VOCAL JAZZ ENSEMBLE (1). A small ensemble with special emphasis given to music in the jazz/swing idiom. Students must have two years college-level vocal jazz ensemble experience or equivalent. PREREQ: Department approval required.

MUS 344. MADRIGAL SINGERS (1). A small ensemble with emphasis on Renaissance vocal music and contemporary vocal music written in a madrigal style. Students must have two years college-level vocal ensemble experience or equivalent. PREREQ: Department approval required.

MUS 345. VOCAL ENSEMBLE: MISCELLANEOUS (1). Various small vocal chamber music ensembles. Students must have two years college-level vocal ensemble experience or equivalent. PREREQ: Department approval required.

MUS 350. SYMPHONIC BAND (1). A select ensemble of approximately 80 wind and percussion players. Performance winter and spring terms. Students must have two years college-level band experience or equivalent.

MUS 351. CONCERT BAND (1). Wind and percussion ensemble of approximately 70 players. Performance each term. Open to all students. Students must have two years college-level band experience or equivalent.

MUS 353. MARCHING BAND (1). A marching and playing unit of more than 160 musicians. Performs for home football games; one trip each year to an off-campus game. Students must have two years college-level band experience or equivalent.

MUS 354. BASKETBALL BAND (1). An ensemble of approximately 50 players. Performs for home games. Students must have two years college-level band experience or equivalent.

MUS 357. SMALL JAZZ ENSEMBLE (1). Concentration on current jazz styles. Performance each term. Students must have 2 years college-level jazz band experience or equivalent.

MUS 358. LARGE JAZZ ENSEMBLE (1). Concentration on current jazz styles. Performance each term. Students must have 2 years college-level jazz band experience or equivalent.

MUS 360. UNIVERSITY SYMPHONY ORCHESTRA (1). An ensemble of 65-80 players. Performance of orchestral repertoire from the 18th, 19th, and 20th centuries. Performance each term. Students must have two years college-level orchestra experience or equivalent. PREREQ: Department approval required.

MUS 363. ACCOMPANYING (1). Piano accompanying and chamber music skills, studio experience, and weekly performance class. Students must have two years college level ensemble or equivalent. COREQ: MUS 390 or MUS 490. PREREQ: Department approval required.

MUS 364. CHAMBER ENSEMBLE: STRINGS (1). Students must have two years college-level ensemble experience or equivalent. PREREQ: Department approval required.

MUS 365. CHAMBER ENSEMBLE: WOODWINDS (1). Students must have two years college-level ensemble experience or equivalent. PREREQ: Department approval required.

MUS 366. CHAMBER ENSEMBLE: BRASS (1). Students must have two years college-level ensemble experience or equivalent. PREREQ: Department approval required.

MUS 367. CHAMBER ENSEMBLE: PERCUSSION (1). Students must have two years college-level ensemble experience or equivalent. PREREQ: Department approval required.

MUS 368. CHAMBER ENSEMBLE: MISCELLANEOUS (1). Students must have two years college-level ensemble experience or equivalent. PREREQ: Department apporval required.

MUS 369. OPERA WORKSHOP (1). See Schedule of Classes for term offered. Students must have two years college-level vocal performance experience or equivalent. PREREQ: Department approval required.

MUS 399. SPECIAL STUDIES (1). Junior level. PREREQ: Department approval required.

MUS 401/MUS 501. RESEARCH (1). PREREQ: Department approval required.

MUS 402/MUS 502. INDEPENDENT STUDY (1). PREREQ: Department approval required.

MUS 403/MUS 503. THESIS (1). PREREQ: Department approval required.

MUS 405/MUS 405. READING AND CONFERENCE (1). PREREQ: Department approval required.

MUS 406/MUS 506. PROJECTS (1). PREREQ: Department approval required.

MUS 407/MUS 507. SEMINAR (1). PREREQ: Department approval required.

MUS 408/MUS 508. WORKSHOP (1). PREREQ: Department approval required.

MUS 410/MUS 510. INTERNSHIP (3). Provides experience in field settings, opportunity to develop personal and professional skills. May repeat up to 12 credits. See department for details. PREREQ: Department approval.

MUS 421. LITERATURE AND MATERIALS OF MUSIC (3). Study of 16th century polyphony through analysis and listening exercises in counterpoint and performance. PREREQ: MUS 223. Offered alternate years.

MUS 422. LITERATURE AND MATERIALS OF MUSIC (3). Study of musical style through analysis and listening exercises in counterpoint and performance. PREREQ: MUS 223. Offered alternate years.

MUS 423/MUS 523. LITERATURE AND MATERIALS OF MUSIC (3,3). A survey of western art music from 1945 to the present including techniques of analysis, musical form, composition, and ear training skills. PREREQ: MUS 223. Offered alternate years.

MUS 441. PERIOD STUDIES (3). Intensive study of music in the Baroque, Classic, Romantic, and Twentieth Century periods. See Schedule of Classes for topic. PREREQ: MUS 123.

MUS 442. GENRE STUDIES (3). Intensive study of selected genres, such as orchestra, chamber music, keyboard literature, vocal literature, music theatre, and opera. See Schedule of Classes for topic. PREREQ: MUS 123.

MUS 443/MUS 543. THEORY AND COMPOSITION STUDIES (3,3). Intensive study of selected subjects, such as analysis, composition, choral arranging, band arranging, and orchestration. See Schedule of Classes for topic. PREREQ: MUS 223.

MUS 444/MUS 544. PIANO PEDAGOGY (3,3). The study of basic principles of piano pedagogy.

MUS 499. SPECIAL STUDIES (1). PREREQ: Department approval required.

Graduate

MUS 516/MUS 517. ADVANCED CONDUCTING: C,3HORAL (3). Baton technique, interpretation and the study of major choral scores. PREREQ: MUS 317.

MUS 518/MUS 519. ADVANCED CONDUCTING: INSTRUMENTAL (3,3). Baton technique, interpretation and the study of major instrumental scores. scores. PREREQ: MUS 319.

MUS 540. OREGON STATE CHOIR (1). A select ensembe of 45-55 mixed voices. Performances each term. Annual tours. 500 level credit available only to students who can demonstrate proficiency and experience to peform at the graduate level. This will be evaluated by the instructor by audition.

MUS 541. PERIOD STUDIES (3). Intensive study of music in the Baroque, Classic, Romantic and Twentieth Century periods. See Schedule of Classes for topic. PREREQ: MUS 324.

MUS 542. GENRE STUDIES (3). Intensive study of selected genres, such as orchestra, chamber music, keyboard literature, vocal literature, music theatre, and opera. PREREQ: MUS 223.

MUS 550. SYMPHONIC BAND (1). A select ensemble of approximately 80 wind and percussion players. Performance winter and spring terms. 500-level credit available only to students who can demonstrate proficiency and experience sufficient to perform at the graduate level. This will be evaluated by the instructor by audition.

MUS 560. UNIVERSITY SYMPHONY ORCHESTRA (1). An ensemble of 65-80 players. Performance of orchestral repertoire from the 18th, 19th, and 20th centuries. Performance each term. 500 level credit available only to students who can demonstrate proficiency and experience to perform at the graduate level. This will be evaluated by the instructor by audition.

MUS 563. ACCOMPANYING (1). Piano accompanying and chamber music skills, studio experience and weekly performance class. 500 level credit available only to students who can demonstrate proficiency and experience sufficient to perform at the graduate level. This will be evaluated by the instructor by audition. COREQ: MUP 590.

MUS 568. CHAMBER ENSEMBLE: MISCELLANEOUS (1). 500 level credit available only to students who can demonstrate proficiency and experience to perform at the graduate level. This will be evaluated by the instructor by audition.

MUS 599. SPECIAL STUDIES (1). PREREQ: Department approval required.

■ MUSIC EDUCATION

Lower Division

MUED 277. INSTRUMENTAL TECHNIQUES (1). Section 1: High Brass; Section 2: Low Brass; Section 3: Single Reeds/Flute; Section 4: Double Reeds/Flute; Section 5: High Strings; Section 6: Low Strings; Section 7: Percussion. Basic instruction for each instrumental family. Emphasis is on techniques for teaching each group of instruments. Includes a survey and evaluation of instrumental methods texts. Emphasis on pedagogic skills as they relate to a beginning instrumentalist rather than upon performance skills.

Upper Division

MUED 372. SINGERS' DICTION I (2). Pedagogical methods for the teaching of Latin and English diction for solo and ensemble singers using the International Phonetic Alphabet. Offered alternate years.

MUED 373. SINGERS' DICTION II (2). Continuation of Singers' Diction I, emphasizing French and German diction. Offered alternate years.

MUED 401/MUED 501. RESEARCH (1-16). PREREQ: Department approval required.

MUED 402/MUED 502. INDEPENDENT STUDY (1-16). PREREQ: Department approval required.

MUED 405/MUED 505. READING AND CONFERENCE (1-16). PREREQ: Department approval required.

MUED 406/MUED 506. PROJECTS (1-16). PREREQ: Department approval required.

MUED 407/MUED 507. THEORY AND PRACTICUM SEMINAR (1-16). Taken concurrently with MUED 410.

MUED 408/MUED 508. WORKSHOP (1-16). PREREQ: Department approval required.

MUED 413. THEORY AND PRACTICUM: FIELD (1-16). Taken concurrently with MUED 407.

MUED 471/MUED 571. FUNDAMENTALS OF MUSIC FOR ELEMENTARY CLASSROOM TEACHERS (3). Music activities for elementary teachers in training. Introductory course designed to build musicianship through experiences which are developmentally appropriate to the teaching of music in the primary elementary classroom.

MUED 472/MUED 572. MUSIC FOR ELEMENTARY CLASSROOM TEACHERS (3). Continuation of MUED 471/MUED 571. Musical activities which are developmentally appropriate for the upper elementary classrooms. PREREQ: MUED 471/MUED 574.

MUED 473/MUED 573. ELEMENTARY METHODS I (3). Methods appropriate for music specialist to teach children from pre-primary through third grade. Presentation of Orff, Kodaly, and Education Through Music concepts; use of instruments and materials. PREREQ: MUED 472.

MUED 474/MUED 574. ELEMENTARY METHODS II (3). Continuation of MUED 473/573. Methods appropriate for music specialist to teach children from 4th through 8th grade. Introduction to vocal and instrumental ensembles, appropriate literature and available music technology. PREREQ: MUED 473/MUED 573.

MUED 475/MUED 575. INSTRUMENTAL ENSEMBLES AND THIER REPERTORY (3). Repertory of bands (including stage band) and orchestra in the high school and community; program planning and administration. PREREQ: MUS 326.

MUED 476. MARCHING BAND TECHNIQUES. (1). Marching styles, show design and music selection.

MUED 477/MUED 577. CLASSROOM INSTRUMENTAL TECHNIQUES (2). A brief overview of fundamental principles and playing techniques of brass, percussion, string, and woodwind instruments designed for the choral music educator who uses instrumental accompaniment or conducts an instrumental ensemble. PREREQ: MUS 222, MUS 234, MUS 319.

MUED 478/MUED 578. TECHNIQUES FOR THE VOCAL INSTRUCTOR (2). Vocal techniques for the public school music teachers. Offered alternate years. PREREQ: MUS 185 or permission of instructor.

MUED 479/MUED 579. THE CHOIR AND ITS REPERTORY (3). Repertory of choral groups in the high school, church and community; program planning and administration. PREREQ: MUS 222, MUS 234, MUS 319.

MUED 499/MUED 599. SPECIAL STUDIES (1). PREREQ: Departmental approval.

Graduate

MUED 510. INTERNSHIP (1-15). Full-time field experience in which the intern will integrate academic study with classroom teaching experience to learn specific competencies relating to functioning well in the context of the classroom and the school, and demonstrate this competency through the assessment of work by supervisors and by evidence collected and presented in work samples. PREREQ: Admission to the M.A.T. Program. 3 credits of seminar (MUED 507) must be taken concurrently with this course; see Schedule of Classes for specific course designator for seminar.

MUED 591. FOUNDATIONS OF MUSIC EDUCATION (3). Overviewing music education topics for music teachers in training, including purposes and foundations of music education, and introduction to research applicable to the teaching of music. Required course for MAT program.

MUED 592. FOUNDATIONS OF MUSIC EDUCATION II (3). Music education topics for music teachers in training including research applicable to the teaching of music curricular designs and curricular development in public music education. Required course for MAT Program. PREREQ: MUED 591.

MUED 593. MUSIC TECHNOLOGY (3). Specific applications for teaching music incorporating appropriate software and hardware for curricular integration and curricular evolution.

MUED 594. ADVANCED MUSIC TECHNOLOGY (3). Continuation of MUED 593. Technological applications relevant to music education. PREREQ: MUED 593 or instructor consent.

■ STUDIO INSTRUCTION

Lower Division

MUP 160. INDIVIDUAL LESSONS: BEGINNING PIANO (1-2).

MUP 161. INDIVIDUAL LESSONS: BEGINNING STRINGS (1-2).

MUP 162. INDIVIDUAL LESSONS: BEGINNING BRASS (1-2).

MUP 163. INDIVIDUAL LESSONS: BEGINNING WOODWINDS (1-2).

MUP 170. INDIVIDUAL LESSONS: INTERMEDIATE PIANO (1-2).

MUP 171. INDIVIDUAL LESSONS: INTERMEDIATE STRINGS (1-2).

MUP 172. INDIVIDUAL LESSONS: INTERMEDIATE BRASS (1-2).

MUP 173. INDIVIDUAL LESSONS: INTERMEDIATE WOODWINDS (1-2).

MUP 177. GROUP LESSONS: BEGINNING PIANO I (1-2).

MUP 178. GROUP LESSONS: BEGINNING PIANO II (1-2).

MUP 179. GROUP LESSONS: BEGINNING PIANO III (1-2).

MUP 190. INDIVIDUAL LESSONS: KEYBOARD (1-2). PREREQ: Department approval required.

MUP 191. INDIVIDUAL LESSONS: VOICE (1-2). PREREQ: Department approval required.

MUP 192. INDIVIDUAL LESSONS: STRINGS (1-2). PREREQ: Department approval required.

MUP 193. INDIVIDUAL LESSONS: WOODWINDS (1-2). PREREQ: Department approval required.

MUP 194. INDIVIDUAL LESSONS: BRASS (1-2). PREREQ: Department approval required.

MUP 195. INDIVIDUAL LESSONS: PERCUSSION (1-2). PREREQ: Department approval required.

MUP 196. INDIVIDUAL LESSONS: MISCELLANEOUS (1-2). PREREQ: Department approval required.

MUP 290. INDIVIDUAL LESSONS: KEYBOARD (1-2). PREREQ: Department approval required.

MUP 291. INDIVIDUAL LESSONS: VOICE (1-2). PREREQ: Department approval required.

MUP 292. INDIVIDUAL LESSONS: STRINGS (1-2). PREREQ: Department approval required.

MUP 293. INDIVIDUAL LESSONS: WOODWINDS (1-2). PREREQ: Department approval required.

MUP 294. INDIVIDUAL LESSONS: BRASS (1-2). PREREQ: Department approval required.

MUP 295. INDIVIDUAL LESSONS: PERCUSSION (1-2). PREREQ: Department approval required.

MUP 296. INDIVIDUAL LESSONS: MISCELLANEOUS (1-2). PREREQ: Department approval required.

Upper Division

MUP 390. INDIVIDUAL LESSONS: KEYBOARD (1-2). PREREQ: Department approval required.

MUP 391. INDIVIDUAL LESSONS: VOICE (1-2). PREREQ: Department approval required.

MUP 392. INDIVIDUAL LESSONS: STRINGS (1-2). PREREQ: Department approval required.

MUP 393. INDIVIDUAL LESSONS: WOODWINDS (1-2). PREREQ: Department approval required.

MUP 394. INDIVIDUAL LESSONS: BRASS (1-2). PREREQ: Department approval required.

MUP 395. INDIVIDUAL LESSONS: PERCUSSION (1-2). PREREQ: Department approval required.

MUP 396. INDIVIDUAL LESSONS: MISCELLANEOUS (1-2). PREREQ: Department approval required.

MUP 490. INDIVIDUAL LESSONS: KEYBOARD (1-2). PREREQ: Department approval required.

MUP 491. INDIVIDUAL LESSONS: VOICE (1-2). PREREQ: Department approval required.

MUP 492. INDIVIDUAL LESSONS: STRINGS (1-2). PREREQ: Departmet approval required.

MUP 493. INDIVIDUAL LESSONS: WOODWINDS (1-2). PREREQ: Department approval required.

MUP 494. INDIVIDUAL LESSONS: BRASS (1-2). PREREQ: Department approval required.

MUP 495. INDIVIDUAL LESSONS: PERCUSSION (1-2). PREREQ: Department approval required.

MUP 496. INDIVIDUAL LESSONS: MISCELLANEOUS (1-2). PREREQ: Department approval required.

Graduate

MUP 590. INDIVIDUAL LESSONS: KEYBOARD (1-2). PREREQ: Department approval required.

MUP 591. INDIVIDUAL LESSONS: VOICE (1-2). PREREQ: Department approval required.

MUP 592. INDIVIDUAL LESSONS: STRINGS (1-2). PREREQ: Department approval required.

MUP 593. INDIVIDUAL LESSONS: WOODWINDS (1-2). PREREQ: Department approval required.

MUP 594. INDIVIDUAL LESSONS: BRASS (1-2). PREREQ: Department approval required.

MUP 595. INDIVIDUAL LESSONS: PERCUSSION (1-2). PREREQ: Department approval required.

MUP 596. INDIVIDUAL LESSONS: MISCELLANEOUS (1-2). PREREQ: Department approval required.

NATURAL RESOURCES

The College of Liberal Arts, in cooperation with the Colleges of Agricultural Sciences, Forestry, and Science, participates in offering a broad-based B.S. degree in Natural Resources. A student enrolls in the department most related to the specialty area he or she selects under the Natural Resources Program. See the Interdisciplinary studies Section of this catalog for curriculum details.

PEACE STUDIES

C/O Speech Communication
Shepard Hall 104
Oregon State University
Corvallis, OR 97331-6199
(503) 737-2461

Faculty

Associate Professor Gregg Walker

Certificate Program

Peace Studies

The Peace Studies Program offers undergraduate and graduate students focused, planned study of issues of conflict, peace, and war. The program includes hourly requirements roughly equivalent to an academic minor, leading to a certificate of peace studies.

The program promotes study in a number of areas, including (a) individual, cultural, systemic, and structural dimensions of conflict and conflict management; (b) personal, social, and international behavior; (c) alternative theories of change; (d) issues of war and peace; and (e) dispute resolution. Core and elective courses come from the Departments of Anthropology, Economics, Geography, History, Philosophy, Political Science, Psychology, Sociology, and Speech Communication.

CERTIFICATE CURRICULUM

To earn a peace studies certificate, students must complete a minimum of 30 credits consisting of 12 credits minimum of core courses and 18 credits of elective courses.

CORE REQUIREMENTS (12)

PAX 201. Study of Peace & Causes of Conflict (3)

Select three of the following:

COMM 440. Theory of Conflict & Conflict Mgmt (3)
SOC 421. Social Change and Modernization (3)
HST 317. Why War: A Historical Perspective (3)
PS 205. Intro to International Relations (3)
PSY 468. Intl Behavior and Pol Psych (3)

Select 18 credits from two of the following areas:

(1) Theory, Research, and Practices in Peace (PAX courses)
(2) Processes of Change, Development, and Modernization
(3) Economic Dimensions of Peace and Conflict;
(4) Historical Dimensions of Peace and Conflict;
(5) Political Dimensions of Peace and Conflict; and
(6) Behavioral Dimensions of Peace and Conflict.

COURSES

Lower Division

PAX 201. STUDY OF PEACE AND THE CAUSES OF (3). Examination of the causes of personal, social, and institutional conflict and peaceful, constructive means of dealing with conflict. The history and current status of peace movements within the outside governments; prospects for world peace. Case studies in peace and conflict. (SS)

Upper Division

PAX 402/PAX 502. INDEPENDENT STUDY (1). Individual basic and applied study projects on peace-related issues, designed in consultation with the Peace Studies Program director or a member of the Peace Studies faculty.

PAX 405/PAX 505. READING AND CONFERENCE (1). Study supervised and directed by members of the Peace Studies Program committee or approved faculty, as arranged by the student and Peace Studies Program director.

PAX 407/PAX 507. SEMINAR (1). Close examination of peace-related topics, including theory, method, research, and application. May be taken more than one time as topics vary.

PAX 410/PAX 510. PEACE STUDIES INTERNSHIP (1). Directed, supervised, and evaluated field work, to supplement the students classroom work, arranged one term in advance.

PAX 415/PAX 515. TOPICS IN PEACE STUDIES (1). Selected topics relevant to the study of conflict, peace, and war. May be taken more than one time as topics vary.

PHILOSOPHY

Kathleen D. Moore, Chair
Computer Science Building 208
Oregon State University
Corvallis, OR 97331-3902
(503) 737-2955

Faculty
Professors Borg, Leibowitz, List; *Associate Professors* Campbell, Hosoi, Moore, Scanlan, Uzgalis; *Assistant Professor* Pacheco, Ramsey; *Senior Instructor* Roberts

Undergraduate Major
Philosophy (B.A., B.S.)
Minor
Philosophy (for nonmajors)

The Department of Philosophy offers an undergraduate program leading to the B.A. or B.S. degree, a minor program and a certificate in Applied Ethics; and participates in the graduate program in Interdisciplinary Studies (M.A.I.S.) through the Graduate School.

The department also teaches general education courses for students interested in broadening their intellectual horizons, developing their abilities for intellectual criticism, and enlarging their understanding of social, ethical, religious, and aesthetic values in contemporary society and in world history.

An undergraduate degree in philosophy provides a broad education and intellectual skills useful in many occupations and is not a preparation for a specific job or vocation. The undergraduate major program also offers valuable background for graduate study in philosophy, and for advanced study in such professional fields as law and public service. The department invites students to combine a serious study of philosophy with the study of another discipline, by earning concurrent degrees.

For the philosophy minor, students may specialize in such areas as logic, philosophy of science, history of philosophy, philosophy of religion, contemporary philosophy, ethics, political philosophy, and philosophy of the arts. In addition the department offers a minor concentration in prelaw studies which includes courses relevant to the law.

MAJOR PROGRAM (44)

History of Philosophy:
PHL 301 and PHL 302, plus one of the following: PHL 303, 311, 312, 313, 315, PHL 371, PHL 372, PHL 373, PHL 411, PHL 412
Contemporary Philosophy–select two courses:
PHL 316, PHL 331, PHL 333, PHL 390, PHL 433, PHL 436, PHL 445, PHL 446, PHL 451, PHL 455, HL 470,or PHL 490
Upper Division Value Theory–select one course:
PHL 342, PHL 360, PHL 365, PHL 440, PHL 441, PHL 443, PHL 444, PHL 447 or PHL 460
Logic–select one course:
PHL 320, PHL 321, PHL 327, or PHL 421
Seminar–select one course:
PHL 407
400-Level Elective: Select one course
General electives:
As many as needed to complete total credit requirement.

B.S. Requirement
12 credits in computer science and quantitative studies.

MINOR (27)

History of Philosophy–Select one course from:
PHL 301, PHL 302, or PHL 303
Logic–Select one course from:
PHL 101, PHL 121, PHL 320, PHL 321, PHL 327, or PHL 421
Electives:
As many as needed to complete total credit requirement. Total must include 12 credits of upper division.

Students must arrange a minor area of concentration with the approval of a faculty adviser.

APPLIED ETHICS CERTIFICATE (28)

The undergraduate certificate in applied ethics builds upon the various courses in ethics taught in the Department of Philosophy and courses with ethics-related content found throughout the university in order to provide students with a systematic and thorough understanding of the moral world for their civic, professional and personal lives.

Students pursuing a major in any academic or professional field may also pursue applied ethics for educational interest and for professional preparation. The certificate would add a critical philosophical dimension to students' understanding of their professional aspirations.

Students seeking a baccalaureate degree at OSU will earn a certificate in applied ethics by completing a minimum of 28 credits of approved course work.

Core Requirements
PHL 205. Ethics (4)
Any listed PHL course (3-4)
9 credits from any of the following courses:
PHL 280. Ethics of Diversity (4)
PHL 342. Contemporary Ethics (4)
PHL 405. Reading/Conference (3)
PHL 440. Environmental Ethics (3)
PHL 443. Worldviews/Environ. Ethics (3)
PHL 444. Bioethics (3)
PHL 470. Philosophy of Science (3)
PHL 490. Ethical Issues in Science (3)

Educational Concentrations & Electives: A minimum of 12 credits of applied ethics will be required beyond the core courses. There are three concentrations available:
Ethics and Scientific Inquiry
Ethics and the Environment
Ethics, Health and Medicine

The student's academic adviser and faculty of the Program of Ethics, Science, and the Environment will assist students in course selection from a list available in the philosophy department.

COURSES

Lower Division

PHL 101. CRITICAL THINKING (4). Analysis of arguments, basic patterns of inductive and deductive reasoning, logical relations, and logical fallacies. Intended to improve analytical, critical and reasoning skills.

PHL 121. *^REASONING AND WRITING (3). Develops critical thinking skills to increase clarity and effectiveness of student writing; uses writing experiences to teach critical thinking skills. Subjects include identifying and evaluating arguments, analyzing assumptions, justifying claims with reasons, avoiding confused or dishonest reasoning, applying common patterns of reasoning in everyday contexts, and writing cogent complex arguments. (Bacc Core Course)

PHL 150. *GREAT IDEAS IN PHILOSOPHY (3). Philosophy explores the assumptions and deeper meanings of familiar concepts and experiences. This course is an introduction to some basic and famous ideas in Western philosophy. Topics may include truth, beauty, infinity, perception, freedom, pleasure, knowledge, mind and body, morality, justice, and political authority. The course is team-taught by philosophers with expertise in different areas of philosophy. (Bacc Core Course)

PHL 160. *QUESTS FOR MEANING: WORLD RELIGIONS (4). A survey and analysis of the search for meaning and life fulfillment represented in major religious traditions of the world, such as Hinduism, Buddhism, Taoism, Zen, Confucianism, Judaism, Christianity, and Islam. (Bacc Core Course)

PHL 199. SPECIAL STUDIES (1-4). Course may be repeated as appropriate.

PHL 201. *INTRODUCTION TO PHILOSOPHY (4). An in-depth introduction to the methods and ideas of Western philosophy, concentrating on such great figures as Socrates, Plato, Aristotle, Descartes, Kant and Nietzsche and such topics as the nature of reality, the existence of God, knowledge and doubt, the relation of consciousness to the world, free will and determinism, good and evil, and minds and machines. Philosophers and ideas covered will vary by the section. Written assignments are required. (Bacc Core Course)

PHL 205. *ETHICS (4). Introduction to ethical theory and to the evaluation of ethical issues in society such as sexual ethics and euthanasia. Includes the study of philosophical theories of moral responsibility and moral virtue, and the philosophical ideas behind ethics debates in society. Students are encouraged to develop their own positions on ethical issues, through discussion projects and term papers. (Bacc Core Course)

PHL 207. *POLITICAL PHILOSOPHY (4). Introductory study of the philosophical justifications of political systems and philosophical theories about the rights and obligations of citizens and governments. (Bacc Core Course)

PHL 220. *WORLD-VIEWS AND VALUES IN THE BIBLE (4). A study of central portions of the Bible (in the Old Testament: Torah, prophets, and wisdom; in the New Testament: Jesus, gospels, and letters) from the perspective of the academic discipline of the biblical scholarship, exploring the philosophical questions of the relationships between story, myth, thought, values, and understandings of life. (Bacc Core Course)

PHL 230. *CHRISTIANITY AND WESTERN CULTURE (4). An introduction to tradition, emphasizing the relationship between Christian construals of reality and culture, from the early church in the Roman Empire through the medieval synthesis to the birth of the modern world in the Reformation and Enlightenment. Not offered every year. (Bacc Core Course)

PHL 280. ETHICS OF DIVERSITY (4). Uses moral philosophy to examine difference-based discrimination and prejudice in the human community. (Bacc Core Course)

Upper Division

PHL 301, PHL 302, PHL 303. *HISTORY OF WESTERN PHILOSOPHY (4). A study of the history of Western philosophy from the early Greeks into the twentieth century. Designed to give an appreciation and understanding of the Western philosophical tradition and the philosophical foundations of Western civilization. May be taken independently. **PHL 301:** Greek and Roman Philosophy. **PHL 302:** The rise of modern Philosophy through Kant. **PHL 303:** Nineteenth and early twentieth century philosophy. PREREQ: 3 credits of philosophy recommended. (Bacc Core Course)

PHL 311, PHL 312, PHL 313. *HISTORY OF NON-WESTERN RELIGIOUS IDEAS (4,4,4). Study of ideas, beliefs, moral values, and comprehensive attitudes toward life through the history of religions. PHL 311: Before Philosophy; Prehistoric and primitive religions, Egypt, Mesopotamia, Greece, and India. PHL 312: Far East; Sankhya Yoga, Jainism, Buddhism, Taoism, Confucianism, Mohism, and Shinto. PHL 313: Near East, Zoroastrinism, Judaism, Christianity, mystery religions, and Islam. PREREQ: 3 credits of philosophy recommended. (Bacc Core Course)

PHL 315. PRECOLUMBIA PHILOSOPHY (4). Philosophical and religious thought and social structure in Mesoamerica prior to the European arrival. Focus primarily on the Maya civilizations of Guatemala and Mexico during the Classic Period, with some attention to Olmecs, Toltecs, Aztecs and other indigenous societies.

PHL 316. INTELLECTUAL ISSUES OF MEXICO AND MEXICAN AMERICANS (4). The philosophical, social, cultural, and political reality of Mexican Americans and their historical roots in Mexico since the Spanish Conquest. Analysis of internal colonialism, racism, machismo, fatalism, alienation, cultural identity, as well as more contemporary issues including NAFTA, immigration and U.S.-Mexican relations.

PHL 320. LEGAL REASONING (4). A study of legal reasoning—the kinds of arguments judges give, the relationship between the reasons and the decisions, and the adequacy of these reasons as support for the decision. Designed to improve the students analytical skills, especially those required for law school. PREREQ: Upper division standing, appropriate placement, or PHL 101. Offered every other year.

PHL 321. DEDUCTIVE LOGIC (4). Development of formal language and deductive system for first-order, quantificational logic. Emphasis on translation of ordinary English statements into formal language. Discussion of the contrast between semantic and syntactic treatment of logical concepts. PREREQ: Upper class standing or PHL 101.

PHL 331. CONTEMPORARY ANALYTIC PHILOSOPHY: RU (4). Major movements and topics in 20th Century analytic philosophy such as logical analysis, logical positivism, and conceptual analysis; Russell, Moore, Austin and Quine; theory of descriptions; status of ethics and metaphysics; and philosophy of language. PREREQ: 3 credits of philosophy. Not offered every year.

PHL 342. CONTEMPORARY ETHICS (4). A study of significant ethical developments and issues in contemporary society, including ethical principles and concepts behind social debates on such matters as sexual ethics, abortion, discrimination, the uses of animals in scientific research, and responsibilities of corporations. REC: PHL 205. Offered every other year.

PHL 360. *PHILOSOPHY AND THE ARTS (4). Major philosophical theories about art and its meaning, from ancient to modern times. How philosophers have understood beauty, the imagination, art and knowledge, art and pleasure, art and emotion. REC: 3 credits of philosophy, or upper division standing. Offered every other year. (Bacc Core Course)

PHL 365. *LAW IN PHILOSOPHICAL PERSPECTIVE (4). A study of philosophical issues in the law through the examination of legal cases and major essays in jurisprudence. Special attention given to concepts of justice, responsibility, liberty, law, and legal ethics. PREREQ: 3 credits of philosophy or upper division standing. Offered every other year. (Bacc Core Course)

PHL 371. *PHILOSOPHIES OF CHINA (4). A study of the traditional philosophies of China, including Confucianism, Taoism, Mohism, Legalism, and Buddhism. PREREQ: 3 credits of upper division philosophy. Not offered every year. (Bacc Core Course)

PHL 372. *PHILOSOPHIES OF INDIA (4). A study of the traditional philosophies of India, including Hinduism, Jainism, and Buddhism. PREREQ: 3 credits of upper division philosophy. Not offered every year. (Bacc Core Course)

PHL 373. *PHILOSOPHIES OF JAPAN (4). Introduction to philosophies of Japan from the Nara period to the present, including such thinkers as Kukai, Saicho, Honen, Shinran, Dogen, Nichiren, Jinsai, Norinaga, and Nichida. PREREQ: 3 credits of upper division philosophy. Not offered every year. (Bacc Core Course)

PHL 390. SPECIAL TOPICS IN PHILOSOPHY (4). Examination of the work of a philosopher or of a specific philosophical problem; e.g., Wittgenstein, determinism, perception, philosophy of mind. REC: 3 credits of upper division philosophy. Not offered every year. Course may be repeated as appropriate.

PHL 402/PHL 502. INDEPENDENT STUDY (1-16).

PHL 405/PHL 505. READING AND CONFERENCE (1-16).

PHL 407/PHL 507. ^SEMINAR (1-4). (Writing intensive course)

PHL 411/PHL 511. GREAT FIGURES IN PHILOSOPHY (4). Study of the works of major philosophers such as Plato, Aristotle, Descartes, Hume, Kant, and Marx. Each course normally devoted to the work of a single figure. PREREQ: 6 credits of philosophy. Need not be taken in sequence. Not offered every year.

PHL 417/PHL 517. FEMINIST PHILOSOPHIES (3). Diverse forms of feminist philosophy, including a variety of critiques, especially those based on race and class w/in-depth consideration of selected social issues such as rape and pornogrphy. PREREQ: 6 credits of philosophy or upper division standing.

PHL 421/PHL 521. MATHEMATICAL LOGIC (3). Rigorous definition of a formal logic and investigation of its characteristics. Emphasis on the distinction and relation between semantic and syntactic methods (model theory and proof theory) and on the meta-mathematical analysis of axiomatic theories. PREREQ: PHL 321,PHL 327, or 6 credits of 400-level mathematics or computer science. Not offered every year.

PHL 436/PHL 536. PHILOSOPHY AND RELIGION (3). Examination of significant philosophical issues or movements and their relationship to theology and religion. PREREQ: 6 credits of philosophy.

PHL 440/PHL 540. ENVIRONMENTAL ETHICS (3). Philosophical ideas about our ethical relationships to the land, with applications to current environmental issues. Includes a study of different conceptions of environmental ethics; philosophical problems in environmental ethics, such as the "rights" of animals and plants; the uses of environmental ethics by environmental groups; and selected contemporary issues on the "environmental front." PREREQ: PHL 205, PHL 342, PHL 365 or 6 credits of philosophy.

PHL 441/PHL 541. CLASSICAL ETHICAL THEORIES (3). Philosophical issues in ethics analyzed through the examination of such classical works in moral philosophy as Aristotles Nichomachean Ethics. PREREQ: either PHL 205,PHL 342,PHL 440, or one course in the history of philosophy. Not offered every year.

PHL 443/PHL 543. *WORLD-VIEWS AND ENVIRONMENTAL VALUES (3). A comparative study of world-views (secular and religious, western and eastern, modern and ancient) and how they affect concepts of nature, environmental values, and selected environmental issues. (Bacc Core Course)

PHL 444/PHL 544. *BIOETHICS (3). Application of ethical principles to selected problems in medicine, the life sciences, and biotechnology, such as euthanasia, reproductive technologies, organ transplants, allocation of medical resources, AIDS, and the professional-patient relationship. Releates social, legal, economic and technological dimensions to ethical decision making. PREREQ: 3 credits of upper division courses in related fields. (Bacc Core Course)

PHL 445/PHL 545. WORLD-VIEWS AND VALUES (3). A multidisciplinary and cross-cultural study of the relationships between world views, values, and the origin and nature of critical issues and problems of global significance. PREREQ: 6 credits of philosophy of upper division standing.

PHL 447/PHL 547. ETHICAL ISSUES IN SCIENCE (3). An examination of the interrelationship between ethical values and scientific practice. Topics include professionalism in science; scientific integrity, misconduct, and whistleblowing; the ethics of authorship; conflicts of interest between academic science and commercial science, and social responsibilities in science.

PHL 451/PHL 551. KNOWLEDGE AND REALITY (3). Examination of significant theories of knowledge, theories concerning the nature of reality, and their connections. Includes an analysis of important concepts and problems, such as perception, induction, belief, empiricism, rationalism, and skepticism. PREREQ: 6 credits of philosophy. Not offered every year.

PHL 455/PHL 555. DEATH AND DYING (3). A multidisciplinary study of cultural, philosophical, and religious perspectives on death, dying, and grieving. PREREQ: 6 credits of philosophy or upper division standing. Not offered every year.

PHL 460/PHL 560. STUDIES IN AESTHETICS (3). An in-depth examination of a selected issue in the philosophy of art. The topic will vary: a recurring theme will be the relation of the aesthetic theories of the past to present-day issues and controversies. Topics include art, pleasure, the imagination, aesthetic perception, the sublime and the beautiful, art and illusion, picturing, mass art/high art. PREREQ: Upper division standing, PHL 360 or 6 credits of philosophy. Not offered every year.

PHL 470/PHL 570. PHILOSOPHY OF SCIENCE (3). Examination of philosophical questions, classic and contemporary, about science and scientific knowledge. Scientific explanations, the structure of theories, the concept of a natural law, revolutions in science, influences of the sciences and philosophy on one another, science and values. PREREQ: 6 credits of philosophy (upper division philosophy recommended). Not offered every year.

PHL 490/PHL 590. TOPICS IN CONTEMPORARY PHILOSOPHY (3). Examination of the work of a contemporary philosopher or of a specific contemporary problem; e.g., Wittgenstein, determinism, perception. PREREQ: 6 credits of upper division philosophy. Not offered every year. Course may be repeated as appropriate.

POLITICAL SCIENCE

James C. Foster, Chair
Social Science 307
Oregon State University
Corvallis, OR 97331-6206
(503) 737-2811

Faculty

Professors Clinton, Dealy; *Associate Professors* Foster, Lunch, Sahr, Shepard; *Assistant Professors* Davenport, Terrio; *Instructors* Banducci, Ferrara

Undergraduate Major

Political Science (B.A., B.S.)

Minor

Political Science

The Department of Political Science offers both a major and minor program; the major program leads to the B.A. or the B.S. degree. Course work in several subfields is offered, including American politics, public policy, public law, public administration, political theory, state and local government, international relations, women and politics, and comparative politics (for example, Latin America, Western Europe, Russia).

Either directly or after graduate study, political science graduates pursue careers in law, foreign service, management (all levels of government), international organizations, journalism, university teaching, research, political office, and—as with many other liberal arts graduates—in business.

Political Science majors must complete core requirements stated below. They may then choose either to concentrate in one or two subfields or to seek breadth by taking courses in a number of the subfields.

Political Science majors are encouraged to incorporate into their studies a minor in other social science fields such as economics, psychology, or sociology, or in a field of interest related to their specialization in political science. For example, students with interest in international relations or comparative politics may choose to minor in a language or in history, emphasizing a specific part of the world.

The Political Science Department also participates in the Master of Arts in Interdisciplinary Studies (M.A.I.S.) degree program. (See Graduate School.)

Major Requirements

Students selecting a major in Political Science must complete 50 credits of political science course work, of which at least 35 credits must be upper division. They must also complete PS 101, PS 102, PS 300, the political field work requirement (see below), and one upper division course from each of the following sets of fields:

- American national politics, public law, state and local politics, public policy and public administration;
- comparative politics, international relations;
- political philosophy.

PS 300 and the one course in political philosophy must be passed with a grade of "C" or better. Students may fulfill the political field work requirement one of three ways: (1) PS 398; (2) PS 406/410; (3) by petitioning the department to accept other field political experiences.

Candidates for a B.A. degree must complete the University foreign language requirement. Students pursuing a B.S. degree must complete 12 credits in computer science and quantitative studies as follows:

1. Computer science (4 credits), and
2. One of the following options (8 credits):
   a. MATH 111 and MTH 112 (8).
   b. ST 201, ST 209, and ST 352 (8).
   c. One of the following MTH 241, MTH 251, or MTH 252 (4). Students electing this option must take an additional 4 credits in any MTH, CS, or ST course.

Students with interest in graduate study are advised to acquire competence in statistics and computer data processing.

No more than 12 credits from PS 402-PS 406 and PS 408 or PS 410 may be applied to the major.

Minor Requirements

Students selecting a minor in political science must complete 27 credits of political science, of which at least 18 must be upper division. They also must complete PS 101 and PS 102. Five minor areas are available: a general minor, and specialized minors in American Government and Politics, Public Law, International Affairs, Public Policy and Public Administration. Descriptions of the minors are available from the Political Science Department. When declaring with the Registrar a Political Science minor, a student may request that the transcript identify the specific minor.

No more than 6 credits from PS 402-PS 406 and PS 408 or PS 410 may be applied to the minor.

Courses

Lower Division Courses

PS 101. *AMERICAN POLITICS (4). Analysis and description of the American Constitution, federalism, civil rights and liberties, interest groups, parties, elections, and the role of the media. (PS 101 and PS 102 form a sequence, though either may be taken independently of the other.) (SS) (Bacc Core Course)

PS 102. *AMERICAN GOVERNMENT (4). Analysis and description of the structure and functions of the American presidency, Congress, bureaucracy, and courts. (PS 101 and PS 102 form a sequence, though either may be taken independently of the other.) (SS) (Bacc Core Course)

PS 200. *INTRODUCTION TO POLITICAL SCIENCE (4). Assumptions, concerns, and major concepts in political science. Includes historical developments and subjects in political philosophy but emphasizes modern concepts and empirical questions. (SS) (Bacc Core Course)

PS 203. STATE AND LOCAL GOVERNMENT (4). Role, organization, and functions of government at the state and local level in the United States. Satisfies teaching certification requirements for course work in state and local government. (SS)

PS 204. INTRODUCTION TO COMPARATIVE POLITICS (4). Major concepts of comparative politics applied to various political settings; the United States, Western Europe, Communist regimes, and developing countries. (SS)

PS 205. INTRODUCTION TO INTERNATIONAL RELATIONS (4). Analysis of the international system and factors affecting world politics. REC: PS 101 or PS 102. (SS)

PS 206. *INTRODUCTION TO POLITICAL THOUGHT (4). Introduction to political philosophy. Major ideas and issues of selected political thinkers. (SS) (Bacc Core Course)

PS 299. SPECIAL STUDIES (1-4). Department approval required.

Upper Division Courses

Courses numbered 500 and above may be taken for graduate credit.

PS 300. POLITICAL ANALYSIS (5). Structure of the discipline and empirical research methods. Roles of values, theory, hypotheses, statistics, data collection techniques, and politics of knowledge. (Lab required.)

PS 311. LEGISLATIVE POLITICS (4). Congressional (and state legislative) politics, both on Capitol Hill and in the district, including campaigns, constituent relations, lobbying, legislating, and the legislature in democratic theory. REC: PS 101 or PS 102.

PS 312. PRESIDENTIAL POLITICS (3). Office, powers, and politics of the American presidency, with reference to other executive offices in American government; emphasis on the importance and effect of the presidency in American politics. REC: PS 101 and PS 102.

PS 313. POLITICAL PARTIES AND ELECTIONS (3). Political parties and elections, the electorate and voting behavior, electoral system, exercise of the suffrage, extent and consequences of voter participation. REC: PS 101 and PS 102.

PS 316. PUBLIC OPINION AND POLITICS (4). Examination of methods of study, formation, and content of public opinion and of its effect on elections and politics, government operations, and public policy, primarily in the United States. REC: PS 101.

PS 317. GENDER AND POLITICS (4). Sources, ideas, and organization of the womens movement in the United States and its impact on public policy. REC: PS 101.

PS 321, PS 322, PS 323. AMERICAN CONSTITUTIONAL LAW (4,4,4). PS 321: The Supreme Court's work from 1789 to 1900; origins of judicial power, issues of federalism, contract clause, status of blacks, women, and native Americans. **PS 322:** The Supreme Court's work from 1900 to 1960; economic substantive due process, judicial formalism, incorporation doctrine, rise of administrative state, beginnings of Second Reconstruction. **PS 323:** The Supreme Court's work from 1960 to the present; status of women and racial minorities, freedom of expression versus social order, defendant's rights versus crime control, privacy issues, law and social change. PREREQ: PS 102. Must be taken in sequence.

PS 331. STATE GOVERNMENT AND POLITICS (3). Importance of states in total governmental process; role of the legislative, executive, judicial branches in shaping state government. Satisfies teaching certification requirement for course work in state and local government. REC: PS 203.

PS 340. EASTERN AND CENTRAL EUROPEAN POLITIC (4). Analyzes domestic and international politics in Central and Eastern Europe, focusing on the period since WW II. Particular attention will be paid to the establishment and dissolution of the Soviet bloc; the interplay of Soviet foreign policy and domestic politics in the various states; and comparisons of domestic political structures, especially since 1989.

PS 341. POLITICAL SYSTEMS OF WESTERN EUROPE (4). Comparative analysis of contemporary institutions of governmental power in Western Europe; political tradition, process, stability and change, subsystems of leadership, political integration, and interest formation. REC: PS 204.

PS 342. THE SOVIET AND POST-SOVIET POLITICAL SYSTEM I (4). Background, formation, and development of the Soviet political system from 1917 up to the Brezhnev era. PREREQ: PS 204.

PS 343. THE SOVIET AND POST-SOVIET POLITICAL SYSTEM II (4). Soviet politics since the Brezhnev era; analysis of current politics based on understanding of past problems and patterns of development. PREREQ: PS 204 and PS 342.

PS 344. LATIN AMERICAN POLITICS (4). Exploration of the region's political culture and of the forces contending for maintenance of the status quo, for reform and for revolution. REC: PS 204.

PS 345. *THE POLITICS OF DEVELOPING NATIONS (4). Different types of governments in the developing nations and how they have confronted the major economic, cultural, and political problems posed by the process of modernization. REC: PS 204. (NC) (Bacc Core Course)

PS 346. ASIAN GOVERNMENT AND POLITICS (4). Comparative analysis of contemporary Asian institutions; political tradition, process, stability and change, leadership, political integration, and interest formation. REC: PS 204.

PS 361. CLASSICAL POLITICAL THOUGHT (4). Major political theorists from the pre-Socratics through the Scholastics. REC: PS 206

PS 362. MODERN POLITICAL THOUGHT (4). Major political theorists from the Renaissance to the mid-nineteenth century. REC: PS 206.

PS 364. MARXISM-LENINISM (4). A review of Marxism-Leninism and its relationship to Bolshevik Revolution and early development of Soviet political-economic system.

PS 371. PUBLIC POLICY PROBLEMS (4). The content and the politics of adoption and application of such policy areas as defense, poverty and welfare, macroeconomics, and regulation. REC: PS 101,PS 102.

PS 398. PRACTICAL POLITICS (3). Exprience in such political activities as voter registration, electoral campaigns, lobbying, and voter education in such organizations as the Oregon Student Lobby, or the Center for National Independence in Politics. Department approval required for all practical political experiences is required. Required discussion group.

PS 399. CURRENT PROBLEMS IN POLITICS (1-4). Selected issues of recent American and international concern, such as Vietnam, Central America, or similar. Course may be repeated when topics vary. (Civil Rights Movement section is Difference, Power and Discrinimation coure.)

PS 402/PS 502. INDEPENDENT STUDY (1-16). Department approval required.

PS 403/PS 503. THESIS (1-16). Department apparoval required.

PS 405. READING AND CONFERENCE (1-16). Department approval required.

PS 406/PS 506. PROJECTS (1-16). Section 11: MU Field Training, 3 credits; Section 12: ASOSU Field Training, 3 credits; each graded P/N. Section 1-5: Reading. Department approval required. Associated with the internship for which credit is given in PS 410. Completion of this course is required to receive credit for PS 410. COREQ: PS 410.

PS 407/PS 506. SEMINAR (1-16). Department approval required.

PS 408/PS 508. WORKSHOP (1-16). Department approval required.

PS 410/PS 510. POLITICAL SCIENCE INTERNSHIP (1-12). Supervised work experience in government- or law-related programs or other public affairs organizations. Reports and appraisals required. May be repeated for a maximum of 12 credits. COREQ: PS 406. sections 1-5:/PS 506. Department approval required.

PS 414/PS 514. ^INTEREST GROUPS (4). Interest group formation, resources, strategies, and internal struggles as well as group influence on elections and politics, in government and policy making, and in relation to democratic theory. PREREQ: PS 101. (Interest group section is Writing Intensive Course.)

PS 415/PS 515. POLITICS AND THE MEDIA (4). Examination of the methods of operation, content and effects of the media in relation to politics and government. Includes analysis of newspaper, radio and television, political advertising, and other forms of political communication. PREREQ: PS 101.

PS 418/PS 518. ELECTORAL POLITICS (3). Treatment of selected aspects of electoral politics in the United States: for example, nominations, elections, campaign finance, voting behavior. PREREQ: PS 101.

PS 419/PS 519. ^TOPICS IN AMERICAN POLITICS (1-4). Topics in American politics not covered in other courses. Course may be repeated when topics vary. PREREQ: At least one upper-division course in American politics. (PS 419 usually taught as a Writing Intensive Course.)

PS 424/PS 524. ADMINISTRATIVE LAW (4). Basic administrative law; control of administrative agencies, powers, limitations, and remedies. PREREQ: PS 101 and PS 102.

PS 425/PS 525. GENDER AND LAW (4). Legal status of American women, with emphasis on constitutional law, the 1964 Civil Rights Act and its amendments, and various state laws as they relate to the legal rights of women. PREREQ: PS 101 and at least one of PS 321,PS 322,PS 323 or comparable experience with the judicial process.

PS 429/PS 529. ^TOPICS IN JUDICIAL POLITICS (1-4). Topics in judicial politics not covered in other courses. Course may be repeated when topics vary. PREREQ: At least one of PS 321, PS 322,PS 323. (PS 419 usually taught as a Writing Intensive Course.)

PS 439/PS 539. ^TOPICS IN STATE AND LOCAL POLITICS (1). Topics in state and local politics not covered in other courses. Course may be repeated when topics vary. PREREQ: At least one course in state or local politics.

PS 449/PS 549. TOPICS IN COMPARATIVE POLITICS (1-4). Topics in comparative politics not covered in other courses. Course may be repeated when topics vary. PREREQ: At least one upper division course in comparative politics.

PS 451/PS 551. AMERICAN FOREIGN POLICY (4). Overview of the role of the United States in the world since World War II and of the factors influencing the formation of our foreign policy. PREREQ: PS 102 or PS 205.

PS 452/PS 552. ALTERNATIVE INTERNATIONAL FUTURES (4). Search for long-term goals, policies, and institutions that can influence the building of bridges between the present and a more sustainable future. PREREQ: PS 205.

PS 453/PS 553. SOVIET POST-SOVIET FOREIGN POLICY (4). Principles, background, evolution, and processes of Soviet foreign policy, aspects of change and continuity in major areas of policy and doctrine. PREREQ: PS 342.

PS 454/PS 554. INTERNATIONAL LAW AND ORGANIZATIONS (3). Theories and historical development of international law, problems in development, classic cases. Interstate interaction and organization; historical, legal, structural, and theoretical analysis; the United Nations system. PREREQ: PS 204 or PS 205.

PS 459/PS 559. ^TOPICS IN INTERNATIONAL RELATIONS (1-4). Topics in international relations not covered in other courses. Course may be repeated when topics vary. PREREQ: at least one upper-division course in international relations.

PS 469/PS 569. TOPICS IN POLITICAL PHILOSOPHY (1-4). Topics in political philosophy not covered in other courses. Course may be repeated when topics vary. PREREQ: At least one upper-division course in political philosophy.

PS 472/PS 572, PS 473/PS 573. PUBLIC ADMINISTRATION (4,4). PS 472: Principles of public administration, administrative organization and procedures, public relations. **PS 473:** Administrative functions, public personnel, and fiscal problems and practices. PREREQ: PS 101.

PS 474/PS 574. BUREAUCRATIC POLITICS AND THE POLICY (4). Government and political organizations and processes as they influence the development and application of public policy, with special emphasis on the role of the bureaucracy and drawing on extended examples from natural resource, environmental, and other policy areas. PREREQ: PS 102 or 6 credits of lower-division courses in political science.

PS 475/PS 575. POLITICS OF ENVIRONMENTAL PROBLEMS (4). The processes and politics that affect management of the physical and natural environment. Emphasizes roles of planning in politics and politics in planning. U.S. national and state policies with minor consideration of international issues and other countries. PREREQ: 6 credits of upper-division political science or of a natural resources discipline.

PS 476/PS 576. *SCIENCE AND POLITICS (4). Relationship between science and the political system in political ideas and history, in bureaucratic politics of science policy, and in contemporary scientific disputes. PREREQ: PS 102 or 6 credits of lower-division courses in political science or permission of instructor. (Bacc Core Course)

PS 477/PS 577. ECONOMICS, POLITICS, AND GOVERNMENT (3). Why and how governments tax, spend, subsidize, regulate, and deregulate; applications of economics and public choice theory. PREREQ: EC 201, EC 202. CROSSLISTED as EC 477, AREC 477.

PS 479/PS 579. ^TOPICS IN PUBLIC POLICY AND PUBLIC (1-4). Topics in public policy or public administration not covered in other courses. Course may be repeated when topics vary. PREREQ: At least one upper-division course in public policy or public administration. (PS 479 usually taught as a Writing Intensive Course.)

PS 489/PS 589. TOPICS IN POLITICAL SCIENCE (1-4). Topics not covered in other courses. Course may be repeated when topics vary. PREREQ: At least one upper-division course in political science.

PSYCHOLOGY

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Faculty

Professors Gillis, Horowitz, Larsen; *Associate Professors* Cruse, Derryberry, Lanning, Ryan, Saslow; *Assistant Professors* Edwards, Reed, Watkins, Wilson

Undergraduate Major

Psychology (B.A., B.S.)

Minor

Psychology (for nonmajors)

The curriculum in psychology explores scientific approaches to a wide range of psychological phenomena. Courses meet the needs of students (a) desiring a knowledge of psychology as part of their general education or professional background, (b) planning to secure entry-level jobs in human services occupations, or (c) preparing for graduate study in psychology or related fields. The Department offers a major program leading to a B.A. or B.S. degree in general psychology, a minor program for undergraduate students with majors in other disciplines, and participates in the Master of Arts in Interdisciplinary Studies (M.A.I.S.) degree program offered by the Graduate School.

Graduates with bachelor degrees in psychology often find entry-level career positions in the human services, business, education, management, sales, and may also go on to graduate study in such fields as psychology, counseling, social work, public and business administration, and law.

Major Program (47-51)

PSY 201 and PSY 202. General Psychology (6)
Departmentally approved statistics course(s) (4-8)
PSY 301. Research Methods in Psychology (4)
Select one of the following lab courses: (3)
- PSY 430. Animal Behavior
- PSY 440. Advanced Experimental Psychology
- PSY 460. Advanced Social Research Methods
- PSY 470. Psychometrics and Psychol Testing
- PSY 480. Case Study Methods

Select a course from each of the following sets:
- PSY 330. Brain and Behavior or
- PSY 340. Cognition (3)
- PSY 350. Human Lifespan Development or
- PSY 360. Social Psychology (3)
- PSY 370. Personality or
- PSY 380. Human Adjustment (3)

Additional courses in psychology, (a) at least four of which are at the 400 level, and (b) no more than 3 credits of individualized research and field experience applied to the major (21)
B.S. candidates must complete an additional 12 credits from a list of approved courses.
Note: Students must receive a grade of C– or better in any course applied towards the Major or Minor degree.

Minor (27)

The Psychology Department recommends the following format for the minor. Students should consult their major advisers to see if specific components are recommended or required in their major.

PSY 201 and PSY 202. General Psychology (6)
Select two of the following: (6)
- PSY 330. Brain & Behavior
- PSY 340. Cognition
- PSY 350. Human Lifespan Development
- PSY 360. Social Psychology
- PSY 370. Personality
- PSY 380. Human Adjustment

Five additional courses, at least three of which must be at the 400 level (15)

Master of Arts in Interdisciplinary Studies

Students design their own M.A.I.S. program around three fields or areas of study, and may use specific areas of psychology for one or more of these fields. At least three courses must be in each field. Students wishing to include psychology as one or more of their three M.A.I.S. specialty areas should submit the following to the department.

1. GRE scores for the verbal, quantitative, and analytic segments of the examination
2. Overall GPA
3. A list of psychology courses taken and the grades achieved in each
4. Transcripts of all previous university work
5. Names of two references who can be contacted by the department
6. A one- or two-page statement of the purpose for including psychology in their graduate program.

To be admitted to a psychology component of the M.A.I.S. program students must obtain written consent of a faculty member in this department who agrees to serve as the field or area adviser, as well as meeting general Graduate School entrance requirements.

Courses

Lower Division

PSY 201, PSY 202. GENERAL PSYCHOLOGY (3,3). Scientific study of behavior and experience. PSY 201: Biological bases of behavior; sensation and perception; conditioning, learning and memory; thinking, problem solving, language, and consciousness; cognitive, personal and social development. PSY 202: Motivation and emotion; personality; measurement of human differences; adjustment, psychopathology and psychotherapy; attitudes and social behavior. (Bacc Core Course) (SS)

Upper Division

PSY 301. RESEARCH METHODS IN PSYCHOLOGY (4). Further study of scientific methodology in psychology, including experimental and observational techniques. Topics include problem identification and hypothesis formation, research design, application of statistics, collection and interpretation of data, computer usage, and research report writing. PREREQ: PSY 201 and Statistics.

PSY 330. BRAIN AND BEHAVIOR (3). Introduction to the relationships of the structure and functioning of the human brain to behavior. Information from neuroanatomy, neurochemistry, neurosurgery and neurology is combined with psychological research on both normal and abnormal human behavior. PREREQ: PSY 201, PSY 202. (SS)

PSY 340. COGNITION (3). Theories, research and applications concerning cognition. Topics include perception, attention, memory, learning, thinking and language. PREREQ: PSY 201, PSY 202. (SS)

PSY 350. HUMAN LIFESPAN DEVELOPMENT (3). An introduction to physical, social, cognitive and linguistic development with an emphasis on theory and methodology. PREREQ: PSY 201, PSY 202. (SS)

PSY 360. SOCIAL PSYCHOLOGY (3). The study of behavior and experience in a social context. Topics include person perception, attribution, attraction and love, attitudes and attitude change, aggression and social influence and group dynamics. Applications of social psychological principles to other fields, e.g., law, health care, etc. PREREQ: PSY 201, PSY 202. (SS)

PSY 370. PERSONALITY (3). An overview of major theories of personality is followed by an introduction to personality testing and research. PREREQ: PSY 201, PSY 202. (SS)

PSY 380. HUMAN ADJUSTMENT (3). The psychological processes of coping with the demands of modern life. Topics include personality dynamics, conflict and stress management, self-concept, interpersonal relationships, individual and family transitions, psychological disorders and psychotherapy. PREREQ: PSY 201, PSY 202. (SS)

PSY 401/PSY 501. RESEARCH (1-16)

PSY 402/PSY 502. INDEPENDENT STUDY (1-16).

PSY 403/PSY 503. THESIS (1-16).

PSY 405/PSY 505. READING AND CONFERENCE (1-16).

PSY 406/PSY 506. PROJECT (1-16).

PSY 407/PSY 507. SEMINAR (1-16).

PSY 408/PSY 508. WORKSHOP (1-16).

PSY 421/PSY 521. HISTORY OF PSYCHOLOGY (3). An examination of the development of psychology. Major psychological concepts, methods, and areas of investigation are viewed both from a historical perspective and from the perspective of the philosophy of science. PREREQ: Three upper-division courses in psychology or consent of instructor.

PSY 422/PSY 522. SELECTED TOPICS IN PSYCHOLOGY (3). Newly emerging or specialized topics which can only be offered occasionally or for particular purposes. As each offering will be structured with a syllabus, this course may be repeated. PREREQ: To be determined for each offering.

PSY 426/PSY 526. SEX DIFFERENCES (3). Survey of theories, life cycles and contemporary problems of women and men in a social context. Emphasis on factors relating to differential self-concept and behaviors. Psychological research in differences between women and men. PREREQ: a 300-level course in psychology. May be offered in alternate years.

PSY 430/PSY 530. ^ANIMAL BEHAVIOR (3). Application of observational and experimental methods to studying species-specific behavior in animals, with emphasis on domestic animals, such as the cat, dog, horse, etc. Relation of species-specific behaviors to inherited differences in nervous, sensory and motor systems and effects of domestication on animal behavior. Labs/field trips/individual projects. PREREQ: PSY 301 or equivalent; PSY 330 or PSY 340 or course work in zoology or animal science. (Writing Intensive Course)

PSY 432/PSY 532. PHYSIOLOGICAL PSYCHOLOGY (3). Basic vertebrate neurophysiology and neuroanatomy in relation to behavior. Neural and hormonal correlates of sensation, learning, memory and motivation. PREREQ: PSY 330 or equivalent biological science background.

PSY 433/PSY 533. PSYCHOPHARMACOLOGY (3). Drug-brain-behavior interactions. Psychoactive drugs and their relationships to normal and abnormal behavior in humans. PREREQ: Upper division standing. Open to juniors with consent of instructor, seniors, and graduate students.

PSY 436/PSY 536. EMOTION (3). Contemporary theory and research concerning the role of emotion in human thought and behavior. Topics include biological bases of emotion, temperament, emotional disorders, and the interactions between emotion, cognition, and arousal. PREREQ: PSY 301 and either PSY 330 or PSY 340. May be offered in alternate years.

PSY 437/PSY 537. MOTIVATION (3). Biological, learning, and cognitive approaches to human and animal motivation. Topics include evolution, homeostasis, drive, arousal, incentive motivation, achievement motivation, and social motivation. PREREQ: PSY 301 and either PSY 330 or PSY 340.

PSY 440/PSY 540. ^COGNITION RESEARCH (3). Advanced scientific methodology primarily in the areas of attention, learning, memory, and thinking. Students will design their own research projects, collect and analyze data, and write a professional report. PREREQ: PSY 301, PSY 340. (Writing Intensive Course)

PSY 442/PSY 542. PERCEPTION (3). Fundamental concepts of animal and human sensation and perception, with emphasis on audition and vision. Applications of psychophysical methods to research in all sensory modalities. Includes review workshops on basic mathematical, physical and physiological concepts necessary to interpret research in this field. PREREQ: PSY 301; PSY 330 or PSY 340.

PSY 444/PSY 544. LEARNING AND MEMORY (3). Experimental and theoretical work on learning, conditioning, and memory in animals and humans. PREREQ: PSY 301,PSY 340.

PSY 446/PSY 546. THINKING AND PROBLEM SOLVING (3). Theories, research, and applications concerning thought processes. Topics will include problem solving, inductive and deductive reasoning, artificial intelligence, and creativity. PREREQ: PSY 301,PSY 340. May be offered in alternate years.

PSY 448/PSY 548. CONSCIOUSNESS (3). Phenomenological, physiological, and psychological approaches to the content and processes of subjective awareness. Topics include philosophical issues, cortical and reticular neurophysiology, sleeping and dreaming, selective attention, imagery, and self-awareness. PREREQ: PSY 301,PSY 340. May be offered in alternate years.

PSY 454/PSY 554. COGNITIVE DEVELOPMENT (3). This course discusses intellectual development from infancy to adulthood. Topics include the origin of thinking, the development of perception, attention, memory, problem solving, language, academic skills, and social cognition. Piaget, Vygotsky, and information processing approaches will be discussed. PREREQ: PSY 350 and upper-division standing. May be offered in alternate years.

PSY 456/PSY 556. SOCIAL DEVELOPMENT (3). This course covers theories and research concerning human social development. Topics include theories of socialization; the development of social relationships; the self-concept; emotion; sex roles; social cognition; prosocial behavior; morality; self-control; and aggression. PREREQ: PSY 350 and upper-division standing. May be offered in alternate years.

PSY 458/PSY 558. LANGUAGE ACQUISITION (3). Psychological processes involved in the acquisition and use of language throughout childhood. Biological, cognitive, and social influences on language, such as language in thought and reading. PREREQ: PSY 350.

PSY 460/PSY 560. ADVANCED SOCIAL RESEARCH METHODS (3). PSY 460A: Seminar format. Course content divided into two parts: attitude theory and scaling procedures. Theory topics; influence processes, attitude functions, consistency theory, and behavior theory of attitude development and maintenance. Scaling procedures focus on the unidimensional techniques of Thurstone, Likert, and Guttman; students jointly develop one of these scales. PSY 460B: This course covers all aspects of experimental research in the social sciences. Students will conduct independent projects as a vehicle for covering the facets of a social psychology experiment. Issues in psychological construct formation and operationalization, experimental design, sampling, data collection, analysis, reliability, validity, and report writing will be covered. (Writing Intensive Course) PREREQ: PSY 301.

PSY 462/PSY 562. INTERPERSONAL RELATIONS & SMALL GROUP PROCESSES (3). Factors influencing interpersonal and small group dynamics. Lecture and commentary used to develop awareness of processes affecting behavior, accomplishments and interpersonal relationships. PREREQ: PSY 360. May be offered in alternate years.

PSY 464/PSY 564. SOCIAL COGNITION (3). Research and theory concerning cognitive structures and processes underlying social judgment and social behavior. Topics include attribution theory, social inference, person memory, schema-based information processing. PREREQ: PSY 360 and upper-division standing. May be offered in alternate years.

PSY 468/PSY 568. INTERNATIONAL BEHAVIOR AND POLITICAL (3). Effect of perception of own and other nations attitudes toward international affairs. Ideological and national loyalties, personal motive states, decision-making processes, and threat management-conflict resolution strategies. Laboratory focus upon simulation of inter-nation interaction and involvement with students engaged in cross-national education. This course will also investigate the functions of social pathology including aggression and prejudice. PREREQ: PSY 360.

PSY 470/PSY 570. ^PSYCHOMETRICS AND PSYCHOLOGICAL TEST (3). An introduction to psychological measurement is provided, with emphasis on the notions of reliability and validity; advanced correlational techniques are introduced. These methods are applied to contemporary tests of personality, aptitude, and achievement. PREREQ: PSY 301 and one of PSY 340, PSY 370, PSY 380. (Writing Intensive Course)

PSY 472/PSY 572. PERSONALITY ASSESSMENT AND RESEARCH (3). Theoretical and methodological issues in the assessment of personality are examined. Applied problems of human judgment, test interpretation, and psychodiagnosis are considered. The contemporary state of research in personality is characterized. PREREQ: PSY 301, PSY 370.

PSY 476/PSY 576. HUMAN VALUES (3). Psychological research on human value priorities. Emphasis upon approaches leading to measurement of value system content, value fulfillment, and competence to make value judgments. Opportunities for students to explore their personal valuing and to study topics of special interest. PREREQ: PSY 202 and PSY 360, PSY 370 or PSY 380. May be offered in alternate years.

PSY 480/PSY 580. ^CASE STUDY METHODS (3). Major interview methods and strategies for evaluating individuals and families. Includes nonverbal and process observation, problem definition, mental status examination, background and history, dynamic formulation, and recommendation. Students develop and practice skills through a series of sequential interviews with each other and with selected volunteer study subjects outside of class. PREREQ: PSY 380 or PSY 483. (Writing Intensive Course)

PSY 481/PSY 581. ABNORMAL PSYCHOLOGY (3). Survey of various forms of psychological disorders; theories regarding etiology and treatment. Special emphasis on research approaches to such disorders. PREREQ: PSY 201, PSY 202; a 300 level course in psychology; upper-division standing.

PSY 482/PSY 582. PSYCHOTHERAPY (3). Survey of the theory, techniques and research on the major contemporary systems of psychotherapy. PREREQ: One of the following: PSY 370, PSY 380 or PSY 481.

PSY 483/PSY 583. COUNSELING AND INTERVIEWING SKILLS (3). Orientation to skills, problems, and issues related to the helping relationship. Through observing demonstration interviews and conducting practice interviews, students are helped to increase their competency in use of basic counseling skills. Class format includes supervised counseling laboratory practice in small groups. PREREQ: PSY 350 or PSY 380 or equivalent.

PSY 485/PSY 585. BEHAVIOR MODIFICATION (3). Review of basics of operant and classical conditioning. Research on behavior modification and behavior therapy with both normal and abnormal animals, human adults, and children. Application areas include: behavior problems, handicaps, eating disorders, time management, self control, stress management, contingency contracts, and cognitive therapies. Individual projects. PREREQ: PSY 350 or PSY 380 or equivalent work in family life or education.

PSY 487/PSY 587. FIELD EXPERIENCE IN HUMAN SERVICES (3). May be repeated for credit for a maximum of 15 credits. Practicum/internship placement in community human service agencies and programs related to the students learning objectives. Includes regular on-site supervision, relevant readings, projects, and faculty site visits. Department approval required.

PSY 496/PSY 596. OCCUPATIONAL PSYCHOLOGY (3). Work and its meaning in the life of the individual; vocational decision-making; relationship of job choice to career development and lifestyle; skill, performance, and adaptation to the work role and setting; pay, interpersonal relationships and work satisfaction; working conditions, job design, participation, work stress and employee assistance programs. PREREQ: PSY 350, PSY 360, PSY 370 or PSY 380. May be offered alternate years.

PSY 498/PSY 598. HEALTH PSYCHOLOGY (3). Psychological factors in the maintenance of good health and in the prevention of, treatment of, and recovery from illness: Behavioral contributions to illness, life-style risk factors, stress and the immune system, psychological response to symptoms and care-givers, health habits and self-care, management of pain and chronic illness, disability and terminal illness. PREREQ: PSY 380. May be offered alternate years.

RUSSIAN STUDIES

Vreneli Farber, Director
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Corvallis, OR 97331-4603
(503) 737-3957

Certificate Program

Russian Studies

The Russian Studies certificate program is designed for students who wish to combine their departmental majors with a basic knowledge and understanding of Russian affairs, past and present. This interdisciplinary program of courses, offered by four departments in the College of Liberal Arts, examines the language, history, politics, economics, and culture of Russia from the tenth century to the present.

The Russian Studies certificate is awarded in conjunction with the B.A. or B.S. degree. Successful completion of the program is noted on the student's official transcript and an official certificate is awarded.

The Russian Studies certificate may enhance career opportunities in business, education, and various public or private agencies concerned with relations between the United States and the former Soviet Union. It also provides a background for undertaking graduate work in Russian studies at other universities.

CERTIFICATE CURRICULUM

The course of study consists of a minimum of 30 credits, 21 credits of required core courses and 9 credits of appropriate electives.

REQUIRED COURSES

RUS 331. Russian Culture: Old Russia (3)
RUS 332. Russian Culture: 19th Century (3)
RUS 333. Russian Culture: 20th Century (3)
RUS 211, RUS 212, RUS 213. 2nd-Year Russian (12)

ELECTIVE COURSES

RUS 311, RUS 312, RUS 313. 3rd-Year Russian (9)
HST 440, HST 441. History of Russia (8)
HST 443. The Russian Revolution (4)
HST 445. Society in Modern Russia (4)
HST 449. Readings in Russian History (3-5)
EC 453. Comparative Economic Systems (3)
EC 455. Soviet Economics (3)
PS 342, PS 343. The Soviet and Post-Soviet Political System (8)
PS 364. Marxism-Leninism (4)
PS 453. Soviet and Post-Soviet Foreign Policy (3)

Courses offered on a one-time basis that are directly related to Russian Studies may be used if the student receives prior approval from the Russian Studies coordinator.

SCIENTIFIC AND TECHNICAL COMMUNICATION

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Graduate Major

Scientific and Technical Communication (M.A., M.S.)

Graduate Minors

Communication Studies
Writing Education

The College of Liberal Arts offers a Master of Arts degree and a Master of Science degree in Scientific and Technical Communication. The program is designed to train people in scientific and technical communication and to help those who have or aspire to have communication management responsibilities in business, industry, government, and educational institutions.

The degree requires completion of a minimum of 45 graduate credits and either a thesis or a program-oriented paper. Candidates may also complete an internship with an organization involved in communicating technical or scientific information. The primary focus of the degree is on communication techniques. In addition to being knowledgeable in communication, graduates will have an understanding of a technical field as demonstrated by the ability to take graduate courses in a specialized technical field.

The M.A./M.S. degree in Scientific and Technical Communication consists of a major in the communication core, and a minor in one of the following areas: a technical area, a communication specialty area, or education, as approved by the candidate's graduate committee. Requirements include a minimum of 45 quarter credits, with a minimum of 30 credits in the major. After candidates have established their competence in the major, they will have freedom, with the approval of their committee, to develop the rest of their program to fit individual strengths and needs.

Minors may be constructed of a minimum of 15 graduate credits from a technical area, or (for those candidates who already have an adequate technical background, as determined by their graduate committee) from a communication specialty area or from an education area. The following is a sample program.

MAJOR CURRICULUM (30)

STC 515. Research Methods (3)
STC 560. Publications Design, Production, and Management (3)
STC 540. Technical Editing (3)
STC 538. Persuasion (3)
STC 524. Communication in Organizations: Theories and Issues (3)
STC 527. Advanced Sci & Tech Writing (3)
STC 512. Current Composition Theory (3)
Select 9 credits from:
STC 510. Internship in Scientific & Technical Writing (3-6)
STC 503. Thesis or STC 506. Projects

MINOR CURRICULUM (15)

Communication Studies
Writing Education
Technical Field

COURSES

Graduate

STC 501. RESEARCH (1).

STC 502. INDEPENDENT STUDY (1).

STC 503. THESIS (1).

STC 504. WRITING AND CONFERENCE (1).

STC 505. READING AND CONFERENCE (1).

STC 506. PROJECTS (1).

STC 507. SEMINAR (1).

STC 508. WORKSHOP (1).

STC 510. INTERNSHIP IN SCIENTIFIC AND TECHNIC (3).

STC 562. SCIENCE WRITING (3). Reporting and writing about science and technology. Interviewing scientists and interpreting scientific information. PREREQ: Upper-division standing. May be repeated to form a nine-credit sequence. CROSSLISTED as WR 562.

STC 512. CURRENT COMPOSITION THEORY (3). Current rhetoric and composition theory and its applications in the classroom. PREREQ: Graduate standing. CROSSLISTED as WR 512.

STC 527. ADVANCED TECHNICAL WRITING (3). Advanced strategies of technical communication. PREREQ: Graduate standing. CROSSLISTED as WR 527.

STC 515. RESEARCH METHODS (3). A review of research methods commonly employed in studies of mass communications. Content analysis, readability, readership, and statistical models in which mass communication behavior plays a role.

STC 524. COMMUNICATION IN ORGANIZATIONS: THEORIES AND ISSUES (3). Analysis of human interaction within the informal and formal systems of organizations. Theory, research, and practice relevant to the analysis of the nature and role of communication within small, mid-range and highly complex organizations. The course addresses structural, functional, and cultural features of communication in organizational environments. CROSSLISTED as COMM 524.

STC 538. PERSUASION (3). Advanced study of theories and perspectives of persuasion; acquire familiarity with specific findings from research literature on persuasion; development of new research projects in persuasion. CROSSLISTED as COMM 538.

STC 540. TECHNICAL EDITING (3). Editing technical and scientific material for style, organization, accuracy, and readability, editing proposals, journal articles, technical reports, and books. PREREQ: WR 327.

STC 560. PUBLICATION DESIGN, PRODUCTION, AND MANAGEMENT (3). Elements of design and typography. Print methods and electronic publishing; publications management.

SOCIOLOGY

Jon Hendricks, Chair
Fairbanks Hall 307
Oregon State University
Corvallis, OR 97331-3703
(503) 737-2641

Faculty

Professors Hendricks, Klemke, Tiedeman; *Associate Professors* Cordray, Jenne', Langford, Mitchell, Starnes, Warner; *Assistant Professors* Cramer, Gallagher, Sanford; *Courtesy Faculty* Gale

Undergraduate Major

Sociology (B.A., B.S.)

Minor

Sociology

Sociology is the study of human social behavior. Sociologists examine processes of interaction within and between groups and resulting social systems. The undergraduate program in the Department of Sociology provides a broad understanding of human societies and culture for persons in all fields, with integrated programs for majors and minors in Sociology leading to B.A. and B.S. degrees.

Master of Arts in Interdisciplinary Studies

The department serves as a field in the Master of Arts in Interdisciplinary Studies degree program and participates as a minor field in other advanced degree programs. The M.A.I.S. program is designed to meet the particular needs and interests of the individual student and features collaborative work in any two other pertinent departments. Sociology may serve as one or more of these fields of concentration and as major and minor foci. Contact department for listing of required course work for either major or minor concentration at the graduate level and for application procedures.

Preparation

High school students planning to major in sociology should take courses in history, social studies, and foreign languages. Substantial work in English composition and mathematics is also highly desirable.

Careers

Students earning bachelor's degrees in sociology are found in a wide variety of vocations open to liberal arts graduates, including business, public administration, social services, recreation, criminal justice and teaching. Undergraduate education in sociology frequently serves as preparation for graduate/professional schools offering advanced degrees in law, urban planning and management, architecture, business administration, social work and other social sciences. Post baccalaureate education is usually required for those seeking careers as professional social scientists in program and policy analysis, marketing, and postsecondary education.

Interest Areas

The clusters of courses listed illustrate ways in which undergraduate students may organize their upper division course work. Selecting courses around a topic or theme of interest adds meaning to one's education and strengthens the base of understanding from which one then pursues a career or further education.

SOCIAL CHANGE, TECHNOLOGY & MODERNIZATION

SOC 360. Population Trends and Policy (3)
SOC 421. Social Change and Modernization (3)
SOC 456. Sci and Tech in Social Context (3)
SOC 460. Comparative Societies (3)
SOC 464. Sociology of Revolution (3)
SOC 466. Intntl Develop: Gender Issues (3)
SOC 480. Environmental Sociology (3)
SOC 481. Society & Natural Resources (3)

DEVIANCE AND SOCIAL CONTROL

SOC 340. Deviant Behavior & Soc Control (3)
SOC 439. Welfare and Social Services (3)
SOC 440. Juvenile Delinquency (3)
SOC 441. Criminology and Penology (3)
SOC 448. Law and Society (3)

SOCIAL POLICY

SOC 350. Health, Illness, and Society (3)
SOC 426. Social Inequality (3)
SOC 430. Gender and Society (3)
SOC 432. Sociology of Aging (3)
SOC 437. Minority Groups and Issues (3)
SOC 439. Welfare and Social Services (3)
SOC 448. Law and Society (3)

INTERPERSONAL AND GROUP RELATIONS

SOC 324. Groups and Organizations (3)
SOC 418. Qualitative Sociology (3)
SOC 424. Social Psychology (3)
SOC 430. Gender and Society (3)
SOC 437. Minority Groups and Issues (3)
SOC 470. Collective Behvr and Soc Mvmts (3)

CONTEMPORARY SOCIETY

SOC 312. Sociology of Family (3)
SOC 350. Health, Illness, and Society (3)
SOC 448. Law and Society (3)
SOC 450. Sociology of Education (3)
SOC 452. Sociology of Religion (3)
SOC 454. Leisure and Culture (3)

SELF-DESIGNED INTEREST AREA

Students with interests not well matched to the areas listed above are encouraged to design a selection to suit their interests. Faculty advisers should be consulted in this process.

Major Program (48)

Maximum of 9 credits from SOC 401, SOC 402, SOC 403, SOC 405, SOC 406, SOC 410.
SOC 204. Introduction to Sociology; prerequisite to all upper division sociology courses (3)
SOC 300. The Sociological Perspective; prerequisite to SOC 413, SOC 415, SOC 416 (3)
SOC 413. Sociological Theory (3)
SOC 415. Understanding Social Research (3)
SOC 416. Conducting Social Research (3)
Sociology electives (33)
Transfer students may apply a maximum of 12 credits of lower division sociology credits toward a degree in sociology.
A minimum grade point average of 2.00 must be earned in sociology course work. A grade of C– or above is required in SOC 300, SOC 413, SOC 415, and SOC 416.
It is strongly recommended that sociology majors also take WR 222 English Composition or WR 327 Technical Writing and PHL 201 Intro to Philosophy.

B.S. Degree Requirements

Candidates for the B.S. degree are required to receive passing grades in 12 credits of departmentally approved course work in professional, quantitative, or scientific areas beyond that taken to fulfill other College of Liberal Arts or baccalaureate core requirements.

Minor Program (27)

Undergraduate students may elect a minor in sociology to complement course work in their major discipline.
SOC 204. Introduction to Sociology; prerequisite to all upper division sociology courses (3)
SOC 300. The Sociological Perspective; prerequisite to SOC 413, SOC 415, SOC 416 (3)
SOC 413. Sociological Theory (3) and/or
SOC 415. Understanding Social Research (3)
Additional sociology courses as necessary to total 27 credits (15-18)
Transfer students may apply a maximum of 12 credits of lower division sociology credits toward a minor in sociology.
A minimum grade point average of 2.00 must be earned in sociology course work.

Courses

Lower Division

SOC 204. *INTRODUCTION TO SOCIOLOGY (3). Development and application of sociological concepts and perspectives concerning human groups, includes attention to socialization, culture, organization, stratification, and societies. Consideration of fundamental concepts and research methodology. (Bacc Core Course)

SOC 205. *INSTITUTIONS AND SOCIAL CHANGE (3). Sociological study of dynamic organizational nature of society through analysis of social change and major social institutions such as family, education, religions, the economy, and political systems. PREREQ: SOC 204. (Bacc Core Course)

SOC 206. SOCIAL PROBLEMS AND ISSUES (3). Examination of social problems with particular focus upon U.S. society. Sociological perspectives on definition, description, and analysis of contemporary and recurrent problems in industrialized societies. Investigation of causes and consequences of social problems considered in societal context. PREREQ: SOC 204.

Upper Division

SOC 300. THE SOCIOLOGICAL PERSPECTIVE (3). Examination of social, historical, and philosophical roots of sociological thought and use of the scientific method in sociology. Special attention to relationship between theory and methods. Includes an introduction to critical thinking in sociology and emphasizes development of sociological imagination. PREREQ: SOC 204.

SOC 312. SOCIOLOGY OF THE FAMILY (3). Survey of the family as a social institution. Variations in family structure and life style in the United States, interdependence between family and other institutions; forces for change in the family. PREREQ: SOC 204.

SOC 324. GROUPS AND ORGANIZATIONS (3). Analysis of group dynamics and individual behavior in organizations, including communication networks, leadership, interaction processes, sociometric techniques, and problems of bureaucratic structure and individual adaptation in organizations. PREREQ: SOC 204.

SOC 340. DEVIANT BEHAVIOR AND SOCIAL CONTROL (3). Current perspectives, research and theories of deviant behavior. Review and analysis of various approaches and programs designed to prevent and deal with deviant behavior. PREREQ: SOC 204.

SOC 350. HEALTH, ILLNESS AND SOCIETY (3). Social and cultural factors in the identification, course, and treatment of illness; analysis of selected health settings and professions. PREREQ: SOC 204.

SOC 360. POPULATION TRENDS AND POLICY (3). Basic socio-demographic factors affecting population size, distribution, composition and change; examination of local, national, and international trends, and demographic policy. PREREQ: SOC 204.

SOC 401. RESEARCH (1-16). Department approval required.

SOC 402. INDEPENDENT STUDY (1-16). Department approval required.

SOC 403. THESIS (1-16). Department approval required.

SOC 405/SOC 505. READING AND CONVERENCE (1-16). Department approval required.

SOC 406/SOC 506. PROJECTS (1-16). Department approval required.

SOC 407/SOC 507. SEMINAR (1). PREREQ: 6 credits of sociology including SOC 204. Department approval required.

SOC 410. INTERNSHIP PRACTICUM (1-16). Graded P/N. Department approval required.

SOC 413/SOC 513. SOCIOLOGICAL THEORY (3). Historical and philosophical foundations of sociological theory, major schools of thought and their major contributors. PREREQ: SOC 204,SOC 300.

SOC 415/SOC 515. UNDERSTANDING SOCIAL RESEARCH (3). Study of basic concepts and principles of qualitative and quantitative social research, including selection of general strategies and specific designs, conceptual and operational measurement, sample selection, data collection, data processing and analysis techniques, interpretation and reporting. Utilizes reports of social research in scholarly journals, popular media, and agency documents. Emphasis on critical evaluation and interpretation. PREREQ: SOC 300,ST 201.

SOC 416/SOC 516. ^CONDUCTING SOCIAL RESEARCH (3). Reviews concepts and principles covered in SOC 415 with emphasis on actual experiences in using techniques of social research and gaining greater depth of knowledge and skill. Assignments involve practicing techniques used in various phases of the research process, including both qualitative field observation and computerized processing and analysis of quantitative information. Individual or group research projects will be required. PREREQ: SOC 415. (Writing Intensive Course)

SOC 418/SOC 518. QUALITATIVE SOCIOLOGY (3). Examines process of change in social scientific models with particular attention to naturalistic inquiry. Details approaches to qualitative analysis of naturally occurring social settings, including entry strategies, data recording, theory development, ethics and reporting. Qualitative field research required. PREREQ: SOC 204.

SOC 421/SOC 521. SOCIAL CHANGE AND MODERNIZATION (3). Major theories of the nature, types, causes and consequences of social change. Political, social, psychological, and economic dimensions of modernization. PREREQ: SOC 204.

SOC 424/SOC 514. SOCIAL PSYCHOLOGY (3). Examines individuals in social context; behavioral processes, causal factors, and results of interaction among persons and groups. Contemporary research design, problems, and findings pertinent to social psychology. PREREQ: SOC 204.

SOC 426/SOC 526. *SOCIAL INEQUALITY (3). Evolution of social inequality in society. Emphasis upon the causes and consequences of inequality in power, privilege, and prestige in human societies with special attention to the United States. PREREQ: SOC 204. (Bacc Core Course)

SOC 430/SOC 530. *GENDER AND SOCIETY (3). Examination of nature and consequences of social differentiation and stratification on the basis of sex and gender. Analysis of social position of women and men in society, focusing on their positions in institutional areas such as the family, politics, work and education. Evaluation of theories of biological, psychological, and sociological bases for the behavior and characteristics of women and men. PREREQ: SOC 204. (Bacc Core Course)

SOC 432/SOC 532. SOCIOLOGY OF AGING (3). Examination of the social significance of age, position and problems of the elderly in society; discusses the societal and individual consequences of an aging population; explores social theories of aging. PREREQ: SOC 204.

SOC 437/SOC 537. MINORITY GROUPS AND ISSUES (3). Relations among majority and minority groups analyzed from a sociological perspective. U.S. focus. Special attention to American Indians and to minorities with African, Latin American, and Asian heritage. PREREQ: SOC 204.

SOC 439/SOC 539. WELFARE AND SOCIAL SERVICES (3). Analysis of social, political, and economic forces affecting welfare and social service systems with overview of current programs, policy issues, public opinions, occupational aspects and societal impacts. PREREQ: SOC 204.

SOC 440/SOC 540. JUVENILE DELINQUENCY (3). Contemporary research and theories of juvenile delinquency. Review and evaluation of various strategies and programs designed to prevent delinquency or for treatment of delinquents. PREREQ: SOC 204.

SOC 441/SOC 541. CRIMINOLOGY AND PENOLOGY (3). Review of sociological perspectives on crime and criminal justice with emphasis upon North America. Review of crime statistics, types of crime, theories of criminality, corrections programs and prisons, and programs to reduce crime. PREREQ: SOC 204.

SOC 448/SOC 548. LAW AND SOCIETY (3). Perspectives on law and legal proceedings in modern western societies; social, political and economic influences upon the formation, enforcement, implementation, and practice of the law and upon the judicial process; issues of access, evidence, and outcome in theory and practice; theories of criminal and social justice. PREREQ: SOC 204.

SOC 450/SOC 550. SOCIOLOGY OF EDUCATION (3). Contemporary perspectives and research on schools, students, teachers and social forces affecting the educational system. Review of comparative and evaluation research on alternative educational strategies and programs. Overview of the literature of educational critics. PREREQ: SOC 204.

SOC 452/SOC 552. SOCIOLOGY OF RELIGION (3). Social patterns within U.S. religious groups, relation of religious groups to society, and the methodological problems in studying such groups. PREREQ: SOC 204.

SOC 454/SOC 554. LEISURE AND CULTURE (3). Examination of leisure in its utilitarian forms, as categories of time and activity, as contrasted to science, art, entrepreneurism and other creative endeavors. PREREQ: SOC 204.

SOC 456/SOC 556. SCIENCE AND TECHNOLOGY IN SOCIAL CON (3). Study of social aspects of science and technology (values, practices, organization, impacts) by analysis of issues revealing their relationship to other social and cultural processes. PREREQ: SOC 204. (Bacc Core Course)

SOC 460/SOC 560. COMPARATIVE SOCIETIES (3). Comparative study of societies, with major emphasis upon societies of the non-Western world. Focus upon factors shaping social structure, patterns of change, and mutual influences among societies. PREREQ: SOC 204.

SOC 464/SOC 564. SOCIOLOGY OF REVOLUTION (3). Focuses upon non-Western societies in addressing social conditions giving rise to revolutions. Specific attention to revolutions in Asia, Latin America, and Africa. Compares models of revolution and examines the role of revolutionary movements. PREREQ: SOC 204. (NC)

SOC 466/SOC 566. INTERNATIONAL DEVELOPMENT: GENDER IS (3). Examines roles and statuses of women and men throughout the world and differential impact of development on men and women. Evaluates traditional development policies and programs and discusses theories of gender stratification and of modernization. PREREQ: SOC 204. (NC)

SOC 470/SOC 570. COLLECTIVE BEHAVIOR AND SOCIAL MOVEM (3). Focuses on responses of people in crowds and in unique social situations with special attention to fads, natural disasters, protest demonstrations, riots and spectators. Analysis of emergence and development of social movements. PREREQ: SOC 204.

SOC 475/SOC 575. RURAL-URBAN SOCIOLOGY (3). Views social life along the rural-urban continuum. Differences and similarities in social behavior, organization and ecology will be covered. Influence of urban ideas on smaller communities will be explored. World-wide focus. PREREQ: SOC 204.

SOC 480/SOC 580. ENVIRONMENTAL SOCIOLOGY (3). Explores the evolution of environmental thought, paradigm shifts, and institutional structures associated with environmental concerns, social movements, and social impacts.

SOC 481/SOC 581. SOCIETY AND NATURAL RESOURCES (3). This course explores the complex interrelationships between humans and natural resources, emphasizing how management decisions and organizations are enmeshed in social and cultural contexts.

SOC 490/SOC 590. SELECTED TOPICS (3). Selected topics of special or current interest not covered in other courses. For advanced undergraduate and graduate students. PREREQ: SOC 204.

SPEECH COMMUNICATION

Mary Jane Collier, Chair
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(503) 737-2461

Faculty

Professors Crisp, Weinman; *Associate Professors* Chesley, Collier, George, Headrick, Moore, Walker; *Assistant Professors* Bowker, Chadwick, Dollar, Iltis, Keith, Knapp; *Instructors* Earl, Rossi, Wendt; *Senior Instructors* Leavitt; *Professor Emeritus* Bennett

Undergraduate Major

Speech Communication (B.A., B.S.)

Options
Communication
Theatre Arts

Minors

Communication
Theatre Arts

Graduate Major

Scientific & Technical Communication (M.A., M.S.)

The Department of Speech Communication offers major programs leading to a B.A. or B.S. degree providing both theoretical and practical aspects of human oral communication as a liberal art, as a social science, as background for further study, or as preprofessional experience. Candidates for the B.S. degree must complete an additional 12 credits of approved science, social science, or professional courses as approved by the department. The department also participates in the Master of Arts in Interdisciplinary Studies (M.A.I.S.) degree program; see Graduate School.

MAJOR PROGRAM

The Communication major in the Speech Communication Department has an Undergraduate Prerequisite Core which must be completed satisfactorily before admission to the major.

UNDERGRADUATE PREREQUISITE CORE

The Undergraduate Prerequisite Core consists of the following requirements:

- The Communication Core
  Completion of COMM 1 1 1, COMM 1 14, COMM 218
- The Baccalaureate Core Writing Requirement
  Completion of the Writing I and Writing II requirements
- A cumulative GPA of 2.0 or better

After a student has successfully completed the Core courses, and if he or she has at least the minimum cumulative GPA requirements, he or she may apply for admission to the Communication Major.

COMMUNICATION MAJOR

The Major in Communication requires 48 credits of course work. Students will be required to complete the following course work and meet the following conditions as part of the requirement.

*COMM 320 and COMM 321
*One course from each of the following areas:

Communication Theory
COMM 418,COMM 422,COMM 426, COMM 430,COMM 440

Rhetorical Theory
COMM 454,COMM 456,COMM 458, COMM 459

Methods
COMM 414,COMM 416,COMM 427,COMM 464 or othermethods course from outside the Department, as approved by advlsor.

*A Writing Intensive Course in the Major
*2 additional courses (6 credits) at the 4xx level required
*3 credits maximum of variable credit courses permitted
*3 credits maximum of lxx and 2xx level coursework permitted
*A minimum of a 2.0 GPA in Major coursework (includes Prerequisite Core)
*48 credits (includes 9 credits from Communication Core in the Undergraduate Prerequisite Core)

BROADCAST MEDIA COMMUNICATION

The option was closed at the end of the 1991-92 academic year.

THEATRE ARTS (48)

TA 147. Introduction to the Theatre (3)
TA 244. Scenecrafts (3)
TA 247. Stage Makeup (3)
TA 248. Fundamentals of Acting (3)
History/Theory/Criticism courses (15)
Performance Studies courses (21)

MINOR PROGRAMS

COMMUNICATION

Communication minors must complete 27 credits, at least 15 of which must be upper division. They must complete COMM 111, COMM 114, COMM 218, and either COMM 320 or COMM 321 (previously COMM 220). Students may not use any variable credit courses toward their minor. Minors must take courses used to fulfill the requirements for a letter grade. A minimum grade point average of 2.0 must be earned in Communication course work.

THEATRE ARTS

Students minoring in theatre arts must complete the following course work:

TA 144. Playreading (1) (May be repeated once for a total of 2 credits)
TA 147. Intro to Theatre Arts (3)
TA 244. Scenecrafts (3)
TA 248. Fundamentals of Acting (3)
TA 344. Playscript Analysis (3)
Plus 15 additional credits of the student's choice, 12 of which must be at upper division level
Activity credits (TA 250-350) may not be counted toward the minor.

GRADUATE PROGRAM

The Department of Speech Communication offers graduate work applicable to the Master of Arts in Interdisciplinary Studies degree (M.A.I.S.) and the Master of Arts and Master of Science in Scientific and Technical Communication (MA/MS STC). See the Graduate School for details. COMM 520 AND COMM 514 OR COMM 564 are recommended for all M.A.I.S. students with Speech Communication as their dominant subject of study.

COURSES

■ COMMUNICATION

Lower Division

COMM 111. *PUBLIC SPEAKING (3). Public communication as it relates to informative and persuasive discourse. The theory and practice of public speaking in informative and persuasive contexts. (Bacc Core Course)

COMM 114. *ARGUMENT AND CRITICAL DISCOURSE (3). Examination of argumentation as a part of human interaction and investigation. The course emphasizes the processes by which people give reasons to gain adherence and to justify beliefs and actions. The course includes readings, writing, and presentations concerned with the nature of arguments, processes of arguing, and argument criticism. (Bacc Core Course)

COMM 180. INTRODUCTION TO THE RHETORIC OF THE FILM (3). The motion picture from prephotographic eras to the present; individuals responsible for major advances in theory and technique. The motion picture and social influence. Films viewed for discussion and analysis. Film fee required.

COMM 218. *INTERPERSONAL COMMUNICATION (3). Introduction to dyadic and relational communication. Overview of current research in such areas as verbal and nonverbal messages, self concept and perception, culture and gender stereotypes and styles, relational development and dissolution, deception, compliance gaining and conflict management. (Bacc Core Course)

COMM 221. FORENSICS (3). Laboratory experience in debate, public speaking, and interpretation of literature. Preparation for intercollegiate debate and forensics participation. Department approval required.

COMM 254. ADVOCACY AND DEBATE (3). The theory and practice of formal academic debate. Strategies of case construction, cross-examination questioning, attack and defense of cases, rebuttal, and refutation. Research skill and research brief development. Debate experience with non-policy (value) and policy questions.

COMM 280. INTRODUCTION TO THE MASS MEDIA (3). A survey of the mass media in America: their development, role in contemporary society, and impact upon national institutions, structures, and the public. An analysis of the organizaiton, structure, economics, and rhetoric of individual media. Legal and regulatory constraints upon the mass media, including issues of censorship, freedom of speech, and manipulation of and by the media. The changing media; those changes in progress and those to come.

Upper Division

COMM 312. ADVANCED PUBLIC SPEAKING (3). Advanced theory and practice in public speaking. Simulated public speaking situations, audience analysis, and rhetorical strategies will be emphasized. Students will prepare and present a variety of public speeches. PREREQ: COMM 114 or COMM 111.

COMM 314. ARGUMENTATION (3). Concepts and processes of argumentation, systems of logic, critical analysis of contemporary efforts to influence. Examination of arguing to gain adherence and argumentation as a way of knowing. Development of cases and argument briefs for presentation. PREREQ: COMM 114. (H)

COMM 316. ADVANCED PERSUASION (3). Advanced theory and practice in persuasion, with evidence on social and behavioral science research. Examination of the cognitive and affective aspects of persuasion, focusing particularly on the audience. Consideration of persuasion in interpersonal relations, organizations, public advocacy, and public relations. PREREQ: COMM 111. (SS)

COMM 318. ADVANCED INTERPERSONAL COMMUNICATION (3). Advanced theory and practice in communication in interpersonal relations. PREREQ: COMM 218. (SS)

COMM 320. INTRODUCTION TO RHETORICAL THEORY (3). Introduction to the basic theories of rhetoric, as well as the background of rhetoric as a discipline in speech communication.

COMM 321. INTRODUCTION TO COMMUNICATION THEORY (3). Introduction to 20th century models, theories, and empirical research programs in communication. Survey of selected theories and social scientific methods across diverse contexts in communication.

COMM 322. SMALL GROUP PROBLEM SOLVING (3). Theory and practice of small group decision making. Group processes of problem solving and decision by consensus. The history and role of group problem solving in a democratic society. Group power, leadership, and roles. Experience with problems of fact, value, and policy. PREREQ: COMM 218. (SS)

COMM 324. COMMUNICATION IN ORGANIZATIONS (3). Examination of the nature and role of communication in formal and informal organizations. Introductory survey of central issues in the study of organizations, including corporate communication, leadership, organizational effectiveness, power, organizational culture, management styles, organizational conflict, and decision making. (SS)

COMM 326. INTERCULTURAL COMMUNICATION (3). Perspectives, theories, and experiences of communication in intercultural, cross-cultural, and pan-cultural relations. (SS)

COMM 327.* ETHNICITY AND COMMUNICATION (3). Examination of issues of ethnic background, ethnic identity, ethnic communication styles, gender issues, discrimination, racism, prejudice, stereotypes, power and conflict, as well as verbal and nonverbal norms, symbols, codes and ethnic cultural and intercultural communication competence. (Bacc Core Course)

COMM 328. NONVERBAL COMMUNICATION (3). The study of human communication behavior that transcends the spoken and written word; nondiscursive symbolism. The course examines the relationship between nonverbal and verbal communication behavior and nonverbal communication skill development. Topics addressed include space, distance, the environment, touch, gesture, facial expression, and gaze as communication. (SS)

COMM 350. DEBATE AND FORENSICS WORKSHOP (1-3). Laboratory experience in debate, public speaking, and interpretation of literature. Preparation for intercollegiate debate and forensics participation.

COMM 368. PROPAGANDA AND SOCIAL CONTROL (3). Case studies, examples, and analyses of direct and indirect influences upon thought, belief, and action involving mass media of communication, including film, theatre, radio, television, posters, and art objects. Historical approach using film, tape, and recordings for student analysis and discussion. (SS)

COMM 377. SIGN LANGUAGE COMMUNICATION (3). A study of issues associated with being deaf. Teaching basic mastery of Oregon Sighed English and manual alphabet. (SS)

COMM 379. SIGN LANGUAGE II (3). This course expands the student's signing vocabulary and contrasts grammatical structures of Signing Exact English (SEE), American Sign Language (ASL) and Pidgin Signed English (PSE). Issues associated with hearing impairment will be discussed in depth. PREREQ: COMM 377.

COMM 380. IMAGE AND MYTH IN FILM (3). Film as a medium for creating, reflecting, and defining values, roles, styles, conflicts, problems, strategies, expectations, and institutions in American life. Various methods of analysis and evaluation are applied to film as an agent and artifact. Film images of the frontier, war, women, men, justice, America, progress, and beauty are explored. Film fee required. (H)

COMM 401. RESEARCH (1-16). Graded P/N. PREREQ: Department approval required.

COMM 402. INDEPENDENT STUDY (1-16). Graded P/N. PREREQ: Department approval required.

COMM 403/COMM 503. THESIS (1-16). Graded P/N. PREREQ: Department approval required.

COMM 405/COMM 505. READING AND CONFERENCE (1-16). Graded P/N. PREREQ: Department approval required.

COMM 406. PROJECT FILMS (1-16). Graded P/N. Section 95: PROJECT FILMS. (3) Instructor consent. PREREQ: Department approval required.

COMM 407/COMM 507. SEMINAR (1-16). Graded P/N. PREREQ: Department approval required.

COMM 408/COMM 508. WORKSHOP (1-16). Graded P/N. PREREQ: Department approval required.

COMM 410/COMM 510. COMMUNICATION INTERNSHIP (1-16). An assignment in a private or public business or agency. The student observes or works in one or more departments of the enterprise, perhaps in one area of interest or specialization (e.g., public relations, training, personnel, research and planning). Work is supervised by the agency staff, supervising department faculty member(s) provide academic evaluation. 12 credits maximum. Departmental approval required. COMM 410 PREREQ: Major with minimum of 21 credits. Department approval required. COMM 510 PREREQ: Graduate committee approval.

COMM 412/COMM 512. TOPICS IN SPEECH COMMUNICATION (3). Contemporary issues in speech communication: appraisal and discussion of current theories, trends, research methods, problems, or applications. May be repeated for up to 9 credits. PREREQ: 9 credits of speech communication.

COMM 414/COMM 514. COMMUNICATION RESEARCH METHODS (3). Communication research and its relationship to theory. Quantitative and qualitative methods of investigation in speech communication. Experimental and non-experimental research design; naturalistic observation; issues of reliability and validity; statistical analysis. Standards and principles of writing and reporting research. PREREQ: COMM 220/COMM 321.

COMM 416/COMM 516 ETHNOGRAPHY OF COMMUNICATION (3). Study and practice of using ethnography of communication as a research method for developing theory in communication studies; topics include data collection, analysis and writing ethnographic reports. PREREQ: COMM 321 or 220.

COMM 418/COMM 518. ^INTERPERSONAL COMMUNICATION THEORY AND RESEARCH (3). Current theory, research, and practice in interpersonal communication. Issues addressed may include compliance gaining, nonverbal behavior, family communication, gender issues, impression formation, rules, and human relations. (SS) (Writing Intensive Course)

COMM 422/COMM 522. ^SMALL GROUP COMMUNICATION THEORY AND RESEARCH (3). Current theory, research, and practice in communication and small group communication. Issues addressed may include leadership, decision making, problem solving, training, and human relations. (SS) (Writing Intensive course)

COMM 426/COMM 526. INTERCULTURAL COMMUNICATION: THEORIES AND ISSUES (3). Advanced study in intercultural communication theoretical developments and research directions. Topics addressed may include intercultural research methods, training, language and culture, acculturation, and intercultural effectiveness. (SS)

COMM 427/COMM 527. CULTURAL CODES IN COMMUNICATION (3). Study and examination of the contestualized use of communication within speech communities and cultures; topics include the cultural patterning of communication and cultural communication theory.

COMM 430/COMM 530. ^THEORETICAL ISSUES IN COMMUNICATION INQUIRY (3). Review of conceptual, philosophical, ontological, epistemological, and methodological issues in the development of theories in human communication; application to contemporary, empirical human communication research. (SS) (Writing Intensive Course)

COMM 432/COMM 532. ^GENDER AND COMMUNICATION (3). Investigation of impact of sex and gender on communication in conflict, decision-making, leadership, nonverbal measages, language, and interpersonal relationships. Focus on definitions of sex and gender in regard to knowledge, social constructs, and self-development. (Writing Intensive Course)

COMM 440/COMM 540. THEORIES OF CONFLICT AND CONFLICT MANAGEMENT (3). Conflict on a variety of levels: intrapersonal, interpersonal, group, public, and social. Conflict in a variety of contexts: relationships, family, organizations, community, and society. Constructive and destructive means of confronting and managing conflict; social and psychological aspects of conflict; conflict analysis; causes of conflict; conflict and peace, social order, and social change; case studies of conflict. (SS)

COMM 442/COMM 542. BARGAINING AND NEGOTIATION PROCESSES (3). Theory and practice of bargaining and negotiation as means of settling disputes, with emphasis on the role of communication. Strategies and tactics of distributive and integrative bargaining orientations. Negotiation preparation and experience through case studies and simulations. (SS)

COMM 444/COMM 544. THIRD PARTIES IN DISPUTE RESOLUTION: MEDIATION (3). AND ARBITRATION Philosophies, strategies, practices, and characteristics of mediation and arbitration processes in the settlement of conflicts and disputes. Study of the role of the third party neutral in the peacemakingprocess. Case studies and simulations in mediation and arbitration. (SS)

COMM 446/COMM 546. COMMUNICATION IN INTERNATIONAL CONFLICT AND DISPUTES (3). Examination of the nature of international conflicts and disputes and the roles culture and communication play in resolving them constructively. Analysis of negotiation, mediation, and international law as approaches to dealing with international political, economic, cultural, and religious disputes. Scrutiny of contemporary world conflicts. (SS)

COMM 454/COMM 554. ADVANCED ARGUMENTATION (3). Advanced study in classical and current theories of the persuasive and epistemological functions of argumentation. Examination of the dominant contemporary theorists, including Toulmin, Perelman, and Willard. Analysis of research and applied perspectives, including conversational argument, argument fields, the philosophy of argument, argument as rhetoric, and argument in contexts. (H)

COMM 456/COMM 556. ^RHETORIC: 500 BC TO 500 AD (3). History and philosophy of rhetorical principles. (Writing Intensive Course) (H)

COMM 458/COMM 558. ^RHETORIC: 500 AD TO 1900 (3). History and philosophy of rhetorical principles. (Writing Intensive Course) (H)

COMM 459/COMM 559. ^CONTEMPORARY THEORIES OF RHETORIC (3). A survey of contemporary rhetorical theories from 1900 to the present. (Writing Intensive Course)

COMM 460/COMM 560. RHETORIC OF REVOLUTIONARIES AND REACTIONARIES: 1750 TO 1900 (3). Speech Criticism; great American speakers, relation of their speaking to the history of ideas; rhetoric and political, social, and religious movements. (H)

COMM 462/COMM 562. THE RHETORIC OF REVOLUTIONAIRES AND (3). REACTIONARIES: 1900 TO PRESENT Speech criticism; great American speakers; relation of their speaking to the history of idea; rhetoric and political, social, and religious movements. (H)

COMM 464/COMM 564. RHETORICAL CRITICISM (3). Explores the approaches to the criticism of rhetoric, including aesthetic, social movement, genre, feminist, and other modes of criticism. (H) (Writing Intensive Course)

COMM 466/COMM 566. ETHICS OF RHETORIC (3). Examines the ethical questions raised by the use of persuasive discourse, including the derivation of standards of ethical persuasion and approaches to ethical judgment about persuasion. (H)

COMM 471. TELEVISION CRITICISM (3). Critical analysis of television based on critical methodologies in rhetoric, cultural studies, television aesthetics, and myth.

COMM 476/COMM 576. ISSUES IN THE FREEDOM OF SPEECH (3). Examination of the theories of free expression and case materials related to tests of free speech in key U.S. Supreme Court cases. The course emphasizes the context of social and political movements from which the cases arise. (H)

COMM 478/COMM 578. POLITICAL CAMPAIGN RHETORIC (3). Theory, research and methods of political campaign rhetoric. Topics include rhetorical strategies and tactics in advertising, national conventions, broadcast debates, media coverage and public opinion polls.

COMM 480/COMM 580. HISTORY OF THE MASS MEDIA (3). A study of the development of the mass media in America, and world media systems, including the dynamic of change in the nature, character, structure, and relationships of a multinational media. The past, present, and future of mass media technology, journalistic and entertainment content, public policy and regulation, distribution, and audiences. PRREQ: COMM 280.

COMM 482/COMM 582. MASS MEDIA IN CULTURE AND SOCIETY (3). A study of the societal-cultural impact of the mass media, and their effect on individuals and upon social, cultural, political, economic, and leisure structures and systems. Special focus on the issues of media as shaping values, molding opinion, and reflecting/projecting attitudes, beliefs, and behaviors, including the mass media's role in racial, gender, and familial relations. The law and regulation of the mass media.

COMM 484/COMM 584. MASS MEDIA CRITICISM (3). Development of criteria for the critical examination of the mass media. Analysis of content, forms and deployment of mass media messages and products. A critical study of the structure, functions, and economics of mass media systems. A consideration of masss media ethics and responsibilities in relation to news and information, entertainment, advertising and marketing, and social-cultural influence. PREREQ: COMM 280.

COMM 486/COMM 586. MEDIA AESTHETICS (3). Aesthetics and the visual/aural media. Theories and principles of creating and structuring visual and aural imagery. Analysis of creative film and video works and artists. PREREQ: COMM 280.

Graduate

COMM 520. GRADUATE SEMINAR IN COMMUNICATION (3). Introductory graduate seminar in the field of communication. Emphasis on the breadth and depth of the discipline, graduate study, and research directions.

COMM 524. COMMUNICATION IN ORGANIZATIONS: THEORIES AND ISSUES (3). Analysis of human interaction within the informal and formal systems of organizations. Theory, research, and practice relevant to the analysis of the nature and role of communication within small, mid-range and highly complex organizations. The course addresses structural, functional, and cultural features of communication in organizational environments. CROSSLISTED as STC 524.

COMM 538. SEMINAR IN PERSUASION (3). Advanced study of theories and perspectives of persuasion; acquiring familiarity with specific findings from research literature on persuasion; development of new research projects in persuasion. CROSSLISTED as STC 538.

■ THEATRE ARTS

Lower Division

TA 121. INTERPRETATION (3). Analysis and presentation of printed materials; emotional reactions that give color and interest, expressive vocal and bodily responses, and performance techniques for effective communication of literary and nonliterary materials. Should be taken in sequence. (FA)

TA 122. INTERPRETATION (3). Analysis and presentation of printed materials; emotional reactions that give color and interest, expressive vocal and bodily responses, and performance techniques for effective communication of literary and nonliterary materials. Should be taken in sequence. (FA)

TA 144. PLAYREADING (1). Reading/discussion/examination of plays from world theatre of past and present from the perspective of production and theatre history. May be repeated once.

TA 147. *INTRODUCTION TO THE THEATRE (3). Origins, history, nature, elements, and style of theatre production; function of artists and craftspersons of the theatre. (FA) (Bacc Core Course)

TA 242. VISUAL PRINCIPLES OF THEATRE (3). An introduction to visual creativity, creative thinking, and visual problem solving as applied to theatre arts as a whole, and to scene and costume design. (FA)

TA 243. PRINCIPLES OF COSTUMING FOR THE STAGE (3). Principles and techniques of costume construction; practical application in the costume shop on theatre productions. PREREQ: TA 147, TA 242.

TA 244. SCENECRAFTS (3). Constructing scenery and stage properties; practical experience in backstage procedures and scene painting. (FA)

TA 245. STAGE LIGHTING (3). Fundamentals of electricity as used in stage lighting; color and light, lighting instruments and control systems, theory and practice of lighting stage production. PREREQ: TA 244.

TA 247. STAGE MAKEUP (3). Basic principles and theory with laboratory experience in most-used applications of theatrical makeup. Preference given to TA majors.

TA 248. FUNDAMENTALS OF ACTING (3). Development of vocal and physical expression; theory and practice in individual and group exercises to heighten awareness, creativity, and imagination. PREREQ: TA 144,TA 147, or consent. (FA)

TA 249. FUNDAMENTALS OF ACTING (3). Emphasis on improvisation, character analysis, and characterization. PREREQ: TA 144,TA 147, or consent. (FA)

TA 250. WORKSHOP: THEATRE ARTS (1). Practical experience in performance, technical theatre, or design. Maximum for graduation of 6 credits. PREREQ: Department approval required.

Upper Division

TA 321. ADVANCED INTERPRETATION (3). Interpretative theory; programming, adapting materials for oral interpretation, Readers Theatre, Chamber Theatre; experimentation in presentational forms. Offered every third year. PREREQ: TA 121, TA 122.

TA 330. *^HISTORY OF THE THEATRE (3). The rise and development of the composite arts of the theatre in their cultural and social context. TA 330: Origins to 1500. TA 331: 1500 to 1870. TA 332: 1870 to present. Offered alternate years. No prerequisite. TA 144 and TA 147 are recommended. (Writing Intensive Course), (Bacc Core Course).

TA 331. *^HISTORY OF THE THEATRE (3). The rise and development of the composite arts of the theatre in their cultural and social context. TA 330: Origins to 1500. TA 331: 1500 to 1870. TA 332: 1870 to present. Offered alternate years. No prerequisite. TA 144 and TA 141 are recommended. (Writing Intensive Course), (Bacc Core Course).

TA 332. *^HISTORY OF THE THEATRE (3). The rise and development of the composite arts of the theatre in their cultural and social context. TA 330: Origins to 1500. TA 331: 1500 to 1870. TA 332: 1870 to present. Offered alternate years. No prerequisite. TA 144 and TA 147 are recommended. (Writing Intensive Course), (Bacc Core Course).

TA 344. PLAYSCRIPT ANALYSIS (3). Study of major approaches to playscript analysis and detailed application of these systems to the theatrical production process. PREREQ: TA 144,TA 147.

TA 346. SCENE AND STAGE DESIGN (3). Designs for stage productions including elements of color, mass, line, and lighting for various types of theatre architecture and plays. Offered alternate years. PREREQ: TA 147,TA 244.

TA 348. ADVANCED ACTING: REALISM (3). Lectures, discussion, research, rehearsal, performance, and criticism of scenes from realistic plays. Offered alternate years. PREREQ: TA 248.

TA 349. ADVANCED ACTING: ROMANTICISM (3). Lectures, discussion, research, rehearsal, performance, and criticism of scenes from plays in the style of romanticism (verse drama). Offered alternate years. PREREQ: TA 248, TA 249.

TA 350. WORKSHOP: THEATRE ARTS (1). Advanced work in acting, directing or technical theatre in dramatic productions; laboratory experience. Maximum of 6 credits may be applied toward graduation. PREREQ: Department approval required.

TA 351. PRINCIPLES OF PLAYWRITING (3). Basic principles and techniques of playwriting. Offered alternate years. PREREQ: TA 144,TA 344.

TA 352. PLAYWRITING WORKSHOP (3). Intensive work on student playscripts generated in TA 351, through re-writes, revision and rehearsals. PREREQ: TA 351. Offered alternate years.

TA 354. FUNDAMENTALS OF PLAY DIRECTION (3). History, theories and techniques of directing; play selection and analysis, study of the audience. Practical experience provided both in class and laboratory theatre. PREREQ: TA 244,TA 248. Offered alternate years.

TA 360. MULTICULTURAL AMERICAN THEATRE (3). Examines the rich panorama of Multicultural-American theatre (e.g., African-Amrican, Gay and Lesbian, Hispanic, Asian-American).

TA 401. RESEARCH (1). PREREQ: Department approval required.

TA 402/TA 502. INDEPENDENT STUDY (1). PREREQ: Department approval required.

TA 403. THESIS (1). PREREQ: Department approval required.

TA 405/TA 505. READING AND CONFERENCE (1). PREREQ: Department approval required.

TA 406/TA 506. PROJECTS (1). PREREQ: Department Approval required.

TA 407/TA 507. SEMINAR (1). PREREQ: Department approval required.

TA 408/TA 508. WORKSHOP (1). PREREQ: Department approval required.

TA 410. THEATRE ARTS INTERNSHIP (6). One to three term residency in a producing theatre, for a maximum allowable total of 15 credits. Student works in a department of the theatre and in related production activities, according to areas of interest or specialization. Work supervised and evaluated by agency staff; academic evaluation by supervising department faculty member(s). Available to upper class theatre arts majors and graduate students approved by faculty and selected by intern agency. PREREQ: Department approval required. 27 credits in theatre arts, with a minimum of 6 credits in area of skill specialization, or 12 credits of upper-division theatre arts courses, with a minimum of 6 credits in area of skill specialization. PREREQ: Must be arranged with instructor prior to registration. Department approval required.

TA 416/TA 516. TOPICS IN THEATRE ARTS (3). An integrated series of lectures on contemporary theories, issues, research methods, problems, or applications of theatre arts. Concentrated research and discussion of selected topics. May be repeated once. Offered as demand and staffing allow. PREREQ: 9 credits of Theatre Arts, or consent.

TA 443/TA 543. COSTUME DESIGN (3). Theory and practice of designing costumes for a theatrical production. PREREQ: TA 243, TA 343.

TA 444/TA 544. THEORY AND CRITICISM OF THEATRE ARTS (3). Major theories which have influenced and motivated theatre practice in western civilization throughout its development. Offered on alternate years. PREREQ: 6 credits of theatre history, or 6 credits of dramatic literature.

TA 450/TA 550. STUDIO: THEATRE ARTS (3). Advanced individual study on approved projects in one of the arts of the theatre: acting, directing or scene/costume/lighting design; or in stage or theatre management. PREREQ: 9 credits of upper-division theatre arts. Departmental approval required.

TA 454/TA 554. ADVANCED PLAY DIRECTING (3). Studies of directing theories in nonproscenium production. Production of a play in laboratory theatre. PREREQ: TA 354. Offered alternate years.

TA 464/TA 564. THEATRE MANAGEMENT (3). Managerial theory and practices of theatre operations, including organizational structure, financial practices, program promotion, and legal concerns. PREREQ: 6 credits of upper division theatre arts courses of equivalent; junior or senior standing. Offered alternate years.

TA 465/TA 565. THEATRE AND AUDITORIUM DESIGN AND PL (3). A study of the major theories, forms, and concepts of theatre and auditorium design, with emphasis on the relationship of the physical environment to the form and style of the production. PREREQ: TA 244. Offered alternate years.

TWENTIETH CENTURY STUDIES

Center for the Humanities
Oregon State University
811 S.W. Jefferson Ave.
Corvallis, OR 97333-4506
(503) 737-2450

Certificate Program

Twentieth Century Studies

The certificate program in Twentieth Century studies allows students to study the experience of contemporary social life in the developed West and in non-Western societies as a complex, evolving whole. The program explores the complex unity of modern social experience from the vantage points of separate disciplines, and, through a series of core courses and thematic courses, from a perspective which integrates the humanities and social sciences.

CERTIFICATE CURRICULUM

To complete the certificate program, students are required to take a minimum of 27 credits, consisting of 9 credits of core courses, 9 credits of thematic interdisciplinary courses, and 9 credits of approved elective courses.

Core Courses (9)
TCS 200. 20th-Century American Realities (3)
TCS 201. 20th-Century American Dreams (3)
TCS 300. World Community in the 20th Century: Development (3)
TCS 301. World Community in the Twentieth Century: Underdevelopment (3)

Thematic Interdisciplinary Courses (9)[13]

Elective Courses (9)
Elective courses may be chosen from among the many regular departmental offerings in the College of Liberal Arts. Elective credits must be outside student's major.

COURSES

Lower Division

TCS 200. *TWENTIETH CENTURY REALITIES: The U. (3). An examination of life in the contemporary U.S., emphasizing ways in which the parts of life—family, school, work, and leisure—reinforce and sustain one another in reproducing the social, cultural, political, and economic relations that characterize contemporary U.S. society. (Bacc Core Course) (H, SS)

TCS 201. *TWENTIETH CENTURY DREAMS: THE U.S. (3). An examination of the historical emergence and the continuing influence of the ideas and values that inform culture aspirations and experiences in the U.S. These dreams—formed around the notions of individualism, success, democracy, and equality—are presented as modes of consciousness that have real consequences in the lives of typical people in the U.S. (Bacc Core Course) (H, SS)

Upper Division

TCS 300. *WORLD COMMUNITY IN THE TWENTIETH CE (3). An examination of the underlying processes which gave rise to rapid technological advancement in world centers and which resulted in the integrated relationship characteristic of much of the contemporary world. A comparative analysis of social, cultural, political, and economic relations in industrialized societies. (Bacc Core Course) (H, SS)

TCS 301. *WORLD COMMUNITY IN THE TWENTIETH CE (3). A study of the relations of dependence in the contemporary world, emphasizing the impact of metropolitan centers upon geographically dispersed, predominantly agricultural societies of the Third World. An examination of the altered social and cultural patterns that dependence entails for traditional communities. (Bacc Core Course) (H, SS, NC)

TCS 407/TCS 507. SEMINAR (1-12). Advanced study of selected topics related to issues and problems in the Twentieth Century introduced in TCS core course offerings. Section I seminars will be Graded P/N and carry 1 credit; other sections will be graded A-F and will carry variable credit.

WOMEN STUDIES

Janet Lee, Director
Social Science Building 200
Oregon State University
Corvallis, OR 97331-6208
(503) 737-2826

Associate Professor Lee; *Instructor* Ferguson
Program faculty in departments throughout the university.

Certificate Program

Women Studies

Women Studies is the multi-disciplinary study of women's lives and experience. Course work explores women's realities in such areas as the political and social sciences, health, psychology, history, literature and arts. Women Studies programs grew out of the women's movement, involving understandings of sexist discrimination in society and a need to celebrate women's strengths, contributions and forms of resistance. Grounded in this feminist knowledge, women studies is constantly growing and changing in order to understand and affirm the role that issues of race, social class, age, ability, appearance and sexual orientation play in women's everyday lives. We hope you will find women studies to be academically challenging and personally rewarding. It is our goal to provide a program that is intellectually sound and vocationally useful, as well as one that encourages personal growth.

CERTIFICATE CURRICULUM (30)

The undergraduate certificate includes a required core through which students are introduced to gender issues from historical, social, political, and literary perspectives.

CORE REQUIREMENTS (18)
WS 223. Women: Self and Society (3)
WS 224. Women: Personal and Societal Change (3)
WS 410. Internship (3)
WS 414. Systems of Oppression in Women's Lives (3)
WS 416. Theories of Feminism (3)
WS 480. International Women (3)

ELECTIVES (12)
A variety of electives are offered by the Women Studies Program and through course work crosslisted with other departments (not listed here). These include:
WS 199. SS/Women Studies (TBA)
Topics include: Women and Eating, Women and Spirituality
WS 299. Topics/Women Studies (3)
Topics include: Resisting violence Against Women, Women and Body Image
WS 399. Topics/Women Studies (3)
Topics include: Women and Health, Women's Relationships
WS 402/WS 502. Independent Study (1-16)
WS 406/WS 506. Resources for Graduate Student's in Women Studies (1)
WS 407/WS 507. Seminar (1-16)
WS 415/WS 515. Women's Social Movements (3)
WS 418/WS 518. Feminist Research (3)
WS 440/WS 540. Women and Work (3)
WS 460/WS 560 Women and Sexuality (3)
WS 499/WS 599. Topics/Women Studies (3)
Topics include: Lesbian Studies, Women of Color, Women and Media, Self Esteem and Personal Power, Feminist Theatre and Performance, Ecofemnism, Feminist Teaching and Learning, Feminist Theology and Spirituality

INTERDISCIPLINARY COURSES
The Women Studies Program also offers course work in other departments. To be considered a Women Studies course, a substantial proportion of the content of a course must relate to women studies—courses are approved annually.

COURSES

Lower Division

WS 199. SPECIAL STUDIES (1). Special topics of contemporary relevance for women in their everyday lives. Workshop format. May be repeated as topics vary.

WS 223. *WOMEN: SELF AND SOCIETY (3). Multidisciplinary introduction to women studies. Focuses on the lives and status of women in society and explores ways institutions such as family, work, media, law and religion affect different groups of women. Explores issues of gender, race, class, age, sexual orientation, size and ability. (H) (Bacc Core Course)

WS 224. *WOMEN: PERSONAL AND SOCIAL CHANGE (3). Examines the way the questioning of traditional gender roles and their accompanying power structures can lead to change in women's personal and public lives. Explores women's heritage and contributions and focuses on issues of self-growth and social movements for change. (H) (Bacc Core Course)

WS 299. TOPICS IN WOMEN STUDIES (3). Current topics related to women. Description and analysis of different realms of knowledge about gender issues. May be repeated as topics vary.

Upper Division

WS 399. TOPICS (3). Current topics on women and gender role issues. May be repeated as topics vary.

WS 402/WS 502. INDEPENDENT STUDY (1-16). PREREQ: Department approval required.

WS 406/WS 506. PROJECTS (1-16). Department approval required.

WS 407. SEMINAR (1-16).

WS 410/WS 510. INTERNSHIP (1-16). The internship experience provides the opportunity to gain experience within an off-campus private, public, or community agency or organization which has as one of its goals the improvement of the status of women in society. Students work with an on-site mentor who guides their field experience in collaboration with the internship coordinator in the WS program. PREREQ: Department approval required.

WS 414/WS 514. *SYSTEMS OF OPPRESSION IN WOMEN'S LIVES (3). Explores the ways different systems of oppression and discrimination impact women's lives. Examines sexism, classism, racism, and anti-Jewish oppression as well as discrimination against lesbians, older women, and those who differ in ability and appearance. WS 414 PREREQ: WS 223 or WS 224 or consent. (Bacc Core Course)

WS 415/WS 515. WOMEN'S SOCIAL MOVEMENTS (3). Explores historical and contemporary women's social movements against prejudice and discrimination. WS 415 PREREQ: WS 223 or WS 224 or consent.

WS 416/WS 516. THEORIES OF FEMINISM (3). Explores feminist conceptions about the nature of the world, women's reality and visions for change. Analyzes major issues raised by the women's movement and the development of feminist ideas, as well as provides a critical examination of feminist thought and different theories which comprise it. WS 416 PREREQ: WS 223 or WS 224 or consent.

WS 418/WS 518. FEMINIST RESEARCH (3). Explores the socio-political and historical context out of which traditional research mechodologies emerge, and the relationship of gender to scientific pursuits. Studies what it means to do emancipatory anti-sexist and participatory research. WS 418 PREREQ: WS 223 or WS 224 or consent.

WS 440/WS 540. WOMEN AND WORK (3). Examines the major changes in the participation of women in the labor force and the effects of these changes on the economy, womens lives, and families. Analyzes the gender gap in earnings, occupational segregation, theories of genderized income transfers and socio-economic policies related to women. WS 440 PREREQ: Upper-division standing.

WS 460/WS 560. WOMEN AND SEXUALITY (3). Explores the historical, theoretical, and political dimensions of female sexuality. The course also examines the basic assumptions about the meaning of female sexuality, how it has been shaped and controlled, and why women's sexuality has been/is a source of both women's liberation and subjugation. WS 460 PREREQ: WS 223 or WS 224 or consent.

WS 480/WS 580. INTERNATIONAL WOMEN (3). Examines the lives and experiences of women in different parts of the world, looking at work, education, the family, the arts and social movements. Explores the comparative realities of various women's struggles for social injustice and studies key definitions and theoretical assumptions relevant to the subject of global feminism. WS 480 PREREQ: WS 223 or WS 224 or consent.

WS 499/WS 599. TOPICS (3). Topics on contemporary research on women and related public policies. May be repeated as topics vary. PREREQ: Upper-division standing.

Graduate

WS 501. RESEARCH (1-16).

WS 503. THESIS (1-16).

WS 507. SEMINAR (1-6).

GRADUATE STUDY IN WOMEN STUDIES

Women Studies are recognized areas in the Master of Arts in Interdisciplinary Studies (M.A.I.S.) Program with specializations in contemporary women's issues; gender, race, and class; and international women's issues. Participating students who declare Women Studies as their primary area are required to take a minimum of 18 credits in Women's Studies, including WS 514. Systems of Oppression in Women's Lives; WS 516. Theories of Feminism; WS 580. International Feminism; WS 510. Internship; and WS 518. Feminist Research (thesis option only). The balance of courses is selected from the graduate Women's Studies courses, projects, and research/thesis.

Students may also choose Women Studies as both their primary and one secondary areas, or as secondary area(s) alone in the M.A.I.S. Program. They must complete a minimum of 12 credits including WS 516, and WS 514 or WS 580 for a secondary area.

The graduate minor in Women's Studies is available to graduate students as they work toward a masters or Ph.D. in departments which offer these degrees. Students working on the graduate minor in Women Studies must complete 12 credits at the Masters level and 18 credits at the Ph.D. level, including WS 514, WS 516, WS 518 and WS 580. The balance of the course work is selected from the graduate women's studies courses (listed above), projects, or research.

For more information about graduate work in women's studies, contact the Director of the Women Studies Program, Social Science Hall 200.

FOOTNOTES

*Baccalaureate Core Course

^Writing Intensive Course (WIC)

[1]Bachelor of Arts candidates must take a minimum of 98 credits outside their major within the College of Liberal Arts and the College of Science. Courses taken for the baccalaureate core and CLA requirements may count towad the 98 credits.

[2]Must be chosen from approved courses. Approved courses are listed in the catalog with a symbol (H), (FA), (SS), or (NC) after the course description.

[3] Must be taken at the upper division level.

[4]PREREQ: Sophomore standing; 6 credits of ENG 200 and above.

[5]PREREQ: Sophomore standing; 3 credits in ENG 200 and above

[6]PREREQ: Upper division standing; 6 credits in ENG 200 and above.

[7]Must be taken on the Corvallis campus.

[8]These courses must be completed with a minimum 3.0 GPA.

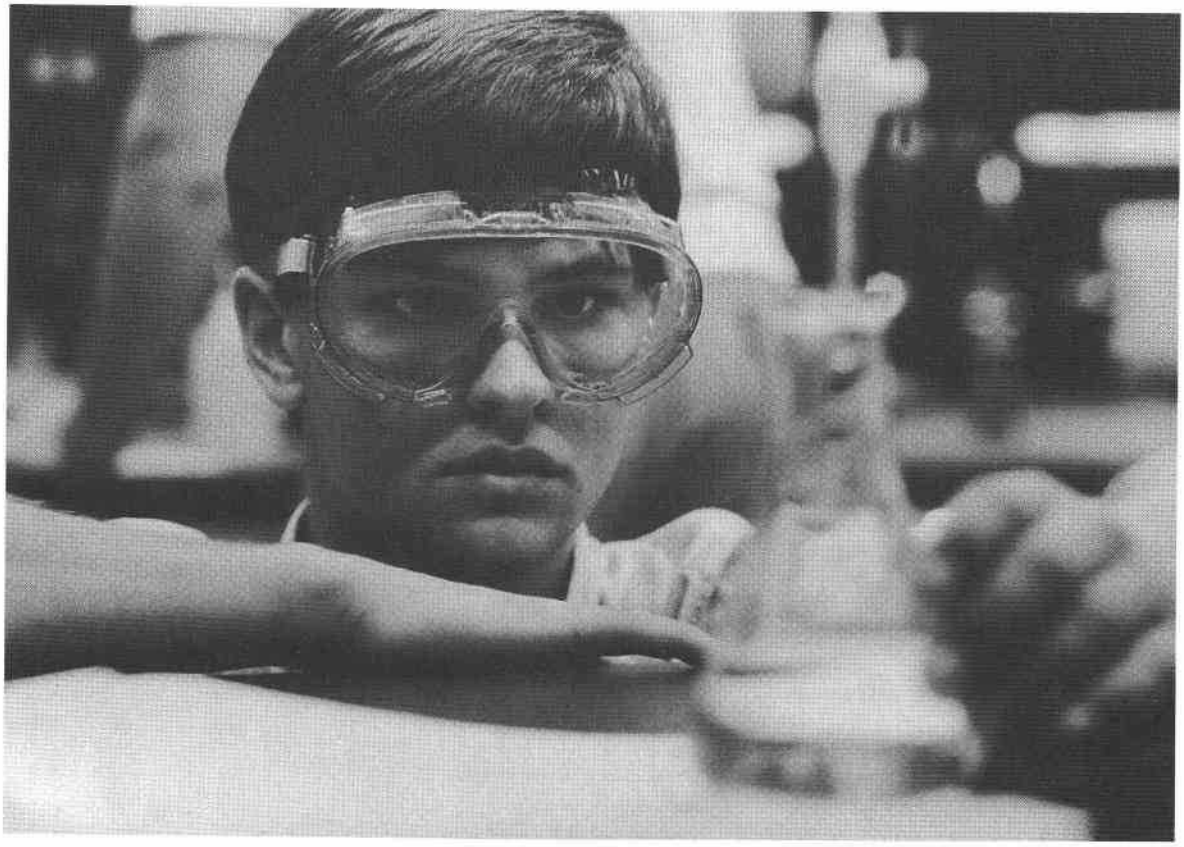
[9]Students interested in teacher creditication should refer to the description of the M.A.T. program. The Conducting Options are also a part f the 5 year Master of Arts in Teaching program for those interested in Oregon Teacher Certification in Music Education. Students wishing to pursue the M.A.T. program must consult a music education adviser at the beginning of their undergraduate studies to ensure that all undergraduate pre-M.A.T. requirements are met.

[10]Piano and vocal proficiency exams must be passed at the end of the sophomore year.

[11]Requires MUS 223 as prerequisite.

[12]No more than 9 credits will count toward the Peace Studies Certificate.

[13]Topics appropriate to Twentieth-Century Studies listed in the annual publication of the Center for the Humanities course description catalog.



One of the largest academic units on campus, with 14 departments and programs, the College of Science offers undergraduate and graduate degrees in classical disciplines and in integrated cross-disciplinary areas. In addition, ten preprofessional programs in the college prepare students who wish to enter a medical profession or another health-related field. Moreover, the College of Science offers the basic science courses essential to the education of every student at OSU.

Research and instruction in the College of Science are enhanced by their context within a university of outstanding professional schools in engineering, oceanography, agriculture, forestry, and pharmacy. Science students can enrich their degrees in science with courses from these areas. They also have numerous opportunities to make original discoveries while working on one of the many research projects on campus.

Majors

The majors of the College of Science have been informally divided into the following groups:

Biological Sciences
Biochemistry & Biophysics, Biology, Botany & Plant Pathology, Entomology, Microbiology, Molecular and Cellular Biology (graduate only), Zoology

Geosciences
Geography, Geology

Interdisciplinary Science
Environmental Science
International Studies
Natural Resources

Mathematical Sciences
Mathematical Sciences, Mathematics, Statistics (graduate only)

Physical Sciences
Biochemistry and Biophysics, Chemistry, Physics

Teaching
Sciences & Mathematics Education (graduate only)

International Degree

Undergraduates with majors in the College of Science can earn a second degree in international studies. See the Interdisciplinary Studies section of this catalog for more information.

Preprofessional Programs

Special programs in health-related fields are offered by the College of Science to help students meet entrance requirements for professional schools in: Dental Hygiene, Dentistry, Medical Technology, Medicine & Osteopathy, Nursing, Occupational Therapy, Optometry, Physical Therapy, Podiatry, Veterinary Medicine.

WICHE Student Exchange Program

The WICHE Professional Student Exchange Program assists students in thirteen western states to obtain access to professional programs not available in their home states. WICHE students receive preference in admission and pay resident tuition at state-supported institutions or reduced tuition at private institutions. See Academic Programs and Support Services for more information.

Curricula in Science

Curricula in science lead to the degrees of Bachelor of Arts (B.A.), Bachelor of Science (B.S.), Master of Arts (M.A.), Master of Science (M.S.), Master of Arts in Teaching (M.A.T), and Doctor of Philosophy (Ph.D.). (See Graduate School for statement of requirements for advanced degrees.) The College also participates in the Master of Arts in Interdisciplinary Studies (M.A.I.S.) program.

Degree Requirements

To graduate with a B.S. degree in the College of Science, undergraduate students must fulfill the following requirements:

University Baccalaureate Core (48)

College of Science Requirements[1]
Computer science (variable credit)[2]
Mathematical sciences (12)
Physical, earth, and/or biological sciences (15)[3]
Department requirements (see each department)

Some departments also grant a B.A. degree which requires a full year of a college-level (200-level or above) foreign language and at least 9 credits of College of Liberal Arts electives in addition to credits required for the baccalaureate core. The science requirements for the B.A. degree are reduced to compensate for the 200-level foreign language sequence and additional liberal arts courses. See the department listings for specific departmental requirements. Science students may also earn a B.A. in International Studies in any science area (See Interdisciplinary Studies section for details).

Department Requirements

The College of Science requires a minimum 2.00 GPA in the major; mathematics and mathematical sciences degrees have a 2.25 GPA requirement for required upper-division courses. The curricula are shown for each major; some substitutions can be made with Department and College approval (e.g., CH 121, CH 122, CH 123, CH 219 for CH 221, CH 222, CH 223). Unless otherwise indicated, the conditions and credits for research, thesis, reading and conference, and seminar are to be arranged with the instructor involved.

Teacher Certification

All professional teacher education at OSU occurs at the post-baccalaureate level as a Master of Arts in Teaching (M.A.T.) degree following completion of a bachelor's degree in an academic major (e.g., biology, chemistry, mathematics, physics). Students planning to teach in the elementary schools may use the curriculum designed for that purpose. (See General Science/Pre-M.A.T. for Elementary Education Option.)

Special mathematics courses (MTH 211, MTH 212, MTH 213, MTH 391) are highly recommended for students who plan to teach elementary or secondary mathemat-

Footnotes for this section on page 147.

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Corvallis, OR
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(503) 737-4811

ADMINISTRATION

Frederick H. Horne
Dean

George D. Pearson
Associate Dean

Richard W. Thies
Associate Dean
Head Adviser

ics. See Education section for admission to the M.A.T. program and education courses.

SUMMER COURSES FOR SECONDARY SCHOOL SCIENCE AND MATHEMATICS TEACHERS

During the summer session, the College of Science offers a number of courses designed especially for high school teachers of science and/or mathematics. For offerings and full descriptions see the *Summer Term Bulletin.*

SCHOLARSHIPS

See the Scholarship section in the front of this catalog for a list of scholarships. The College of Science offers a variety of scholarships to deserving students who have taken at least 30 credits in the college. Additional information and application forms are available from the College of Science.

BIOCHEMISTRY AND BIOPHYSICS

Christopher Mathews, Chair
Ag and Life Sciences 2011
Oregon State University
Corvallis, OR 97331-7305
(503) 737-4511

Faculty

Professors Anderson, Barnes, Gamble, Johnson, Mathews, Pearson, Reed, Schaup, Schimerlik, van Holde; *Associate Professors* Ho, Merrill; *Assistant Professor* Hsu, McFadden

Undergraduate Major

Biochemistry and Biophysics (B.S.)

Graduate Major

Biochemistry and Biophysics (M.S., Ph.D.)

Graduate Areas of Concentration
Biochemistry
Biophysics

The major in biochemistry and biophysics provides a foundation in both the physical and biological sciences. It is designed to help a student prepare for a career in the health sciences, for technical employment at the B.S. level, or for graduate study in the life sciences. Graduates of the department's programs have found challenging careers in medicine, dentistry, clinical chemistry, biotechnology, genetics, cell biology, pharmacology, physiology, toxicology, and nutrition as well as in biochemistry or biophysics.

UNDERGRADUATE STUDIES

High school students interested in careers in biochemistry or biophysics should prepare for college by taking four years of mathematics and at least one year each of physics and chemistry. Additional course work in biology, computer science, written and spoken English, and foreign languages is highly desirable. Students transferring from a community college should have completed one year each of the following by the end of the sophomore year, if they plan to graduate in four years' total time: general chemistry, organic chemistry, calculus-based physics, and general biology. Three semesters or four quarters of college-level math should have been taken, starting with calculus.

Biochemists and biophysicists find employment in colleges and universities, in medical schools, in government and private research institutes, in hospitals, and in industry. Industrial employers include chemical companies, food-processing plants, drug manufacturers, the cosmetic industry, and manufacturers of agricultural chemicals (fertilizers, pesticides, etc.). Biochemistry is extensively intertwined with biotechnology, which is the use of modern techniques in biology to achieve practical objectives. This has greatly expanded the industrial market for biochemists and biophysicists. The most rewarding careers require completion of a doctoral degree—Ph.D. or a professional degree. This is essential for anyone who wants to direct an independent research program.

Three or four members of the faculty serve as undergraduate advisers; these faculty members are most familiar with undergraduate program requirements and career opportunities. The present advisers are Drs. Gamble, Schaup, and Mathews. Because of the diversity of student interests, students are not assigned to an adviser, but can choose the adviser whose background most closely matches the student's interests. Also, the student is encouraged to seek out any other member of the faculty for informal advice.

The department has one set of curricular requirements (see below), which lead to the B.S. degree with a major in biochemistry and biophysics. All degree programs must include at least one year of a foreign language; German, French, Spanish, or Russian is recommended. All upper division students are encouraged to take additional elective courses in areas related to their major fields of interest (e.g., chemistry, microbiology, genetics, nutrition, physics, pharmacy, biology, or computer science). Upper division students are also encouraged to carry out a research project in the laboratory of a faculty member.

GRADUATE STUDIES

The Department of Biochemistry and Biophysics offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. Most graduate students are admitted for study leading to the Doctor of Philosophy degree, although the Master of Science can be awarded. The Ph.D. program includes course work in both biochemistry and biophysics, passing written and oral examinations, participation in the departmental seminar program and research leading to a doctoral thesis. Although most students in the department receive financial support in the form of research assistantships, all students are expected to participate, to a limited amount, in the teaching program of the department, regardless of the source of support. In general, financial support is provided for Ph.D. candidates only.

CURRICULUM

Freshman Year
CH 221, CH 222, CH 223. Gen Chemistry (15)
MTH 251, MTH 252, MTH 253. Calculus (12)
WR 121. English Composition (3)
HHP 231. Fitness (3)
PH 211. General Physics (4)
Electives (8)

Sophomore Year
BI 211, BI 212, BI 213. Biology (12)
CH 334, CH 335, CH 336. Organic Chem (9)
MTH 254. Vector Calculus (4)
PH 212, PH 213. General Physics (8)
Electives (12)

Junior Year
BI 214. Cell and Molecuar Biology (3)
BB 490, BB 491, BB 492. Biochemistry (9)
CH 361, CH 362. Experimental Chemistry (6)
BI 311. Genetics (4)
CH 440, CH 441, CH 442. Physical Chem (9)
Electives (14)

Senior Year
BB 493, BB 494, BB 495. Biochemistry Lab (6)
BB 481, BB 482, BB 483. Biophysics (9)
Electives (30)

COURSES

Lower Division

BB 100. THE MOLECULES OF LIFE (2). A brief introduction to molecular biology for nonspecialists. Subjects vary but have included biochemical basis of origin of life, biochemical genetics, biochemical aspects of memory and behavior, mutagenesis, bioenergetics and nutrition, and environmental biochemistry.

Upper Division

BB 331. INTRODUCTION TO MOLECULAR BIOLOGY (3). Sequence course dealing with the molecular basis of cellular function, with emphasis upon modern developments, and the foundation for practical applications of this knowledge. First quarter will involve the conceptual background necessary to appreciate the applications of molecular biology. Throughout the course opportunities will be given to discuss public policy issues and questions: What are the moral and practical problems that flow from identification of an individual as being at risk for a late-appearing genetic disorder, such as Huntington's disease or certain cancers? Does the scientific or public value of knowing the entire DNA sequence of the human genome justify a individual or small-scale research cannot be supported? What issues arise when the fruits of biological research, mostly publicly funded, are commercialized? Should a novel organism be patented? How can biotechnology be applied to environmental problems? PREREQ: CH 122, CH 202, or CH 222.

BB 332. *INTRODUCTION TO MOLECULAR BIOLOGY (3). Second term of two-term sequence with emphasis on the applications of molecular biology-protein structure, gene expression, the genetic code, recombinant DNA technology, methods for gene transfer, site-directed mutagenesis, etc. Discussions will focus upon interactions between science and society. PREREQ: CH 122, CH 202, or CH 222.

BB 350. ELEMENTARY BIOCHEMISTRY (4). Service course for students desiring a short introduction to biochemistry. Four lectures weekly. PREREQ: CH 331 or equivalent. Concurrent registration in CH 332 or its equivalent is recommended.

BB 351. ELEMENTARY BIOCHEMISTRY (5). A short introduction to biochemistry for non-majors. Structures of biomolecules, bioenergetics, intermediary metabolism, structure and expression of genetic information, experimental basis for current concepts. Four lectures and one 3 hr lab. Satisfies Baccalaureate Core requirement for a biological science. PREREQ: CH 331 or equivalent. Concurrent registration in CH 332 or its equivalent is recommended.

BB 401. UNDERGRADUATE RESEARCH (1-16).

BB 405. READING AND CONFERENCE (1-16).

BB 407. BIOCHEMISTRY/BIOPHYSICS SEMINAR (1). Informal seminars presenting information about research problems and careers and research programs on campus in biochemistry or biophysics.

BB 450/BB 550, BB 451/BB 551, BB 452/BB 552. GENERAL BIOCHEMISTRY (4,4,4). Sequence course for students with a limited background in physical chemistry. Must be taken in order. BB 450/BB 550, three lectures and one recitation; BB 451/BB 551 and BB 452/BB 552, three lectures. PREREQ: CH 332 or (preferably) CH 336.

BB 481/BB 581, BB 482/BB 582, BB 483/BB 583. BIOPHYSICS (3,3,3). Sequence professional course covering quantitative properties of biological systems and biological phenomena using concepts derived from mathematics and physics. Must be taken in order. PREREQ: CH 442.

BB 490/BB 590, BB 491/BB 591, BB 492/BB 592. BIOCHEMISTRY (3,3,3). Sequence professional course to meet the requirements of majors in biochemistry and biophysics. Must be taken in order. PREREQ: CH 336. COREQ: CH 440,CH 441,CH 442.

BB 493/BB 593, BB 494/BB 594, BB 495/BB 595. BIOCHEMISTRY LABORATORY (3,3,3). Laboratory to accompany BB 450,BB 451, BB 452 or BB 490, BB 491,BB 492. Should be taken in order. Lec/lab.

Graduate

BB 501. RESEARCH (1-16).

BB 503. THESIS (1-16).

BB 505. READING AND CONFERENCE (1-16).

BB 507. SEMINAR (1-2). Section 1: Descriptions of campus research programs in biochemistry and biophysics, 1 credit fall. Should be taken by all entering departmental graduate students. Graded P/N. Section 2: Student presentations of current research literature, 1 credit winter and spring. Should be taken by all first-year graduate students. Section 3: Research presentations by visiting scientists, OSU faculty, and advanced graduate students, 1 credit any term. Graded P/N. Section 4: Presentation of departmental research seminar, 2 credits any term. Ph.D. candidates in biochemistry and biophysics present a departmental research seminar in the third or fourth year. One registers in the term the seminar is presented.

BB 536. MOLECULAR VIROLOGY (4). A survey of representative viruses with an emphasis on the molecular mechanisms involved in replication, transcription, and pathogenesis. CROSSLISTED as GEN 536, MB 536, MCB 536.

BB 601. RESEARCH (1-16).

BB 603. THESIS (1-16).

BB 605. READING AND CONFERENCE (1-16).

BB 607. SEMINAR (1-16). Section 1: Descriptions of campus research programs in biochemistry and biophysics, 1 credit fall. Should be taken by all entering departmental graduate students. Graded P/N. Section 2: Student presentations of current research literature, 1 credit winter and spring. Should be taken by al first-year graduate students. Section 3: Research presentations by visiting scientist, OSU faculty, and advanced graduate students, 1 credit any term. Graded P/N. Section 4: Presentation of departmental research seminar, 2 credits any term. Ph.D. candidates in biochemistry and biophysics present a departmental research seminar in the third or fourth year. One registers in the term the seminar is presented.

BB 650. SELECTED TOPICS IN BIOCHEMISTRY (3). Nonsequence courses designed to acquaint student with current research in biochemistry. Courses include cell surfaces, enzyme kinetics, metabolism, neurochemistry, trace element metabolism, biological oxidations, and bioenergetics. Most courses offered alternate years.

BB 651. SELECTED TOPICS IN BIOCHEMISTRY (3). Nonsequence courses designed to acquaint student with current research in biochemistry. Courses include cell surfaces, enzyme kinetics, metabolism, neurochemistry, trace element metabolism, biological oxidations, and bioenergetics. Most courses offered alternate years.

BB 652. SELECTED TOPICS IN BIOCHEMISTRY (3). Nonsequence courses designed to acquaint student with current research in biochemistry. Courses include cell surfaces, enzyme kinetics, metabolism, neurochemistry, trace element metabolism, biological oxidations, and bioenergetics. Most courses offered alternate years.

BB 653. PLANT BIOCHEMISTRY (3). Chemical processes and metabolism in plant systems. PREREQ: BB 451/BB 551,BB 492/BB 592, or equivalent. Offered alternate years.

BB 654. PROTEINS (3). Advanced treatment of protein structure and function. PREREQ: BB 451/BB 551, BB 492/BB 592, or equivalent.

BB 655. DNA-PROTEIN INTERACTIONS (3). Structures of DNA-protein complexes. Proteins and enzymes involved in replication, transcription, repair, recombination, regulation, and restriction. PREREQ: BB 451/BB 551, BB 492/BB 592, or equivalent. Offered alternate years.

BB 657. NUCLEOTIDES (3). Chemistry, enzymology, and metabolism of nucleotides, emphasizing experimental methods, genetic regulation, antimetabolites, and biological control mechanisms. PREREQ: BB 451/BB 551,BB 492/BB 592, or equivalent. Offered alternate years.

BB 659. PROTEIN SYNTHESIS (3). Advanced course which uses current literature and monographs to provide a basis for the understanding of protein synthesis in biological systems. Both eukaryote and prokaryote protein synthesis are discussed. The process itself and the fidelity with which it occurs are explored. The evolution of the system is also considered. PREREQ: BB 451/BB 551, BB 492/BB 592, or equivalent. Offered alternate years.

BB 660. EUKARYOTIC TRANSCRIPTION (3). Molecular details of gene regulation in higher organisms, emphasizing current literature and experimental methods. PREREQ: BB 451,BB 492, or equivalent. Offered alternate years.

BB 662. HORMONE ACTION (3). Mechanisms of action of peptide and steroid hormones and related compounds at the cellular level. PREREQ: BB 452/BB 552, BB 492/BB 592, or equivalent. Offered alternate years.

BB 664. PHYSICAL METHODS IN BIOPHYSICS AND BIOCHEMISTRY (3). Important techniques for studying biopolymers and biological systems. PREREQ: BB 483/BB 583. Not offered every year.

BIOLOGY PROGRAM

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Faculty

Faculty members are listed under the biological science departments.

Undergraduate Major

Biology (B.S.)

Minor

Biology

The undergraduate biology major is available for students who wish to obtain broad, interdisciplinary training in the biological sciences rather than enter into a traditional biological subdiscipline represented by the Departments of Biochemistry and Biophysics, Botany and Plant Pathology, Entomology, Microbiology, and Zoology at OSU. Biology students may transfer to one of these departments if their interests change as they progress in their undergraduate studies. Biology majors are encouraged to complete courses in an *Area of Interest* in order to develop depth in at least one field of study.

CURRICULUM

CORE PROGRAM

Freshman Year

BI 198. Seminar (1)
BI 211, BI 212, BI 213. Biology (12)
CH 221, CH 222, CH 223. Gen Chemistry (15)
WR 121. English Composition (3)
MTH 251, MTH 252. Calculus (8)
HHP 231. Lifetime Fitness for Health (3)
Required courses and/or electives (3)

Sophomore Year

CH 331, CH 332, CH 337. Organic Chem (10)
BI 214. Cell and Molecular Biology (3)
PH 201, PH 202, PH 203. General Physics (15)
Required courses and/or electives (17)

Junior and Senior Years

BB 450, BB 451. General Biochemistry (7)
ST 351, ST 352. Intro to Statistical Methods (8)
BI 311. Genetics (4)
BI 370. General Ecology (3)
MB 302, MB 303. General Microbiology (5)
BI 445. Evolution (3)
BI 460. Cell Biology (3)
BI 461. Cell Biology Lab (2)
HSTS 415. Theory of Evolution and Foundation of Modern Biology (3)
Writing intensive course (3)
Additional upper division courses (12)
Other required courses and electives (40)

Suggested Areas of Interest

Biology majors may elect to concentrate coursework in an area of interest. Below is a list of suggested areas and courses. Students electing marine biology must take BI 450, BI 451.

Cell and Development Biology
Ecology
Environmental Biology
Evolutionary Biology
Genetics
Marine Biology
Physiology
Plant Biology

PREPROFESSIONAL PROGRAMS

The following preprofessional programs may be accommodated within the biology major: Dentistry, Medicine, Medical Technology, Optometry, Podiatry, and Veterinary Medicine. Please consult with an adviser to plan your program.

Approved courses with a BI designator are accepted for major credit by the Departments of Biochemistry and Biophysics, Botany, Entomology, Microbiology, and Zoology. Approved courses listed above carrying BOT, Z, MB, GEN, or HSTS designators are accepted for credit in biology.

MINOR

The minor in biology requires 27 credits, which includes an introductory biology sequence with a chemistry prerequisite or corequisite (BI 211, 212, 213), a course in cell and molecular biology (BI 214) and at least 12 credits of upper division credits from courses offered under subject areas listed below. **No upper division course used to satisfy a major requirement can be used to fulfill a minor requirement.**

1. BI 211, BI 212, BI 213, BI 214 (4,4,4,3)
2. One course in each of the following subject areas[1]:

a. PHYSIOLOGY
BI 488 (3), BOT 331 (5), ENT 416 (3), Z 423 (4), Z 430 (4), or Z 431 (5)

b. ECOLOGY and SYSTEMATICS
BI 370 (3), BOT 341 (4), ENT 420 (3), MB 448 (3), Z 348 (3), or Z 351 (3)

c. EVOLUTION
BI 445 (3), HSTS 415 (3), or Z 345 (3)

d. GENETICS
BI 311 (4)

Other courses in a subject area may be allowable; a petition must be submitted and approved by the Biology Program before a different course will be accepted.

COURSES

Lower Division

***BI 101, BI 102, BI 103. GENERAL BIOLOGY (4).** An introductory course in the principles and methods of biology, intended for majors in fields other than the biological sciences. Diversity of life, ecology, population biology, and, human environmental impacts. (Bacc Core Course)

BI 107. HEALTH PROFESSIONS: DENTAL (1). Discussion of matters relating to careers in dentistry by local dentists. Includes application procedures, the importance of various requirements, admission, professional school curricula, financing your education and related matters.

BI 108. HEALTH PROFESSIONS: ALLIED (1). Broad overview of various medical and allied health professions such as nursing, occupational therapy, and medical technology. Includes application procedures, the importance of various requirements, admission, professional school curricula, financing your education and related matters.

BI 109. HEALTH PROFESSIONS: MEDICAL (1). Discussion of matters relating to careers in medicine. Includes application procedures, the importance of various requirements, admission, professional school curricula, financing your education and related matters.

BI 198. DISTINGUISHED BIOLOGY SCHOLARS SEMINAR SERIES (1). Presentations made by eminent teachers and researchers who will discuss various aspects of biology. Graded P/N.

BI 211, BI 212, BI 213. *INTRODUCTORY BIOLOGY (4). Origins of life, energy transformations, plant and animal diversity; cell biology, organ systems, plant and animal physiology; genetics, evolution, natural selection, and ecology. PREREQ:/COREQ:General Chemistry. For life science majors and professional students. Lec/lab. (Bacc Core Courses)

BI 214. CELL AND MOLECULAR BIOLOGY (3). Fundamental concepts of prokaryotic and eukaryontic cell biology. Emphasizes cell structure and function at the molecular level. PREREQ: One year of college chemistry; BI 211, BI 212, and BI 213, CH 331. COREQ: CH 332.

BI 298. RESEARCH IN THE BIOLOGICAL SCIENCES (1). Presentations made by faculty who will describe their research and its significance. Open to undergraduate majors in biology, biochemistry, botany, entomology, environmental science, microbiology, and zoology. Course may be repeated for 2 credits. Graded P/N.

Upper Division

BI 300. *PLAGUES, PESTS, AND POLITICS (3). Integration and interaction of agricultural and public health aspects of entomology in society and history. CROSSLISTED as ENT 300. (Bacc Core Course)

BI 301. *HUMAN IMPACTS ON ECOSYSTEMS (3). Selected human impacts on ecosystems are examined in depth, including air quality, global climate change, management of agricultural and forest resources, and threats to biological diversity. The causes, approaches to investigating, and potential solutions for each issue are discussed from a scientific and social perspective. Adverse effects on ecosystems that result from each environmental problem are examined. PREREQ: One year of college biology or chemistry. (Bacc Core Course)

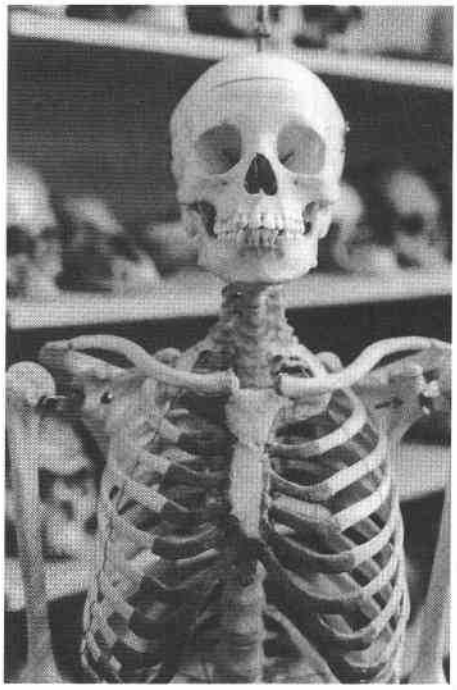
BI 311. GENETICS (4). Fundamentals of Mendelian, quantitative, population, molecular, and developmental genetics. PREREQ: One year each of biology and chemistry.

BI 333. *^ENVIRONMENTAL PROBLEM SOLVING (3). Case studies involving environmental problems are first reviewed in the context of scientific inquiry. Subsequently, the origins of these problems are traced to analyze social, political, and cultural roles in creating and solving such problems. PREREQ: One year of college chemistry and biology. (Bacc Core Course and Writing Intensive Course)

BI 350. ANIMAL BEHAVIOR (3). Concepts of behavior; sensory receptors, internal mechanisms, governing responses; learning and habituation; social organization and communication. PREREQ: One year of biological science.

BI 370. GENERAL ECOLOGY (3). The biology of ecosystems: energy, patterns of ecosystems and populations, interspecies interactions, diversity, and development. PREREQ: One year of biological science.

BI 371. ^ECOLOGICAL METHODS (3). Experimental design, data collection, analysis and synthesis in ecological studies; local ecosystems emphasized. PREREQ: BI 370. (Writing Intensive Course)



BI 401. RESEARCH (1-16). PREREQ: Department approval required.

BI 405/BI 505. READING AND CONFERENCE (1-16). PREREQ: Department approval required.

BI 407. SEMINAR (1). Section 1: Senior Seminar; crosslisted as BOT 407, Section 1. Intended to instruct students on proper techniques for presentation of scientific material. Each student is expected to prepare and present a scientific seminar and a statement of professional goals. PREREQ: Junior standing in botany or biology. CROSSLISTED as BOT 407, Section 1.

BI 410. INTERNSHIP (1-16). PREREQ: Departmental approval.

BI 434/BI 534. FIELD PHOTOGRAPHY (3). Photographic techniques utilized in accurately recording natural phenomena in the field and presenting the results in an attractive and professional manner. The laboratory is devoted exclusively to field work and practical applications of techniques and procedures learned. PREREQ: Two years of biological science. Field trip fee.

BI 445/BI 545. EVOLUTION (3). Formal analysis of genetic and ecological mechanisms producing evolutionary change; special topics include speciation, ecological constraints, adaptive radiations, paleontology, biogeography, the origin of life, molecular evolution, and human evolution. PREREQ: GEN 311; BI 370.

BI 450/BI 550. MARINE BIOLOGY (8). (Hatfield Marine Science Center). A comprehensive introduction to the flora and fauna of the marine environment approached from the level of the cell to the whole organism. Ecological patterns and processes characteristic of marine communities will be emphasized. PREREQ: A one year course in biology or equivalent courses in introductory botany and zoology. Department approval required. COREQ: BI 451/BI 550.

BI 451/BI 551. MARINE BIOLOGY LABORATORY (8). Hatfield Marine Science Center. Laboratories and field experience with flora and fauna of the marine environment, microbes, physiological and biochemical characteristics and adaptations of marine organisms, ecological patterns and processes of marine populations, communities, and ecosystems. Must be taken concurrently with BI 450/BI 550. Department approval required. Field trip fee.

BI 460. CELL BIOLOGY (3). In-depth study of eukaryotic cells with emphasis on relationships between structural components and functional processes withing and between cells. Topics include nuclear and cytoplasmic compartments, organization and assembly of the cytoskeleton, and abnormal cell development. PREREQ: One year of biological science. PREREQ/COREQ: BB 450, BB 451.

BI 461. CELL BIOLOGY LABORATORY (2). Laboratory experiments to study the structure and functions of eukaryotic cells. PREREQ/COREQ: BI 460.

BI 466. ELECTRON MICROSCOPY (3). Transmission and scanning EM as well as x-ray instrument theory and design, sample preparation, and applications to biological and materials microstructural studies. PREREQ: Introductory college physics; junior standing.

BI 488. ENVIRONMENTAL PHYSIOLOGY OF PLANTS (3). Introduces students to mechanisms of plant responses to environmental change caused by humans, including atmospheric, nutrient, water, and global climate factors. Concepts are built around principles of plant environment relations. PREREQ: One course in plant physiology or one course in ecology. CROSSLISTED as BOT 488.

BI 489. *^ANALYSIS OF ENVIRONMENTAL ISSUES (3). Introduces students to the process of analyzing environmental issues by developing their capacity to acquire facts, synthesize ideas, and communicate their knowledge. Students work within a group and prepare a written analysis. PREREQ: One year of chemistry or biology. CROSSLISTED as BOT 489. (Bacc Core Course and Writing Intensive Course)

Graduate

BI 550. MARINE BIOLOGY (8).

BI 566. ELECTRON MICROSCOPY (3). Transmission and scanning EM as well as x-ray instrument theory and design, sample preparation, and applications to biological and materials microstructural studies. PREREQ: Introductory college physics; junior standing.

BI 570. COMMUNITY STRUCTURE AND ANALYSIS (4). Quantitative methods for the analysis of biotic communities, including community concepts, estimation of community composition parameters, theoretical aspects of multivariate methods of analyzing species-importance data, and overview of multivariate tools; hands-on computer analysis of data sets. PREREQ: A course in ecology; ST 412/ST 512 or equivalent; calculus. Lec/lab.

BI 588. ENVIRONMENTAL PHYSIOLOGY OF PLANTS (3). Introduces a students to mechanisms of plant responses to environmental change caused by humans, including atmospheric, nutrient, water, and global climate factors. Concepts are built around principles of plant environment relations. PREREQ: One course in plant physiology or one course in ecology. CROSSLISTED as BOT 588.

BI 589. ANALYSIS OF ENVIRONMENTAL ISSUES (3). Introduces students to the process of analyzing environmental issues by developing their capacity to acquire facts, synthesize ideas, and communicate their knowledge. Students work within a group and prepare a written analysis. PREREQ: One year of chemistry or biology. CROSSLISTED as BOT 589.

BI 670. COMMUNITY STRUCTURE AND ANALYSIS (4). Quantitative methods for the analysis of biotic communities, including community concepts, estimation of community composition parameters, theoretical aspects of multivariate methods of analyzing species-abundance data, and overview of multivariate tools; hands-on computer analysis of data sets. PREREQ: A course in ecology; ST 412/ST 512 or equivalent; calculus. Lec/lab.

BOTANY AND PLANT PATHOLOGY

Stella Coakley, Chair
Cordley Hall 2082
Oregon State University
Corvallis, OR 97331-2902
(503) 737-3451

Faculty

Professors Armstrong, Arp, Coakley, Hansen, Koepsell, McIntire, Meints, Mills, L. Moore, T. Moore, Powelson, Rickson, Smiley, Spotts, Zobel; *Associate Professors* Crowe, Denison, E. Ingham, R. Ingham, K. Johnson, Lajtha, Lomax, McCune, Muir, Mundt, Pscheidt, Rivin, Wilson, Winner; *Assistant Professors* Ciuffetti, Dolja, Hyman, Liston, Spatafora, Stone, Sugar, Wolpert; *Senior Instructors* Russell, Soeldner; *Instructors* Halse, Putnam

Courtesy Faculty:

Professors Hampton, Linderman, Welty; *Associate Professor* Loper, Neilson; *Assistant Professors* Alderman, Meinke

Undergraduate Major

Botany (B.S.)

Minor

Botany

Graduate Major

Botany and Plant Pathology (M.A., M.S., Ph.D.)

Graduate Areas of Concentration
Ecology and Systematics
Plant Molecular Biology and Genetics
Plant Pathology
Plant Physiology
Structural Botany

UNDERGRADUATE STUDIES

The field of plant biology, which encompasses botany and plant pathology, involves the study of plants at levels of organization ranging from the molecular to the global ecosystem. Plant scientists in the 21st Century will be called upon to provide information useful for producing food, fiber, and medicine for an increasing population, and for increasing our understanding of the diversity of plant and ecological systems and their interactions with humans. Students studying botany and plant pathology at OSU receive the basic science background necessary for such contributions, and may choose to focus in a particular area within plant science.

The undergraduate program in the Department of Botany and Plant Pathology is designed for students who wish to emphasize studies in plant biology and receive a B.S. degree in botany. Students may also have an undergraduate major in biology and emphasize botany courses in their upper division work.

Completion of the undergraduate curriculum can qualify students for graduate work in various areas of plant biology and plant pathology, and for positions in state and federal agencies and industries concerned with plants and their products.

It is desirable that prospective botany majors obtain a strong background in the biological and physical sciences at the high school level. Specifically recommended are a minimum of three years of high school mathematics, including algebra, geometry, and some exposure to trigonometry; one year of chemistry; one year of biology; and courses designed to develop computer and writing skills. Students without an adequate background in mathematics and science can make up these deficiencies early in their college careers.

CURRICULUM

The required curriculum meets the course distribution requirements of the University and the College of Science and provides opportunity for specialized study in one or more principal areas of plant science. The undergraduate major, in regular consultation with a faculty adviser, prepares an academic program which meets University requirements, provides adequate scientific background, and fulfills individual goals and interests.

B.S. DEGREE IN BOTANY

Freshman and Sophomore

BI 211, BI 212, BI 213. Biol (12)
CH 121, CH 122, CH 123, CH 219 or CH 221, CH 222, CH 223. Gen Chem (15-17)
CH 331, CH 332. Organic Chem (8)
MTH 251 and MTH 252 or MTH 241 and MTH 245. Calculus (8)
BOT 221. Introduction to Plant Systematic (4)

Baccalaureate Core

Writing and speech (9)
Fitness (3)
Perspectives (15)

Electives (11-15)

Junior and Senior

PH 201, PH 202, PH 203. General Physics (15)
ST 351. Statistics (4)
BB 350 or BB 351 or BB 450 and BB 451. Biochem (4-7)
BOT 411. Biology of Non Vascular Plants (4)
BOT 413. Plant Anatomy (4)
BOT 331. Plant Physiology (5)
BOT 341. Plant Ecology (4)
BOT 350 or MB 302. Plant Pathology or Microbiology (3-4)
BI 311. Genetics (4)
Additional upper division biology (4)
(College of Science courses, outside of botany and plant pathology)

Baccalaureate Core

Synthesis (6)
Writing Intensive Course (3)

Electives (26-30)

TOTAL (180)

MINOR (27)

BOT 221. Introduction to Plant Systematics (4)
BOT 331. Plant Physiology (5)

BOT 341. Pant Ecology (4)
BI 311. Genetics (4)
Any additional 10 credit hours of BOT courses

The requirements listed above are subject to the following constraints:
Courses required for a major taken in the major department may not count toward a minor.
An individual course may not count toward more than one minor.

GRADUATE STUDIES

The Department of Botany and Plant Pathology offers graduate programs leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees.

Plant pathology, physiology, systematics and ecology, structural botany, and genetics comprise the five major disciplines within the department.

Plant pathology includes nematology, bacteriology, virology, forest pathology, epidemiology, physiology of parasitism, and the genetics and biochemistry of host-pathogen interactions.

Physiology includes photosynthesis, nitrogen metabolism, synthesis and mode of action of phytohormones, and the biochemical and physiological control of gene expression during differentiation and morphogenesis.

Systematics and Ecology include terrestrial and aquatic ecology and taxonomy and systematics of algae, fungi and angiosperms.

Structural Botany includes cytology, anatomy, and morphology of various plant groups with associated techniques in cytology, histology and light and electron microscopy.

Genetics includes analysis of genomic diversity in plants; plant gene regulation; and molecular, classical and population genetics of plant-associated microorganisms.

Students with majors in any one area can incorporate into their programs minors in other areas within the department or in other departments in the Colleges of Science, Agricultural Sciences, and Oceanic and Atmospheric Sciences. Integrated minors, such as pest management, or interdisciplinary programs in plant physiology and genetics are also available.

The Ph.D. and M.S. (thesis options) degrees offered by the Department of Botany and Plant Pathology require, in addition to course work, research experience, resulting in presentation and defense of a thesis. In addition, Ph.D. candidates must pass a written and oral preliminary examination upon completion of their course work. A non-thesis M.S. degree is also available. The M.A. degree requires the knowledge of one foreign language. Inquiries concerning graduate studies can be forwarded to the chairperson of the Department of Botany and Plant Pathology.

COURSES

Lower Division

BOT 101. *BOTANY: A HUMAN CONCERN (4). Introductory botany for non-majors emphasizing the role of plants in the environment, agriculture and society. Includes molecular approaches to the study of plant function and genetic engineering. Lec/lab. (Bacc Core Course)

BOT 221. INTRODUCTION TO PLANT SYSTEMATICS (4). Vascular plant classification, diversity, and evolutionary relationships. Lab emphasizes the collection and identification of ferns, gymnosperms, and flowering plants in the Oregon flora. PREREQ: BI 213. CH 223 or CH 123 and CH 219. Lec/lab.

Upper Division

BOT 331. PLANT PHYSIOLOGY (5). Physiological and metabolic processes of plants. Survey of photosynthesis and plant metabolism, mineral nutrition and ion uptake, water relations, transport processes, regulation of plant growth and development, and whole plant physiology. PREREQ: BI 213; CH 223 or CH 123 and CH 219. Lec/lab.

BOT 341. ^PLANT ECOLOGY (4). Study of higher plants in relation to their environment. The relationship of plant physiology and reproduction to environmental factors; competition and other species interactions; the structure, dynamics and analysis of vegetation. PREREQ: BI 213. REC: BOT 221 with 342. Lec/lab. (Writing Intensive Course when taken with BOT 342.)

BOT 342. ^WRITING ABOUT PLANT ECOLOGY (1). Introduction to the kinds of writing used by plant ecologists with practice in their use and production. With BOT 341, a Writing Intensive course for botany majors only. PREREQ/COREQ: BOT 341. Lec. (Writing Intensive Course)

BOT 350. INTRODUCTORY PLANT PATHOLOGY (4). Symptoms, causal agents, diagnosis, and prevention of plant diseases, with emphasis on fungi, bacteria, nematode, and virus pathogens. PREREQ: BI 213. Lec/lab.

BOT 401. RESEARCH (1-16). Untitled sections only, graded P/N.

BOT 405. READING AND CONFERENCE (1-16).

BOT 407. SEMINAR (1-16). Section 1: Senior Seminar (1). Intended to instruct students on proper techniques for presentation of scientific material. Each student is expected to prepare and present a scientific seminar, and a statement of professional goals. Graded P/N. PREREQ: Junior or senior standing in botany or biology. CROSSLISTD as BI 407 Section 1. Section 2: Seminar Lichen and Bryophyte Research (1). Weekly one-hour meetings for reporting and discussion of ative research projects, discussion of proposal research, review and discussion of recent literature, and mini-workshops on particular problems. PREREQ: Gradute or consent of instructor. Section 3: Departmental seminar.

BOT 411/BOT 511. BIOLOGY OF NON-VASCULAR PLANTS (4). Structure, life histories, classification, and ecology of algae, fungi, and bryophytes. Field trips. PREREQ. BI 213. Lec/lab.

BOT 412/BOT 512. MORPHOLOGY OF VASCULAR PLANTS (4). Structure, reproduction, and evolutionary history of vascular plants. PREREQ: BI 213. Offered alternate years. Lec/lab.

BOT 413/BOT 513. PLANT ANATOMY (4). Origin, structure and development of the tissues of vascular plants. PREREQ: BI 213. Lec/lab.

BOT 414/BOT 514. AGROSTOLOGY (4). Classification and identification of grasses, with emphasis on the modern system of grass classification; laboratory practice in keying grass specimens to genus and tribe. PREREQ: BOT 221. Lec/lab.

BOT 415/BOT 515. FOREST INSECT AND DISEASE MANAGEMENT (5). Effects of insects and diseases on forest ecosystems. Recognition of important groups, prediction of pest responses to environmental changes, and management strategies for protection of forest resources. Field trips. PREREQ: BI 213. CROSSLISTED as ENT 415/ENT 515. Lec/rec/lab.

BOT 416/BOT 516. AQUATIC BOTANY (4). Taxonomy and ecology of aquatic vegetation, emphasizing freshwater and marine algae and the submergent vascular plants. Morphology, physiology, and classification of the algae; morphological and physiological adaptations of aquatic vascular plants; and primary production in aquatic ecosystems. Laboratory practice in the identification of local taxa. PREREQ: BI 213. Lec/lab.

BOT 421/BOT 521. ADVANCED PLANT SYSTEMATICS (4). Experimental plant systematics. Methods of phylogenetic reconstruction. Collection and analysis of taxonomically informative characters including structural, cytological, genetic, biochemical, and molecular data. PREREQ: BOT 221, BI 311. Lec/lab.

BOT 425/BOT 525. PLANT TAXONOMY (3). Use of taxonomic keys; floral structure relationships and diagnostic characteristics of vascular plants. PREREQ: BI 213. Lec/lab.

BOT 433/BOT 533. HORMONAL REGULATION OF PLANT GROWTH AND DEVELOPMENT (3). Roles of hormones, inhibitors, and phytochrome in the regulation of growth and development of seed plants. The biochemistry of growth substances and phytochrome; effects of physical environment upon specific growth and developmental events and the salient biochemical changes correlated with those events. PREREQ: BOT 331.

BOT 441/BOT 541. PLANT AUTECOLOGY (3). The nature of the environment and plant responses to major environmental factors, physiological plant ecology. PREREQ: BOT 341; BOT 331. Lec/lab.

BOT 442/BOT 542. PLANT POPULATION ECOLOGY (3). Ecological aspects of plant form and reproduction; demography and population modelling; species interactions, including competition, mutualism, and herbivory. PREREQ: BOT 341 or equivalent. Lec/lab.

BOT 443/BOT 543. PLANT COMMUNITY ECOLOGY (3). The structure, diversity, and successional dynamics of terrestrial plant communities; methods of analysis. PREREQ: BOT 341 or equivalent. Lec/lab.

BOT 452/BOT 552. PLANT DISEASE MANAGEMENT (4). Analysis of host, pathogen, and environmental factors influencing the increase and spread of plant disease. Epidemiological theory will be used as a basis for developing and evaluating principles and concepts of plant disease management. PREREQ: BOT 350 or 550. Offered alternate years. Lec/lab.

BOT 453/BOT 553. PLANT DISEASE DIAGNOSIS (3). Diagnosis of plant diseases and identification of causal agents. Laboratory practice in identification techniques. Observation of symptoms exhibited by diseased plants in greenhouse and field locations. Field trips. PREREQ: BOT 350 or BOT 550. Lec/lab.

BOT 461/BOT 561. INTRODUCTORY MYCOLOGY (4). A broad taxonomic survey of the fungi. Topics include life histories, systematics, ecology, genetics, and ethnomycology. Participation on field trips and the submission of a specimen collection are required. PREREQ: BI 213. Lec/lab.

BOT 470/BOT 570. MICROTECHNIQUE (4). Techniques of cytology, cytochemistry, histochemistry, and autoradiography. PREREQ: BI 213. Lec/lab.

BOT 488/BOT 588. ENVIRONMENTAL PHYSIOLOGY OF PLANTS (3). Introduces students to mechanisms of plant responses to environmental change caused by humans, including atmospheric, nutrient, water, and global climate factors. Concepts are built around principles of plant environment relations. PREREQ: One course in plant physiology or one course in ecology. CROSSLISTED as BI 488/BI 588.

BOT 489/BOT 589. *^ANALYSIS OF ENVIRONMENTAL ISSUES (3). Introduces the students to the process of analyzing environmental issues by developing their capacity to acquire facts, synthesize ideas, and communicate their knowledge. Students work within a group and prepare a written analysis. PREREQ: One year chemistry or biology. CROSSLISTED as BI 489/BI 589. (Bacc Core and Writing Intensive Course)

BOT 490/BOT 590. SELECTED TOPICS IN MYCOLOGY (1-3). Advanced topics in mycology through analysis of current literature. Detailed study of an aspect of mycology beyond those covered in regular classes. Seminar and discussion format. PREREQ: BOT 461/BOT 561 or Consent of instructor.

Graduate

BOT 501. RESEARCH (1-16).

BOT 503. THESIS (1-16).

BOT 505. READING AND CONFERENCE (1-16).

BOT 507. SEMINAR (1). Section 1: Departmental seminar. Section 2: Lichen and Bryophyte Research (1). Weekly one-hour meetings for reporting and discussions of proposal research, review and discussion of recent literature, and mini-workshops on particular problems. PREREQ: Graduate or consent of instructor. Graded P/N. Section 3: Graduate Teaching Seminar (1). Covers technical aspects of serving as a graduate teaching assistant. Required for first-time teaching assistants supervised by the Department of Botany and Plant Pathology. Open to teaching assistants from other biological science departments. May be repeated for credit. Graded P/N.

BOT 508. WORKSHOP (1-16).

BOT 544. PLANT GEOGRAPHY (3). Description and control of species distribution. Characteristics, distribution, history and environmental limitations of the major units of vegetation, with emphasis on the Americas. PREREQ: BOT 221; a graduate course in ecology. Offered alternate years. Lec/lab.

BOT 550. PLANT PATHOLOGY (4). Causal agents of plant disease, diagnosis, pathogenesis, epidemiology, and disease management principles and strategies. PREREQ: BI 203 or BI 213. Field trip fee. Lec/rec/lab.

BOT 551. PLANT PATHOGENESIS (3). Analysis of current concepts in the physiology, biochemistry and genetics of host-parasite interactions. Topics covered include specificity, recognition, penetration, toxin production, altered plant metabolism during disease, resistance mechanisms and regulatory aspects of gene expression during host-parasite interactions. PREREQ: BOT 550. Offered alternate years.

BOT 554. PLANT PATHOGENIC NEMATODES (2). Survey of nematodes which cause plant disease. Includes: taxonomy; identification; life cycles; symptomology; interactions with other plant pathogens; and how nematodes cause plant disease. PREREQ: BOT 550; 6 credits of upper division biology. Offered alternate years. Lec/lab.

BOT 555. PLANT VIROLOGY (3). Nature and properties; symptomology; transmission; inhibitors; purification; electron microscopy; serology; control. PREREQ: BOT 550; 6 credits of upper division biology. Lec/lab. Offered alternate years.

BOT 556. PLANT PATHOGENIC FUNGI (3). Biology of fungi which cause disease of cultivated plants. Includes: reproduction, dissemination, interactions with host and vectors, classification, and structure. Field trips. PREREQ: BOT 550. Offered alternate years. Lec/lab.

BOT 557. PLANT PATHOGENIC BACTERIA (2). Identification/classification, biology of pathogens; symptoms; prokaryote interactions on and within plants. PREREQ: BOT 550. Offered alternate years. Lec/lab.

BOT 593. SELECTED TOPICS-PLANT CELL AND MOLECULAR BIOLOGY (1-3). Seminar and discussion format. Recent advances in cellular and molecular approaches to the study of plant functions of ecological and physiological significance. Topics vary from year to year. May be repeated for credit.

BOT 601. RESEARCH (1-16).

BOT 603. THESIS (1-16).

BOT 605. READING AND CONFERENCE (1-16).

BOT 607. SEMINAR (1-16).

BOT 608. WORKSHOP (1-16).

BOT 616. FOREST PATHOLOGY (3). Advanced topics in Forest Pathology with an emphasis on field problems facing managers of forest resources. PREREQ: BOT 415/BOT 515 or BOT 550. Offered alternate years. Lec/lab.

BOT 625. PLANT MOLECULAR GENETICS (3). Structure, expression and interactions of the plant nuclear, chloroplast and mitochondrial genomes. Critical examination of the current literature on gene regulation, mobile genetic elements and biotechnology in higher plants. PREREQ: GEN 421 and BB 451 or consent of instructor. Offered alternate years. CROSSLISTED AS BI 625, MCB 625.

BOT 664. HOST PARASITE INTERACTIONS: GENETICS AND PHYSIOLOGY (3). Mendelian and molecular analysis of host-pathogen genetics. Biochemical and physiological basis of plant disease. Topics include gene organization and function, chromosome mapping, parasexuality and genetic models for plant disease resistance. Also, host-parasite recognition, pathogenicity and host response to infection. Offered alternate years. Lec. CROSSLISTED as MCB 664, GEN 664.

BOT 668. HOST-PARASITE INTERACTIONS: POPULATIONS (4). Evaluation of processes affecting the dynamics of plant disease and pathogen populations through analysis of current literature. Students will be expected to conduct extensive reading and analysis of literature and to meet with the instructor for small group discussions. PREREQ: BOT 550; ST 412. Offered alternate years.

BOT 691. SELECTED TOPICS-PLANT ECOLOGY (1-3). Graded P. Recent advances and developing problems in plant ecology, with critical evaluation of current literature. Topics vary from year to year. May be repeated for credit. Offered alternate years. PREREQ: Graduate level ecology.

BOT 692. SELECTED TOPICS-PLANT PATHOLOGY (1-3). Seminar and discussion of selected topics in plant pathology, emphasizing current literature and theory. Topics vary from year to year. May be repeated for credit. PREREQ: BOT 550 or equivalent.

CHEMISTRY

Carroll DeKock, Chair
Gilbert Hall 153
Oregon State University
Corvallis, OR 97331-4003
(503) 737-2081

Faculty

Professors Daniels, DeKock, Evans, Freeman, G. Gleicher, Gould, Horne, Ingle, Krueger, Loveland, Nibler, Piepmeier, Schuyler, Sleight, Thies, Thomas, Westall, White; *Associate Professors* Gable, Keszler, Loeser, Watson; *Assistant Professors* Lerner, Somoza; *Senior Instructors* Albrecht, M. Gleicher, Pastorek; *Courtesy Professors:* Barofsky, Deinzer, Field, Gerwick

Undergraduate Major

Chemistry (B.A., B.S.)

Minor

Chemistry

Graduate Major

Chemistry (M.A., M.S., Ph.D.)

Graduate Areas of Concentration

Analytical Chemistry
Inorganic Chemistry
Nuclear and Radiation Chemistry
Organic Chemistry
Physical Chemistry
Solid State Chemistry

The Department of Chemistry offers the degrees of Bachelor of Science, Bachelor of Arts, Master of Science, Master of Arts, Master of Arts in Interdisciplinary Subjects, and Doctor of Philosophy in Chemistry.

A major in chemistry may serve the undergraduate student as preparation for professional work in chemistry and related sciences such as biochemistry, agricultural chemistry, oceanography, and environmental or atmospheric sciences, or as a core for preprofessional training in a field such as medicine or dentistry.

The major in chemistry helps students prepare for graduate work in pure or applied chemistry, for positions as research chemists and technical experts in commercial laboratories and chemical industries, for positions with the federal government, and for teaching positions in universities, colleges, community colleges, and high schools.

The chemistry core curriculum consists of general, organic, analytical, physical, and inorganic chemistry course work, plus three years of laboratory work in chemistry. The remainder of the B.S. program consists of 12 credits of approved career-supportive electives, of which at least three are to be in laboratory courses or research. (For the B.A. program, it is 9 credits, including at least three in lab or research.)

Most chemistry majors take advantage of the opportunity to become involved in research projects in the department. Working with a research group can be an exciting way to apply to ideas and skills acquired in formal coursework. Students make contact directly with faculty members to set up such projects and work closely with the faculty member and other members of the research group. The student registers for CH 401 or CH 403; the hours per week are flexible. Areas of research available are highly varied and include: synthesis of new compounds and materials, development of instrumentation and its application to practical problems, studies in photochemistry, laser applications, surface science, mechanisms of molecular action in biological processes, fundamental properties of molecules, polymer materials, environmental chemistry, and nuclear chemistry. Research experience is helpful in making the decision about entering graduate work in chemistry and provides valuable experience for entering the job market.

The B.S. degree is normally taken by students intending to carry out graduate work in chemistry or to find employment as a chemist. The B.A. degree is normally taken by students who desire a broader range of courses, with a reduced number of chemistry and mathematics courses. The B.A. may be appropriate for students interested in health-related, or other professional careers.

The facilities, faculty, and curricular offerings of this department are approved by the American Chemical Society. Graduates who have fulfilled all departmental requirements for the B.S. degree are eligible for certification by the chairman of the department to become members of the Society after two years of professional experience.

Graduate Studies

The Department of Chemistry offers graduate work leading toward Master of Arts, Master of Science, and Doctor of Philosophy degrees in analytical chemistry, inorganic chemistry, nuclear and radiation chemistry, organic chemistry, physical chemistry, and solid state chemistry. All students are required, early in their graduate study, to demonstrate a certain level of competence in three of the above fields, or in two of them plus either biochemistry or physics. Such competence is generally demonstrated by completing in each field two 3-credit "core" courses at the 500 level. The required written preliminary examinations for the Ph.D. take the form of a number of "cumulative examinations," except for a single written examination required for the major in nuclear and radiation chemistry. The major emphasis of the Ph.D. program is on research. All degrees require a research thesis. Most graduate students in chemistry are supported either as graduate teaching assistants or as graduate research assistants.

Minor (29)

The requirements for a minor in chemistry include 29 credits of chemistry (CH) courses. These credits must include a complete general chemistry sequence including three terms of laboratory (CH 221, CH 222, CH 223, or CH 201, CH 202, CH 203, CH 219, or CH 121, CH 122, CH 123, CH 219). In addition, a minimum of 14 upper division credits in at least two areas of chemistry (organic, physical, analytical, inorganic, or nuclear) and including one laboratory course is required. CH 401, CH 403, CH 595, and CH 596 cannot be used to fulfill the upper division credits.

Curriculum

B.S. Degree

Perspectives courses (15), Synthesis courses (6), Writing courses (9), and the fitness course (3) are baccalaureate core requirements. The quarters in which these are taken are flexible, except that Synthesis courses must be taken at the junior-senior level. The timing of the biology courses is flexible, also.

Nine or more credits of independent research are strongly recommended. These may be taken as CH 401 Research or as CH 403 Thesis. The latter leads to a senior thesis, submitted to the chemistry faculty.

Chemistry majors may not use S/U grading in courses that meet Department of Chemistry or College of Science requirements.

Freshman Year
CH 221, CH 222, CH 223. Gen Chem (15)
MTH 251, MTH 252. Calculus (8)
MTH 253. Infinite Series and Sequences (4)
Writing I (3)
HHP 231 (3)
Perspectives (6)
PH 211. General Physics (5)

Sophomore Year
CH 334, CH 335, CH 336. Organic Chem (9)
CH 361, CH 362. Experimental Chemistry I (6)
MTH 254. Vector Calculus I (4)
MTH 256. Applied Differential Equations (4) or MTH 341. Linear Algebra (3)
PH 212, PH 213,[4] and PH 212R, PH 213R. General Physics (10)
PH 314 or BB 490 or BB 450 (4 or 3)
Writing II (3)
Perspectives (6)

Junior Year
CH 421, CH 422. Analytical Chemistry (6)
CH 440, CH 441, CH 442. Physical Chem (9)
CH 461, CH 462, CH 463[6]. Experim Chem II (9)
BI 211 or BI 101. Biology (4)
Perspectives and synthesis (6)
Writing III/speech (3)
Electives (6-9)

Senior Year
CH 411, CH 412. Inorganic Chemistry (6)
Approved career-supportive electives (must include 3 credits of lab and be approved by the adviser and the department by the end of the winter quarter of the junior year.) (12)
CH 464. Experimental Chemistry II (3)
Perspectives and Synthesis courses (3)
Electives (21)

B.A. Degree

Perspectives courses (15), synthesis courses (6), writing courses (9), and the fitness course (3) are baccalaureate core requirements. The quarters in which these are taken are flexible, except that synthesis courses must be taken at the junior-senior level. The timing of the language and biology courses is flexible, also. The elective courses must include 9 credits of approved courses in the College of Liberal Arts.

Independent research is recommended. This may be taken as CH 401 Research or as CH 403 Thesis. The latter leads to a Senior thesis, submitted to the chemistry faculty.

Chemistry majors may not use S/U grading in courses that meet Department of Chemistry or College of Science requirements.

Freshman Year
CH 221, CH 222, CH 223. Gen Chem (15)
MTH 251, MTH 252. Calculus (8)
Writing I (3)
HHP 231 (3)
Perspectives (6)
Electives (10)

Sophomore Year
CH 334, CH 335, CH 336. Organic Chem (9)
CH 361, CH 362. Experimental Chemistry I (6)
MTH 253. Calculus (4)
PH 211, PH 212, PH 213 and PH 211R, PH 212R, PH 213R, or PH 201, PH 202, PH 203. General Physics (15)
Writing II (3)
Perspectives (6)
Electives (3)

Junior Year

CH 324 or CH 325 or CH 425. Analyt Chem (4)
The Combination of CH 421, 422, CH 461 may be substituted.
CH 440, CH 441, CH 442. Physical Chem (9)
BI 211 or BI 101. Biology (4)
Perspectives and synthesis (6)
Writing III/speech (3)
Language (1st year) (12)
Electives (6)

Senior Year

CH 411, CH 412. Inorganic Chemistry (6)
CH 463. Experimental Chemistry II (3)
Approved career-supportive electives (must be approved by the adviser and the department by the end of the winter quarter of the junior year.) (9)
Perspectives and synthesis (3)
Language (2nd year) (9-12)
Electives (12-15)

COURSES

Lower Division

For any combination of general chemistry courses that is the equivalent of a full-year sequence, no more than 15 credits earned may be counted toward graduation.

CH 121, CH 122, CH 123. *GENERAL CHEMISTRY (5, 5). A general chemistry sequence for students who have had no previous training in chemistry and for those whose college aptitudes test scores indicate the need for a more elementary introduction to chemistry. Entering students are expected to have a working knowledge of high school algebra, logarithms, and scientific notation. This sequence and CH 219 prepares students to take advanced laboratory courses in chemistry. Must be taken in order. (CH 122, CH 123 Bacc Core Courses)

CH 201, CH 202, CH 203. *CHEMISTRY FOR ENGINEERING MAJORS (3,3,3). A sequence of selected chemistry topics for pre-engineering students. This sequence and CH 219 prepares students to take advanced laboratory courses in chemistry. (CH 121 is accepted in lieu of high school chemistry as a prerequisite for this sequence. Must be taken in order. PREREQ: One year of high school chemistry and acceptable aptitude test scores. (Bacc Core Course)

CH 219. GENERAL CHEMISTRY LABORATORY (2). Laboratory work to supplement the instruction in CH 121, CH 122, CH 123 and CH 201,CH 202,CH 203 and to prepare students for more advanced laboratory courses such as CH 324,CH 337,CH 361. PREREQ: CH 203 or CH 123. Lec/lab.

CH 221, CH 222, CH 223. *GENERAL CHEMISTRY (5,5,5). A general chemistry sequence for students majoring in most sciences, pharmacy, and chemical engineering. (CH 121 is accepted in lieu of high school chemistry as a prerequisite for this sequence. Must be taken in order. PREREQ: One year of high school chemistry and acceptable aptitude test scores. Lec/lab/rec. (Bacc Core Courses)

CH 221, CH 222, CH 223: GENERAL CHEMISTRY—MAJORS A general chemistry sequence for students majoring in chemistry. The lecture and lab parts meet together with CH 221, CH 222, CH 223, General Chemistry, but recitation/discussion sections are separate. PREREQ: One year of high school chemistry and acceptable aptitude test scores. Lec/lab/rec. (Bacc Course Course)

CH 224, CH 225, CH 226. *HONORS GENERAL CHEMISTRY (5,5,5). A general chemistry sequence for high aptitude students. The lecture and lab parts meet together with CH 221, CH 222, CH 223, General Chemistry, but the recitation/discussion sections are separate and require student discussion of topics at a more advanced level. PREREQ: One year of high school chemistry and acceptable aptitude test scores. Lec/lab/rec. (Bacc Core Courses)

Upper Division

CH 324. QUANTITATIVE ANALYSIS (4). A basic course in modern chemical analysis. PREREQ: one year of college chemistry. Lec/lab.

CH 325. QUANTITATIVE CHEMISTRY (4). Calculations of stoichiometry and equilibrium, and a limited number of analytical techniques appropriate for the life sciences. Recommended for premedical, predental, and preveterinary students. PREREQ: one year of college chemistry. Lec/lab.

CH 331, CH 332. ORGANIC CHEMISTRY (4,4). Service course covering aliphatic and aromatic chemistry. Introduction to nomenclature, mechanism and synthesis. Must be taken in order. PREREQ: one year of college chemistry. Lec/rec.

CH 334, CH 335, CH 336. ORGANIC CHEMISTRY (3,3,3). Professional sequence for majors in chemistry and chemical engineering and other students who need a year of organic chemistry. In-depth treatment of major classes of organic compounds. Interrelation of mechanistic and synthetic approaches. Must be taken in order. PREREQ: One year college chemistry.

CH 337. ORGANIC CHEMISTRY LABORATORY (2). Laboratory course in organic chemistry for nonmajors, designed to supplement CH 331,CH 332 and CH 334,CH 335,CH 336. PREREQ: CH 332 or CH 336; CH 223 or CH 219.

CH 361, CH 362. EXPERIMENTAL CHEMISTRY I (3,3). First integrated laboratory sequence for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Must be taken in order. COREQ: CH 334, 335. Lec/lab.

CH 374. TECHNOLOGY, ENERGY, AND RISK (3). Decision-making in a technical, democratic society. Discussion of current issues such as acid rain, toxic organic chemicals in the environment, energy resources, etc.

CH 401. RESEARCH (1-16).

CH 403. THESIS (1-16).

CH 405. READING AND CONFERENCE (1-16).

CH 407. SEMINAR (1-16).

CH 411/CH 511, CH 412/CH 512, CH 413/CH 513. INORGANIC CHEMISTRY (3,3,3). Structure and bonding of inorganic compounds, chemistry of nontransition elements from the standpoint of the periodic table and atomic structure, ligand field theory and descriptive chemistry of transition metal compounds, bioinorganic chemistry, group theory and x-ray crystallographic methods. Need not be taken in order. PREREQ: CH 442/CH 542.

CH 418/CH 518. NUCLEAR CHEMISTRY (3). Radioactive decay, nuclear properties, nuclear structure, alpha, beta, and gamma decay, nuclear reactions, fission, interaction of radiation with matter, chemical techniques, radiation safety, and nuclear instrumentation. COREQ: CH 440/CH 540 or PH 314.

CH 419/CH 519. RADIOACTIVE TRACER METHODS (4). Radionuclides, radioactivity, and radiotracer methods as research tools in physical and biological science. PREREQ: two years of college chemistry. Lec/lab.

CH 421/CH 521, CH 422/CH 522. ANALYTICAL CHEMISTRY (3,3). A two-course professional sequence for majors in chemistry. Chemical equilibrium, analytical electrochemistry, separations, spectroscopy, basic electronics and instrumentation, and treatment of data. Need not be taken in order. PREREQ: One year of college chemistry, one year of college physics; COREQ: CH 440/CH 540,CH 441/CH 541.

CH 425. ANALYTICAL CHEMISTRY (4). Professional course for majors in chemical engineering. PREREQ: one year of college chemistry, one year of college physics. Lec/lab.

CH 428/CH 528. INSTRUMENTAL ANALYSIS (4). Service course covering instrumental analytical techniques, designed for graduate students in other departments. PREREQ: Two years of college chemistry or consent of instructor. Lec/lab.

CH 435. STRUCTURE DETERMINATION BY SPECTROSCOPIC METHODS (3). Use of ultraviolet, infrared, nuclear magnetic resonance, and mass spectra for determination of structures and stereochemistry of complex organic molecules. PREREQ: CH 336,CH 442/CH 542.

CH 440, CH 441, CH 442. PHYSICAL CHEMISTRY (3,3,3). Thermodynamics, electrochemistry, solutions, kinetic theory of gases, chemical kinetics, quantum theory and statistical mechanics, molecular structure and spectroscopy. Must be taken in order. PREREQ: One year of college chemistry, one year of college physics; MTH 254.

CH 445/CH 545. PHYSICAL CHEMISTRY OF MATERIALS AND SURFACES (3). Physical chemistry of materials, surface chemistry, polymers, catalysis. PREREQ: CH 442/CH 542.

CH 448/CH 548. COLLOID AND SURFACE CHEMISTRY (3). Colloids: optical properties, rheology, etc. Physical properties of interfaces and monolayers. Electrodes and electrokinetics. Adhesion. Molecular self assembly: membranes, vesicles, micromulsions. PREREQ: CH 442/CH 542.

CH 450/CH 550. INTRODUCTORY QUANTUM CHEMISTRY (3). Elementary wave mechanics and matrix mechanics of atoms and molecules. Quantum basis of chemical structure. PREREQ: CH 442, one year college physics.

CH 453/CH 553. CHEMICAL THERMODYNAMICS (3). The laws of chemical thermodynamics applied to analyze properties of gases, gas mixtures, liquid solutions, fluctuations, critical phenomena, and magnetic systems. PREREQ: CH 442/CH 542.

CH 454/CH 554. STATISTICAL THERMODYNAMICS (3). Ensemble theory, fluctuations, properties of ideal and monatomic gases, theories of non-ideal gases, simple liquids, and atomic crystals. PREREQ: CH 453/CH 553.

CH 461, CH 462, CH 463, CH 464. ^EXPERIMENTAL CHEMISTRY II (3,3,3,3). Second integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Must be taken in order. PREREQ: CH 361,CH 362; COREQ: CH 421,CH 422;CH 440,CH 441,CH 442. Lec/lab. (CH 463 is Writing Intensive Course)

CH 467/CH 567. MOLECULAR SPECTROSCOPY (4). Infrared, Raman, electronic, NMR and ESR spectroscopy, identification and analysis applications, determination of molecular structures and other molecular parameters. PREREQ: CH 442/CH 542. Lec/lab.

CH 490/CH 590. COMPUTER PROGRAMMING FOR SCIENTISTS (3). Programing, numerical and graphical analysis, problem solving, simulations and use of data bases for information handling and retrieval. Applications to problems in chemistry. PREREQ: Two years of college chemistry.

CH 494/CH 594. CHEMICAL KINETICS (3). Reaction rates, experimental methods, elementary processes, complex inorganic reactions, complex organic reactions, catalysis, general theories, and potential energy surfaces. PREREQ: CH 442/CH 542.

Graduate

CH 501. RESEARCH (1-16).

CH 503. THESIS (1-16).

CH 505. READING AND CONFERENCE (1-16).

CH 507. SEMINAR (1-16). Section 1: Analytical Chemistry. Section 2: Physical/Inorganic/Nuclear Chemistry. Section 3: Organic Chemistry. Section 4: Teaching Chemistry. One-hour sections.

CH 514, CH 515, CH 516. SELECTED TOPICS IN INORGANIC CHEMISTRY (3,3,3). Nonsequence courses designed to acquaint the advanced graduate student with recent advances in fields such as solid state chemistry, theoretical inorganic chemistry, spectroscopy and magnetism, chemistry of coordination compounds, kinetics and mechanisms of inorganic reactions, acid-base theory and reactions in nonaqueous solvents, organometallic chemistry, and chemistry of the less familiar elements. PREREQ: CH 413/CH 513.

CH 530, CH 531, CH 532, CH 533. ADVANCED ORGANIC CHEMISTRY (3,3,3,3). Molecular orbital bonding theory, orbital symmetry, reaction mechanisms, stereoisomerism, conformational analysis, and advanced methods of synthesis. PREREQ: CH 336,CH 442/CH 542.

CH 535. STRUCTURE DETERMINATION BY SPECTROSCOPIC METHODS (3). Use of ultraviolet, infrared, nuclear magnetic resonance, and mass spectra for determination of structures and stereochemistry of complex organic molecules. PREREQ: CH 336,CH 442/CH 542.

CH 536, CH 537, CH 538. SELECTED TOPICS IN ORGANIC CHEMISTRY (3,3,3). Nonsequence courses designed to acquaint students with recent advances in organic chemistry and their application to special fields of study. Topics covered vary from term to term and year to year. Topics include: theoretical organic chemistry, recent advances in reaction mechanisms, advanced synthesis, free radical reactions, organic sulfur chemistry, and biosynthesis of natural products. PREREQ: CH 533. Need not be taken in order. Not offered every year.

CH 540, CH 541, CH 542. PHYSICAL CHEMISTRY (3,3,3). Thermodynamics, electrochemistry, solutions, kinetic theory of gases, chemical kinetics, quantum theory and statistical mechanics, molecular structure and spectroscopy. Must be taken in order. PREREQ: One year of college chemistry, one year of college physics; MTH 254.

CH 551. QUANTUM MECHANICS OF ATOMS AND MOLECULES (3). PREREQ: CH 450/CH 550.

CH 552. QUANTUM MECHANICS OF MOLECULAR SPECTROSCOPY (3). PREREQ: CH 551.

CH 560. SPECTROCHEMICAL ANALYSIS (3). Theoretical concepts and methodology of optical spectrochemical methods of analysis, components of spectrometers, atomic and molecular spectrometry. PREREQ: CH 442/CH 542.

CH 561. CHROMATOGRAPHY (3). Theory, instrumentation, and practice of all forms of chromatography and related techniques; handling and interpretation of chromatographic data. PREREQ: Three years of college chemistry.

CH 562. ANALYTICAL ELECTROCHEMISTRY (3). Study of current, voltage and time relationships in electrochemical cells. PREREQ: CH 442/CH 542.

CH 563, CH 564, CH 565. ADVANCED LABORATORY IN ANALYTICAL CHEMISTRY (1,1,1). Optional laboratory to supplement CH 560,CH 561,CH 562. COREQ: CH 560,CH 561,CH 562.

CH 576. ACTIVATION ANALYSIS (4). Theory; various methods of activation emphasizing neutron activation, fundamentals of radioactivity detection, instrumental and radiochemical methods; applications to physical, chemical, biological, geochemical fields, etc. Instrumentation and laboratory techniques include use of beta-ray and gamma-ray detectors, and use of multichannel analyzers. PREREQ: CH 419/CH 519 or senior standing in chemistry or physics, or graduate standing in science or engineering disciplines.

CH 577. EXPERIMENTAL NUCLEAR CHEMISTRY (3). Individualized instruction in experimental nuclear chemistry and activation analysis. Advanced activation analysis, nuclear spectroscopy, nuclear reaction studies, radiochemistry, advanced radiotracer methodology, and low-level techniques. Original research problem. PREREQ: CH 418/CH 518,CH 419/CH 519, or CH 576.

CH 580, CH 581, CH 582. SELECTED TOPICS IN PHYSICAL CHEMISTRY (2,2,2). Nonsequence courses designed to acquaint students with recent advances in physical chemistry. Topics include molecular structure determination (x-ray, electron and neutron diffraction), spectroscopy (nonlinear and multiphoton, magnetic resonance, photoelectron, Moessbauer effect), physical chemistry of condensed phases (ionic, molecular and liquid crystals,critical phenomena, mass transport), theoretical chemistry (chemical bonding, scattering theory, group theory, dynamics), electronic structure theory of molecules. Need not be taken in order. PREREQ: Graduate standing.

CH 583, CH 584, CH 585. SELECTED TOPICS IN ANALYTICAL CHEMISTRY (2,2,2). Nonsequence courses designed to acquaint the advanced graduate student with recent advances in analytical chemistry. PREREQ: Graduate standing or consent of instructor.

CH 586, CH 587, CH 588. SELECTED TOPICS IN NUCLEAR AND RADIATION CHEMISTRY (2,2,2). Nonsequence courses designed to acquaint the advanced graduate student with recent advances in nuclear and radiation chemistry. PREREQ: Graduate standing or consent of instructor. CH 595.

CH 595. ELECTRONICS FOR SCIENTISTS (4). Electronics. Studies of the principles of basic and digital electronics. Topics include a.c. and d.c. circuits, operational amplifiers, switching, signal conditioning, analog/digital conversion, and simple digital circuits.

CH 596. COMPUTER INTERFACING (4). Introduction to the use of micro- and mini-computers for data acquisition and data manipulation in the laboratory. The emphasis will be on the use of software and hardware for the IBM PC class of personal computer. Programming in assembly and high-level languages will be covered as well as use of commercial software and hardware. Familiarity with simple digital circuitry will be assumed.

ENTOMOLOGY

R. E. Berry, Interim Chair
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(503) 737-4733

Faculty

Professors AliNiazee, Anderson, Berry, Burgett, Croft, Fisher, Kogan, Krantz, Lattin, Miller, Reed, Schowalter, Stephen, Westigard; *Associate Professors* DeAngelis, McEvoy, Riedl, Rossignol; *Assistant Professor* Giebultowicz; *Courtesy Professors* Beckwith, Daterman, Lighthart, Nielsen, Poinar, Radovsky, Sartwell, Torgerson, Wickman

Undergraduate Major

Entomology (B.A., B.S.)
Options
General Entomology
Pest Management

Minors

Entomology
Insect Pest Management

Graduate Major

Entomology (M.A., M.S., Ph.D.)
Graduate Areas of Concentration
Acarology
Agricultural Entomology
Apiculture
Aquatic Entomology
Biological Control
Entomology
Forest Entomology
Insect Biochemistry
Insect Biosystematics
Insect Ecology
Insect Physiology
Insect Systematics
Insect Toxicology
Integrated Pest Management
Medical Entomology
Pollination Biology

Entomology courses help students gain an understanding of the life processes of insects, their role in the biosphere, the diversity of insect life, means of population control and regulation, and recognition characters of the main insect groups. The Department of Entomology offers programs leading to undergraduate and graduate degrees.

The undergraduate major in entomology is intended for students who wish to emphasize the study and management of insects. Two options are offered: (a) general entomology and (b) pest management. Both curricula are designed to qualify students for graduate study in entomology or for employment with state or federal government, or with agencies or industries dealing with insects and their management.

Students enrolled in either option complete the same core requirements during their freshman and sophomore years. During the junior and senior years, emphasis for students in general entomology is placed on development of more advanced knowledge in entomology and biology; students in pest management develop more advanced knowledge in entomology and agriculture-related fields.

The department also offers two minors: insect pest management for students majoring in agriculture and entomology for students majoring in the biological sciences.

In consultation with an academic adviser, each undergraduate entomology major prepares a course of study that consists of a minimum set of required courses plus elective courses compatible with the student's background, interests, and career objectives.

The B.A. degree requires 12 credits of foreign language and 9 credits of approved electives in the College of Liberal Arts. Program modification for the B.A. degree necessitates exclusion of 21 credits of course work in the major that are normally included in the B.S. degree requirements. Choice of courses to be excluded should be

made with care and in consultation with academic advisers.

The Department of Entomology is a component of the Agricultural Experiment Station, which has many research facilities for students and staff, including the entomology farm, greenhouses, an aquatic insect laboratory, and forest insect research laboratory. The department is a member of the Biology Computing Consortium and has excellent computer facilities including linkages to the University Local Area Network, to microcomputers in the department, and to an information network serving all counties and branch agricultural experiment stations in Oregon. In addition to the OSU faculty, state and federal entomologists stationed in the vicinity are available for consultation in their fields of specialization. The Systematic Entomology Laboratory has more than 2,500,000 specimens of insects and mites.

Training in entomology emphasizes traditional areas of strength at OSU and includes acarology, agricultural entomology, apiculture, aquatic entomology, biological control, forest entomology, insect biochemistry, insect biosystematics, insect ecology, insect physiology, insect systematics, insect toxicology, integrated pest management, medical entomology, and pollination biology.

CURRICULUM

Perspectives courses (15), synthesis courses (6), writing courses (9), and a fitness course (3) are Baccalaureate Core requirements. The year in which these are taken is flexible except for the synthesis courses, which must be taken at the junior/senior level. Entomology majors may not use S/U grading in courses taken to meet Department of Entomology or College of Science requirements.

REQUIRED COURSES[9]

Freshman and Sophomore Years
CH 121, CH 122, CH 123, or CH 221, CH 222, CH 223. General Chemistry (15)
CH 331, CH 332, CH 337. Organic Chem (10)
BB 350. Biochemistry (4)
MTH 251, MTH 252 or MTH 241, MTH 245. Mathematics (8)
BI 211, BI 212, BI 213. Biology (12)
ENT 350. Biology of Insects (4)
Writing (9)
Perspectives (15)
HHP 231. Fitness (3)
Electives (10)

OPTIONS

GENERAL ENTOMOLOGY OPTION

Junior and Senior Years
ENT 416. Insect Phys and Anat (3)
ENT 453. Systematics and Morphology of Adult Insects (4)
ENT 420. Insect Ecology (3)
Select 12 credits from the following required upper division entomology alternative courses: ENT 433, ENT 435, ENT 440, ENT 442, ENT 452, ENT 455
BI 311. Genetics (4)
BI 370. General Ecology (3)
BI 371. Ecological Methods (3)
Z 361, Z 362. Invertebrate Biology (5)
BOT 331. Plant Physiology (5)
ST 351, ST 352. Principles of Statistics (8)
PH 201, PH 202. General Physics (10)
Synthesis (6)
Electives (24)

PEST MANAGEMENT OPTION

Junior and Senior Years
ENT 311. Intro to Insect Pest Management (5)
ENT 442, ENT 444. Principles of Insect Pest Management I, III (7)
ENT 453. Systematics and Morphology of Adult Insects (4)
ENT 416. Insect Phys and Anat (3)
ENT 420. Insect Ecology (3)
Select one of the following required upper-division alternative courses:
ENT 362, ENT 415, ENT 435, ENT 440, ENT 455, ENT 486 (3)
BI 311. Genetics (4)
BI 370. General Ecology (3)
BI 371. Ecological Methods (3)
CSS 300. Intro. to Crop Production or HORT 301. Princ. of Horticulture Technology (4)
CSS 305. Principles of Soils Science (5)
CSS 440. Weed Control (5)
BOT 350. Introductory Plant Pathology (4)
ST 351, ST 352. Principles of Statistics (8)
AREC 111. Computer Applications (3)
Synthesis (6)
Electives (20)

MINORS

The Department of Entomology offers two minors designed for students from other departments: Entomology and Insect Pest Management. A minimum of 27 credits is required for the minor. Students may elect to have their minor designated on their transcript.

Core Courses
ENT 350. Biology of Insects (4)
ENT 416. Insect Physiology (3)
ENT 420. Insect Ecology (3)
ENT 442. Prin of Insect Pest Mgmt (3)
ENT 453. Systematics and Morphology of Adult Insects (4)
Select 10 credits from the following:
ENT 300. Plagues, Pests & Politics (3)
ENT 433. Aquatic Entomology (4)
ENT 440. Insect Toxicology (3)
ENT 454. Systematics and Morphology of Immature Insects (3)
ENT 455. Field Studies in Insect Biology (3)
ENT 461 General Acarology (4)
ENT 486. Biological Control (3)

INSECT PEST MANAGEMENT

Core Courses
ENT 311. Introduction to Pest Management (5)
ENT 442. Prin of Insect Pest Mgmt I (3)
ENT 444. Prin of Insect Pest Mgmt III (4)
ENT 453. Systematics and Morphology of Adult Insects (4)
ENT 486. Biological Control (3)
Select 8 credits from the following:
ENT 362. Apiculture (3)
ENT 415. Forest Insect & Disease Mgmt (5)
ENT 435. Med & Pub Hlth Entomol (3)
ENT 440. Insect Toxicology (3)
ENT 443. Prin of Insect Pest Mgmt II (4)
ENT 454. Systematics and Morphology of Immature Insects (3)
ENT 455. Field Studies in Insect Biol (3)

COURSES

Upper Division

Courses numbered 500 and above may be taken for graduate credit.

ENT 300. *PLAGUES, PESTS, AND POLITICS (3). Integration and interaction of agricultural and public health aspects of entomology in society and history. CROSSLISTED as BI 300. (Bacc Core Course)

ENT 311. INTRODUCTION TO INSECT PEST MANAGEMENT (5). Recognition, biology and management of injurious and beneficial insects; insects and human welfare. Concurrent laboratory is designed to illustrate principles of insect pest management in agricultural cropping systems including medical and veterinary entomology. PREREQ: One year college biology.

ENT 350. BIOLOGY OF INSECTS (4). Introduction to the study of insects, stressing the biological attributes responsible for the success and dominance of insects. Emphasis on taxonomy, morphology, behavior, ecology, and coevolutionary interrelationships.

ENT 362. APICULTURE (3). The biology and commercial management of the honey bee Apis mellifera L.; relationship of honey bees to current agricultural production; problems of pesticide usage, disease, and changing agricultural systems. PREREQ: One year college biology. Offered alternate years. Offered 1995-96.

ENT 401. ENTOMOLOGY RESEARCH (1-16). Work on approved problems carried on in the library, laboratory or field. Approval of instructor required.

ENT 405. ENTOMOLOGY READING AND CONFERENCE (1-16). Reading and discussions on special topics. Approval of instructor required.

ENT 407. ENTOMOLOGY SEMINAR (1). Graded P/N.

ENT 415/ENT 515. FOREST INSECT AND DISEASE MANAGEMENT (5). Effects of insects and diseases on forest ecosystems. Recognition of important groups, prediction of pest responses to environmental changes, and management strategies for protection of forest resources. Field trips. PREREQ: BI 203 or BI 213. CROSSLISTED as BOT 415.

ENT 416/ENT 516. INSECT PHYSIOLOGY AND ANATOMY (3). Structure and function of the appendages and principle organ systems, nerve transmission, locomotion, digestion, excretion, respiration, and reproduction. PREREQ: ENT 311 or 350; BI 213.

ENT 420/ENT 520. INSECT ECOLOGY (3). Insect ecology, evolution, and management. Biohysical ecology; foraging and feeding; life cycles; population dynamics, regulation, and control; species interactions including herbivore-plant, predatory-prey, parasite-host, competition, and mutualism; diversity, food web structure, agricultural ecology, exercises merge models, experiments, and sampling. PREREQ: ENT 350, BI 370 or equivalent. Offered alternate years. Not offered 1995-96.

ENT 421/ENT 521. INSECT-PLANT COMMUNITIES (3). Dynamics of arthropod assemblages and species interactions. Ecological consequences of insect-plant interactions including vegetative succession, nutrient cycling, and ecosystem stability. PREREQ: ENT 350; BI 213 or consent of instructor. Offered alternate years. Offered 1995-96.

ENT 427/ENT 527. INSECT BEHAVIOR (3). Current mechanistic and evolutionary aspects of arthropod behavior relative to ecology, biosystematics, and pest management. PREREQ: BI 350; ENT 416/ENT 516 or equivalent. Not offered every year. Not offered 1995-96.

ENT 433/ENT 533. AQUATIC ENTOMOLOGY (4). Biology, ecology, collection, and identification of aquatic insects. PREREQ: Upper division standing. Not offered every year.

ENT 435/ENT 535. MEDICAL AND PUBLIC HEALTH ENTOMOLOGY (3). Arthropod pests of humans and domestic animals, including biology of pests, disease transmission mechanisms, epidemiology of important arthropod-borne diseases, and prevention and control of pest-related problems, PREREQ: Two terms of biology or general zoology. CROSSLISTED as H 435/H 535.

ENT 440/ENT 540. INSECT TOXICOLOGY (3). Mechanistic and metabolic aspects of insecticides; growth regulators and cross resistance. Methods of analysis, bioassay and numerical interpretation of dose/response data. Ineractions between insecticides and neurohormones, derivation of new chemical agents from insect hormones and plant products. Biooxidation, selectivity, adaptive responses and synergism. Not offered every year.

ENT 442/ENT 542. PRINCIPLES OF INSECT PEST MANAGEMENT I (3). Scope, ecological basis, and tactics of insect pest management, including use of insecticides, biological control agents, behavior-modifying chemicals, host plant resistance, cultural, and genetic methods. PREREQ: ENT 311 or ENT 350; BI 370.

ENT 443/ENT 543. PRINCIPLES OF INSECT PEST MANAGEMENT II (4). Principles of IPM design focusing on use of systems analysis as a means to integrate management tactics, environmental and biological monitoring, pest control models, and implementation elements into a cohesive whole. Students will design a hypothetical crop-pest management system during the course. PREREQ: ENT 442/ENT 542. Not offered every year.

ENT 444/ENT 544. PRINCIPLES OF INSECT PEST MANAGEMENT III (4). Quantification in pest management, including sampling, monitoring, and prediction; population dynamics (dispersal, life histories), environmental effects, and systems approach. PREREQ: ENT 443/ENT 543; BI 370,BI 371; ST 412/ST 512. Not offered every year. Offered 1995-96.

ENT 452/ENT 552. INSECT MORPHOLOGY (3). Structure and function of insects, stressing morphological features of biological and taxonomic importance. PREREQ: ENT 350. Offered alternate years. Offered 1995-96.

ENT 453/ENT 553. SYSTEMATICS AND MORPHOLOGY OF ADULT INSECTS (4). Identification, systematics, literature, distribution, and biology of the major families of insects. PREREQ: ENT 350.

ENT 455/ENT 555. FIELD STUDIES IN INSECT BIOLOGY (3). Methods of studying living insects; collecting and preserving specimens. Individual field projects and preparation of an insect collection. PREREQ: ENT 311. Not offered every year.

ENT 461/ENT 561. GENERAL ACAROLOGY (4). Taxonomy of mites and ticks; collection and preservation. PREREQ: ENT 350 or consent of instructor. Not offered every year.

ENT 486/ENT 586. BIOLOGICAL CONTROL (3). Use of biotic agents in control and population regulation of insect pests and weeds; case history examples of biocontrol. PREREQ: ENT 311 or ENT 350 and ENT 442. Offered alternate years. Offered 1995-96.

Graduate

ENT 501. ENTOMOLOGY RESEARCH (1-16). Work on approved problems carried on in the library, laboratory or field. Approval of instructor required.

ENT 503. ENTOMOLOGY THESIS (1-16).

ENT 505. ENTOMOLOGY READING AND CONFERENCE (1-16). Reading and discussions on special topics. Approval of instructor required.

ENT 507. ENTOMOLOGY SEMINAR (1). Graded P/N.

ENT 591. SELECTED TOPICS IN ENTOMOLOGY (1-16). Important topics of current interest in the areas of systematics, insect physiology and toxicology, ecology and behavior, and pest management. Course content and title will change with each offering.

ENT 601. RESEARCH (1-16).

ENT 603. ENTOMOLOGY THESIS (1-16).

ENT 605. READING AND CONFERENCE (1-16).

ENT 607. SEMINAR (1-16).

ENT 691. SELECTED TOPICS IN ENTOMOLOGY (1-16). Important topics of current interest in the areas of systematics, insect physiology and toxicology, ecology and behavior, and pest management. Course content and title will change with each offering.

ENVIRONMENTAL SCIENCE

See the Interdisciplinary Studies section of this catalog for more information.

GENERAL SCIENCE

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Undergraduate Major

General Science (B.S.)

Graduate Major

General Science (M.A., M.S., Ph.D.)
Graduate Area of Concentration
Environmental Science
Options
Earth Science
Pre-M.A.T. for Elementary Education

UNDERGRADUATE STUDIES

The College of Science grants certain types of degrees in General Science.

The **Earth Science Option**, advised in the Department of Geosciences, consists of a blend of geology, geography, oceanography, and atmospheric science courses. This option provides the appropriate background for middle-school earth science teaching, for military careers, and for other careers requiring a broad earth science background.

What was earlier offered as an **Environmental Science Option** is now a separate degree. Please see "Environmental Sciences" in the Interdisciplinary Studies section of this catalog.

The **Pre-M.A.T. for Elementary Education Option** provides a degree appropriate for entry into the Master of Arts in Teaching (M.A.T.) degree program in elementary education. Admission into the M.A.T. degree programs is competitive. The pre-professional core is a common set of courses used in such degrees in science, liberal arts, or home economics.

Some students who complete one of the pre-professional programs, e.g., pre-physical therapy, can receive a degree in General Science. Option codes are used for such programs as pre-physical therapy, but these options do not appear on the transcript.

GRADUATE STUDIES

Graduate programs leading to M.A., M.S., or Ph.D. are interdisciplinary degrees aimed primarily at history of science and environmental science. The research areas include effects of air pollutants, environmental effects of global climate change, plant responses to environmental stress, effects of UV radiation, lichen ecology, and history of science.

Brochures describing the graduate program may be obtained from the Botany office.

CURRICULUM

The required courses below can be taken in any order.

Freshman Year
Writing I (3)
CH 121, CH 122, CH 123, CH 219 or CH 221, CH 222, CH 223. General Chemistry (15-17)
Approved mathematical science (12)[11]
Fitness (3)
Required courses and/or electives (10-12)

Sophomore Year
General physics or physical science (12-15)
General biology (12)
Writing II (3)
Required courses and/or electives (15-18)

Junior and Senior Years
HSTS course, History of science (6)
Writing III (3)
Synthesis (6)
Option and/or required courses and/or electives (75)[12]

OPTIONS

EARTH SCIENCE OPTION

Lower Division
GEO 101, GEO 102. Earth Science or GEO 201, GEO 202. Geology (8)

Upper Division Earth Science (at least 24 credits)
Four courses for at least 12 credits in one of the following:
Physical Geography (prerequisite GEO 101, GEO 102, or GEO 261)
Geology
Atmospheric Science or Oceanography (must be at 400 or above level and may not include biological oceanography—it may include geography climate courses)
And at least two additional courses from the areas not used above. Courses with ATS or OC designators are counted in the 24-credit total as long as they are 400 level or above.

PRE-M.A.T. FOR ELEMENTARY EDUCATION OPTION

Mathematical Science
MTH 111. College Algebra (4)
MTH 211, MTH 212, MTH 213. Foundations Elementary Math (9)
MTH 391. Elementary Problem Solving (3)
CS 101. Computers: Applications & Implications (4)
Pre-professional Core (nonscience)
HST 203 and two additional history classes (9)
PSY 201, PSY 202. Psychology (6)
GEO 105, GEO 106. Geography (6)
Three English courses from Baccalaureate Core courses (9)
PSY 350. Human Lifespan Development (3)
ED 309. Field Practicum (3)/CI 311. Educational Psychology (3)
ED 312. Introduction to Curriculum & Instruction (3)
ED 313. Trends and Issues in Education (3)
Upper Division (at least 24)
Must consist of at least 30 credits of upper division science courses (including 6 credits of History of Science) that are pre-approved by the head adviser in the College of Science. No more than 6 credits of unstructured courses numbered 401, 403, 405, 407, and 410 may be included in the major option. The major must include an approved WIC course.
Recommendations:
Foreign Language is strongly recommended, especially Spanish.

CERTIFICATE PROGRAMS

Contact Paul Farber, Milam 306B, (503) 737-1273, for more information about the Science, Technology, and Society Certificate program.

The Science, Technology, and Society Certificate program combines topics in the history, philosophy, and sociology of science and technology with science policy studies, environmental studies, and anthropology. The thrust of the program is in understanding science and technology as a process, an institution, and a component of culture.

REQUIREMENTS

To complete the curriculum, students are required to take 30 credits consisting of 9 credits of a general core and 21 credits or approved electives.

COURSES

Lower Division

GS 199. SPECIAL STUDIES (1-16).

Upper Division

GS 401/GS 501. RESEARCH (1-16).

GS 403/GS 503. THESIS (1-16).

GS 405/GS 505. READING AND CONFERENCE (1-16).

GS 407/GS 507. SEMINAR (1-16). One-credit sections, graded pass/no pass.

GS 410. SCIENCE INTERNSHIP (1-9). Supervised scientific work experience at selected cooperating institutions, agencies, laboratories, or companies. PREREQ: Upper division standing in appropriate major.

Graduate

GS 601. RESEARCH (1-16).

GS 603. DISSERTATION (1-16).

GS 605. READING AND CONFERENCE (1-16).

GS 606. PROJECTS (1-16).

GS 607. SEMINAR (1-16).

GEOSCIENCES

Sherman H. Bloomer, Chair
Gordon E. Matzke, Associate Chair
Wilkinson Hall 104
Oregon State University
Corvallis, OR 97331-5506
(503) 737-1201

Faculty

Professors Bloomer, Kimerling, Muckleston, Nolan, Pease, Yeats; *Associate Professors* Clark, Dilles, Grunder, Jackson, Jones, Lawrence, Lillie, Matzke, Morris, Niem, Rosenfeld, Taylor; *Assistant Professor* Wright; *Courtesy Appointments* Agnew, Boucot, Brandhorst, Charles, Duncan, Glasmann, Grant, King, Levi, Marks, Meganck, Moore, Nielsen, Pearson, Ripple, Santelmann, Schmitt, Stankey, Swanson, Terich

Undergraduate Majors

Geography (B.A., B.S.)
Option
Earth Information Science and Technology

Geology (B.A., B.S.)
Options
Earth Materials
Geomorphology—Engineering Geology
Sedimentary Geology
Structure—Tectonics—Geophysics

Minors

Earth Information Science and Technology
Environmental Geosciences
Geology
Regional Studies
Resource Geography
Rural and Resource Planning

Graduate Majors

Geography (M.A., M.S., Ph.D.)
Graduate Areas of Concentration
Geographic Techniques
Physical Geography
Resource Geography
Rural and Resource Planning

Geology (M.A., M.S., Ph.D.)
Graduate Areas of Concentration
Glacial Geology—Geomorphology
Igneous Petrology—Volcanology
Mineral Deposits—Geochemistry
Sedimentology—Sedimentary Petrology—Biostratigraphy
Structural Geology—Tectonics—Geophysics

The Department of Geosciences offers two undergraduate and graduate degree programs, geography and geology, and advises students in the Earth Science option General Science degree. The program in geography emphasizes the earth's land surfaces and people's interaction with the earth. Geology is concerned with the internal and external processes of the earth over time. These two programs merge in broad areas relating to surficial processes, remote sensing, earth resources, and the application of computers to natural and man-made phenomena. The department offers a minor in environmental geosciences appropriate for students in the interdisciplinary environmental science major who want a strong earth science element in their program. The department also has a strong international commitment that includes the study of the global environment.

ENVIRONMENTAL GEOSCIENCES MINOR (27)

Students pursuing other environmentally oriented degrees may choose an environmental geosciences minor. For a minor field to be listed on the transcript, students must take 27 credits of minor courses, none of which can be in the student's major program. Twelve credits must be upper division. Specific requirements are listed below.

Required Core (15)
GEO 101, GEO 102 (8)
GEO 322 (4)
GEO 300 (3)

Elective Courses (12)
Four courses at 3 credits each from the following:
GEO 306, GEO 323, GEO 324, GEO 422, GEO 424, GEO 425, GEO 431, GEO 432, GEO 434, GEO 439, GEO 482, GEO 483, GEO 487

■ GEOGRAPHY PROGRAM

Gordon E. Matzke, Director

Geography offers programs leading to the B.A., B.S., M.A., M.S. and Ph.D. in the College of Science. Geography minors are available for graduate programs from other departments and for students in the M.A.I.S. program. Geography also offers a minor program for undergraduate students with majors in other disciplines.

The department has strengths in the broad areas of resource and physical geography as well as geographic information science. Course offerings combined with excellent facilities and supportive electives allow students to develop particular interests such as resource management, environmental analysis, land use planning and cartography/geographic information systems/remote sensing.

The Bachelor of Arts degree is designed for students wanting substantial breadth in an undergraduate geography major. In

addition to the geography curriculum, students will work to develop their communication skills, study a foreign language and satisfy the core curriculum of the University. Students will become acquainted with each of the aspects of geography offered by the department, but will place special emphasis on regional, cultural and resource geography. This degree program is an appropriate choice for students preparing to enter a teacher training program with a social science emphasis, management studies, or employment in the non-technical areas of professional geography, such as the tourist industry. It is especially well suited for students preparing for graduate school studies outside of the areas of physical geography and geographic information science.

The Bachelor of Science degree is designed for students seeking to acquire scientific and technical depth in an undergraduate geography major. Outside of the geography curriculum, students will develop their mathematical, statistical, and computer skills and meet the core curriculum of the University. Students will become acquainted with each of the aspects of geography offered by the department, but will place special emphasis on geographic information science, resource geography and physical geography. This degree program focuses on the scientific and technical training of professional geographers. It is an appropriate choice for students preparing to enter a teacher training program or graduate school with an earth science emphasis, employment as a professional cartographer or geographic information system specialist, work in rural resource management, or land use planning, work as an environmental analyst, or employment as an earth scientist.

GEOGRAPHY MINORS

Students pursuing other degrees may choose one of five geography minors: environmental geosciences, resource geography, regional studies, rural and resource planning, or EIST.

GEOGRAPHY CURRICULUM

The Bachelor of Science and Bachelor of Arts curriculum is identical for the freshman and sophomore years.

Freshman Year
GEO 105. Geog of the Non-Western World (3)
GEO 106. Geog of the Western World (3)
GEO 101, GEO 102. Earth Science I, II (8)
Mathematics (3)
Writing I (3)
Writing II (3)
Physical or biological science sequence (2 courses) (8)
Fitness (3)
Perspectives (3)
Electives (8)

Sophomore Year
GEO 261. Map Interpretation (3)
Writing III/speech (3)
Physical or Biological Science (4)
Mathematics (MTH 112 or higher) (4)
ST 351, ST 352. Statistics (8)
Perspectives (12)
Electives (11)

BACHELOR OF SCIENCE

Junior Year
GEO 322, GEO 323, GEO 324. Intermediate Physical Geography (12)
Human Geography (3)
GEO 360. Cartography (4)
GEO 462. Geographic Field Techniques (4)
GEO 300. Environmental Conservation (3)
Upper division cluster in non-geog field (12)
Electives (7)

Senior Year
GEO 418. Geographic Photo Interpretation (3)
Advanced physical geography (3)
Geographic information science (6)
Resource geography (9)
Contemporary global issues (3)
Science, technology and society (3)
Upper division regional geography (3)
Science electives (9)
Electives (6)

BACHELOR OF ARTS

Junior Year
Second year foreign language (12)
GEO 322, GEO 323, GEO 324. Intermediate Physical Geography (12)
GEO 360. Cartography (4)
Upper division regional geography (6)
GEO 300. Environmental Conservation (3)
Electives (8)

Senior Year
Upper division regional geography (6)
Upper division human geography (6)
Resource geography (9)
One course selected from GEO 445, GEO 465, GEO 466 (3)
Contemporary global issues (3)
Science, technology, and society (3)
Liberal arts electives (9)
Electives (6)

GEOGRAPHY MINOR PROGRAMS

For a minor field to be listed on the transcript, students must take 27 credits of minor courses, none of which can be in the student's major program. Twelve credits must be upper division. Specific requirements are listed below.

ENVIRONMENTAL GEOSCIENCES MINOR

Core Requirements
One sequence of courses selected from:
GEO 101. Earth Science I(4)
GEO 102. Earth Science II (4)
–OR–
GEO 201. Geol of the Interior of Earth (4)
GEO 202. Geology of the Surface of Earth (4)
GEO 300. Environmental Conservation (3)
GEO 322. Geomorphology (4)

Specialty Requirements
Four courses from the following:
GEO 306. Earth Resources and Geologic Hazards (3)
GEO 323. Climatology (4)
GEO 324. Biogeography (4)
GEO 424. Water Resources Geography (3)
GEO 431. Applied Climatology (3)
GEO 432. Applied Geomorphology (3)
GEO 433. Ecological Biogeography (3)
GEO 434. Field Research in Physical Geog (3)
GEO 439. Topics in Physical Geography (3)
GEO 482. Forest Geomorphology (3)
GEO 483. Geomorphology of Mountain Streams (3)
GEO 487. Hydrogeology (3)

GEOGRAPHY MINORS

Core Requirements
GEO 101. Earth Science I (4) or GEO 102. Earth Science II (4)
GEO 105. Geog of the Non-West World (3) or GEO 106. Geog of the Western World (3)
GEO 300. Environmental Conservation (3)
GEO 261. Map Interpretation (3)

REGIONAL STUDIES MINOR

Geography Minor Core (13)
World regional geography course not taken as part of minor core
GEO 105 or GEO 106. (3)
Four courses selected from the following: GEO 313, GEO 325, GEO 326, GEO 327, GEO 328, GEO 329, GEO 339 (12)

RESOURCE GEOGRAPHY MINOR

Geography Minor Core (13)
GEO 420. Geography of Resource Use (3)
Four courses selected from the following: GEO 422, GEO 423, GEO 424, GEO 425, GEO 429, GEO 459, GEO 350, GEO 485 (12)

RURAL AND RESOURCE PLANNING MINOR

Geography Minor Core (13)
GEO 423. Land Use (3)
GEO 451. Environmental Site Planning (3)
GEO 452. Princ and Prac of Rural and Resource Planning (3)
GEO 453. Resource Planning Methods/EIS (3)
One course selected from the following: GEO 420, GEO 424, GEO 425, GEO 459, GEO 462 (3)

EARTH INFORMATION SCIENCE AND TECHNOLOGY (EIST) UNDERGRADUATE MINOR AND OPTION

Undergraduate Minor
See Interdisciplinary Studies section of this catalog.

Undergraduate Option
(21 credits, including 15 upper division)
Geography majors must take the 5 required EIST core courses plus two advanced courses from the list in the Interdisciplinary Studies section of this catalog. The two advanced courses are selected in consultation with a department faculty adviser to best meet the student's professional interests.

■ GEOLOGY PROGRAM

Sherman H. Bloomer, Director

Majors in geology will receive education in a wide range of sciences in addition to a firm base in earth science. Academic advisers assist the student in selecting an appropriate program.

The Bachelor of Science degree program in geology provides essential education for careers in energy resource and mining companies, geotechnical and environmental firms, state and federal government

agencies, and in earth science research and teaching at universities or community colleges. The B.S. program has depth appropriate to successful completion of graduate school entrance examinations and breadth appropriate to a variety of graduate-level specialties. Students are advised to obtain an advanced degree before pursuing a professional career.

The Bachelor of Arts degree program is intended for students who want a diverse, interdisciplinary education. Course work through the second year of a foreign language is required. The B.A. program is a good choice for students interested in careers in science education or elementary education, technical writing, journalism, law, land-use planning, environmental protection, philosophy of science, or physical geography.

Graduate degrees include the Master of Science and the Doctor of Philosophy. In these degree programs, students pursue independent research in (1) sedimentology-sedimentary petrology-biostratigraphy, (2) igneous petrology-volcanology, (3) mineral deposits-geochemistry, (4) glacial geology-geomorphology, (5) structural geology-tectonics-geophysics. Most graduate research includes field study. An approved field course of at least 9 credits (quarter basis) is prerequisite to candidacy for an advanced degree. Dual majors can be arranged in some areas. A minor in water resources is possible.

Minor

An undergraduate geology minor provides a means for students majoring in physics, chemistry, civil engineering, forest engineering, and related fields to develop a strong geology background as part of their program.

Geology Curriculum

Freshman and Sophomore Years
GEO 201. Geology of the Interior of Earth or GEO 101. Earth Science I (4)
GEO 202. Geology of the Surface of the Earth or GEO 102. Earth Science II(4)
GEO 203. Geologic Evolution of North America (4)
Math (through at least MTH 252, calculus) (12)
CH 121, CH 122, CH 123 or CH 221 , CH 222, CH 223. General Chemistry (15)
Writing I (3)
Writing II (3)
Fitness (3)
Perspectives (3)
Biological science (4)
Electives (12)

Sophomore and Junior Years
GEO 310. Crystallography and Mineralogy (4)
GEO 315. Lithology (4)
GEO 320. Optical Mineralogy (4)
GEO 370. Stratigraphic Paleontology (4)
GEO 412. Igneous Petrology (4)
Writing III/speech (3)
General Physics (PH 211, PH 212, PH 213 recommended or PH 201, PH 202, PH 203) (12-15)
Perspectives (9)
Computer sci course (CS 101 or equivalent) (3-4)
Electives (12)

Junior and Senior Years
GEO 413. Sedimentary Petrology or GEO 470. Stratigraphy and Sedimentology (4)
GEO 450 Structural Geology (5)
Select a course from: GEO 463, GEO 430, GEO 322. (3-4)
GEO 454. Advanced Structural Geology (3)
GEO 490. Geologic Field Methods (4)
Perspectives (3)
Synthesis (6)
Electives (11)

Summer of Junior or Senior Year
GEO 495. Field Geology (12)

Bachelor of Arts Degree

Freshman and Sophomore Years
GEO 201. Geology of the Interior of the Earth or GEO 101. Earth Science I (4)
GEO 202. Geology of the Surface of the Earth or GEO 102. Earth Science II (4)
GEO 203. Geologic Evolution of North America (4)
MTH 111, MTH 112 or MTH 111, MTH 245 or MTH 111 and ST 201, ST 202. Mathematics or Statistics (8)
CH 121, CH 111 or CH 221, CH 222. General Chemistry (10)
Writing I (3)
Writing II (3)
Fitness (3)
Second year of foreigh language (12)
Perspectives (3)
Electives (17)

Sophomore and Junior Years
GEO 310. Crystallogreaphy and Mineralogy (4)
GEO 315. Lithology (4)
GEO 370. Stratigraphic Paleontology (4)
Writing III/Speech (3)
Biological Science (4)
PH 201, PH 202 or PH 104, PH 106. General Physics (8-10)
Perspectives (12)
Comuter Science Course (CS 101 or equivalent) (3-4)
Electives (17)

Junior and Senior Years
GEO 470. Stratigraphy and Sedimentology (4)
GEO 450. Structural Geology (5)
GEO 490. Geologic Field Methods (4)
GEO 322. Geomorphology (4)
GEO 411. Development of Geol Thought (3)
Synthesis (3)
Courses in College of Liberal Arts (9)
Electives (13)

Geology Minor Program (27)

GEO 201. Geology of the Interior of the Earth or GEO 101. Earth Science I (4)
GEO 202. Geology of the Surface of the Earth or GEO 102. Earth Science II (4)
GEO 203. Geologic Evolution of North America (4)
GEO 310. Crystallography and Mineralogy (4)
GEO 315. Lithology (4)
Two geology courses from GEO 320 or above to total 7 credits. These courses must be at least 3 credits each. See department for a list of approved geology courses. For students interested in advanced geology degrees, Structural Geology (GEO 450) and Field Geology (GEO 490) are recommended for the minor.

Options

Sedimentary Geology

GEO 413. Sedimentary Petrology (4)
GEO 470. Stratigraphy and Sedimentology (4)
GEO 474. Regional Depotectonics (3)
GEO 476. Biofacies and Paleogeography (3)

Earth Materials

GEO 414. Metamorphic Petrology (4)
GEO 419. Rock-forming Minerals (3)
GEO 427. Volcanology (4)
GEO 430. Geochemistry (3)
GEO 440. Economic Geology (4)

Structure-Tectonics-Geophysics

GEO 454. Advanced Structural Geology (3)
GEO 456. Western Cordilleran Tectonics (3)
GEO 463. Intro. Solid Earth Geophysics (4)
GEO 464. Seismic Reflection Interpretation (4)

Geomorphology-Engineering Geology

GEO 322. Geomorphology (4)
GEO 481. Glacial Geology (4)
GEO 482. Forest Geomorphology (3)
GEO 483. Geomorphology of Mountain Streams (3)
GEO 486. Engineering Geology (3)
GEO 487. Hydrogeology (3)
Additional requirement for Bachelor of Science only:
400-level or 500-level courses in Colleges of Science, Forestry, Oceanography, or Engineering (12)

Courses

Lower Division

GEO 101. *EARTH SCIENCE I (4). A general overview of the earth for non-science students covering the earth system as a whole, the origin and interaction of the atmosphere and ocean systems, and the structure and processes of the interior. Lec/lab. (Bacc Core Course)

GEO 102. *EARTH SCIENCE II (4). A general overview of the earth for non-science students covering the surface processes of the earth, biogeography, and a summary of earth history. Lec/lab. (Bacc Core Course)

GEO 105. *GEOGRAPHY OF THE NON-WESTERN WORLD (3). An introduction to the rich variety of peoples, traditions, and landscapes in Asia, the Pacific Islands, the Middle East, Africa, and Latin America. Emphasis is on the origins and evolution of the diverse cultural heritages of these regions and on present interaction between these peoples and their environments. Lec/rec. (Bacc Core Course)

GEO 106. *GEOGRAPHY OF THE WESTERN WORLD (3). The evolution and present status of cultures and environments in Europe and North America. Australia and New Zealand will also be considered as a region with Western traditions. Lec/rec. (Bacc Core Course)

GEO 199. SPECIAL STUDIES (1-16).

GEO 201. *GEOLOGY OF THE INTERIOR OF THE EARTH (4). The earth's interior interpreted using principles of physical science. Magma generation, volcanic, intrusive, and metamorphic rocks. Earthquakes, seismology and internal earth structure. Processes and products of rock deformation. Plate tectonics and mountain building. Geologic resources, hazards, and environmental problems. Field trip(s) required; transportation fee charged. Lec/lab. (Bacc Core Course)

GEO 202. *GEOLOGY OF THE SURFACE OF THE EARTH (4). Surface features of the earth interpreted using principles of physical science. Basic plate tectonics and geologic time. Minerals and rocks; weathering and sedimentary rocks; slope, river, glacier, groundwater, wind, coast, and submarine processes and landforms. Geologic resources, hazards, and environmental problems. Field trip(s) required; transportation fee charged. Lec/lab. (Bacc Core Course)

GEO 203. GEOLOGIC EVOLUTION OF NORTH AMERICA (4). Evolution of the continent in Late Precambrian and Phanerozoic time, with emphasis on the processes of change. Invertebrate organisms related to rock formation. Field trip(s) required; transportation fee charged. PREREQ: GEO 202, GEO 102. Lec/lab.

GEO 221. *PHYSICAL GEOLOGY FOR ENGINEERS (3). Introductory geology topics related to engineering, including minerals, rocks, and location of construction materials; geologic hazards including landslides, flooding, effects of dams, ground water pollution, earthquakes, volcanism, coastal processes. Field trip(s) required; transportation fee charged. Designed for, but not restricted to, engineering; forest engineering; and range management majors. Lec/lab. (Bacc Core Course)

GEO 261. MAP INTERPRETATION (3). Reading, analysis, and interpretation of maps. Characteristics and historical evolution of topographic maps, navigational charts, statistical maps, and other geoscience maps. Lec/lab.

GEO 265. GEOGRAPHIC INFORMATION SYSTEM (GIS) PRACTICUM. (3). Practical experience in using a widely popular geographic information system for spatial data input, analysis and display.

Upper Division

GEO 300. *ENVIRONMENTAL CONSERVATION (3). Geography of human relationships to the earth's environmental limitations; modifications of earth systems to achieve human benefits; ramifications of human influences, including increased population, food production, land use control, resource exploitation, and technology development are examined with reference to conservation alternatives. (Bacc Core Course)

GEO 305. GEOLOGY OF THE VOLCANIC CASCADES (3). The role of plate tectonics, earthquakes, volcanism, and glaciation in the development of Cascade landforms. Geology of Rainier, Crater lake, and Lassen National Parks; Mount St. Helens, eruption hazards, geothermal energy. PREREQ: One term introductory-level geology. Offered alternate years.

GEO 306. EARTH RESOURCES AND HAZARDS (3). The geologic causes and the environmental and social consequences of volcanic, earthquake, and landslide hazards. Contemporary problems of supply and pollution related to energy, mineral, and water resources. Offered alternate years.

GEO 308. GLOBAL CHANGE AND EARTH SCIENCES (3). Study of global change over different time scales during the history of the earth, with emphasis on evolution of its atmosphere, plate tectonics, paleoclimates, and mass extinctions. Offered alternate years.

GEO 310. CRYSTALLOGRAPHY AND MINERALOGY (4). Principles of crystal geometry, morphology, and structure. Characteristics, identification, and origins of minerals. PREREQ: GEO 201 or GEO 221; COREQ: MTH 112, CH 121. Lec/lab.

GEO 313. GEOGRAPHY OF THE PACIFIC NORTHWEST (3). Physical, human and economic geography of the Pacific Northwest with special reference to Oregon.

GEO 315. LITHOLOGY (4). Characteristics, identification, and classification of common rocks and typical rock associations. Laboratory study focused on hand samples. Field trip may be required, transportation fee charged. PREREQ: GEO 310. Lec/lab.

GEO 320. OPTICAL MINERALOGY (4). Theory and technique of optical mineralogy applied to study of minerals. PREREQ: GEO 310. Lec/lab.

GEO 321. *CHANGING HUMAN LANDSCAPES (3). Survey of the historical role of human agency in modifying the earth's surface. Focus is global; analyzes the evidence for, and processes of, landscape alteration. PREREQ: 3 credits of lower-division geograghy. (Bacc Core Course)

GEO 322. GEOMORPHOLOGY (4). Examination of surficial processes and terrestrial landforms of the earth, including slopes, rivers, glaciers, deserts, and coastlines. Field trip(s) required, transportation fee charged. PREREQ: GEO 102 OR GEO 202. Lec/lab.

GEO 323. CLIMATOLOGY (4). Systematic analysis of global and regional climates. Physical principles of climate, climate classifications, and distribution and characteristics of climate regimes. PREREQ: GEO 101 and GEO 102. Lec/lab.

GEO 324. BIOGEOGRAPHY (4). Systematic study of plant, animal, and biotic community distribution. The relation of ecosystem characteristics and development to climate and landforms. Field trips required; transportation fee charged. PREREQ: GEO 101 and GEO 102. Lec/lab.

GEO 325. *GEOGRAPHY OF AFRICA (3). An introduction to the physical, historical, cultural, political, and development geography of Africa south of the Sahara. Offered alternate years. (Bacc Core Course)

GEO 326. *GEOGRAPHY OF EUROPE (3). A regional overview precedes a topical examination of Europe's diverse physical and cultural landscapes and lifestyles. (Bacc Core Course)

GEO 327. *GEOGRAPHY OF ASIA (3). Geographic analysis of Asia's lands and peoples. Emphasis on regional physical environments, resources and development potentials, population trends, and international importance to the United States. May not be offered each year. (Bacc Core Course)

GEO 328. *GEOGRAPHY OF LATIN AMERICA (3). This course focuses on the diverse landscapes, peoples and cultural traditions of Latin America, a vast region extending from the United States Mexican border to the southern tip of South America. (Bacc Core Course)

GEO 329. *GEOGRAPHY OF THE UNITED STATES AND CANADA (3). Cultural, economic, political, and settlement geography. Emphasis on regional patterns and problems. Analysis of recent and projected changes. (Bacc Core Course)

GEO 339. AREA STUDIES (3). Physical and cultural processes that give geographical identity to and influence people's organization and use of selected world areas. Areas vary; number may be repeated (from 1-6 hrs) with consent of adviser. PREREQ: 3 credits of lower-division geography. Not offered every year.

GEO 350. *POPULATION GEOGRAPHY (3). Patterns of spatial distribution of human populations, data sources, data display, population structure and dynamics, relationship between population, resources, and quality of life. Problems of growth and alternative futures. PREREQ: Upper class standing. Offered alternate years. (Bacc Core Course)

GEO 360. CARTOGRAPHY (4). Basic cartographic principles. Design, compilation, and construction of maps. Lec/lab.

GEO 370. STRATIGRAPHIC PALEONTOLOGY (4). Study of stratigraphically useful groups of invertebrate fossils, above species level. Applications to paleobiogeography and paloecology. Biostratigraphic principles and practice. PREREQ: GEO 203. Lec/lab.

GEO 400/GEO 500. FIELD TRIPS (1-16). Participation in group field trips that are not a part of any other course. Transportation fee is charged. Students may prepare guides for trips. Faculty sponsor must be prearranged. Graded P/N. (GEO 400-Departmental approval required)

GEO 401/GEO 501. RESEARCH (1-16). Independent, original research subjects guided by faculty conferences and resulting in a brief written report. Faculty sponsor must be prearranged. (GEO 401-Department approval required)

GEO 403/GEO 503. THESIS (1-16). Independent, original study that culminates in a senior thesis. Faculty sponsor must be prearranged. (GEO 403-Department approval required)

GEO 405/GEO 505. READING AND CONFERENCE (1-16). Independent reading in specialized topics guided by and discussed in faculty conferences. Faculty sponsor must be prearranged. (GEO 405-Department approval required)

GEO 407/GEO 507. SEMINAR (1-16). (GEO 407-Department approval required) Graded P/N.

GEO 408/GEO 508. WORKSHOP (1-16). (GEO 408-Department approval required)

GEO 410/GEO 510. INTERNSHIP (1-15). Pre-career professional experience under joint faculty and employer supervision. GEO 510 may not be used to meet minimum credit hour requirements for graduate degrees in geography. PREREQ: 12 credits of upper division geography. Graded P/N.

GEO 411/GEO 511. *^DEVELOPMENT OF GEOLOGIC THOUGHT (3). Analysis of scientific method in earth science using important early papers in geology. Discussion of philosophy of science issues in geology. Observation, inference, data, hypothesis, and theory in geology. Ethical standards in research and application of results. PREREQ: GEO 101, GEO 102 or GEO 201, GEO 202. Offered alternate years. (Bacc Core Course; Writing Intensive Course)

GEO 412/GEO 512. IGNEOUS PETROLGY (4). Petrogenesis of igneous rocks. Petrographic analysis using polarizing microscopes. PREREQ: GEO 310, GEO 315, GEO 320. Lec/lab.

GEO 413/GEO 513. SEDIMENTARY PETROLOGY (4). Field occurrence, description, and petrogenesis of sedimentary rocks, petrographic analysis using polarizing microscope, mechanical analysis of sediments. Field trip may be required, transportation fee charged. PREREQ: GEO 320. Lec/lab.

GEO 414/GEO 514. METAMORPHIC PETROLOGY (4). Field occurrence, desciption, and petrogenesis of metamorphic rocks. Use of mineral reactions for thermometry, barometry and fluid equilibria. PREREQ: GEO 315 and GEO 320. Lec/lab. Offered alternate years.

GEO 418/GEO 518. GEOGRAPHIC PHOTO INTERPRETATION (3). Measurement and interpretation techniques with an emphasis on applications of aerial photography to mapping, resource evaluation, and field research. Covers photographic theory, flight planning, basic photogrammetry, and applications. PREREQ: MTH 112. Lec/lab.

GEO 419/GEO 519. ROCK-FORMING MINERALS (3). Identification, structure, and phase petrology of silicate, oxide, carbonate, and other important groups of rock-forming minerals. PREREQ: GEO 320. Offered alternate years.

GEO 420/GEO 520. GEOGRAPHY OF RESOURCE USE (3). Functional concepts of resources, institutions affecting resource use, role of resources; resource supply, bases of controversy. PREREQ: 9 credits of upper division geography.

GEO 421/GEO 521. HUMANS AND THEIR WILDLIFE ENVIRONMENT (3). Examines research themes associated with the interface of humans and wildlife resources. Includes discussions of resource use conflicts, differing philosophies of wildlife, wildlife ownership, patterns of both illegal and legal use, and alternative strategies for incorporating wildlife in planning. PREREQ: 9 credits of upper-division geography. Offered alternate years.

GEO 422/GEO 522. ECOLOGICAL KNOWLEDGE AND ENVIRONMENTAL PROBLEMS (3). Evaluation of successes and failures in applying ecological principles to environmental problems. Case studies of fisheries, forests, lakes, grasslands, pest control and desease in human-modified natural systems. Synthesis emphasizing how the study of the environmental problems has contributed to paradigms in contemporary geosciences and ecology. PREREQ: 9 credits of upper division geography or environmental science. Offered alternate years.

GEO 423/GEO 523. LAND USE (3). Development of a conceptual framework for land use study; analysis of land as a resource, land use trends in the U.S., land use principles, and management issues as related to planning.

GEO 424/GEO 524. WATER RESOURCES GEOGRAPHY (3). Geographical analysis of the spatial relations among biophysical factors, human factors, and water resource developments. Comparison of water use systems in developed and developing countries and in planned and unplanned economies. The spatial consequences of various water uses. PREREQ: 9 credits of upper division geography. Offered alternate years.

GEO 425/GEO 525. WATER RESOURCES MANAGEMENT IN THE UNITED STATES (3). Geographic analysis of various water management techniques, institutional processes; multiple, conflicting, and complementary uses of water; spatial consequences of various water management strategies; research problems. PREREQ: 9 credits of upper-division geography. Offered alternate years.

GEO 426/GEO 526. THIRD-WORLD RESOURCE DEVELOPMENT (3). Examines alternative resource development strategies used in less developed countries. Alternatives in agriculture, forestry, fisheries, energy, wildlife management, mineral development, land use, disease control, and population manipulation are examined. Offered alternate years.

GEO 427/GEO 527. ^VOLCANOLOGY (4). A survey of volcanoes: their distribution, forms, composition, eruptive products, eruptive styles, and associated phenomena. Field trip may be required, transportation fee charged. PREREQ: GEO 315. Lec/lab. Offered alternate years. (Writing Intensive Course)

GEO 429/GEO 529. TOPICS IN RESOURCE GEOGRAPHY (3). Fundamental problems with stress upon methods of analysis. Topics vary; number may be repeated (from 1-6 hrs.) with consent of major professor. PREREQ: 9 credits of upper-division geography. Not offered every year.

GEO 430/GEO 530. GEOCHEMISTRY (3). Principles of geochemistry applied to problems of earth science. PREREQ: GEO 315; CH 121, CH 123. Offered alternate years.

GEO 431/GEO 531. APPLIED CLIMATOLOGY (3). Geographic climatology with a focus on human/climate relationships. Techniques of climate classification and data analysis for applied use. Special reference to climate systems of North America. PREREQ: GEO 323. Offered alternate years.

GEO 432/GEO 532. APPLIED GEOMORPHOLOGY (3). Effect of landform processes upon human activity; consequences of resource management strategies on erosional balance within landscape; identification of mitigation of natural hazards; role of geomorphic process studies in environmental planning. Taught as seminar, themes TBA. Field trip(s) may be required; transportation fee charged. PREREQ: GEO 322.

GEO 433/GEO 533. ECOLOGICAL BIOGEOGRAPHY (3). Ecological and biogeographic principles related to the distribution of plants, animals, and biotic communities. Consideration is given to systematics, paleoecological interpretation, dispersal, spatial/temporal patterns. PREREQ: 9 credits of upper-division geography. Offered alternate years.

GEO 434/GEO 534. FIELD RESEARCH IN PHYSICAL GEOGRAPHY (3). Exposure to the broad spectrum of physical environments in Oregon, focusing on a variety of research problems in physical geography, environmental planning, and conservation. Course consists of field experience and several seminars. Field trip(s) may be required; transportation fee charged.

GEO 439/GEO 539. TOPICS IN PHYSICAL GEOGRAPHY (3). Fundamental problems with stress upon methods of analysis. Topics vary; number may be repeated (from 1-6 hrs.) with consent of major professor. PREREQ: GEO 462. Not offered every year.

GEO 440/GEO 540. ECONOMIC GEOLOGY (4). Principles of the origin, distribution, and importance of metallic mineral deposits formed by magmatic, hydrothermal, and sedimentary processes. PREREQ: GEO 315, GEO 450. Lec/lab.

GEO 441/GEO 541. SPATIAL VARIATION IN ECOLOGY AND EARTH SCIENCE. (3) Objectives and techniques of spatial analysis in earth sciences and ecology. Moving windows, geostatistics, and related techniques. PREREQ: ST 411/ST 511. Offered alternate years.

GEO 444/GEO 544. REMOTE SENSING (3). Physical principles; theory and operation of remote sensing systems; imagery interpretation and applications. Introduction to satellite remote sensing and digital image processing. PREREQ: GEO 418/GEO 518. Lec/lab.

GEO 445/GEO 545. COMPUTER-ASSISTED CARTOGRAPHY (3). Concepts and techniques underlying the production of maps by computer. Practical experience with a variety of computer mapping packages. PREREQ: GEO 360; MTH 112. Lec/lab.

GEO 450. STRUCTURAL GEOLOGY (5). Descriptive geometry of geologic structures in three dimensions using field and lab data on maps, cross sections, and stereonets. Folds, faults, joints, fabrics, diapirs, and igneous structures. Mechanical principles of rock deformation. Application of stress and strain to brittle and ductile rock deformation. Field trip required, transportation fee charged. PREREQ: GEO 201, or GEO 221; PREREQ or COREQ: Diff. calc. Lec/lab.

GEO 451/GEO 551. ENVIRONMENTAL SITE PLANNING (3). The use of geographic concepts/techniques in land use and site planning; especially natural area inventory, classification and analysis. Findings-of-fact presentation and report writing. Two local field trips may be required; transportation fee charged. Offered alternate years.

GEO 452/GEO 552. PRINCIPLES AND PRACTICES OF RURAL AND RESOURCE PLANNING (3). Principles, techniques, and current practices of land use planning for rural areas. Emphasis on resource issues, organization of data, policy development, and decision-making. PREREQ: GEO 423/GEO 523 and graduate standing. Offered alternate years.

GEO 453/GEO 553. RESOURCE EVALUATION METHODS/EIS (3). Methods of resource analysis for land use planning; resource rating systems; environmental impact assessment: laws, procedures, and methods. Field trip(s) may be required; transportation fee may be charged. PREREQ: GEO 452.

GEO 454/GEO 554. ADVANCED STRUCTURAL GEOLOGY (3). Mechanical principles of brittle and ductile rock deformation. Analysis of stress and strain in rocks. Advanced structural analysis of folds and faults. PREREQ: GEO 450; PREREQ or COREQ: GEO 315. Lec/lab.

GEO 456/GEO 556. WESTERN CORDILLERAN TECTONICS (3). Regional structural geology and tectonic evolution of western North America in a plate-tectonic framework. Emphasis on Mesozoic and Cenozoic. Description of individual structural provinces and comparison to modern analogs such as the Western Pacific. Field trip required, transportation fee charged. PREREQ: GEO 450. Offered alternate years.

GEO 457/GEO 557. TECTONOSTRATIGRAPHIC TERRANES (2). Identification of terranes; processes of terrane amalgamation, accretion, and dispersion; determining terrane source regions; relationship between terranes and resources (ores and petroleum). PREREQ: GEO 450.

GEO 458/GEO 558. PLATE TECTONICS OF CONTINENTAL COLLISION (3). Comparative tectonics of selected regions of the world. Tectonics of strike-slip faults and transform zones, convergent and collision regions, foreland fold-and-thrust belts, metamorphic hinterland thrust belts, ophiolite emplacement, melange and suture zones. Comparison of currently active deformation zones to past orogenic belts. PREREQ: GEO 450. Offered alternate years.

GEO 459/GEO 559. TOPICS IN LAND USE (3). Recent developments in approaches to selected land use problems; environmental constraints and impacts, conflicts, and planning criteria; processes and implementation techniques. Topics vary and number can be repeated (from 1-6 hrs.). PREREQ: GEO 452/GEO 552, GEO 465/GEO 565. Not offered every year.

GEO 460/GEO 560. MAP DESIGN AND PRODUCTION (4). Perceptual principles of map design. Laboratory experience with photomechanical map production techniques. Materials fee charged. PREREQ: GEO 360. Lec/lab.

GEO 461/GEO 561. GEOLOGY OF EARTHQUAKES (3). Tectonics of the present day as based on surface geology, geodesy, seismicity, and crustal structure; description of active faults and folds; use of neotectonics in evaluation of earthquake hazard. Field trip(s) may be required, transportation fee charged. PREREQ: GEO 450. Offered alternate years.

GEO 462/GEO 562. GEOGRAPHIC FIELD TECHNIQUES (4). Field data gathering techniques; focus on field reconnaissance problems. Organization for field work from instrumentation to data collection and analysis to report writing. PREREQ: 360. Lec/field lab. (Writing Intensive Course)

GEO 463/GEO 563. ^INTRODUCTORY SOLID EARTH GEOPHYSICS (4). Principles of geophysics, including seismology, gravity, magnetism, heat flow, and applications to plate tectonic theory. Laboratory exercises include computer modeling and interpretation of observed data. For students with backgrounds in geology. PREREQ: MTH 251, PH 213. CROSSLISTED as GPH 463/GPH 563. PREREQ: MTH 251, PH 213. Lec/lab. (Writing Intensive Course)

GEO 464/GEO 564. ^SEISMIC REFLECTION INTERPRETATION (4). Seismic reflection data used to interpret subsurface geology. Integration of reflection data with other geophysical and geological data to interpret the structure and stratigraphy of sedimentary basins and the gross structure of the earth's crust. Overview of wave propagation theory and acquisition and processing procedures. Laboratory includes computer modeling of reflection data and interpretation of profiles from various tectonic settings. For students with backgrounds in either geology or geophysics. CROSSLISTED as GPH 464/GPH 564. PREREQ: GEO 463/GEO 563 or GPH 463/GPH 563 or consent of instructor. Lec/lab. (Writing Intensive Course)

GEO 465/GEO 565. GEOGRAPHIC INFORMATION SYSTEMS (3). Collecting, structuring, manipulating, and graphically displaying data using Geographic Information Systems. Practical experience with a commonly used GIS such as ArcInfo in a class project setting. PREREQ: GEO 360. Lec/lab.

GEO 466/GEO 566. DIGITAL IMAGE PROCESSING (3). Digital analysis of remote sensor data. Image display enhancement, classification, and rectification principles. Practical experience with an image processing system. PREREQ: GEO 444/GEO 544. Lec/lab. Offered alternate years.

GEO 469/GEO 569. TOPICS IN GEOGRAPHIC TECHNIQUES (3). Advanced and specialized geographic information processing techniques, procedures, and applications. Topics vary; number may be repeated (from 1-6 hrs.) with consent of major professor. Not offered every year.

GEO 470/GEO 570. STRATIGRAPHY AND SEDIMENTOLOGY (4). Historical development; lithostratigraphy; the stratigraphic code; correlation; sequence magneto and seisic stratigraphy; sedimentary processes, structures, facies, and depositional environments; field and laboratory procedures. Field trip(s) may be required; transportation fee charged. PREREQ: GEO 315, GEO 450. Lec/lab.

GEO 479/GEO 579. CLAY MINERALOGY (3). Nature, properties, occurence, genesis, and applications of clay minerals in geologic and soil environments. Field trip required; transportation fee charged. Lec/lab. Offered alternate years.

GEO 481/GEO 581. GLACIAL GEOLOGY (4). Mass balance of glaciers, physics of glacial flow, processes of glacial erosion and deposition, glacial meltwater, glacial isostasy and eustasy, and Quaternary stratigraphy. Field trip(s) may be required, transportation fee charged. PREREQ: GEO 202. Lec/lab. Offered alternate years.

GEO 482/GEO 582. FOREST GEOMORPHOLOGY (3). Interdisciplinary approach to analysis of roles of landforms and geomorphic processes in upland, riparian, and fluvial ecosystems. PREREQ: Basic background in physical and biological sciences. Offered alternate years.

GEO 483/GEO 583. GEOMORPHOLOGY OF MOUNTAIN STREAMS (3). Processes and landforms in high-gradient streams, including fluvial hydraulics, sediment transport and channel bed morphology at various scales. Interactions between geomorphic and biotic processes are stressed. PREREQ: Upper division course work in physical or biological sciences. Offered alternate years.

GEO 484/GEO 584. TRAVEL AND TOURISM IMPACTS (3). Physical, economic, and socio-cultural impacts of tourism development are considered from a geographical perspective. PREREQ: Senior or graduate standing and appropriate topical background. Offered alternate years.

GEO 485/GEO 585. TOURISM AND RECREATION RESOURCES (3). Geographic analysis of world tourism and recreation resources. PREREQ: Senior or graduate standing and appropriate topical background. Offered alternate years.

GEO 486/GEO 586. ENGINEERING GEOLOGY (3). Application of geologic principles and processes to the study of rock and soil materials and to subsurface fluids; includes site investigations for buildings and dams, routes for tunnels and pipelines and highways; earth materials for construction; surface and groundwater resources and pollution; and evaluation of geologic hazards. PREREQ: GEO 201, GEO 202, or GEO 221, GEO 487. Offered alternate years.

GEO 487/GEO 587. HYDROGEOLOGY (3). Geologic processes and principles as related to gound-water and surface-water resources, properties and interactions of fluids in rock and unconsolidated earth materials, applications of basic geology to the resolution of pollution, both natural and anthropogenic. PREREQ: GEO 201 and GEO 202. Offered alternate years.

GEO 488/GEO 588. QUATERNARY STRATIGRAPHY OF NORTH AMERICA (3). Stratigraphic principles applied to Quaternary deposits. Survey Quaternary dating methods. Proxy records of glaciation and climate change. Quaternary stratigraphy of North America, emphasizing stratigraphic records of ice sheets, glaciers, and pluvial lakes. PREREQ: GEO 481/GEO 581, or consent of instructor. Offered alternate years.

GEO 490. ^GEOLOGIC FIELD METHODS (4). Methods of geologic field mapping, note taking, and report writing. Use and interpretation of aerial photos, geologic maps, cross sections, and columnar sections. Field trip(s) required; transportation fee charged. PREREQ: GEO 315 and GEO 450. Lec/lab. (Writing Intensive Course)

GEO 495/GEO 595. FIELD GEOLOGY (12). A 7 week program of intensive geological field studies, conducted in central Oregon each summer session. Operational fee will be charged to meet costs of transportation, food, lodging, and supplies. PREREQ: GEO 315, GEO 450, GEO 490.

GEO 497/GEO 597. FIELD MAPPING OF ORE DEPOSITS (3). Eight-day field trip over spring vacation to a mineral district in the western United States, emphasizing detailed mapping of outcrops, trenches, and underground workings. Students prepare final maps and a report suitable for presentation to management or publication during spring term. Transportation fee charged. PREREQ: GEO 440, GEO 495. Not offered every year.

Graduate Courses

GEO 515. HISTORY AND PHILOSOPHY OF GEOGRAPHY (3). The historical development of research traditions in the discipline of geography. This includes an examination of changes in conceptual structures and current trends. PREREQ: Graduate standing in geography.

GEO 516. INTERPRETATION OF GEOLOGIC MAPS (2). Development of skills in formulating geologic problems, using geologic maps, and developing solutions by the scientific method. PREREQ: GEO 495.

GEO 517. GEOLOGIC REPORT WRITING (2). Construction of geologic reports and research proposals. Clarity, integrity, and criticism in written communication.

GEO 528. MICROPROBE ANALYSIS (3). Theory and application of electron microprobe analysis to problems in geology, engineering, chemistry, physics, and biology. CROSSLISTED as OC 528.

GEO 546. ADVANCED LANDSCAPE ECOLOGY (3). Patteen-process interactions in large scale ecological and physical systems. Hypothesis testing, field techniques, spatial models/statistics, GIS/remote sensing. PREREQ: 9 credits of graduate science credits.

GEO 571. RESEARCH DESIGN (3). Identification of graduate student research topics, formulation of research design, development of proposal. PREREQ: Graduate standing in geography.

GEO 593. TOPICS IN QUATERNARY GEOLOGY (2). Survey of current ideas and issues relating to Quarternary-age geologic environments. Topics may include advances in geochronology, causes of climate change, modeling of ice age geodynamics. May be repeated (2-10 hrs.)

GEO 598. GRADUATE FIELD GEOLOGY (1-16). Field study of geologic problems for graduate students.

GEO 600. FIELD TRIPS (1-16). Participation in group field trips that are not part of any other course. Transportation fee charged. Students may prepare guide for trips. Faculty sponcers must be arranged. Graded P/N.

GEO 601. RESEARCH (1-16).

GEO 603. THESIS (1-16).

GEO 605. READING AND CONFERENCE (1-16).

GEO 606. PROJECTS (1-16).

GEO 607. SEMINAR (1-16). Graded P/N.

GEO 608. WORKSHOP (1-16).

GEO 622. IGNEOUS PETROLOGY (3). Controls on the distribution of major and trace elements; theory, applications, and examples. PREREQ: GEO 412. Offered alternate years.

GEO 632. LOW TEMPERATURE GEOCHEMISTRY (3). Geochemistry of the weathered crust, hydrosphere, and atmosphere. Composition, origin, and evolution of major surficial reservoirs. PREREQ: Graduate standing in geology or related fields. Offered alternate years.

GEO 633. GEOCHRONOLOGY AND ISOTOPE GEOLOGY (3). Measurements of cosmic and geologic time by radioactive decay. Use of radiogenic and stable isotopic tracers in geology. PREREQ: Graduate standing in geology or related fields. Offered alternate years.

GEO 646. MAGMATIC AND HYDROTHERMAL ORE DEPOSITS (4). High-temperature metallic mineral deposits considered in terms of geologic and petrochemical indicators of genesis, features of exploration significance, and economic relevance. Lec/lab. Offered alternate years.

GEO 672. ADVANCED SEDIMENTOLOGY (3). Ancient and modern clastic and/or carbonate environments, non-marine and marine processes of sedimentation, interpretation of sedimentary structures and facies, relationship between tectonism and basin development. Field trip(s) may be required, transportation fee charged. PREREQ: GEO 470. Offered alternate years.

GEO 680. ADVANCED SEDIMENTARY PETROLOGY (4). Examination and interpretation of siliciclastic and/or carbonate sedimentary rocks using petrographic microscope, luminoscope, fluoroscope, scanning electron microscope, X-ray diffraction, and other analytical techniques. Composition, texture, diagenesis, geochemistry and provenance, depositional and tectonic settings of sandstone, shale, and carbonate rocks are treated. Field trip(s) may be required, transportation fee charged. Can be repeated once. PREREQ: GEO 413. Lec/lab. Offered alternate years.

GEO 692. TOPICS IN IGNEOUS PETROLOGY (1). Survey of recent research and advanced concepts in igneous petrology. Can be repeated (from 1-6 hrs.).

GEO 694. TOPICS IN ORE GENESIS (3). In-depth examination of published research on selected mineral deposits to build an understanding of environments and processes of ore formation. Can be repeated (from 3-6 hrs.). PREREQ: GEO 440 Offered alternate years.

GEO 695. TOPICS IN TECTONICS (2). Topics of current interest in regional structural geology, mechanics of rock deformation, or tectonics. Subjects will vary in different years. Can be repeated once. PREREQ: GEO 450. Offered alternate years.

HISTORY OF SCIENCE

Full descriptions of the History of Science courses (HSTS) are listed in the Liberal Arts section of the catalog with the History listings. They can be used for upper division science credit and HSTS 415, HSTS 416, HSTS 417, HSTS 418, and HSTS 419 are approved as WIC courses for General Science and Biology degrees.

MATHEMATICS

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Faculty
Professors Burton, B. I. Fein, Flaherty, Guenther, Lee, Musser, Parks, Petersen, Schori, Solmon, Waymire; *Associate Professors* Chen, Dick, Dray, Finch, Flahive, Garity, Higdon, Jones, Murphy, Newberger, Ossiander, Robson, Thomann; *Courtesy Associate Professor* Manogue; *Assistant Professors* Bogley, Escher, Faridani, B. Y. Fein, King, Peterson, Pohjanpelto, Reddy, Reichstein, Schmidt, Weideman

Undergraduate Major

Mathematics (B.S.)
Options
Actuarial Science
Applied Mathematics
Comprehensive
General Mathematics
Numerical Analysis
Pure Mathematics

Mathematical Sciences (B.S.)
Minor
Mathematical Sciences

Minors

Mathematics
Actuarial Science

Graduate Major

Mathematics (M.A., M.S., Ph.D.)
Graduate Areas of Concentration
Algebra
Analysis
Applied Mathematics
Computational Mathematics
Geometry
Mathematics Education
Mechanics
Numerical Analysis
Probability
Topology

The department offers programs leading to the B.S., M.A., M.S., M.A.I.S., and Ph.D. degrees in mathematics. Minors are offered in mathematics and in actuarial science. In addition, the department offers the B.S. degree in mathematical sciences. The mathematical sciences degrees are offered with the cooperation of the Departments of Computer Science and Statistics. The Computer Science Department also offers a separate undergraduate degree. The Statistics Department offers graduate degree programs. There is also a minor in mathematical sciences.

The Comprehensive Option under the mathematics major is intended primarily for those students preparing for careers in teaching mathematics at the secondary level. Such students should contact the Department of Mathematics and arrange for an advising session.

Additional information pamphlets about both the undergraduate and graduate programs are available from the Mathematics Department office. The graduate program is also described in the OSU *Graduate Catalog*.

Mathematics Degree (B.S)

Courses of study are offered in all the principal branches of pure and applied mathematics. As indicated in the degree requirements below, an option system helps students to focus their programs toward specific interests and career goals. Interdisciplinary programs with other departments are strongly encouraged. Possibilities exist for joint programs with computer science, statistics, and numerous other departments within the College of Science and the Colleges of Engineering, Oceanography, Business, Forestry, and Agricultural Sciences.

The department also sponsors an internship program at the undergraduate and graduate levels. Internships provide planned and supervised training at selected governmental, industrial, or business placement sites. To apply, a student must submit two letters of recommendation and take a mathematics competency test covering MTH 311, MTH 312, and MTH 341. Application for the internship program should be made early in the academic year through the department.

Requirements

In addition to fulfilling the University baccalaureate core requirements and the College of Science requirements, an undergraduate mathematics major must complete the mathematics core and at least one option.

Mathematics Core
Lower division: Calculus: MTH 251-MTH 255; Discrete Math: MTH 235; Ordinary Differential Equations: MTH 256, PH 211 One year approved courses in the physical or biological sciences may include PH 211. Proficiency in a high level computer programming language.
Upper division: At least 36 credits, at least a grade of C- and GPA of 2.25 in all required upper division courses: Advanced Calculus: MTH 311, MTH 312, MTH 313; Linear Algebra: MTH 341, MTH 342; 12 credits from MTH 411 through MTH 467 and one course each from two of the following three lists:
- *Analysis:* MTH 351, MTH 361, MTH 362, MTH 365, MTH 367, MTH 411-MTH 428, MTH 451-MTH 467.
- *Algebra:* MTH 393, MTH 440, MTH 441, MTH 447, MTH 448, MTH 491
- *Geometry and Topology:* MTH 333, MTH 338, MTH 339, MTH 434-437, MTH 492, MTH 493

Note: For those in the Comprehensive Option, MTH 313 is not required and MTH 491, MTH 492, MTH 493 and ST 422 meet the 12-credit requirement. ST 422 also is allowed in the 12-credit requirement for the Actuary Option.

Mathematics Major Options

ACTUARIAL SCIENCE OPTION
Any two of: MTH 351, MTH 361, MTH 365, ST 411, ST 412, ST 448; all of the following: MTH 463, MTH 464, MTH 467; ST 421, ST 422.

APPLIED MATHEMATICS OPTION
PH 211, PH 212, PH 213; MTH 256 and MTH 351; two sequences, which have no course in common, selected from:
MTH 417, MTH 419, MTH 420
MTH 421, MTH 422, MTH 423
MTH 419, MTH 427, MTH 428
MTH 451, MTH 452, MTH 453
MTH 463, MTH 464, MTH 465
MTH 417 and or MTH 420 and two of MTH 427, MTH 428, MTH 451, MTH 463

COMPREHENSIVE OPTION
MTH 235; MTH 361 or ST 421; ST 422; MTH 337, MTH 338, MTH 392, MTH 393; MTH 491, MTH 492, MTH 493

GENERAL MATHEMATICS OPTION
MTH 235, MTH 256; 42 upper division credits in mathematics.

NUMERICAL ANALYSIS OPTION
MTH 256; MTH 351, MTH 352, MTH 451, MTH 452, MTH 453

PURE MATHEMATICS OPTION
One of MTH 333, MTH 345, MTH 351, or MTH 361; both of MTH 417 and MTH 441; two sequences, which have no course in common, selected from the following:
MTH 411, MTH 412, MTH 413
MTH 421, MTH 422, MTH 423
MTH 434, MTH 435 and one of MTH 436 or MTH 437
MTH 441, MTH 447, MTH 448
MTH 451, MTH 452, MTH 453
MTH 463, MTH 464, MTH 465
Select three of MTH 419, MTH 420, MTH 427, MTH 428.

Sample Mathematics Curriculum

The following schedule indicates how the requirements above may be incorporated in a four year program of study:

Freshman and Sophomore Years
Mth 251, MTH 252, MTH 253, MTH 254, MTH 255. Calculus (20)
MTH 235. Discrete Math and MTH 256. Appl Diff Eqns (7)
Computer proficiency in a high level lang (3-4)
PH 211, PH 212, PH 213. Physics (12)
College of Science & University requirements & electives (47)

Junior and Senior Years
GPA of 2.25 or better in all upper division required courses
MTH 311, MTH 312, MTH 313. Adv Calc (9)
MTH 341, MTH 342. Linear Algebra (6)
4 quarters approved 400 level course work (12)
Additional approved breadth and option requirements (9-18) (credits required will depend on the chosen option)
College of Science & University requirements & electives (45-54)

Mathematics Minors

The department offers both a minor in mathematics and a minor in actuarial science.

The requirements for the minor in mathematics are 30 credits of MTH courses numbered 235 or higher, including MTH 311 or MTH 341, and a total of 15 credits of

upper division work (where MTH 311 and/or MTH 341 are counted in the 15 credits). No more than 3 credits total can be used from both of MTH 290 and MTH 390.

The requirements for the minor in actuarial science are MTH 251, MTH 252, MTH 253, MTH 254, MTH 255, MTH 341, ST 421, and two of MTH 351, MTH 365, ST 422, ST 412, ST 415, ST 448.

Mathematical Sciences Degree

The mathematical sciences degree provides breadth of training in the three areas of computer science, mathematics, and statistics. The major in mathematical sciences allows concentration in applied mathematics, mathematical statistics, applied analysis, assemblers and compilers, and operating systems. The program is designed to provide employment opportunities in industry and government and to prepare students for graduate work in areas requiring a quantitative background without narrow specialization.

Students begin by taking a common group of courses. Areas of specialization are developed in the junior and senior years.

A pamphlet describing the mathematical sciences degree program in more detail is available at the Mathematics Department main office.

Requirements

In addition to fulfilling the University baccalaureate core requirements and the College of Science requirements, a mathematical sciences major must complete the following:

Lower division: MTH 251, MTH 252, MTH 253, MTH 254, MTH 255, MTH 256 and CS 131, CS 161, CS 162, CS 251, CS 261.

Upper division: A grade point average of at least 2.25 in all upper division courses required below. Upper division courses must include MTH 311, MTH 341, MTH 351, and one of MTH 312 and MTH 342; ST 351, ST 421, ST 422, ST 423 and ST 448; CS 325, CS 361 or CS 381; any upper division prerequisite for the chosen senior sequence; and a senior sequence chosen from the following list:

- *Numerical analysis:* MTH 451, MTH 452, MTH 453
- *Continuum mechanics:* MTH 421, MTH 422, MTH 423
- *Applied mathematics:* MTH 417, MTH 419, MTH 420
- *Systems programming:* CS 411 and two of CS 420-CS 480
- *Probability:* MTH 463, MTH 464, MTH 465
- *Applied statistics:* ST 411, ST 412, ST 413
- *Operations research I:* ST 441, ST 443, ST 445
- *Operations research II:* ST 481, ST 483, ST 485

Mathematical Sciences Sample Curriculum

The following schedule indicates how the requirements above may be incorporated in a four year program of study:

Freshman and Sophomore Years

MTH 251, MTH 252, MTH 253, MTH 254, MTH 255. Calculus (20)
MTH 256. Applied Differential Equations (4)
CS 161, CS 162. Intro. to Prog. Methods and Data Structures (8)
CS 131. Intro. to Fortran Programming (4)
CS 261. Advanced Data Structures (3)
College of Science & University requirements & electives

Junior and Senior Years

GPA of 2.25 or better in required math science courses
MTH 311, MTH 341, MTH 351 and one of MTH 312, MTH 342 (12)
CS 325, CS 361 or CS 381 (15)
ST 351, ST 421, ST 422, ST 423 ST 448 (15)
Approved senior sequence (see list above) (9-12)
College of Science & University requirements & electives

Mathematical Sciences Minor

The requirements for the minor in mathematical sciences are a total of ten courses, totaling at least 30 credits, selected from either the mathematical sciences major or MTH 345, MTH 361, MTH 362, MTH 365, MTH 367, ST 431. These must include 15 upper division credits and two courses each from computer science, mathematics, and statistics. Restriction: No upper division course used to satisfy a requirement in the student's major can be used to satisfy mathematical sciences minor requirements of the student.

Courses

MTH 65. ELEMENTARY ALGEBRA (3). Arithmetic of signed numbers, order of operations, simplifying algebraic expressions, solution of linear equations, and inequalities. Rules of exponents, addition, subtraction, and multiplication of polynomials, factoring, solution of quadratic equations by factoring, reducing rational expressions. Word problems involving linear equations, graphing of linear equations, inequalities. (Offered only through CHE.)

MTH 95. INTERMEDIATE ALGEBRA (3). Addition, subtraction, multiplication, and division of rational expressions, long division of polynomials, solution of fractional equations, applications involving linear equations. Fractional equations, inequalities, literal equations, and variations. Negative and fractional exponents, radicals, solution of quadratic equations, and complx numbers. Cartesuan coordinates, graphs of linear equations and inequalities, distance formula, slope, equations of lines, solutions of systems of linear equations in two unknowns and inequalities. PREREQ: MTH 65 (Offered only through CHE.)

Lower Division

MTH 105. *INTRODUCTION TO CONTEMPORARY MATHEMATICS (3). Elementary linear programming, combinatorics, descriptive statistics, elementary probability, exponential growth and decay, examples of major mathematical ideas and models. PREREQ: MTH 95 or equivalent high school preparation. (Bacc Core Course)

MTH 111. *COLLEGE ALGEBRA (4). Polynomial equations and inequalities, polynomial functions and graphs, inverse functions, exponential and logarithmic functions, systems of equations in three or more unknowns and inequalities, matrix algebra, rational functions and graphs. PREREQ: MTH 95 or equivalent high school preparation. (Bacc Core Course)

MTH 112. *ELEMENTARY FUNCTIONS (4). Triangle trigonometry, circular functions and graphs, trigonometric equations and identities, complex numbers, exponential and logarithmic functions and graphs, conic sections, polar coordinates, composite and inverse functions. PREREQ: MTH 111. (Bacc Core Course)

MTH 199. *TOPICS IN MATHEMATICS (1-16). Maximum 3 credits per term, 9 credits total. Does not meet University group requirement in physical science. (Bacc Core Course)

MTH 211. *FOUNDATIONS OF ELEMENTARY MATHEMATICS (3). Introduction to problem solving, sets, whole numbers, number theory, fractions, decimals, percent, ratio and proportion, integers. Intended primarily for prospective elementary teachers. PREREQ: MTH 95. (Bacc Core Course)

MTH 212. *FOUNDATIONS OF ELEMENTARY MATHEMATICS (3). Rational and real numbers, probability, statistics, and informal geometry. PREREQ: MTH 211.

MTH 213. *FOUNDATIONS OF ELEMENTARY MATHEMATICS (3). Measurement, congruence, similarity, coordinate and transformational geometry. PREREQ: MTH 212. (Bacc Core Course)

MTH 231, MTH 232. *ELEMENTS OF DISCRETE MATHEMATICS (4,4). Elementary logic, mathematical induction, functions and sequences, finite and infinite sets, counting techniques, basic matrix algebra, relations, graphs, trees, semigroups. Mth 231 and Mth 235 cannot both be taken for credit. MTH 231 PREREQ: Placement in MTH 251; MTH 232: MTH 231. (Bacc Core Course)

MTH 235. *DISCRETE MATHEMATICS (3). Elementary logic, mathematical induction, functions and sequences, finite and infinite sets, counting techniques, relations, graphs, trees, and semigroups. MTH 231 and MTH 235 cannot both be taken for credit. PREREQ: MTH 251. (Bacc Core Course)

MTH 241. *CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE (4). Elementary differential and integral calculus of polynomial, logarithmic, and exponential functions and their applications to business, management and social sciences. PREREQ: MTH 111. (Bacc Core Course)

MTH 245. *MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES (4). Techniques of counting, probability and elements of statistics including binomial and normal distributions. Introductory matrix algebra. Elements of linear programming. PREREQ: MTH 111. (Bacc Core Course)

MTH 251. *DIFFERENTIAL CALCULUS (4). Differential calculus for engineers and scientists. Rates of change: the derivative, velocity, and acceleration. The algebraic rules of differential calculus and derivatives of polynomial, rational, and trigonometric functions. Maximum-minimum problems, curve sketching, and other applications. Antiderivatives and simple motion problems. PREREQ: MTH 112. (Bacc Core Course)

MTH 252. *INTEGRAL CALCULUS (4). Definite integrals, elementary applications to area, force, and work. Integral tables and basic techniques of integration, calculus of logarithmic and exponential functions, polar coordinates, applications to areas, volumes, force, work, and growth and decay problems. PREREQ: MTH 251.

MTH 253. *INFINITE SERIES AND SEQUENCES (4). Indeterminate forms. Sequences and series, especially Taylor's formula and power series. Applications to numerical estimation with error analysis. Series with complex terms and the Euler identities. Brief introduction to functions of several variables, partial derivatives, the chain rule, and double integrals in rectangular coordinates. PREREQ: MTH 252.

MTH 254. *VECTOR CALCULUS I (4). Vectors and vector functions, parametric curves, tangents, velocity, and acceleration in space. Applications to motion problems. Surfaces, partial derivatives, gradients, and directional derivatives. Maximum-minimum problems. Double and triple integrals with applications to area, volume, and mass. Related matrix and linear algebra concepts. PREREQ: MTH 253.

MTH 255. *VECTOR CALCULUS II (4). Double integrals in polar coordinates, triple integrals in rectangular, cylindrical, and spherical coordinates. Introduction to vector analysis: divergence, curl, line integrals and work, surface integrals, conservative fields, and the theorems of Gauss and Stokes. PREREQ: MTH 254.

MTH 256. *APPLIED DIFFERENTIAL EQUATIONS (4). First order linear and nonlinear equations, and second order linear equations. Applications to electric circuits and mechanical oscillators. Introduction to the Laplace transform and higher order equations. Introduction to linear systems of differential equations, eigenvalues and normal modes. Related matrix and linear algebra concepts. Solution methods and applications appropriate for science and engineering. PREREQ: MTH 254.

MTH 299. *TOPICS IN MATHEMATICS (1-16). Maximum 3 credits per term, 9 credits total.

Upper Division

MTH 311, MTH 312, MTH 313. *ADVANCED CALCULUS (3,3,3). Limits and continuity in R^n and foundations of one variable differential and integral calculus, including uniform continuity and convergence. Foundations of multivariable differential and integral calculus, including the implicit and inverse function theorems. PREREQ: for MTH 311: MTH 235 or equivalent experience with proofs; for MTH 312: MTH 311 and COREQ: MTH 341; for MTH 313: MTH 312.

MTH 333. *^FUNDAMENTAL CONCEPTS OF TOPOLOGY (3). Open and closed sets, continuity, compactness, connectedness, winding number, fixed point theorems in the plane. PREREQ: MTH 254.

MTH 337. *EUCLIDEAN GEOMETRY (3). Tilings, investigations of the properties of polyhedra and other 3-dimensional solids, their intersections and plane cross-sections, Eulers formula, the incidence of points, lines and planes in space, tesselations. Major results of Euclidean geometry. Intended primarily for prospective secondary teachers. PREREQ: MTH 252 and MTH 235.

MTH 338. *^NON-EUCLIDEAN GEOMETRY (3). Introduction to non-Euclidean geometries. Selected topics such as hyperbolic and elliptic geometry, spherical geometry, projective geometry, geometries arising from alternative metrics. PREREQ: MTH 252.

MTH 339. *TOPICS IN GEOMETRY (3). Selected topics in Euclidean and non-Euclidean geometry.

MTH 341. *LINEAR ALGEBRA (3). Vector spaces, linear transformations and matrices, systems of linear equations. PREREQ: MTH 254.

MTH 342. *LINEAR ALGEBRA (3). Determinants, eigenvalues and vectors, similarity, inner-product spaces and their transformations. PREREQ: MTH 254.

MTH 345. *COMBINATORICS (3). Permutations and combinations, generating functions, linear recurrence relations, the principle of inclusion and exclusion, graph theory, trees, circuits, and cut sets. PREREQ: MTH 231 or MTH 235 and MTH 252.

MTH 351. *INTRODUCTION TO NUMERICAL ANALYSIS (3). Introduction to the computation of approximate solutions to mathematical problems that cannot be solved by hand: analysis of errors; rootfinding for nonlinear equations in one variable; interpolation of functions; numerical integration. PREREQ: MTH 253 and programming experience.

MTH 352. *INTRODUCTION TO NUMERICAL ANALYSIS (3). Introduction to numerical linear algebra, elements of approximation theory including data fitting and fast Fourier transform. PREREQ: MTH 254, MTH 351.

MTH 361. *INTRODUCTION TO PROBABILITY (3). Overview of probability and the laws of random events using concepts developed in calculus. Topics include probability models, discrete and continuous random variables, expectation and variance, the law of large numbers, and the central limit theorem. PREREQ: MTH 253.

MTH 362. *INTRODUCTION TO STOCHASTIC PROCESSES AND SIMULATION (3). Use of computer simulation to study random processes occurring in time or space. This allows the illustration of deep properties whose mathematical proofs may be difficult, or even unknown. Topics are likely to include stochastic models, random number generators, Markov processes, point processes and percolation models. PREREQ: MTH 254, MTH 341, and some computer experience.

MTH 391. *ELEMENTARY PROBLEM SOLVING (3). Mathematical problem solving techniques from the approach of George Polya. Problems will be drawn from the areas of number theory, algebra, geometry, probability, and the real number system. Intended primarily for prospective elementary teachers. PREREQ: MTH 213.

MTH 392. *PROBLEM SOLVING (3). Mathematical problem solving techniques from the approach of George Polya. Problems will be drawn from the areas of number theory, geometry, probability, and calculus. Intended primarily for prospective secondary teachers. PREREQ: MTH 253.

MTH 393. *NUMBER THEORY AND THEORY OF EQUATIONS (3). Mathematical induction, divisibility and primes, congruences, basic properties of groups, rings, and fields, rings of polynomials, roots and factors of polynomials. PREREQ: MTH 235 and MTH 253.

MTH 401/MTH 501. *RESEARCH (1-16). Department approval required.

MTH 403/MTH 503. *THESIS (1-16). Department approval required.

MTH 405/MTH 505. *READING AND CONFERENCE (1-16). Department approval required.

MTH 406/MTH 506. *PROJECTS (1-3). Department approval required.

MTH 407/MTH 507. *SEMINAR (3). Department approval required.

MTH 410/MTH 510. *OCCUPATIONAL INTERNSHIP (3-12). Graded P. Planned and supervised training experience at selected government, industrial, or business placement sites. Must be followed by a one-hour postinternship seminar. Consult departmental head adviser. PREREQ: Junior standing in mathematics, cumulative 3.00 GPA in mathematics, head adviser approval. Department approval required.

MTH 411/MTH 511, MTH 412/MTH 512, MTH 413/MTH 513. *REAL ANALYSIS (3,3,3). Topological concepts in metric, normed, and inner product spaces. Properties of continuous functions, including the Stone-Weierstrass theorem. Introduction to function spaces, contraction mappings, fixed points, and applications. Lebesgue measure and integration in one and several variables, basic convergence theorems, L^p spaces, Fubinis theorem, and applications such as to Fourier transforms and probability. PREREQ: MTH 313 and 341.

MTH 417. *COMPLEX VARIABLES (3). Introduction to the complex differential and integral calculus: Cauchys theorem and formula, the residue calculus, power series and Laurent series, harmonic functions, conformal mapping, and applications. PREREQ: MTH 311.

MTH 419/MTH 519. *INTEGRAL TRANSFORMS AND GENERALIZED FUNCTIONS (3). Fourier and Laplace transforms; introduction to generalized functions; applications to differential equations and physical problems. PREREQ: MTH 256 and 311.

MTH 420. *TENSORS AND DIFFERENTIAL FORMS (3). Introduction to tensor algebra and the algebra of exterior differential forms with emphasis on Euclidean space; differentiation of tensors and forms; integration of forms; selected applications from hydrodynamics, elastic media, electromagnetism, and Yang-Mills fields. PREREQ: MTH 256 AND MTH 341.

MTH 421/MTH 521, MTH 422/MTH 522, MTH 423/MTH 523. *PRINCIPLES OF CONTINUUM MECHANICS (3,3,3). Review of tensors; axioms of continuum mechanics; strain, stress, motion, thermodynamics of continuous media; construction of constitutive equations for real materials. Applications to problems in fluid dynamics, and elasticity. PREREQ: MTH 312. Must be taken in order.

MTH 427/MTH 527. *INTEGRAL EQUATIONS (3). Volterra and Fredholm integral equations of the second kind, Fredholm alternative, eigenvalues and eigenfunctions for self-adjoint problems and the Hilbert-Schmidt theory, applications to Sturm-Liouville problems and the separation of variables technique. PREREQ: MTH 312.

MTH 428/MTH 528. *VARIATIONAL PROBLEMS (3). Basic problems in the calculus of variations, first and second variation of functionals and the Euler-Lagrange equations, applications to physical problems and conservation laws, Ritz-Galerkin methods and other direct methods of the calculus of variations. PREREQ: MTH 256 and MTH 312.

MTH 434/MTH 534. *DIFFERENTIAL GEOMETRY (3). Local curve theory; global curve theory; exterior surface theory; fundamental forms, curvatures, geodesics; differentiable 2-manifolds; differential forms, exterior products, and derivatives, integration of forms. PREREQ: MTH 312 and MTH 341.

MTH 435/MTH 535, MTH 436/ MTH 536. *DIFFERENTIAL GEOMETRY (3,3,3). Local curve theory; global curve theory; exterior surface theory; fundamental forms, curvatures, geodesics; differentiable 2-manifolds; differential forms, exterior products, and derivatives, integration of forms. PREREQ: MTH 312 and MTH 341.

MTH 437/MTH 537. *GENERAL RELATIVITY (3). Geometry of special relativity. Tensor analysis, metrics, geodesics, curvature. Einstein field equations, cosmological models, black holes. Selected topics such as global structure, conserved quantities, spinors. PREREQ: MTH 311. REC: MTH 434.

MTH 440/MTH 540. TOPICS IN NUMBER THEORY (3). Graded P. Selected topics in number theory. PREREQ: MTH 253 or MTH 231.

MTH 441/MTH 541. *ABSTRACT LINEAR ALGEBRA (3). Abstract vector spaces, linear transformations, rational and Jordan forms, inner product spaces. PREREQ: MTH 341.

MTH 447/MTH 547, MTH 448/MTH 548. *ABSTRACT ALGEBRA (3,3,3). Groups, rings and ideals, polynomials and unique factorization rings, modules and vector spaces, fields. PREREQ: MTH 342.

MTH 451/MTH 551. *NUMERICAL LINEAR ALGEBRA (3). Computation of solutions of linear systems using direct and iterative methods; least-squares solution of overdetermined systems; computation of eigenvalues and eigenvectors. PREREQ: MTH 341 and programming experience. REC: MTH 342, MTH 351.

MTH 452/MTH 552. *NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS (3). Numerical solution of initial-value problems using Runge-Kutta methods and linear multistep methods; introduction to boundary-value problems. Analysis of stability, accuracy, and implementation of methods. PREREQ: MTH 256, MTH 451.

MTH 453/MTH 553. *NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS (3). Numerical solution of boundary value problems and initial-boundary value problems using finite difference and finite element methods. Analysis of stability, accuracy, and implementation of methods. PREREQ: MTH 452.

MTH 458. ^*NUMERICAL SOLUTION OF ORDINATRY DIFFERENTIAL EQUATIONS (4). WITH WRITING INTENSIVE SEGMENT The mathematical topics for this course are the same as those for MTH 452. In addition, several project reports are expected. PREREQ: MTH 451, REC: MTH 256.

MTH 463/MTH 563, MTH 464/MTH 564, MTH 465/MTH 565. *THEORY OF PROBABILITY (3,3,3). Random variables, central limit theorem; distributions of standard statistics; Markov chains, continuous and discontinuous stochastic processes. PREREQ: MTH 312 and MTH 341; COREQ: MTH 313.

MTH 467/MTH 567. *ACTUARIAL MATHEMATICS (3). Foundations of actuarial science from the point of view of mathematical models which arise in the design and management of insurance systems. Most models will be life insurance based. PREREQ: MTH 463 or ST 421.

MTH 468/MTH 568. LIFE CONTINGENCIES I (3). Construction and use of probability models in financial contingencies. Course will cover life tables and their use for financial transactions that commence or terminate at death. PREREQ: MTH 463 or ST 421.

MTH 469/MTH 569. LIFE CONTINGENCIES II (3). Construction and use of probability models in financial contingencies. Course will cover the models for long term funding and reserving. PREREQ: MTH 468/MTH 568.

MTH 470/MTH 570. LIFE CONTINGENCIES III (3). Construction and use of probability models in financial contingencies. Course will cover the extensions to contingencies other than death, and more general reserving theories. The material constitutes the mathematical core of the life actuarial theories. PREREQ: MTH 469/MTH 569.

MTH 473/MTH 573. *^HISTORY OF MATHEMATICS (3). Selected topics from the history of mathematics. PREREQ: 6 credits of upper division mathematics. (Writing Intensive Course)

MTH 481/MTH 581, MTH 482/MTH 582, MTH 483/ MTH 583. *MATHEMATICAL METHODS FOR ENGINEERS AND SCIENTISTS (3,3,3). Linear and nonlinear systems of ordinary differential equations, elementary stability theory, higher order equations, boundary value problems, series solution of ordinary differential equations. PREREQ: MTH 256.

MTH 487/MTH 587, MTH 488/MTH 588, MTH 489/MTH 589. *NUMERICAL METHODS FOR ENGINEERS AND SCIENTISTS (3,3,3). Interpolation, numerical integration, root-finding, Fourier series, fundamentals of numerical linear algebra and numerical solution of ordinary and partial differential equations. Emphasis on the practical implementation of numerical algorithms. PREREQ: MTH 256,MTH 341,MTH 482, and programming experience. REC: MTH 351.

MTH 490. *INTENSIVE SUMMER RESEARCH IN MATHEMATICS (12). Combination of seminar, lectures, and individual research projects designed to introduce students to research mathematics. PREREQ: This course is open to participants in the OSU Undergraduate Summer Research Program in Mathematics (REU program).

MTH 491/MTH 590, MTH 492/MTH 592, MTH 493/MTH 593. *ALGEBRA AND GEOMETRIC TRANSFORMATIONS (3,3,3). MTH 491: Groups and their properties, particular examples of groups of geometric transformations, Lagranges Theorem and its consequences, group homomorphisms and isomorphisms, rings, integral domains, fields, ordered fields, the rational, real and complex number fields, algebraic and transcendental numbers, constructible points and numbers and the classical geometric constructions. Credit not granted for both MTH 447 and MTH 491. Intended primarily for prospective secondary teachers. **MTH 492/MTH 592:** Isometries and similitudes of the plane (translations, rotations, reflections, glide reflections, dilations), groups and cosets of isometries, representations of isometries, similitudes, and inversions as functions of a complex variable. Intended primarily for prospective secondary teachers. **MTH 493/MTH 593:** Matrix representations of transformations in Euclidean space, spherical transformations and projections, genealogy of geometric transformations, invariants, group structure, applications of projective transformations to computer graphics. Intended primarily for prospective secondary teachers. PREREQ: for MTH 491/MTH 591: MTH 341 and 393; for MTH 492/ MTH 592: MTH 491/MTH 591 and MTH 337; and for MTH 493/MTH 593: MTH 492/MTH 592.

Graduate

MTH 514, MTH 515, MTH 516. COMPLEX ANALYSIS (3,3,3). Basic theory of analytic functions of a complex variable, including Cauchy's theorem, residue theorem, analytic continuation, conformal mappings, entire, and meromorphic functions. PREREQ: MTH 411/MTH 511 or MTH 417. Must be taken in order.

MTH 524, MTH 525. DIFFERENTIAL EQUATIONS AND DYNAMICAL SYSTEMS (3,3). Basic existence, uniqueness, and continuous dependence results for systems of ordinary differential equations, extendibility of solutions, stability theory, geometric theory including the Poincare-Bendixson theorem, phase space dynamical systems and chaos. PREREQ: MTH 411/MTH 511.

MTH 529, MTH 530, MTH 531. DIFFERENTIAL AND INEGRAL EQUATIONS OF MATHEMATICAL PHYSICS (3,3,3). Partial differential equations of physics, including those of potential theory, wave propagation, and heat flow, treated by classical means, generalized functions and variational principles. L^2 methods and integral equations. PREREQ: 6 credits of senior-level analysis. Must be taken in order.

MTH 554, MTH 555, MTH 556. NUMERICAL ANALYSIS (3,3,3). Theory and algorithms for approximations in normed spaces, optimization. Theory of approximate solution of equations. Numerical solution of differential equations. PREREQ: MTH 412/MTH 512, MTH 451/MTH 551. Normally offered alternate years.

MTH 558. COMPUTATIONAL MATHEMATICS (3). Introduction to mathematical software packages such as Mathematica, Matlob, and Maple. Examples of advanced mathematical topics that can be illuminated by computational examples and experimentation. Exploration of how numerical and symbolic computation can aid research in mathematics and related areas. PREREQ: Graduate standing in mathematics or a related field, or consent of instructor.

MTH 559. TOPICS IN MATHEMATICAL MODELING (3). Mathematical treatment of topics of current interest in the physical and biological sciences and technology. May be repeated for credit, if taken with different topics. PREREQ: PASCAL or FORTRAN and consent of instructor.

MTH 590. MODERN APPROACHES TO CALCULUS (3). Alternative approaches to calculus instruction based on the availability of computers and calculators. Applications of symbolic-graphical calculators, spreadsheets, symbolic algebra systems, and graphics packages to the teaching of calculus. PREREQ: MTH 253 and consent of instructor.

MTH 594. MODERN APPROACHES TO EUCLIDEAN GEOMETRY (3). Various aspects of Euclidean geometry, based on research and curriculum efforts of the last 20 years. Familiarity with Euclidean geometry at the level of MTH 337 will be presumed. Topics include partitioning the plane and space, tessellations and tilings, polyhedra, visualization and drawing, polygons and numbers, coordinates, transformations, conic sections, curves and surfaces, and computer graphics. PREREQ: MTH 337 or consent of instructor.

MTH 595. TEACHING AND LEARNING PROBABILITY AND STATISTICS (3). Experimental, activity-based approaches to introductory probability and statistics are explored. Topics include computer simulations, exploratory data analysis, misuses of statistics, and misconceptions of probability. PREREQ: Consent of instructor.

MTH 596. GRAPHICS CALCULATORS IN PRECALCULUS MATHEMATICS (3). Uses of hand-held graphics technology in algebra, trigonometry, and precalculus. Recommendations from the National Council of Teachers of Mathematics on the use of graphing calculators in the secondary curriculum. PREREQ: Consent of instructor.

MTH 597. COMPUTERS AND MATHEMATICS (3). A variety of mathematical problems are investigated with a laboratory approach using microcomputers and a wide variety of software. Problems may be taken from number theory, calculus, geometry, probability, and elementary numberical analysis. PREREQ: Ability to program in either BASIC or PASCAL; MTH 392 or consent of instructor.

MTH 598. ADVANCED PROBLEM SOLVING (3). Mathematical problem solving using the heuristic approach of George Polya. Problems may be taken from a variety of areas, including number theory, calculus, geometry, probability, abstract and linear algebra. PREREQ: MTH 392 or consent of instructor.

MTH 599. TOPICS IN MATHEMATICS EDUCATION (3). Topics may vary. May be repeated for credit. Consent of instructor required.

MTH 601. RESEARCH (1-16). Department approval required.

MTH 603. THESIS (1-16). Department approval required.

MTH 605. READING AND CONFERENCE (1-16). Department approval required.

MTH 607. SEMINAR (1-16). Department approval required.

MTH 611, MTH 612, MTH 613. MEASURE THEORY AND NORMED SPACES (3,3,3). Outer measures, measures, measurable functions and integration, convergence theorems, Fubinis theorem, L^p-spaces, Banach and Hilbert spaces, dual spaces and representation theorems for linear functionals, selected topics and applications. PREREQ: MTH 413/MTH 513.

MTH 614, MTH 615, MTH 616. FUNCTIONAL ANALYSIS (3,3,3). Topological vector spaces, generalized functions, operator theory. PREREQ: MTH 513. Must be taken in order. Normally offered alternate years.

MTH 617, MTH 618, MTH 619. PARTIAL DIFFERENTIAL EQUATIONS (3,3,3). Advanced theory including existence proofs and distributional approach. PREREQ: MTH 513. Normally offered alternate years.

MTH 620. TOPICS IN ANALYSIS (3). May be repeated for credit.

MTH 621, MTH 622, MTH 623. MECHANICS OF FLUIDS AND SOLIDS (3,3,3). One or more of the following topics treated each year: boundary layers, rotating fluids, magnetohydrodynamics, liquid crystals, nonlocal theory of fluids and solids, turbulent flows, wave motion, fractures. May be repeated once for credit. Must be taken in order. Normally offered alternate years.

MTH 629. TOPICS IN APPLIED MATHEMATICS (3). May be repeated for credit.

MTH 630. TOPICS IN TOPOLOGY (3). May be repeated for credit.

MTH 631, MTH 632, MTH 633. GENERAL TOPOLOGY AND FUNDAMENTAL GROUPS (3,3,3). Topological spaces and maps. Separation axioms, compactness, convergence, extension theorems, metrizability and compactification. Product spaces and simplicial complexes. Definition and basic properties of the fundamental group functor, with applications to the theory of covering spaces. Selected topics from dimension theory, manifold theory, and other areas of topology. PREREQ: MTH 411/MTH 511. Must be taken in order.

MTH 634, MTH 635, MTH 636. ALGEBRAIC TOPOLOGY (3,3,3). Simplicial and singular homology, products, and cohomology; applications to fixed-point and separation theorems. Topics selected from homotopy, manifold and obstruction theory. PREREQ: MTH 632. Must be taken in order. Normally offered alternate years.

MTH 637, MTH 638, MTH 639. DIFFERENTIAL GEOMETRY OF MANIFOLDS (3,3,3). Differentiable manifolds, connections in linear bundles, Riemannian manifolds and submanifolds. Selected topics such as variational theory of geodesics, harmonic forms, and characteristic classes. PREREQ: MTH 341 and MTH 411/MTH 511. Must be taken in order. Normally offered alternate years.

MTH 640. TOPICS IN GEOMETRY (3). May be repeated for credit.

MTH 641, MTH 642, MTH 643. MODERN ALGEBRA (3,3,3). Group theory (permutation groups, homomorphism theorems, Sylow theorems), Galois theory, and ring theory (polynomial rings, modules, commutative and non-commutative rings). PREREQ: MTH 448/MTH 548. Normally offered alternate years.

MTH 649. TOPICS IN ALGEBRA AND NUMBER THEORY (3). May be repeated for credit.

MTH 659. TOPICS IN NUMERICAL ANALYSIS (3). May be repeated for credit.

MTH 661, MTH 662, MTH 663. STOCHASTIC PROCESSES (3,3,3). Random processes occurring in the physical and biological sciences, engineering, and management. PREREQ: MTH 463/563 or MTH 361 and MTH 413/513. Must be taken in order. Normally offered alternate years.

MTH 665, MTH 666. ADVANCED PROBABILITY THEORY (3,3). General theory of probability measures and random variables, including the law of large numbers, central limit theorems, law of the iterated logarithm, Levys stable laws, conditional expectation, infinitely divisible distributions, martingales and limit theorems under dependence. PREREQ: MTH 411/MTH 511. Equivalent to ST 564, ST 565. Offered alternate years.

MTH 669. TOPICS IN PROBABILITY (3). May be repeated for credit.

MTH 699. TOPICS IN MATHEMATICS EDUCATION (3). May be repeated for credit.

METEOROLOGY

See Atmospheres Sciences in College of Oceanic and Atmospheric Sciences.

MICROBIOLOGY

J. L. Fryer, Chair
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Faculty

Professors Bottomley, Brown, Dougherty, Fryer, Hruby, Leong, Sandine; *Associate Professors* Reno, Geller, Giovannoni; *Assistant Professors* Field, Trempy; *Senior Instructors* Burke, Williams

Undergraduate Major

Microbiology (B.S.)
Minor
Microbiology

Graduate Major

Microbiology (M.A., M.S., Ph.D)
Graduate Areas of Concentration
Food and Dairy Microbiology
Immunology and Virology
Microbial Ecology
Microbial Genetics and Molecular Biology
General Microbiology
Pathogenic Microbiology

Microbiology is concerned with the forms and activities of bacteria, yeasts, molds, and viruses. It plays varied roles in the practical applications of technology and medicine as well as in the most theoretical problems of biology. Microbiologists are involved in activities as different as the study of gene structure, the control of disease, and the industrial processes based on the ability of microorganisms to decompose and synthesize complex organic molecules. Microbiology is one of the most rewarding of professions because it provides the opportunity to be in contact with all the other natural sciences and thus to contribute in many different ways to the betterment of life.

UNDERGRADUATE STUDIES

Many fields of microbiology are available to students and research workers. These include fundamental aspects such as the physiology, systematics, structure, or genetics of microorganisms; the applications of microbiology concerned with soil fertility, food and dairy production and processing, sanitation, immunology, and human, animal and plant diseases. Undergraduate studies in these areas will prepare students for admission to professional schools, graduate programs in microbiology and for positions as health officers, sanitarians, and biotechnicians for private industry and government.

High school students or community college transfers considering a career in microbiology will find it helpful to have a strong background in mathematics and chemistry. An excellent advising program is available to undergraduates and prospective students are encouraged to consult with the department's chief adviser or other faculty members working in an area of interest to them. Upper division students are also encouraged to carry out a research project in the laboratory of a faculty member and/or to serve as an undergraduate teaching assistant. Many students gain practical experience through internships, particularly in food microbiology. Several scholarships are available for microbiology majors. For more information, contact the microbiology chief adviser.

GRADUATE STUDIES

The Department of Microbiology offers graduate programs leading to the Master of Science, Master of Arts, and Doctor of Philosophy degrees. Major fields of study in the department include molecular biology, microbial physiology; genetics; plant and animal virology; dairy, soil, freshwater, and marine microbiology; immunology; and pathogenic microbiology, including bacteria and viruses. The department also participates in the Master of Arts in Interdisciplinary Studies and the Masters of Agriculture graduate programs. Students in both the Master's and Ph.D. programs are required to complete a research project leading to a thesis. Students pursuing the Ph.D. degree must complete both written and oral examinations. All students are expected to participate to a limited degree in the teaching program of the department. Teaching and research assistantships are available, and salaries are very competitive.

For additional information, contact the chair of the department, J. L. Fryer, or other faculty members conducting research in areas which are of interest.

CURRICULUM (B.S.)

To receive a B.S. degree in microbiology, a student must complete all university baccalaureate core requirements plus departmental requirements which include CH 221, CH 222, CH 223, CH 331, CH 332, CH 337, CH 324; MTH 251 and MTH 252; CS 101 or higher; PH 201, PH 202 and PH 203; BI 211, BI 212, BI 213, and BI 214 and BB 450 and BB 451. Majors must have 36 hours in microbiology with a minimum grade average of 2.0. They must receive a C or better in all required microbiology courses (MB 302, MB 303, MB 304, MB 306, MB 307, and MB 416. They must complete one course each in the applied or environmental area and the medical area of microbiology. They must also have 2 laboratory courses in microbiology beyond MB 303 and MB 307. A 2 hour seminar course is required (MB 407). Research (MB 401), Reading and Conference (MB 405) and Special Projects (MB 406) cannot account for more than 3 of the required 36 microbiology hours. Additional hours in these subjects will count toward elective credits. All required science courses must be taken for a grade. CH 324 may be taken S/U. An exit interview is given prior to graduation.

Freshman Year
CH 221, CH 222, CH 223. Gen Chemistry (15)
MTH 251, MTH 252. Calculus (8)
Writing I, II (6)
Fitness (3)
LS 190 (1)
BI 211, 212, 213 (12)

Sophomore Year
CH 331, CH 332, CH 337. Organic Chem (10)
BI 214 Cellular and Molecular Biology(3)
CH 324. Quantitative Analysis (4)
MB 302, MB 303. General Microbiology (5)
CS 101. Computers: Appl and Impl (4)
Perspectives (12)
Writing III/Speech (3)
Electives (4)

Junior Year
MB 304, MB 306. Adv Gen Microbi (6)
MB 307. Critical Think & Exper (3)
PH 201, PH 202, PH 203. General Physics (15)
BB 450, BB 451. General Biochemistry (7)
Synthesis (6)
Perspectives (3)
Electives (5)

Senior Year
Approved 400-level microbiology (21)
MB 407. Senior Seminar (2)
Electives, upper division (mathematics, foreign languages, chemistry and biology for those planning advanced studies in microbiology. Microbiology majors planning advanced professional training in medicine, consult a premedical, medical technology or other appropriate adviser) (22)

MINOR (27)

The microbiology minor is designed for students from other majors who have an additional interest in microbiology. The curriculum consists of a required core of MB 302, MB 303, MB 304, MB 306, MB 307, MB 407, and MB 416 plus twelve additional credits of upper division microbiology courses, (one of which must be a laboratory course) selected after consultation with the chief adviser in the Department of Microbiology. All of these courses must be graded, not S/U.

COURSES

Lower Division

MB 230. *INTRODUCTORY MICROBIOLOGY (4). Microbiology as it affects our everyday lives. The impact of microorganisms on health, food/water sanitation, environment, industry, and genetic engineering. Lec/Lab. (Bacc Core Course)

Upper Division

Courses numbered 500 and above may be taken for graduate credit.

MB 302. GENERAL MICROBIOLOGY (3). Emphasis on cytology, physiology, genetics, virology, growth and control of growth with coverage of the role of microorganisms in nature, disease and as useful tools. PREREQ: Two terms organic chemistry, one term biology.

MB 303. GENERAL MICROBIOLOGY LABORATORY (2). Development of laboratory techniques; exercises designed to reinforce concepts covered in MB 302. PREREQ: Two terms organic chemistry; COREQ: MB 302 or BI 213.

MB 304. ADVANCED GENERAL MICROBIOLOGY (3). Structure, function, genetics, metabolism, and physiology of prokaryotes. Must be taken in order. PREREQ: MB 303, COREQ: BB 450, BB 451.

MB 306. ADVANCED GENERAL MICROBIOLOGY (3). Structure, function, genetics, metabolism, and physiology of prokaryotes. Must be taken in order. PREREQ: MB 303, COREQ: BB 450, BB 451.

MB 307. ^CRITICAL THINKING AND EXPERIMENTATION IN MICROBIOLOGY (3). Exercises in the physiology and genetics of microorganisms. PREREQ or COREQ: MB 306.

MB 390. *THE WORLD ACCORDING TO MICROBES (3). Explores the impact microbes have on human socities and the contemporary global issues surrouding the uses and abuses of microbes. From biological warfare to the foods we consume to the reduction of pollution, microbes are eager participants in our lives. Social, legal, economical, political and ethical issues surrounding the exploitation of microbes will be debated. PREREQ: Upper-division standing. (Bacc Core Course)

MB 401. RESEARCH (1-16). Graded P.

MB 403. THESIS (1-16). Graded P.

MB 405. READING AND CONFERENCE (1-16). Conference: Instruction in microbiology.

MB 406 PROJECTS (3). Reading and Conference/ Instructor in Microbiology. Must have adviser approval before signing up for these credits.

MB 407. SEMINAR (1-16). Graded P.

MB 410. OCCUPATIONAL INTERNSHIP (1-10). Graded P. Supervised work experience at selected cooperating institutions, agencies, laboratories, clinics or companies. Maximum of 10 credits allowed but no more than 3 credits may be used to satisfy microbiology major requirement of 36 credits. Certain prerequisites may be needed. Permission of microbiology chief adviser required.

MB 416/MB 516. IMMUNOLOGY (3). Basic theory and applications of immunochemistry, immunogenetics, and cellular immunology. Examination of immunologically related diseases. PREREQ: MB 306, BB 451.

MB 417/MB 517. IMMUNOLOGY LABORATORY (2). Laboratory on the applications of current immunological techniques. PREREQ or COREQ: MB 306.

MB 420/MB 520. MICROBIAL DIVERSITY (3). Evolution and diversity of bacteria and lower eukaryotes. Molecular phylogeny and conventional techniques in microbial systematics and diagnostics. PREREQ: MB 302. Offered alternate years.

MB 421/MB 521. MICROBIAL DIVERSITY LABORATORY (2). Techniques for the enrichment and isolation of bacteria. Microbial identification using molecular probes. PREREQ or COREQ: MB 420/MB520. Offered alternate years.

MB 430/MB 530. PATHOGENIC MICROBIOLOGY (3). Bacteria pathogenic for humans, emphasizing the structural, physiological and genetic mechanisms of pathogenesis. Role of the immune system in pathogenesis and protection. PREREQ: MB 302

MB 431/MB 531. PATHOGENIC MICROBIOLOGY LABORATORY (2). Laboratory instruction in classical methods of identification of important human pathogenic bacteria. PREREQ: MB 303; two years of chemistry.

MB 434/MB 534. VIROLOGY (3). Properties of viruses, serological reactions, cultivation. Emphasis on animal viruses, including the major groups and their relation to disease. PREREQ: MB 306,MB 430/ MB 530; BB 350 or BB 450,BB 451.

MB 435/MB 535. VIROLOGY LABORATORY (2). Laboratory experiments to accompany MB 434/MB 534. Offered alternate years.

MB 440/MB 540. FOOD MICROBIOLOGY (3). Role of microorganisms in food spoilage, infection, and intoxication; also basic principles in contamination control and germicidal treatment during processing, preparing, and distributing food for consumption. PREREQ: MB 303 or equivalent.

MB 441/MB 541. FOOD MICROBIOLOGY LABORATORY (2). Laboratory techniques to accompany MB 440/MB 540. PREREQ or COREQ: MB 440/MB 540.

MB 442/MB 542. DAIRY MICROBIOLOGY (3). Advanced techniques important to dairy and food microbiologists; control of microorganisms in production and handling; emphasis on bacteria, yeasts, molds, and bacteriophages in cultured milks and cheese; metabolism and genetics of lactic acid bacteria. PREREQ: MB 302.

MB 448/MB 548. MICROBIAL ECOLOGY (3). A comparison of soil sediments and freshwater as microbial habitats. Discussion of the role of microorganisms in nutrient cycles, effects of microbial activity on plant and animal life. PREREQ: MB 302.

MB 449/MB 549. MICROBIAL ECOLOGY LABORATORY (2). Laborataory studies to accompany MB 448/MB 548. PREREQ or COREQ:MB 448/MB 548.

MB 454/MB 554. MICROBIAL GENETICS (3). Principles of microbial genetics and their application to modern microbiological problems. PREREQ: GEN 311 or consent of instructor; BB 350 or BB 450,BB 451 or equivalent.

MB 456/MB 556. PLASMID BIOLOGY (3). General biology of natural, genetically engineered, and composite plasmids. Major topics include extrachromosomal DNA replication, plasmid transmission,insertion elements, transposons, gene expression, and recombinant DNA vectors. Relevance to host-parasite and host-symbiotic interaction in both procaryotes and eucaryotes. PREREQ: MB 302; BB 350 or BB 450, BB 451.

MB 479/MB 579. FOOD BIOTECHNOLOGY (3). Principles and applications of genetic engineering for food and beverage production. PREREQ: BB 450, MB 302, or by consent of instructor. CROSSLISTED as FST 479/FST 579.

MB 492/MB 592. DISEASES OF FISH (3). Diagnosis, prevention, and treatment of the economically important disease agents of fish emphasizing microbiology, parasitology, pathology, immunology, and serology. PREREQ: Two years of biology.

MB 493/MB 593. DISEASES OF FISH LABORATORY (2). PREREQ or COREQ: MB 492/MB 592. Offered alternate years.

Graduate

MB 501. RESEARCH (1-16).

MB 503. THESIS (1-16).

MB 505. READING AND CONFERENCE (1-16).

MB 506. PROJECTS (1-16).

MB 507. SEMINAR (1). Graded P/N.

MB 536. MOLECULAR VIRLOGY (4). A survey of representative viruses with an emphasis on the molecular mechanisms involved in replication, transcription, and pathogenesis. CROSSLISTED as BB 536, MCB 536, GEN 536.

MB 601. RESEARCH (1-16). Graded P/N.

MB 603. THESIS (1-16).

MB 605. READING AND CONFERENCE (1-16). Graded P/N.

MB 607. SEMINAR (1). Graded P/N

MB 660. MOLECULAR PLANT VIROLOGY (3). An in-depth study of plant viruses with an emphasis on the relationship between structure and function. Areas covered include infection, replication, genomic expression, encapsidation and transmission. Offered alternate years.

MB 662. SELECTED TOPICS IN MOLECULAR GENETICS AND VIROLOGY (3). Current topics in molecular biology, genetics, plasmid biology and virology. Specific course content will be determined by the instructor(s). PREREQ: MB 534. Offered alternate years.

MB 664. MICROBIAL CELL BIOLOGY (3). Compartmentalization of macromolecules, membrane assembly and organelle biogenesis. Offered alternate years.

MB 666. CURRENT TOPICS IN ENVIRONMENTAL MICROBIOLOGY (3). Recent advances in our understanding of the development and functioning of symbiotic associations between microorganisms and plants. A broad spectrum of topics will be covered from genetics to applied agricultural issues. Offered alternate years.

MB 668. MOLECULAR EVOLUTION AND CELLS AND ORGANELLES (4). Analytical concepts in gene sequence analysis and their applications to cellular evolution. Current topics in molecular phylogeny, including the evolution of eubacteria, archaebacteria and lower eukaryotes, with emphasis on microbial diversity and symbiosis. Subjects will also include the origins of mitochondria and plastids, intron evolution in prokaryotes, genome evolution, mechanism of genetic change at the nucleotide level, and RNA editing. A course project and a computer lab will be used to introduce students to critical concepts, data bases, and the newest analytical software.

MB 670. MOLECULAR AND CELLULAR IMMUNOLOGY (3). Major concepts in immunochemistry, molecular immunology and cellular immunology utilizing primary literature sources. Analysis of the use of current and historic immunological methodologies in resolving theoretical and practical immunological problems. Offered alternate years.

MOLECULAR AND CELLULAR BIOLOGY

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(503) 737-3799
(503) 737-3045 (FAX)

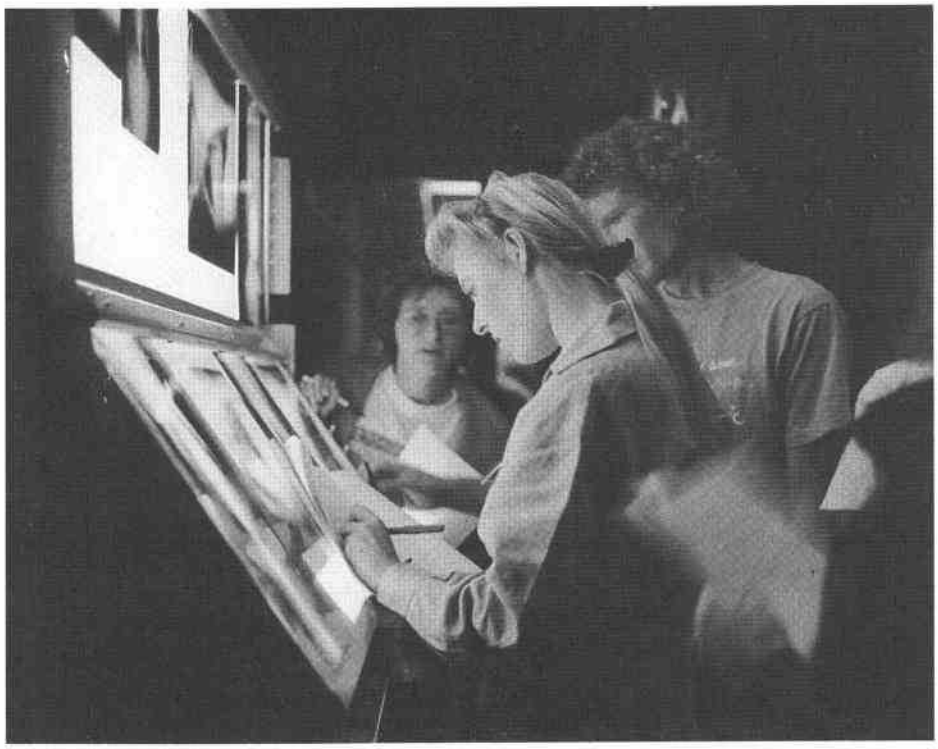
Affiliate Faculty
Sixty-five faculty drawn from thirteen departments in five colleges participate in the MCB program.

Graduate Major

Molecular and Cellular Biology (Ph.D.)
Graduate Areas of Concentration
Cell Biology
Genetics
Virology
Structural Biology
Biotechnology

The interdepartmental Molecular and Cellular Biology Program coordinates graduate studies related to molecular biology. Students receive Ph.D. degrees and training in molecular and cellular biology. Students in the MCB program complete a core curriculum consisting of MCB 511, MCB 525, MCB 553, MCB 554, MCB 555 and MCB 556. Additional requirements include seminar presentations, journal club participation, research rotations, teaching assistance and at least 9 additional units of relevant course work.

MCB students do research rotations in three laboratories during the first year, and then carry out their thesis research in subsequent years under the direction of a member of the MCB faculty. The MCB program lowers interdisciplinary barriers



and allows each individual the opportunity to select the most suitable adviser and committee.

COURSES

MCB 511. RESEARCH PERSPECTIVES IN MOLECULAR AND CELLULAR BIOLOGY (3). Provides graduate students with an in-depth exposure to the faculty members at OSU involved in molecular and cellular biology and their specific fields of research.

MCB 512. RESEARCH PERSPECTIVES IN MOLECULAR AND CELLULAR BIOLOGY (3). Provides graduate students with an in-depth exposeure to the faculty members at OSU involved in molecular and cellular biology and their specific fields of research.

MCB 524. MOLECULAR AND CELLULAR BIOLOGY TECHNIQUES (1). Modern methods for manipulation of cellular macromolecules. Recombinant DNA technology and protein chemistry methods will be covered. Includes daily lectures over a three-week period. PREREQ: BB 451 or equivalent. May not be taken concurrently with MCB 525. Department consent required. Graded P/N.

MCB 525. TECHNIQUES IN MOLECULAR AND CELLULAR BIOLOGY (3). An intensive laboratory course introducing modern methods for the manipulation of cellular macromolecules. Recombinant DNA technology, protein chemistry, and in situ hybridization methods presented in a format which emphasizes experimental continuity. The course required 2 weeks of intensive full-time involvement. Department approval required. Department consent required.

MCB 536. MOLECULAR VIROLOGY (4). A survey of representative viruses with an emphasis on the molecular mechanisms involved in replication, transcription, and pathogenesis. CROSSLISTED as BB536, GEN 536, MB 536.

MCB 541. PLANT TISSUE CULTURE (4). Principles, methods, and applications of plant organ, tissue, cell, and protoplast culture. Laboratory is important part of course. Topics include callus culture, regeneration, micropropagation, anther culture, mutant selection, somatic hybridization, and transformation. PREREQ: BOT 331, BI 311, or CSS 430. CROSSLISTED as HORT 541.

MCB 551. PLANT PATHOGENESIS (3). Analysis of current concepts in the physiology, biochemistry and genetics of host-parasite interactions. Topics covered include specificity, recognition, penetration, toxin production, altered plant metabolism during disease, resistance mechanisms and regulatory aspects of gene expression during host-parasite interactions. PREREQ: BOT 550. Offered alternate years. CROSSLISTED as BOT 551.

MCB 553. STRUCTURE AND FUNCTION OF EUKARYOTIC CELLS (2). Examination of structural elements in eukaryotic cells and their relationship to function. Topics include methods for cellular analysis, membranes, organelles, intracellular sorting, cell signalling, and cell cycles. PREREQ: Two terms of biochemistry and genetics, or consent of instructor.

MCB 554. MICROBIAL GENETICS (3). Principles of microbial genetics. Topics include prokaryotic genetics, replication, transcription, translation, plasmids and transposons, DNA repair, and gene regulation. PREREQ: Two terms of biochemistry and genetics or conset of instructor. CROSSLISTED as MB 554.

MCB 555. EUKARYOTIC MOLECULAR GENETICS (4). Current concepts of eukaryotic molecular genetics with emphasis on gene structure and regulation of gene expression. Topics include recombinant DNA techniques, eukaryotic gene structure transcription and translation, post-translational effects, genome evolution and genetic engineering. PREREQ: Two terms of biochemistry and genetics, or consent of instructor. MCB 553 and MCB 554 recommended.

MCB 556. MOLECULAR AND CELLULAR BIOLOGY (3). Current concepts of integrated cellular function in multicellular organisms, presented in an integrated manner. Topics such as development, differentiation, immunology, neurobiology and tumorigenesis in both animals and plants will be covered. PREREQ: Two terms of biochemistry and genetics, or consent of instructor. MCB 553, MCB 554, MCB 555 recommended.

MCB 573. CYTOGENETICS (4). Effects of variations in chromosome structure and number. PREREQ: GEN 430/GEN 530 or consent of instructor. Offered alternate years. CROSSLISTED as GEN 573, HORT 573.

MCB 593. SELECTED TOPICS IN MOLECULAR BIOLOGY (1-3). Seminar and discussion format. Recent advances in cellular and molecular approaches to the study of plant functions of ecological and physiological significance. Topics vary from year to year. May be repeated for credit. CROSSLISTED as BOT 593.

MCB 595. SELECTED TOPICS IN MOLECULAR VIROLOGY (1-3). Seminar and discussion format. Recent advances in Molecular Virology with heavy reliance on the current literature. Topics vary from term to term. May be repeated for credit.

MCB 601. RESEARCH (1-16).

MCB 603. THESIS (1-16).

MCB 605. READING AND CONFERENCE (1-16).

MCB 607. SEMINAR (1-3).

MCB 609. PRACTICUM (1-16).

MCB 610. INTERNSHIP (1-9). Laboratory rotation. For MCB graduate students only.

MCB 625. PLANT MOLECULAR GENETICS (3). Structure, expression, and interactions of the plant nuclear, chloroplast, and mitochondrial genomes. Critical examination of the current literature on gene regulation, mobile genetic elements, and biotechnology in higher plants. PREREQ: GEN 554/MCB 554, GEN/MCB 555, GEN 556 AND BB 451 or consent of instructor. Offered alternate years. CROSSLISTED as BOT 625 AND GEN 625.

MCB 664. HOST PARASITE INTERACTIONS: GENETICS AND PHYSIOLOGY (3). Mendelian and molecular analysis of host-pathogen genetics. Biochemical and physiological basis of plant disease. Topics include gene organization and function, chromosome mapping, parasexuality, and genetic models for plant disease resistance. Host-parasite recognition, pathogenicity, and host responses to infection. PREREQ: GEN 421, BOT 551, BOT 331, BB 451. Offered alternate years. CROSSLISTED as BOT 664, GEN 664.

MCB 691. SELECTED TOPICS IN MOLECULAR AND CELLULAR BIOLOGY (1-5).

MCB 692. SELECTED TOPICS: PLANT PATHOLOGY (1-3). Seminar and discussion of selected topics in plant pathology, emphasizing current literature and theory. Topics vary from year to year. May be repeated for credit. PREREQ: BOT 550 or equivalent. CROSSLISTED as BOT 692.

NATURAL RESOURCES

The College of Science, in cooperation with the Colleges of Agricultural Sciences, Forestry, and Liberal Arts participates in a broad-based B.S. degree in Natural Resources. A student enrolls in the department most-related to the specialty area sd under the Natural Resources Program. See the Intersection of this catalog for curriculum details.

PHYSICS

Kenneth Krane, Chair
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(503) 737-4631

Faculty
Professors Fairchild, Gardner, Griffiths, Jansen, Kocher, Krane, Landau, Madsen, Siemens, Stetz, Warren, Wasserman; *Associate Professors* Hetherington, Manogue, McIntyre, Tate; *Assistant Professors* Giebultowicz, Welch; *Courtesy Faculty:* Barofsky, Coakley, Dray, Goodnick, Plant, Sleight, Thomas, Van Vechten, Warnes

Undergraduate Major

Physics (B.A., B.S.)
Minor
Physics
Options
Applied Physics
Biophysics
Chemical Physics
Computational Physics
Geophysics
Mathematical Physics
Optical Physics

Graduate Major

Physics (M.A., M.S., Ph.D.)
Graduate Areas of Concentration
Atomic Physics
Computational Physics
Nuclear Physics
Optical Physics
Particle Physics
Solid State Physics

Physics is the study of the fundamental structure of matter and the interactions of its constituents. Physicists are concerned with the development of concepts needed for a precise description of nature and with experiments to test such concepts.

For students of science and engineering, the study of physics provides the basic foundation needed to understand the complex workings of the material world, from the forces that build atoms to those that build bridges. For students of the liberal arts, the study of physics provides an introduction to modern ideas about the most fundamental and elemental aspects of nature and how those ideas developed in their cultural and historical context. Physics is a basic and indispensable tool in all technical fields, and its development figures prominently in any discussion of the intellectual history of our civilization.

UNDERGRADUATE DEGREE PROGRAMS

The department offers several programs leading to degrees in physics. A basic physics curriculum in the College of Science stresses the detailed and advanced preparation needed for graduate work or employment in physics. Options are available within the physics degree program which prepare students for graduate work or employment in an allied field, such as applied physics, biophysics, computational physics, geophysics, atmospheric physics, chemical physics, or physical oceanography. An Engineering Physics curriculum in the College of Engineering encompasses advanced study both in physics and in one of the engineering disciplines. Other programs are offered which train students for careers in physics teaching. A physics minor is available for students majoring in other areas of science and engineering.

GRADUATE DEGREES

Graduate programs leading to the M.A., M.S., and Ph.D. are offered, emphasizing theoretical or experimental studies in the areas of atomic physics, computational physics, nuclear physics, optical physics, particle physics, and solid state physics. The M.S. degree has both thesis and nonthesis options. Comprehensive written and oral examinations must be passed before the student can become a candidate for an advanced degree.

CAREERS

A multitude of opportunities exists for students who complete undergraduate degrees in physics. They include employment in technological industries, including electronics, computers, optics, materials science, and aerospace; graduate study leading to an advanced degree in physics or a related area such as mathematics, computer science, engineering, or astronomy; and degree programs leading to professions such as law or medicine, with specialties in areas in which a physics background is essential.

PREPARATION

Recommended high school preparation for students who plan to major in physics includes one year each of chemistry and physics and four years of mathematics through analytic geometry. Mathematics preparation is especially important; students who are not ready to start calculus (MTH 251) upon entering may be delayed in their progress toward a degree. Transfer students who have completed introductory physics and mathematics courses at another institution are encouraged to contact the Department of Physics as early as possible to discuss their placement in the course curricula.

ADVISING

Each undergraduate student is assigned an adviser, who helps select the most appropriate degree program and assists in planning the curriculum. Minor variations in the requirements for degrees are possible, but must be discussed with the adviser and approved at an early stage in curriculum planning. Near the end of the degree program, the adviser can help the student to apply for employment or admission to graduate programs.

Requirements

All undergraduate students must satisfy the university requirements for graduation (see the description of the Baccalaureate Core in this catalog) and the college requirements (see the descriptions in the College of Science or College of Engineering section). Specific requirements for the degree in engineering physics may be found in the course descriptions of the College of Engineering. For graduation under the basic physics option, upper-division course requirements include PH 314, PH 361, PH 411, PH 412, PH 421, PH 422, PH 423, PH 431, PH 432, PH 441, PH 442, PH 451, PH 452, PH 453, PH 461, PH 462, PH 481, and either PH 415 or PH 465. Seniors must complete at least 3 credits of PH 401 and PH 403 to satisfy the WIC requirement.

To qualify for the Bachelor of Arts degree in physics, the student must complete the above basic list of courses with the exception of the following 9 credits: PH 423, PH 442, PH 453; in addition, the student must complete 9 credits of approved electives in the College of Liberal Arts and must complete or demonstrate proficiency in the second year of a foreign language.

Options

Students desiring to combine the study of physics with that of another related subject should consider the options below, or should consult with a Department of Physics adviser about substituting upper-division work in a related field for certain of the upper-division physics requirements. All such substitutions must constitute a coherent program in a related area *and* must be approved *in advance* by the Department of Physics.

Applied Physics Option

PH 411, PH 412, PH 415, PH 421, PH 422, PH 431, PH 432, PH 451, PH 452, PH 461, PH 462, PH 481

Plus 15 credits of upper division work in an engineering discipline. (The engineering courses must be approved in advance by a Department of Physics adviser.) Engineering Science (ENGR) courses cannot be used to satisfy this option.

Biophysics Option

PH 411, PH 412, PH 415, PH 421, PH 422, PH 431, PH 432, PH 451, PH 452, PH 461, PH 462, PH 481

CH 440, CH 441, CH 442

BB 481, BB 482, BB 483

Chemical Physics Option

PH 411, PH 412, PH 415, PH 421, PH 422, PH 431, PH 432, PH 451, PH 452, PH 461, PH 462, PH 481; PH 441 or CH 440

Plus 12 credits of approved upper-division work in chemistry, including at least one lab course.

Computational Physics Option

PH 411, PH 412, PH 415, PH 421, PH 422, PH 431, PH 432, PH 441 or PH 451, PH 461, PH 462, PH 465, PH 466, PH 481

Plus 15 credits of approved upper-division work constituting a coherent program in computational science.

Geophysics Option

PH 411, PH 412, PH 415, PH 421, PH 422, PH 431, PH 432, PH 441, PH 461, PH 462, PH 481

Plus 15 credits selected from:

ATS 411, ATS 412, ATS 475

GEO 463, GEO 464

OC 430

Mathematical Physics Option

PH 411, PH 412, PH 421, PH 422, PH 431, PH 432, PH 441, PH 451, PH 452, PH 461, PH 462, PH 463, PH 465

Plus 12 credits of approved upper-division work in mathematics. MTH 481-MTH 483 can be substituted for PH 461-PH 463.

Optical Physics Option

PH 411, PH 412, PH 415, PH 421, PH 422, PH 431, PH 432, PH 441, PH 442, PH 451, PH 452, PH 453, PH 461, PH 462, PH 481, PH 482, PH 483

Physics Minor

The physics minor requires completion of 16 credits of introductory physics (PH 211, PH 212, PH 213, PH 314), plus at least 12 credits of upper-division courses selected after consultation with a physics adviser.

Engineering Physics

Students selecting the engineering physics program should register in the College of Engineering. Engineering physics students complete a slightly reduced curriculum of physics courses, and in addition take a curriculum of advanced courses in the engineering discipline of their choice. A detailed description of the engineering physics degree program can be found in the College of Engineering section of this catalog. Engineering physics majors have the option of simultaneously earning two degrees, a B.S. in physics (through the College of Science) and a B.S. in engineering physics (through the College of Engineering). Arrangements for this curriculum must be made through a Department of Physics adviser.

Astronomy

The Department of Physics offers an introductory sequence in astronomy, PH 205, PH 206, PH 207, which covers a full range of topics in astronomy. A less rigorous descriptive course, PH 104, is also available. Students who desire careers in astronomy can design a curriculum under the geophysics option, which includes related course work in geology and in atmospheric sciences. This curriculum would qualify the student for graduate work in astronomy.

Sample Curriculum

Freshman Year

PH 211. General Physics with Calculus (4)
PH 211. Physics Recitation (1)
MTH 251, MTH 252, MTH 253. Calculus (12)
CH 221, CH 222, CH 223. Gen Chemistry (15)
Fitness (3)
Writing I (3)
Perspectives (3)
Computer Programming (4)

Sophomore Year

PH 212, PH 213. Gen Physics with Calculus (8)
PH 212, PH 213. Physics Recitation (2)
PH 314. Introductory Modern Physics (4)
MTH 254, MTH 255, MTH 256. Calculus and Differential Equations (12)
Biological Science (4)
Writing II, III (6)
Perspectives (9)

Junior Year

PH 361. Introductory Mathematical Physics (3)
PH 411, PH 412. Electronics Laboratory (4)
PH 421, PH 422, PH 423. Intermediate Mechanics (9)
PH 431, PH 432. Electromagnetic Theory (6)
PH 461, PH 462. Mathematical Physics (6)
MTH 341. Linear Algebra (3)
Perspectives (3)
Synthesis (6)
Electives (5)

Senior Year

PH 441, PH 442. Thermal Physics (6)
PH 451, PH 452, PH 453. Quantum Physics (9)
PH 415. Computer Interfacing (3) or PH 465. Computational Physics (3)
PH 401. Research (1)
PH 403. Thesis (2)
PH 481. Optics (4)
Electives (20)

Courses

Lower Division

PH 101. PHYSICS ORIENTATION (1). An introduction to the profession of physics, including a survey of study curricula, research fields, and career opportunities. Required of and open only to freshman or first-year transfer physics and engineering physics majors.

PH 104. *DESCRIPTIVE ASTRONOMY (4). Historical and cultural context of discoveries concerning planets and stars and their motions. Topics include the solar system, the constellations, birth and death of stars, pulsars and black holes, galaxies, quasars, and theories of cosmology. An accompanying laboratory is used for demonstrations, experiments, and projects, as well as for outdoor observations. (Bacc Core Course)

PH 106. *PERSPECTIVES IN PHYSICS (4). A descriptive and non-mathematical study of the development of physical concepts and their historical and philosophical context. The emphasis is on the orgin, meaning, significance, and limitations of these concepts and their role in the evolution of current understanding of the universe. Concepts to be covered include Copernican astronomy. Newtonian mechanics, energy, electricity and magnetism, relativity, and quantum theory. Intended primarily for non-science students. (Bacc Core Course)

PH 199. SPECIAL STUDIES (1-16). One-credit sections are graded pass/no pass.

PH 201, PH 202, PH 203. *GENERAL PHYSICS (5,5,5). Introductory survey course covering broad spectrum of classical and modern physics, with applications. Topics include dynamics, vibrations and waves, electricity and magnetism, optics, and modern physics. Laboratory and recitation sections accompany the lectures. Mathematical preparation should include college algebra and trigonometry. PREREQ: MTH 111,MTH 112. Must be taken in order. (Bacc Core Course)

PH 205. *SOLAR SYSTEM ASTRONOMY (4). History, laws, and tools of astronomy. Composition, motion, and origin of the sun, planets, moons, asteroids, and comets. An accompanying laboratory is used for demonstrations, experiments, and projects, as well as for outdoor observations. The courses in the astronomy sequence (PH 205, PH 206, PH 207) can be taken in any order. Lec/lab. (Bacc Core Course)

PH 206. *STARS AND STELLAR EVOLUTION (4). Properties of stars; star formation, evolution, and death; supernovae, pulsars, and black holes. An accompanying laboratory is used for demonstrations, experiments, and projects, as well as for outdoor observations. The courses in the astronomy sequence (PH 205, PH 206, PH 207) can be taken in any order. Lec/lab. (Bacc Core Course)

PH 207. *GALAXIES, QUASARS, AND COSMOLOGY (4). Nature and content of galaxies, properties of quasars, and the cosmic background radiation. Emphasis on the Big-Bang model and its features. An accompanying laboratory is used for demonstrations, experiments, and projects, as well as observations. The courses in the astronomy sequence (PH 205, PH 206, PH 207) can be taken in any order. Lec/lab. (Bacc Core Course)

PH 211, PH 212, PH 213. *GENERAL PHYSICS WITH CALCULUS (4,4,4). A comprehensive introductory survey course intended primarily for students in the sciences and engineering. Topics include mechanics, wave motion, thermal physics, electromagnetism, and optics. Elementary calculus is used. Laboratory work accompanies the lectures. Concurrent enrollment in a recitation section is strongly recommended. PREREQ: MTH 251 for PH 211; MTH 252 and PH 211 for PH 212; MTH 253 and PH 212 for PH 213. COREQ: MTH 252 for PH 211; MTH 253 for PH 212; MTH 254 for PH 213. Lec/lab.

PH 211, PH 212, PH 213: Recitation Section of General Physics (1,1,1). One-hour weekly session for the development of problem-solving skills in calculus-bases general physics. Graded P/N. COREQ: Ph 211, PH 212, PH 213 for PH 211. PH 212, PH 213 for Recitation.. (Bacc Core Course)

Upper Division

PH 313. *ENERGY ALTERNATIVES (3). Exploration of the challenges and opportunities posed by dwindling resources; physical and technological basis of our current energy alternatives; new or controversial technologies such as nuclear or solar power; overview of resource availability, patterns of energy consumption, and current governmental policies. PREREQ: Upper-division standing and 12 credits of introductory science. (Bacc Core Course)

PH 314. INTRODUCTORY MODERN PHYSICS (4). An elementary introduction to relativity and quantum theory, emphasizing the experiments that revealed the limitations of classical physics. Applications include the properties of atoms, nuclei, and solids. Laboratory work accompanies lectures. PREREQ: PH 213. COREQ: MTH 256.

PH 331. *SOUND, HEARING, AND MUSIC (3). Basic course in the physics, technology, and societal implications of sound. Intended for students in non-technical majors. Topics include wave motion, hearing and the perception of sound, noise pollution, music and musical instruments, architectural acoustics, and sound recording and reproduction. PREREQ: Upper-division standing and one year of university science or consent of instructor. (Bacc Core Course)

PH 332. *LIGHT, VISION, AND COLOR (3). Basic physics of light, optical instruments (lenses, telescopes, microscopes), the eye and visual perception, colors, photography, environmental lighting, lasers and holography. For non-technical majors. PREREQ: Upper-division standing or one year of university science. (Bacc Core Course)

PH 361. INTRODUCTORY TECHNIQUES IN MATHEMATICAL PHYSICS (3). Introductory mathematical techniques needed in preparation for the PH 461,PH 462,PH 463 sequence and for other 400-level work in advanced physics. Complex numbers, complex infinite series, vector analysis, linear equations, coordinate transformations, eigenvectors, Fourier series, and applications to physical problems. PREREQ: PH 213, MTH 256.

PH 401. ^RESEARCH (1-16). A research project under the supervision of a faculty member, whose approval must be arranged by the student in advance of registration. (Writing Intensive Course)

PH 403. ^THESIS (1-16). A research project leading to a thesis under the supervision of a faculty member, whose approval must be arranged by the student in advance of registration. (Writing Intensive Course)

PH 405. READING AND CONFERENCE (1-16). An independent study project under the supervision of a faculty member, whose approval must be arranged by the student in advance of registration.

PH 407. SEMINAR (1-16). Department seminars or colloquium.

PH 411/PH 511, PH 412/PH 512. ELECTRONICS LABORATORY (2,2). Principles of electronics with integrated laboratory exercises in electrical measurements, digital and analog electronics, and their applications. PREREQ or COREQ: PH 314.

PH 415/PH 515. COMPUTER INTERFACING AND INSTRUMENTATION (3). Applications of computers as scientific instruments, with emphasis on hardware and instrumentation, on-line data acquisition, and computer control of experiments. PREREQ: Upper division or graduate standing; PH 412/PH 512 or equivalent background in electronics; and consent of instructor. Departmental approval required.

PH 421/PH 521, PH 422/PH 522, PH 423/PH 523. INTERMEDIATE MECHANICS (3,3,3). Kinematics and dynamics of particles and rigid bodies; generalized coordinates; relativity. PREREQ: PH 213, MTH 256. Must be taken in order.

PH 431/PH 531, PH 432/PH 532. ELECTROMAGNETIC THEORY (3). Electromagnetic theory and applications in electrostatics, magnetostatics, electrodynamics, electromagnetic radiation, and guided waves. PREREQ: PH 213, MTH 256. Must be taken in order.

PH 441/PH 541, PH 442/PH 542. THERMAL PHYSICS (3,3). Fundamental concepts and laws of thermodynamics; entropy and other characteristic thermodynamic functions; kinetic theory of gases; classical and quantum statistical mechanics. PREREQ: PH 451. Must be taken in order.

PH 451/PH 551, PH 452/PH 552, PH 453/PH 553. QUANTUM PHYSICS (3,3,3). PH 451/PH 551: Introduction to quantum mechanics and the Schroedinger equation, with applications to atomic physics. PH 452/PH 552: Applications to molecular structure and solid-state physics. PH 453/PH 553: Applications to nuclear physics and fundamental particles. PREREQ: PH 314. Must be taken in order.

PH 461/PH 561, PH 462/PH 562, PH 463/PH 563. METHODS IN MATHEMATICAL PHYSICS (3,3,3). Mathematical methods applied to classical and modern topics in physics, including complex variable theory, equations of motion and special functions, Greens functions, integral transforms. PREREQ: PH 314, PH 361 or equivalent, MTH 256. Must be taken in order.

PH 465/PH 565, PH 466/PH 566. COMPUTATIONAL PHYSICS (3,3). The use of basic mathematical and numerical techniques in computer calculations leading to solutions for typical physical problems. Topics to be covered include models and applications ranging from classical mechanics and electromagnetism to modern solid state and particle physics. PREREQ: Mathematical physics, such as PH 461/PH 561, PH 462/PH 562, PH 463/PH 563 or MTH 481/MTH 581, MTH 482/MTH 582, MTH 483/MTH 583, plus knowledge of a compiled language such as Pascal, C, or Fortran. A physics background including PH 421/PH 521, PH 431/PH 531, and PH 451/PH 551 is assumed.

PH 481/PH 581. PHYSICAL OPTICS (4). Wave propagation, polarization, interference, diffraction, and selected topics in modern optics. PREREQ: PH 432/PH 532 or equivalent.

PH 482/PH 582. OPTICAL ELECTRONICS (4). Laser theory, laser systems, photodetectors, coherent optical detection, electro-optic and acousto-optic modulation, optical networks. PREREQ: PH 481/PH 581 or equivalent. CROSSLISTED as ECE 482.

PH 483/PH 583. GUIDED WAVE OPTICS (4). Optical fibers, fiber mode structure and polarization effects, fiber interferometry, fiber sensors, conventional and coherent fiber communications, coherent OTDR, integrated opto-electronic devices. PREREQ: PH 481/PH 581 or equivalent. CROSSLISTED as ECE 483.

PH 499/PH 599. SELECTED TOPICS IN PHYSICS (3). Topics vary from year to year. May be repeated for credit. Not offered every year.

Graduate

PH 501. RESEARCH (1-16).

PH 503. THESIS (1-16).

PH 505. READING AND CONFERENCE (1-16).

PH 507. SEMINAR (1-16). PH 507 Section 1: Departmental Colloquium. PH 507 Section 2, PH 507Section 3: Nuclear and Particle Physics. PH 507 Section 4, PH 507Section 5: Atomic, Molecular, and Optical Physics. PH 507 Section 6, PH 507 Section 6: Solid State Physics. PH 507 Section 8, PH 507 Section 9: Computational Physics. One-credit options are graded pass/no pass.

PH 601. RESEARCH (1-16).

PH 603. THESIS (1-16).

PH 605. READING AND CONFERENCE (1-16).

PH 607. SEMINAR (1-16). PH 607 Section 1: Departmental Colloquium. PH 607 Section 2, PH 607 Section 3: Nuclear and Particle Physics. PH 607 Section 4, PH 607 Section 5: Atomic, Molecular, and Optical Physics. PH 607 Section 6, PH 607 Section 7: Solid State Physics. PH 607 Section 8, PH 607 Section 9: Computational Physics. One-credit options are graded pass/no pass.

PH 621. DYNAMICS OF SINGLE- AND MULTI-PARTICLE SYSTEMS (3). Methods of Lagrange, Hamilton, Jacobi, and others for treatment of motion of one, two, and many particles. Canonical transformation theory. PREREQ: PH 423/PH 523 or equivalent.

PH 631, PH 632, PH 633. ELECTROMAGNETIC THEORY (3,3,3). Electrostatics; multipole expansion; magnetostatics; radiation fields; dynamics of relativistic particles and electromagnetic fields. PREREQ: PH 432/PH 532 or equivalent. Must be taken in order.

PH 641, PH 642. STATISTICAL THERMOPHYSICS (3,3). Macroscopic thermodynamics and kinetic theory. Classical and quantal statistical ensembles; partition functions. Applications to atoms and molecules, clustering, solids, radiation. PREREQ: PH 621.

PH 651, PH 652, PH 653. QUANTUM MECHANICS (3,3,3). Basic principles of nonrelativistic quantum theory and applications. Schroedinger theory, quantum theory of angular momentum, matrix mechanics, perturbation theory, identical particles, scattering. PREREQ: PH 423/PH 523 and PH 453/PH 553 or equivalents. Must be taken in order.

PH 654, PH 655, PH 656. ADVANCED QUANTUM THEORY (3,3,3). Scattering theory, second quantization and many body theory, relativistic quantum mechanics, quantization of fields, quantum electrodynamics, and elementary particles. PREREQ: PH 653. Must be taken in order.

PH 665. RELATIVITY (3). Application of Lorentz transformation theory to mechanics and electromagnetism; general relativity. PREREQ: PH 621, PH 633. Not offered every year.

PH 671, PH 672, PH 673. SOLID STATE PHYSICS (3,3,3). Band theory and methods; Fermi gas; theory of metals; particle interactions and quasiparticles; optical and transport properties of metals and semiconductors; theory of magnetism and superconductors. PREREQ: PH 653. Should be taken in sequence. Offered in alternate years.

PH 681, PH 682, PH 683. ATOMIC, MOLECULAR, AND OPTICAL PHYSICS (3,3,3). Atomic and molecular structure, atomic scattering, interaction with radiation lasers, nonlinear optics, guided-wave optics. PREREQ: PH 653. Not offered every year.

PH 691, PH 692, PH 693. NUCLEAR AND PARTICLE PHYSICS (3,3,3). Nuclear forces, elements of nuclear structure, and models of complex nuclei; nuclear scattering, reactions, and decays; elementary particles; quark model. PREREQ: PH 656. Should be taken in sequence. Offered in alternate years.

PH 699. SELECTED TOPICS IN PHYSICS (3). Topics vary from year to year. May be repeated for credit. PREREQ: PH 653. Not offered every year.

PREPROFESSIONAL PROGRAMS IN THE HEALTH SCIENCES

The College of Science offers specialized programs for students who wish to pursue careers in health-related fields. They provide excellent academic preparation for students who plan to enter medical, veterinary, or dental school, and for those choosing careers in dental hygiene, nursing, medical technology, occupational therapy, optometry, physical therapy, and podiatry.

Completion of some preprofessional programs, such as premedicine, lead to either a preprofessional bachelor's degree in general science or a bachelor's degree in one of the traditional departmental majors (e.g., biology, biochemistry, zoology). The programs for dental hygiene, nursing, and occupational therapy lead to a bachelor's degree obtained at the professional school (for example, the Oregon Health Sciences University), while the program in medical technology leads to a bachelor's degree in medical technology from Oregon State University. Some of the preprofessional programs allow a student to enter the professional school after three years at OSU and still receive a bachelor's degree from OSU upon completion of the first year at the professional school.

DENTAL HYGIENE
(PREPROFESSIONAL)

Chere Pereira, Adviser

Students who wish to become dental hygienists may attend OSU for two years prior to entering the School of Dentistry at the Oregon Health Sciences University (OHSU) for professional training. Upon completion of dental hygiene certification, students are awarded a bachelor's degree from the School of Dentistry. A bachelor's degree program is also offered by the Oregon Institute of Technology in Klamath Falls; students should consult with the predental hygiene adviser for more details. The following curriculum includes prerequisites for admission to dental hygiene school and provides ample opportunity to satisfy the lower division requirement for a block of 36 credits divided between science, social science, and arts and letters (humanities). The curriculum is not a rigid framework, and courses listed can be readily switched between freshman and sophomore years.

CURRICULUM

Freshman Year
WR 121. English Composition (3)
CH 121, CH 122, CH 203. Gen Chemistry (13)
COMM 111. Public Speaking (3)
SOC 204. Intro to Sociology (3)
PSY 201. General Psychology (3)
Humanities electives (9)
Required courses and electives (11)

Sophomore Year
English composition (3)
BI 101, BI 102, BI 103 or Z 331, Z 332, Z 333 and Z 341, Z 342, Z 343. Biological Science (12-15)
NFM 225. Human Nutrition (4)
ANTH 110. Intro to Cultural Anthropology (3)
Required courses and electives (20-23)

Junior and Senior Years
(in a Dental Hygiene program)

DENTISTRY
(PREPROFESSIONAL)

Chere Pereira, Chief Adviser

The College of Science offers a three- or four-year predental curriculum leading to a bachelor's degree in general science which satisfies the requirements for admission to the School of Dentistry at the Oregon Health Sciences University and to most other dental schools. The majority of students who are admitted to dental school complete a baccalaureate degree prior to entry; however, many dental schools accept a few students after they complete 90 credits of undergraduate work. Students planning to elect this option would complete a three-year predental curriculum and would qualify for a bachelor's degree in general science from OSU after one year of dental school.

Many students may wish to declare another major, such as biology, microbiology, or zoology, to gain a background suitable for an alternative vocation should plan to enter dental school change. In this case, students should consult with an appropriate departmental adviser as soon as feasible and select electives that will satisfy the requirements in the chosen major.

CURRICULUM

Freshman Year
WR 121. English Composition (3)
MTH 251, MTH 252. Calculus (8)
CH 221, CH 222, CH 223. Gen Chemistry (15)
BI 107. Predental Orientation (1)
Required courses and electives (18)

Sophomore Year
CH 331, CH 332, CH 337 Organic Chem (10)
BI 211, BI 212, BI 213 Biology (12)
ST 201 or ST 351 Statistics (3-4)
Required courses and electives (19-20)

Junior Year
BI 214. Cell and Molecular Biology (3)
BB 450, BB 451 or BB 351. Biochemistry (5-7)
PH 201, PH 202, PH 203. General Physics (15)
BI 360. Cell Biology (5)
Z 425. Embryology (5)
BI 311. Genetics (4)
HSTS (any 400-level History of Science) (3)
Required courses and electives (3-5)

Senior Year
Students who spend their senior year at OSU should plan their program in consultation with their predental adviser. Graduation in predentistry requires a total of 36 credits of upper division science. Additional laboratory work in chemistry, microbiology or zoology is helpful preparation for dental school. Business and art courses are also recommended.

MEDICAL TECHNOLOGY (B.S.)

Susan Williams, Chief Adviser

Medical technologists perform routine and highly specialized diagnostic procedures in clinical laboratories. They must be certified by the American Society of Clinical Pathologists (ASCP) or the National Certification Agency (NCA). Certification requires one year of training at an accredited professional school of medical technology. Oregon currently has one such school at the Oregon Health Sciences University (OHSU); Washington and California have several; and other schools are located throughout the U.S. Most medical technology schools require a bachelor of science degree for admission to their educational program; however, some schools (notably OHSU) accept students who have had three years of appropriate college work.

The curriculum in the OSU premedical technology program was developed in cooperation with nearby medical technology schools, and OSU students have shown a high success rate in these schools. Most premedical technology students complete the B.S. degree in a field closely related to medical technology, such as microbiology, biochemistry, or zoology, and then attend medical technology school (4+1 program). OSU will award a second B.S. degree in medical technology to students who complete their professional training. Students who enroll in an accredited medical technology school after three years of college work (3+1 program) can qualify for a B.S. degree in Medical Technology from OSU after completion of their professional training.

Curriculum

Freshman Year
CH 221, CH 222, CH 223. Gen Chemistry (15)
BI 211, BI 212, BI 213. Biology (12)
WR 121. English Composition (3)
MTH 251, MTH 252. Calculus (8)
HHP 231. Lifetime Fitness (3)
Required courses (4)

Sophomore Year
CH 331, CH 332, CH 337. Organic Chem (10)
MB 302, MB 303. General Microbiology (5)
CS 101. Computers: Appl and Implicat (4)
Required courses and electives (26)

Junior Year
MB 416, MB 417. Immunology (5)
MB 430, MB 431. Pathogenic Microbiology (5)
Z 332, Z 333. Human Anatomy and Physiology (6)
CH 324. Quantitative Analysis (4)
PH 201, PH 202, PH 203. General Physics (15)
Required courses and electives (10)

One year in an accredited medical technology school or completion of courses in major field of study, followed by one year in an accredited medical technology school. Suggested electives include Genetics (BI 311), Biochemistry (BB 350), Introduction to Human Diseases (H 320), Epidemiology (H 425), Virology (MB 434, MB 435), Statistics (ST 201), Food Microbiology (MB 440), Dairy Microbiology (MB 442), Medical Terminology (PHAR 210).

Medicine and Osteopathy

(PREPROFESSIONAL)

Chere Pereira, Chief Adviser

The College of Science premedical curriculum prepares students for entrance into standard (allopathic) and osteopathic medical schools (see Academic Programs and Support Services for WICHE information that applies to osteopathy schools). Allopathic medical schools grant the M.D. degree, while osteopathic medical schools grant the D.O. degree. Osteopathic schools include training in manipulative therapy. The preprofessional training is identical for both.

Admission to medical school is very competitive. Students are chosen according to grades; scores on the Medical College Admission Test administered by the Association of American Medical Colleges; references from instructors, counselors, and others; and apparent motivation for medicine. Most students apply during the summer preceding their senior year for admission to medical school after graduation.

A member of the premedical committee is assigned to each student as an adviser.

Premedical Program

The curriculum described below satisfies the entrance requirements for most medical schools in the United States and elsewhere. The book, *Medical School Admission Requirements*, published by the Association of Medical Colleges, lists the specific requirements for all U.S. and Canadian medical schools.

Many variations on the suggested curriculum are possible. Premedical students should obtain a copy of the Premedical Guide from the College of Science and consult with their adviser to arrange a program suited to their individual needs.

Curriculum

Freshman Year
WR 121. English Composition (3)
CH 221, CH 222, CH 223. Gen Chemistry (15)
MTH 251, MTH 252. Calculus (8)
BB 100. Molecules of Life (2)
BI 109. Premedical Orientation (1)
ENG (any ENG course) (3)
Required courses and electives (13)

Sophomore Year
CH 334, CH 335, CH 336, CH 337 (11) or
CH 331, CH 332, CH 337. Organic Chem (10)
BI 211, BI 212, BI 213. Biology (12)
Social Science (any two) (6)
PH 201, PH 202, PH 203. General Physics (15)
Required courses and electives (1-2)

Junior Year
BI 214. Cell and Molecular Biology (3)
BB 450, BB 451. Biochemistry (7)
ST 201 or ST 351. Statistics (3-4)
BI 360. Cell Biology (5)
BI 311. Genetics (4)
CH 325. Quantitative Chemistry (4)
HSTS (any 400-level HSTS course) (3)
ENG (any ENG course) (3)
Required courses and electives (12-13)

Senior Year
Z 425. Embryology (5)
Required courses and electives (40)
Students should plan their senior year in consultation with a premedical adviser. Graduation in General Science/ premedicine requires a total of 41 credits of upper division courses in science.

Students who follow this curriculum are awarded a bachelor's degree in general science; however, since the basic entrance requirements for most medical schools include a year of biology, physics, math, general chemistry, and organic chemistry, this course work can easily be combined with many other majors. Many medical schools have indicated a preference for such a departmental major (biology, chemistry, etc. rather than premedicine), and this choice would give a student more career options should plan to enter medical school change.

Nursing

(PREPROFESSIONAL)

Mary Ann Matzke, Chief Adviser

The College of Science offers a preparatory curriculum designed to meet the general requirements for admission to a baccalaureate degree nursing program. One or two years of prenursing followed by two or three years of professional training at a school of nursing leads to a bachelor of science degree in nursing (B.S.N.). Satisfactory completion of the prenursing requirements does not guarantee admission to a B.S.N. program since applicants are accepted on a competitive basis.

B.S.N. programs in the state of Oregon are offered by the Oregon Health Sciences University (OHSU) School of Nursing in Portland, which also administers the BSN programs at Eastern Oregon State College (EOSC) in LaGrande, at Oregon Institute of Technology (OIT) in Klamath Falls, and at Southern Oregon State College (SOSC) in Ashland. Private schools are the University of Portland School of Nursing, Linfield-Good Samaritan School of Nursing, and Walla Walla College School of Nursing in Portland. Application for admission to these schools is usually made early in the sophomore year.

Associate degrees in nursing (A.D.N.) are offered by community colleges in Oregon. Nurses with associate degrees are qualified to provide direct patient care. To become a Registered Nurse, both B.S.N. and A.D.N. graduates must pass a licensing examination administered by the State Board of Nursing.

Curriculum

The courses listed below are recommended to fulfill the general requirements for admission to a B.S.N. program. However, requirements vary from school to school, so students planning a program must check the specific requirements of the B.S.N. programs to which they plan to transfer.

Freshman Year
WR 121, WR 222. English Composition (6)
CH 121, CH 122, CH 203. Gen Chemistry (13)
MTH 111. College Algebra (4)
NFM 225. Human Nutrition (4)
PSY 201, PSY 202. General Psychology (6)
SOC 204. General Sociology (3)
ANTH 110. Cultural Anthropology (3)
Literature and Arts(6)

Sophomore Year
Students should consult with the prenursing adviser to plan their sophomore years.
Z 331, Z 332, Z 333. Anatomy and Physio (9)
Z 341, Z 342, Z 343. Anatomy and Physiology Lab (6)
MB 230. Microbiology (4)
PSY 350. Human Development (3)
ST 201. Statistics (3)
Other required courses[13] and electives (22)

Occupational Therapy

(PREPROFESSIONAL)

Mary Ann Matzke, Chief Adviser

Occupational therapy uses occupation (meaningful activity) to help people of all ages prevent, lessen, or overcome disabilities. Occupational therapists work in hospitals, schools, and mental health and community agencies.

The College of Science offers a preprofessional program designed to meet the requirements for admission to the baccalaureate program at Pacific University in Forest Grove, Oregon. With the completion of other prerequisite courses, students may apply to bachelor's and master's degree programs around the country. Financial assistance is available for students in some western states, including Oregon, through

the WICHE program. Occupational therapy programs are offered at the following participating WICHE institutions: Pacific University, Forest Grove, OR; University of North Dakota; University of Washington; University of Puget Sound, Tacoma, WA; Colorado State University; Loma Linda University and the University of Southern California (see Academic Programs and Support Services for WICHE information). For programs at the bachelor's degree level, students must meet both preprofessional requirements and general education requirements at the school to which admission is desired. Therefore, students are urged to check the prerequisite courses at each school carefully and to work closely with admissions officers to see that these requirements are fulfilled.

Satisfactory completion of the OSU course work facilitates but does not guarantee admission to a school of occupational therapy. Individual applicants are selected on a competitive basis and are usually admitted after their sophomore or junior year.

CURRICULUM

Freshman Year

BI 103 or BI 212. General Biology (4)
MTH 111. College Algebra (4)
PSY 201, PSY 202. General Psychology (6)
WR 121. English Composition (3)
SOC 204. Intro to Sociology (3)
SOC 206. Social Problems and Issues (3)
COMM 111. Public Speaking (3)
EXSS 132. Pretherapy (2)
PH 201. General Physics (5) or PH 106. Perspectives in Physics (4)
HHP 231. Lifetime Fitness (3)
Foreign language (100-level course or demonstrated proficiency at college intermediate level) (0-4)
Applied Art and/or humanities (8-13)[14]

Sophomore Year

Z 331, Z 332, Z 333. Hum. Anat. and Phys. (9)
Z 341, Z 342, Z 343. Hum. Anat. and Phys. Lab (6)
PSY 380. Human Adjustment (3)
PSY 350. Human Life Span Development (3)
PSY 481. Abnormal Psychology (3)
WR 222. English Composition (3)
EXSS 333M. Ex and SS Pract (Pretherapy) (2)[15]
CS 101. Computers: Apps and Implications (4)
ST 201. Statistics (3)
H 386. Adv First Aid/Respond (need not be taken for credit) (0-3)
Applied Art and/or humanities (7-10)[14]
PHAR 210. Terminology of the Health Sci (2)

OPTOMETRY

(PREPROFESSIONAL)

Carl Kocher, Chief Adviser

To prepare for optometry, students need three or four years of undergraduate work in science, followed by four years at an accredited college of optometry. Completion of the professional program leads to the degree of Doctor of Optometry. The curriculum described below satisfies the entrance requirements of the 17 accredited optometry schools in the United States (see Academic Programs and Support Services for WICHE information). Applicants to optometry schools are accepted on a competitive basis and are occasionally admitted at the end of their junior year of undergraduate residence. Preoptometry majors interested in working toward a biology degree should see Biology.

CURRICULUM

Freshman Year

CH 221, CH 222, CH 223. General Chemistry (15)
MTH 251, MTH 252. Calculus (8)
Writing I, II (6)
HHP 231. Lifetime Fitness (3)
Perspectives (6)
CS 101. Computers (4)
Electives (2)

Sophomore Year

CH 331, CH 332, CH 337. Organic Chem (10)
BI 211, BI 212, BI 213. Biology (12)
PH 201, PH 202, PH 203 or PH 211, PH 212, PH 213. General Physics (15)
PSY 201, PSY 202. General Psychology (6)
Writing III/Speech (3)

Junior Year

BI 214. Cell and Molecular Biology (3)
Z 331, Z 332, Z 333. Anatomy & Physiology and Z341, Z342, Z343. Anatomy & Physiology Lab (15) or
Z 422. Comparative Anatomy and Z430, Z436. Principles of Physiology (11)
MB 302, MB 303. General Microbiology (5)
ST 201, ST 209 or ST 351. Statistics (4)
Perspectives (6)
WR 327. Technical Report Writing (3)
HSTS 417. (3)
Synthesis (6)

Senior Year

Upper division science electives (7-15)
Electives (30-38)

Students who undertake a four-year program should plan their senior year in consultation with their adviser. Two study plans are available:

1) A department major may be completed in any department of the College of Science.
2) Students without a departmental major may earn a bachelor's degree in general science; a total of 41 credits of upper division courses in science are required.

Recommended science electives: Molecular Biology (BB 331,BB 332); Biochemistry (BB 450, BB 451, BB 452); Cell Biology (BI 360); General Ecology (BI 370); Developmental Biology (BI 425); Physical Chemistry (CH 440, CH 441, CH 442); Population and Quantitative Genetics (GEN 430); History of Science (HSTS 412,HSTS 413); History of Medicine (HSTS 417); Advanced General Microbiology (MB 304, MB 306, MB 307); Immunology (MB 416,MB 417); Pathogenic Microbiology (MB 430, MB 431); Virology (MB 434, MB 435); Calculus and Differential Equations (MTH 253, MTH 254, MTH 256); Brain and Behavior (PSY 330); Perception (PSY 442); Physiological Psychology (PSY 432); Embryology (Z 421); Comparative Anatomy (Z 422); Vertebrate Physiology (Z 431, Z 432, Z 436); Behavioral Neurobiology (Z 438); Histology (Z 461).

PHYSICAL THERAPY

(PREPROFESSIONAL)

Mary Ann Matzke, Chief Adviser

The College of Science offers a preparatory program designed to meet the general requirements for admission to physical therapy schools. Students in some western states, including Oregon, can apply for financial assistance from the WICHE program to attend physical therapy school. Participating WICHE institutions with physical therapy programs include: Chapman University Orange, California; Loma Linda University, California; University of Southern California, Los Angeles; University of Colorado Health Sciences Center, Denver; Pacific University, Forest Grove, Oregon; University of Utah, Salt Lake City; University of Puget Sound, Tacoma, Washington; Mount St. Mary's College, Los Angeles; University of the Pacific, Stockton, California; University of Montana, Missoula; University of New Mexico, Albuquerque; University of North Dakota, Grand Forks; and University of Washington, Seattle (see Academic Programs and Support Services for WICHE information).

Satisfactory completion of the OSU course work facilitates but does not guarantee admission to a school of physical therapy. Individual applicants are selected on a competitive basis and are usually admitted after their junior or senior year. Students who complete the four-year prephysical therapy program earn a baccalaureate degree in general science. In some cases, a student may substitute up to 48 credits of the first year of physical therapy school for the senior year to complete a bachelor of science degree in general science from OSU.

CURRICULUM[16]

Freshman Year

CH 121, CH 122, CH 123 or CH 221, CH 222, CH 223. General Chemistry (15)
Math (at least through MTH 112) (4)
SOC 204. General Sociology (3)
PSY 201, PSY 202. General Psychology (6)
WR 121, WR 222, WR 323. English Composition (9)
EXS 132. Pretherapy (2)
Required courses and/or electives (6)

Sophomore Year

CH 219. (to complete 100 series) (2)
CH 331, CH 332, CH 337. Organic Chem (10)
BI 211, BI 212, BI 213. General Biology (12)
CS 101. Computers: Apps & Implications (4)
ST 201. Statistics (3)
H 320. Intro Human Disease (3)
PSY 350. Human Lifespan Development (3)
Required courses and/or electives (8-10)

Junior Year

PH 201, PH 202, PH 203. General Physics (15)
Z 331, Z 332, Z 333. Human Anat and Phys (9)
Z 341, Z 342, Z 343. Human Anat and Phys Lab (6)
PSY 481. Abnormal Psychology (3)

EXSS 322. Anatomical Kinesiology (4)
EXSS 323. Biomech of Sports & Exer (4)
Required courses and/or electives (4)

Senior Year
MB 302. Microbiology (3)
BI 311. Genetics (4)
EXSS 411. Mvmnt Skill Learning & Control (4)
EXSS 324. Physiology of Exercise (4)
HSTS (approved WIC course) (3)
Required courses and/or electives (27)

PODIATRY

(PREPROFESSIONAL)

Chere Pereira, Chief Adviser

Podiatry is a growing and challenging health profession that focuses on the care of the human foot and leg. Podiatrists prevent, diagnose, and treat diseases and disorders of the foot through both medical and surgical methods.

Students wishing to become podiatrists attend a four-year postbaccalaureate training program leading to a Doctor of Podiatric Medicine (D.P.M.) at one of seven schools of podiatric medicine in the United States (see Academic Programs and Support Services for WICHE information). These schools are located in California, Florida, Illinois, Iowa, New York, Ohio, and Pennsylvania. To practice in Oregon a D.P.M. must also take the qualifying examination administered by the State Board of Podiatric Examiners.

Preparing for Podiatric Medicine

Before entering a school of podiatric medicine, students must first complete four years of undergraduate study and fulfill entrance requirements to the school of their choice. Students in the College of Science may combine departmental requirements to major in a scientific discipline, such as biology or zoology, and the prepodiatry curriculum; or they may enroll in prepodiatry and receive a B.S. degree in general science upon completion of the curriculum shown below. The preparatory program at OSU will satisfy requirements for entrance to all the schools.

CURRICULUM

Freshman Year
WR 121. English Composition (3)
CH 221, CH 222, CH 223. Gen Chemistry (15)
Math Sciences (at least through MTH 112) (8)
Required courses and electives (19)

Sophomore Year
CH 331, CH 332, CH 337. Organic Chem (10)
BI 211, BI 212, BI 213. Biology (12)
ST 201 or ST 202 or ST 351, ST 352 (6-8)
Required courses and electives (15-17)

Junior Year
BB 450, BB 451. Biochemistry (7)
BI 311. Genetics (4)
PH 201, PH 202, PH 203. General Physics (15)
HSTS (any 400-level HSTS course) (3)
Required courses and electives (16)

Senior Year
Courses should be planned in consultation with student's adviser; graduation in prepodiatry requires a total of 36 credits of upper division science, to include at least two courses in anatomy, physiology, histology, or embryology.

VETERINARY MEDICINE

(PREPROFESSIONAL)

Chere Pereira, Head Adviser

The College of Science offers a preprofessional program for students who wish to pursue careers in veterinary medicine. This program, especially tailored to the Oregon State University College of Veterinary Medicine, also meets admission requirements for most schools of veterinary medicine in the country.

Preveterinary students may select a major in general science or any other discipline while completing the admission requirements for veterinary school. Scientific disciplines such as biology, microbiology, zoology, or animal science in the College of Agricultural Sciences are most frequently chosen, but areas outside of science are also acceptable. A student who is accepted into a veterinary school after three years of preprofessional work, can apply up to 48 credits of the first year of professional study toward completion of a bachelor's degree in biology, general science, or zoology from OSU. Completion of a bachelor's degree is required before one can receive a Doctor of Veterinary Medicine degree.

Admission to schools of veterinary medicine is competitive, and completion of the preveterinary requirements facilitates but does not guarantee acceptance. Admission committees look for a combination of academic ability and personal characteristics. Academic ability includes both the grades received in college courses and test scores.

The OSU College of Veterinary medicine requires the general test of the Graduate Record Exam (GRE). Personal characteristics include motivation, seriousness of purpose, and determination. In addition, an applicant's experience in working with animals and an understanding of the veterinary profession are important considerations in the selection process. Applicants should have significant veterinary medical exposure and experience by November 1 of the year of application. Such experience could involve breeding, rearing, feeding, and showing animals or work in biomedical research laboratories, veterinary clinics, and hospitals.

The OSU College of Veterinary Medicine is part of the Washington-Oregon-Idaho Regional Program in Veterinary Medical Education. Each year, 28 residents of Oregon and eight residents from the WICHE compact states begin their veterinary training on the OSU campus (see Academic Programs and Support Services for WICHE information). Additional information regarding application and professional education may be found in the veterinary medicine section of this catalog.

CURRICULUM

While completing the requirements for a bachelor's degree, a preveterinary student will take the courses necessary for admission to veterinary school. These courses include mathematics through trigonometry; year-long courses in general chemistry (including laboratory), organic chemistry (including laboratory), biology, and physics (including electricity, optics, and sound); and courses in biochemistry and genetics. All science courses required for veterinary school admission must be taken for a letter grade. The following is a recommended course of study.

Freshman Year
BI 211, BI 212, BI 213. General Biology (12)
CH 221, CH 222, CH 223 or CH 121, CH 122, CH 123, CH 219. General Chemistry (15-17)
Math (at least through MTH 112) (8)
WR 121. English Composition (3)
VM 110. Preveterinary Medicine (1)
Required courses and electives (4-6)

Sophomore Year
CH 331, CH 332, CH 337. Organic Chem (10)
BI 214. Cell and Molecular Biology (3)
ANS 121. Introduction to Animal Science (4)
Writing/Speech (6)
CS 101. Computers (4)
Z 410. Occupational Internship (0-6)
Required courses and electives (12-18)

Junior Year
PH 201, PH 202, PH 203 General Physics (15)
BB 350 or BB 351 or BB 450, BB 451. Biochemistry (4-7)
BI 311 or ANS 378. Genetics (4-5)
Required courses and electives (18-22)

Senior Year
First year in veterinary school or completion of courses in major field of study. Courses should be planned in consultation with an adviser. A minimum of 32 credits in upper division science courses is required for students who wish to complete a bachelor's degree in general science, preveterinary medicine option. Courses in microbiology, genetics, anatomy, physiology, embryology, animal behavior, and animal science are recommended.

SCIENCE AND MATHEMATICS EDUCATION

Margaret Niess, Chair
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Faculty
Professor Niess; *Associate Professor* Lederman; *Associate Professor* Erickson; *Assistant Professor* Flick

Graduate Major

Mathematics Education (M.A.T., M.S., M.A., Ph.D.)
Science Education (M.A.T., M.S., M.A., Ph.D.)

The Department of Science and Mathematics Education offers the M.A.T., M.S., M.A., and Ph.D. degrees. The Master of Arts in Teaching (M.A.T.) is designed solely for the preparation of beginning-secondary school science and mathematics teachers. Students must complete a 63-credit prescribed set of course work of which 48 graduate credits are approved for the M.A.T. degree. Completion of the 63 credits meets requirements for Oregon teacher licensure in the appropriate field (advanced mathematics, integrated science, biology, chemistry, or physics). Nine quarter credits of graduate course work must be taken in the teaching field.

Within the Master of Science (M.S.) and Master of Arts (M.A.) degrees in science education or mathematics education, three options are provided: (A) preparation for secondary science and mathematics teacher pursuing standard licensure, or for secondary science and mathematics teachers preparing as secondary curriculum specialists, department heads, or other supervisory or research-oriented positions; (B) preparation for teaching at the community college level or becoming educational trainers in business/industry; (C) preparation for teaching mid-level science or mathematics. Students must complete 45 quarter credits of approved graduate courses. Two-thirds of the work must be in the major and one-third in the minor. Major fields include science education or mathematics education. Minor fields must be related to the teaching specialty including biological, physical, earth, or general science, mathematics, computer science, and integrated science. A minor of integrated science requires a minimum of 9 quarter credits from a specific minor area. Option C allows two additional minor fields: mathematics education and science education. Option B requires that one-third of the major be course work in the teaching field (in addition to the course work in the minor). The curriculum may be completed during the academic year or during the summer session. Students may elect a project option or thesis option.

The doctorate (PH.D.) in science or mathematics education provides two options (A) preparation of science and mathematics teacher educators and (B) preparation of community college/college science and mathematics teachers.

Option A requires a major that includes 37 credits of professional courses in science/mathematics education (including the doctoral research core) and 11 credits meeting the research competency; this option requires a 28-credit minor.

Option B requires a major that includes 18 credits of professional courses in science/mathematics education (including the doctoral research core), 8 credits of college teaching practicum and 8 credits meeting the research competency; this option contains a 36 credit minor.

A dissertation is required for both options.

COURSES

Upper Division

SED 401. RESEARCH (1-16).

SED 405. READING AND CONFERENCE (1-16).

SED 406. PROJECTS (1-16).

SED 407. SEMINAR (1-16).

SED 412. INSTRUCTIONAL TECHNOLOGY AND TEACHING MATH (3). Laboratory course designed to provide the preservice mathematics teacher with experience with instructional tools for teaching secondary mathematics in the twenty-first century. Instruction with computers includes educational software and Logo programming as tools for learning mathematics; computer-managed instruction tools. Instruction emphasizes the integration of computer activities with manipulatives for the presentation of mathematical concepts. PREREQ: Admission to Professional Teacher Education Program.

SED 413. INSTRUCTIONAL TECHNOLOGY AND TEACHING SCIENCE (3). Laboratory course designed to provide the preservice science teacher with instructional tools for teaching secondary science in the twenty-first century. Instruction with computers includes educational software for learning science and real-time data collection in the science laboratory; computer-managed instruction tools. Instruction emphasizes the integration of computer activities and calculator activities for the presentation of science concepts. PREREQ: Admission to Professional Teacher Education Program.

SED 452. MATHEMATICS METHODS PRACTICUM I (3). Methods and problems in planning for mathematics instruction, selecting teaching strategies, organizing materials, evaluating student progress, and managing student behavior. PREREQ: Admission to Professional Teacher Education Program.

SED 453. SCIENCE METHODS PRACTICUM I (3). Designed to allow each student to develop the theoretical background, practical knowledge, and skills which are essential for successful science teaching. Specific emphasis is placed upon instructional methods/modes, curriculum development, contemporary science curriculum goals, and instructional planning. PREREQ: Admission to Professional Teacher Education Program.

Graduate

SED 501. RESEARCH (1-16).

SED 503. THESIS (1-16).

SED 505. READING AND CONFERENCE (1-16).

SED 506. PROJECTS (1-16).

SED 507. SEMINAR (1-16).

SED 508. WORKSHOP (1-16).

SED 510. PROFESSIONAL INTERNSHIP: SCIENCE/MATHEMATICS EDUCATION (3-12). Full-time field experience in which intern will integrate academic study with classroom teaching experience to learn specific competencies relating to functioning well in the context of the classroom and the school, and demonstrate this competency through the assessment of work by supervisors and by evidence collected and presented in work samples. PREREQ: Admission to MAT Program.

SED 511. DIRECTED ACTIVITIES IN TEACHING/LEARNING (3). Practicum designed to provide the preservice science/mathematics teacher with experience with the organization in the seconday science/mathematics curriculum, the students in the science/mathematics setting and with administrative and instructional activities of the secondary science/mathematics teacher. The practicum begins in late August to provide observation and experience with the process of beginning the school year. PREREQ: Admisison to the MAT Program.

SED 515. PROFESSIONAL INTERNSHIP FOR SCIENCE/MATHEMATICS (3). On-campus instruction integrated with the full-time supervised teaching experience of the preservice science/mathematics teacher. PREREQ: Admisison to MAT Program.

SED 543. INTEGRATING SCIENCE AND MATH SOFTWARE INTO CURRICULUM (3). A detailed survey and evaluation of computer software available for secondary level science and mathematics. Includes techniques for integrating software as a supplement to classroom instruction. No knowledge of computers is assumed.

SED 552. MATHEMATICS METHODS/PRACTICUM II (3). Methods and problems in planning for mathematics instruction using activity and laboratory approach. Includes electing teaching strategies, organizing materials, evaluating student progress, and managing student behavior. Practical experience in using current manipulatives, models, and technology. PREREQ: Admission to MAT Program.

SED 553. SCIENCE METHODS/PRACTICUM II (3). Methods and problems in planning for science instruction using an acitivity and laboratory approach. Includes selecting teaching strategies, organizing materials, evaluating student progress, and managing student behavior. Practical experience in setting up laboratory activities, in presenting demonstations, in program planning, maintaining, and designing laboratory materials. PREREQ: Admission to MAT Program.

SED 562. MATHEMATICS MICROTEACHING LABORATORY (3). Develop, practice, and improve specific instructional skills, strategies, and modes in smallgroup teaching learning situations with video-tape feedback and critique by self, peers, and supervisor. For mathematics preservice teachers. PREREQ: Admisison to MAT Program.

SED 563. SCIENCE MICROTEACHING LABORATORY (3). Develop, practice, and improve specific instructional skills, strategies, and modes in small-group teaching learning situations with video-tape feedback and critique by self, peers, and supervisor. For science preservice teachers. PREREQ: Admission to MAT Program.

SED 580. RESEARCH AND EVALUATION (3). Analysis of qualitative and quantitative empirical research in science education, mathematics education and education in general. Development of data collection instruments for use by researchers and teachers of science education, mathematics education and education in general, including portfolio and other forms of alternative assessment.

SED 581. PROFESSIONAL DEVELOPMENT AND PRACTICUM IN MATHEMATICS (3). Supervised field practicum in mathematics teaching which leads to the development of state required work sample/ - portfolio. This course is required for Standard Licensure. PREREQ: Basic Teaching Licensure in Advanced Mathematics.

SED 582. MATHEMATICS PEDAGOGY (2). Designed to allow each student to develop pedagogical content knowledge. Specific emphasis is placed upon classroom tested in instructional activities and approaches as presented by actual mathematics secondary school classroom teacher. Each course addresses a specific theme of the 6-12 mathematics curriculum. Students in the MAT Program are required to take at least two of the three courses. May be repeated for credit. PREREQ: Admission to MAT Program.

SED 583. SCIENCE PEDAGOGY (2). Designed to allow each student to develop pedagogical content knowledge. Specific emphasis is placed upon classroom tested instructional activities and approaches as presented by actual science secondary school classroom teacher. Each course addresses a specific theme of the 6-12 science curriculum. Students in the MAT Program are required to take at least two of these courses. May be repeated for credit. PREREQ: Admission to MAT Program.

SED 585. MATHEMATICS SCIENCE CURRICULUM PRACTICUM (5). The aim of mathematics/science education for the 1990's is to develop mathematics, science, and technological literacy for all citizens. This aim emphasizes a general understanding of mathematics, science, and technology including knowledge, processes, applications, and information concerning opportunities for those interested in careers in mathematics and science. To accomplish this goal, each participant will gain exposure to science, mathematics and technology in the everyday lives and work places of future citizens. Through this exposure the beginning teacher will gain in-depth knowledge of appropriate curriculum content and structure. PREREQ: Admission to MAT Program.

SED 588. MATHEMATICS CURRICULUM IN SECONDARY SCHOOLS (3). Current trends, history of these trends, and the rationale for the modern revolution.

SED 589. ADVANCED TOPICS: MATHEMATICS EDUCATION (3). Current issues in mathematics education. May be repeated for credit with different topics.

SED 592. PROFESSIONAL DEVELOPMENT AND PRACTICUM IN SCIENCE (3). Supervised field practicum in science teaching which leads to the develoment of state required work sample/portfolio. This course is required for Standard Licensure.

SED 593. ADVANCED STRATEGIES: SCIENCE (3). Provides additional exposure and development of instructional strategies and models of science teaching. Special emphasis is placed upon promoting critical thinking and decision making.

SED 594. ADVANCED STRATEGIES: MATHEMATICS (3). Provides additional exposure and development of instructional strategies and models of mathematics teaching. Special emphasis is placed upon promoting critical thinking and decision making.

SED 595. ASSESSMENT AND EVALUATION (3). Contemporary assessment and evaluation theory and the development of valid cognitive, affective, and psycho-motor assessment items/tasks. In-depth attention is given to the development and scoring of alternative assessment techniques such as portfolios and projects.

SED 596. METHODS OF COLLEGE TEACHING IN MATHEMATICS AND SCIENCE (3). Focuses on methods and problems in planning and implementing mathematics or science instruction at the college level. Particular emphasis is placed upon selecting teaching strategies, organizing materials, and evaluating student assessment.

SED 597. CLINICAL SUPERVISION IN MATHEMATICS AND SCIENCE (3). Provides for the development of a variety of classroom observation techniques and clinical supervision skills. This course fulfills state requirements for becoming a supervisor of student interns.

SED 598. SCIENCE CURRICULUM IN SECONDARY SCHOOLS (3). Trends, problems, and procedures in junior high school, middle school, and secondary school curricula.

SED 599. TOPICS IN SCIENCE EDUCATION (3). Current issues, trends, and topics in science education. May be repeated for credit with different topics. PREREQ: Department approval required.

SED 601. RESEARCH (1-16).

SED 603. DISSERTATION (1-16).

SED 605. READING AND CONFERENCE (1-16).

SED 606. PROJECTS (1-16).

SED 607. SEMINAR (1-16).

SED 608. WORKSHOP (1-16).

SED 611. SURVEY OF LITERATURE (3). Broad overview of primary areas currently being researched in science, mathematics, and computer science education.

SED 612. RESEARCH DESIGN AND CRITICAL ANALYSIS (3). A study of research designs and analytical procedures. PREREQ: SED 611.

SED 613. RESEARCH PRACTICUM (3). Planning, conducting, and reporting research projects. PREREQ: SED 612.

SED 615. PRACTICUM IN COLLEGE TEACHING IN MATHEMATICS/SCIENCE (4). Supervised field practicum in college mathematics/science teaching. PREREQ: Admission to Ph.D. program in science and mathematics education and SED 596. May be repeated or up to 8 credits.

SED 805. READING AND CONFERENCE (1-16).

SED 806. PROJECTS (1-16).

SED 808. WORKSHOP (1-16).

STATISTICS

Justus Seely, Chair
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Faculty

Professors Butler, Pierce, Ramsey, Seely, Thomas, Urquhart, Waymire; *Associate Professors* Arthur, Birkes, Peters, Schafer; *Assistant Professors* Lesser, Murtaugh

Graduate Major

Operations Research (M.A., M.S.)
Statistics (M.A., M.S., Ph.D.)
Graduate Areas of Concentration
Applied Statistics
Biometry
Operations Research
Statistics
Theory of Statistics

The Department of Statistics offers undergraduate service courses, as well as graduate courses and programs leading to the M.A., M.S., and Ph.D. degrees or to a minor for an advanced degree in other fields. Students planning to major in statistics at the graduate level should have a minimum of mathematics through multivariable calculus and an upper division sequence in mathematical statistics.

COURSES

Lower Division

ST 201, ST 202. PRINCIPLES OF STATISTICS (3,3). ST 201: Design of experiments, descriptive statistics, the normal curve, probability, chance variability, sampling, confidence intervals for averages and percentages. ST 202: Tests of significance for averages and percentages for one and two samples, Students t curve, chi-square tests, nonparametric tests, correlation and regression. Must be taken in order.

ST 209. PRINCIPLES OF HYPOTHESIS TESTING (1). Tests of significance for averages and percentages for one and two samples, Students t curve, limitations of significance testing. PREREQ: ST 201. Self-paced. May be taken concurrently with a self-paced section of ST 201.

ST 211. INTRODUCTION TO HYPOTHESIS TESTING (1). Hypothesis testing for means and proportions using one and two samples. This course serves as a transition between ST 201 and ST 352. PREREQ: ST 201. Self-paced. May be taken concurrently with a self-paced section of ST 201.

Upper Division

ST 314. INTRODUCTION TO STATISTICS FOR ENGINEERS (3). Probability, expectation, common probability distributions, sampling distributions, statistical inference, one- and two-sample problems, regression analysis. PREREQ: MTH 253.

ST 351, ST 352. INTRODUCTION TO STATISTICAL METHODS (4,4). ST 351: Descriptive statistics, random variables, normal distribution, sampling distributions, confidence intervals and hypothesis tests for means using one and two samples. ST 352: Simple and multiple linear regression, correlation, analysis of variance, analysis of categorical data. Must be taken in order. ST 352 PREREQ: ST 211 or ST 351. Lec/lab.

ST 406/ST 506. Section 1: PROJECTS (1-16), graded P/N. Section 2: TEACHING EXPERIENCE (1-16), graded P/N. Section 3: DIRECTED WORK (1-16), graded P/N.

ST 411/ST 511, ST 412/ST 512, ST 413/ST 513. METHODS OF DATA ANALYSIS (4,4,4). ST 411/ST 511: Graphical, parametric and nonparametric methods for comparing two samples; one-way and two-way analysis of variance; simple linear regression. ST 412/ST 512: Multiple linear regression, including model checking, dummy variables, using regression to fit analysis of variance models, analysis of covariance, variable selection methods; nonlinear regression; logistic regression; multivariate regression. ST 413/ST 513: Principles of experimental design; randomized block and factorial designs; repeated measures; categorical data analysis, including comparison of proportions, tests of homogeneity and independence in cross-classified frequency tables, Mantel-Haenszel test, logistic models, interpretation of log-linear models. PREREQ: ST 209 or ST 351 or the equivalent. Must be taken in order. Lec/lab.

ST 415/ST 515. DESIGN AND ANALYSIS OF PLANNED EXPERIMENTS (3). Principles of experimental design; uses, construction and analysis of completely randomized, randomized block and Latin square designs; covariates; factorial treatments, split plotting; random effects and variance components. PREREQ: ST 352 or ST 411/ST 511.

ST 421/ST 521, ST 422/ST 522. INTRODUCTION TO MATHEMATICAL STATISTICS (4,4). ST 421/ST 521: Probability, random variables, expectation, discrete and continuous distributions, multivariate distributions, sampling distributions, central limit theorem. ST 422/ST 522: Maximum likelihood estimation, unbiased estimation, confidence intervals, hypothesis testing. PREREQ: MTH 253. Must be taken in order.

ST 431/ST 531. SAMPLING METHODS (3). Estimation of means, totals and proportions; sampling designs including simple random, stratified, cluster, systematic, multistage and double sampling; ratio and regression estimators; sources of errors in surveys; capture-recapture methods. PREREQ: ST 411/ST 511.

ST 435/ST 535. QUANTITATIVE ECOLOGY (3). Statistical and mathematical models in ecological theory and application, quantitative theories of communities and populations, theory and practice of sampling and analyzing ecological data, parameter estimation. PREREQ: ST 412/ST 512. Not offered every year.

ST 439/ST 539. SURVEY METHODS (3). Survey design, sampling, data collection and analysis, general methodology. PREREQ: ST 201 or ST 351. Not offered every year.

ST 441/ST 541. PROBABILITY, COMPUTING, AND SIMULATION IN STATISTICS (4). Review of probability, including univariate and multivariate distributions, conditional distributions, and limit theorems. Random-number generation, simulation of statistical distributions, bootstrap, variance reduction techniques. Emphasis on the use of computation in statistics, using the MATLAB programming language. PREREQ: ST 422/ST 522. Lec/lab.

ST 443/ST 535. APPLIED STOCHASTIC MODELS (3). Development of stochastic models commonly arising in statistic and operations research, such as Poisson processes, birth-and-death processes, discrete-time and continuous-time Markov chains, renewal and Markov renewal processes. Analysis of stochastic models by simulation and other computational techniques, using the MATLAB programming language. PREREQ: ST 421/ST 521, experience with a high-level programming language, statistical package or mathematical computation package.

ST 445/ST 545. STOCHASTIC OPERATIONS RESEARCH MODELS (3). Selected stochastic OR models. Dynamic programming and Markov decision processes; queueing models; maintenance, inspection, and repair models; reliability theory. PREREQ: ST 443/ST 543.

ST 447/ST 547. RELIABILITY MODELS (3). Stochastic models for the failure of complex systems; statistical evaluation of reliability, optimal maintenance, inspection and repair policies. PREREQ: ST 421/ST 521 or MTH 463/MTH 563. Not offered every year.

ST 448. OPERATIONS RESEARCH METHODS (3). Survey of operations research methods and applications, including linear programming, dynamic programming, Markov chains, queueing theory, and other topics such as network analysis, integer programming, nonlinear programming, inventory theory, decision analysis and reliability. PREREQ: MTH 245.

ST 481/ST 581. LINEAR PROGRAMMING (3). Formulation and solution of linear programming models; development of the simplex method and related pivot algorithms; duality, postoptimality analysis, extensions and applications of linear programming; special classes of linear programming. PREREQ: MTH 341 or MTH 367 or ST 448.

ST 483/ST 583. MATHEMATICAL PROGRAMMING (3). Integer programming and discrete optimization; network optimization; multiple objective optimization; linear complementarity problems; decomposition of linear programs and other advanced linear programming techniques. PREREQ: MTH 367 or ST 481/ST 581.

ST 485/ST 585. NONLINEAR OPTIMIZATION (3). Fundamentals of nonlinear optimization. Convex sets and convex functions; gradients, Hessians; necessary and sufficient conditions for optimality; nonlinear duality; algorithms for unconstrained and constrained optimization. PREREQ: MTH 254; MTH 341.

ST 491/ST 591. SPECIAL TOPICS I (1). May be repeated for credit. Not offered every year.

ST 492/ST 592. SPECIAL TOPICS II (2). May be repeated for credit. Not offered every year.

ST 493/ST 593. SPECIAL TOPICS III (3). May be repeated for credit. Not offered every year.

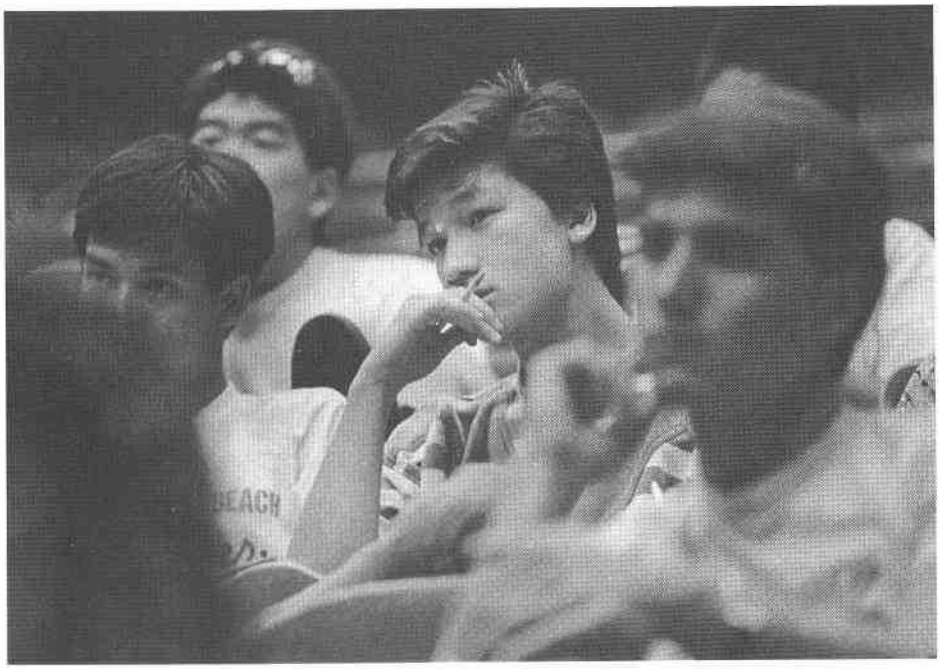
ST 494/ST 594. SPECIAL TOPICS IV (4). May be repeated for credit. Not offered every year.

Graduate

ST 501. RESEARCH (1-16). Department consent required.

ST 503. THESIS (1-16). Consent required.

ST 505. READING AND CONFERENCE (1-16). Consent required



ST 507. SEMINAR (1-2). Section 1: Attendance at consulting seminar, 1 credit, graded P/N. **Section 2:** Consulting Seminar, 2 credits, graded P/N. **Section 3:** Research Seminar, 1 credit, graded P/N. **Section 4:** Computing Facilities, 1 credit, graded P/N.

ST 551, ST 552, ST 553. STATISTICAL METHODS (4,4,4). ST 551: Properties of t, chi-square and F tests; randomized experiments; sampling distributions and standard errors of estimators, including delta method, jackknife, and bootstrap methods; comparison of several groups of measurements; two-way tables of measurements. ST 552: Simple and multiple linear regression including polynomial regression, indicator variables, weighted regression, and influence statistics; nonlinear regression and linear models for binary data. ST 553: Principles and analysis of designed experiments, including factorial experiments, analysis of covariance, random and mixed effect models, and split plot designs; introduction to multivariate analysis and repeated measures designs. PREREQ: ST 422/ST 522. COREQ: MTH 341. Must be taken in order.

ST 555. ADVANCED EXPERIMENTAL DESIGN (3). Incomplete block designs, confounding and fractionalization, split plots, response surfaces, change- over designs, repeated measures, analysis of unbalanced data. PREREQ: ST 553.

ST 557. APPLIED MULTIVARIATE ANALYSIS (3). Multivariate data structures, linear combinations; principal components, factor and latent structure analysis, canonical correlations, discriminant analysis; cluster analysis, multidimensional scaling. PREREQ: ST 412/ST 512; MTH 252 or MTH 245. Not offered every year.

ST 561, ST 562, ST 563. THEORY OF STATISTICS (3,3,3). ST 561: Basic theory of probability and random variables; functions of random variables; approximations to moments and distributions, including linear approximations and asymptotic normal distributions; location-scale families, exponential families. ST 562: Multiparameter families of distributions; models for non-identically-distributed observations and regression-type models; likelihood functions and sufficiency; Bayesian inference; reparameterizations and nuisance parameters; point and interval estimation in multiparameter models; exact optimal methods and asymptotically optimal methods. ST 563: Hypothesis testing; uniformly most powerful tests; testing in multiparameter models; similar tests in exponential families; large-sample methods based on asymptotic distributions of estimators; likelihood ratios; score tests. PREREQ: ST 422/ST 522. Must be taken in order.

ST 565. TIME SERIES MODELS (3). Analysis of serially correlated data in both time and frequency domains. Autocorrelation and partial autocorrelation functions, autoregressive integrated moving average models, model building, forecasting; filtering, smoothing, spectral analysis, frequency response studies. PREREQ: ST 412/ST 512, ST 422/ST 522. Offered alternate years.

ST 601. RESEARCH (1-16). Consent required.

ST 603. THESIS (1-16). Consent required.

ST 606. PROJECTS (1-16). Section 1: Projects; **Section 2:** Teaching Experience, graded P/N; **Section 3:** Directed Work, graded P/N.

ST 623. GENERALIZED REGRESSION MODELS II (3). Maximum likelihood analysis for frequency data; regression-type models for binomial and Poisson data; iterative weighted least squares and maximum likelihood; analysis of deviance and residuals; overdispersion and quasi-likelihood models; log-linear models for multidimensional contingency tables. PREREQ: ST 553, ST 563.

ST 625. GENERALIZED REGRESSION MODELS II (3). Multiparameter analysis using large-sample likelihood methods, primarily applied to response-time data multiparameter models, reparameterization, and regression- type models; likelihood functions, including censored data; testing based on maximum likelihood estimators, likehood ratios, and score tests; computational methods including the EM algorithm; partial likelihood methods for proportional hazards models; analysis of grouped data. PREREQ: ST 553, ST 563.

ST 627. TOPICS IN TIME SERIES (3). Topics not covered in ST 565. PREREQ: ST 565. Not offered every year.

ST 632. SAMPLING THEORY (3). The basic sampling model for probability selection, basic sampling methods, generalization of the basic model, common applications of the general theory. PREREQ: ST 422/ST 522. Offered alternate years.

ST 651, ST 652, ST 653. LINEAR MODEL THEORY (3,3,3). ST 651: Least squares estimation, best linear unbiased estimation, parameterizations, multivariate normal distributions, distributions of quadratic forms, testing linear hypotheses, simultaneous confidence intervals. ST 652,ST 653: Advanced topics including classification models, mixed-effects models and multivariate models. PREREQ: ST 553,ST 563. Must be taken in order. Offered alternate years.

ST 661, ST 662, ST 663. ADVANCED THEORY OF STATISTICS (3,3,3). Exponential families, sufficient statistics; unbiased, equivariant, Bayes and admissible estimators; large-sample theory, maximum likelihood estimation; uniformly most powerful, unbiased, similar, and invariant tests; likelihood ratio and score tests. PREREQ: ST 563, MTH 511. Must be taken in order. Offered alternate years.

ST 665, ST 666, ST 667. ADVANCED PROBABILITY THEORY (3,3,3). (See MTH 665, MTH 666, MTH 667.).

ZOOLOGY

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Faculty

Professors Bayne, Blaustein, Boucot, Dawson, Farber, Hixon, King, Lubchenco, Menge, Mix, Moore, Morris, Roberts, Ruben, Somero; *Associate Professors* Brownell; *Assistant Professors* Anderson, Mason, Taylor; *Instructor* Beatty, Gaffin; *Adjunct Faculty* Baer, Field, Fryer, Potter, Yamada

Undergraduate Major

Zoology (B.S.)

Minor

Zoology

Graduate Major

Zoology (M.A., M.S., Ph.D.)

Graduate Areas of Concentration

Behavioral Ecology
Behavioral Endocrinology
Cell Biology
Comparative Immunology
Conservation Biology
Developmental Biology
Evolutionary Biology
Genetics
Marine Ecology
Neurobiology
Parasitology
Physiology
Population Biology

A major in zoology can prepare students for those vocations which require foundations in biological science. It is an ideal major for advanced graduate education in biological science and for pre-professional preparation in medicine, dentistry, optometry, and veterinary medicine. In addition, zoology majors can enter such varied fields as environmental affairs, conservation, teaching, laboratory technology, elementary education, scientific journalism, field biology, biomedical illustration, and other areas associated with biomedical and environmental sciences.

The department offers B.S., M.A., M.S., and Ph.D. degrees. Excellent opportunities exist for studies at field stations on the Pacific Coast, in the Great Basin Desert, and at other locations. In consultation with advisers, students can plan programs to meet their particular needs.

GRADUATE STUDY

The Department of Zoology has strong programs of graduate study in behavioral ecology, marine biology and ecology, evolutionary biology, physiology, behavioral endocrinology, population biology, genetics, neurobiology, cell and developmental biology and comparative immunology. Detailed information on the graduate faculty and program is available from the Department of Zoology.

B.S. CURRICULUM

All students majoring in zoology are required to take a common core of courses. The following list of requirements organizes courses into freshman through senior years, as an exemplary program, but, according to individual needs, students may make adjustments in the order in which courses are taken.

CURRICULUM

Freshman Year

BI 211, BI 212, BI 213. Introductory Biology (12)
CH 221, CH 222, CH 223. General Chemistry (15)[17]
MTH 251. Differential Calculus (4)
WR 121. English Composition (3)
HHP 231. Health and Human Fitness (3)
Z 110. Zoology Tutorial (1)
Additional required courses/electives (7)[18]

Sophomore Year

Z 371, Z 372. Vertebrate Biology and Lab(5)
BI 214. Cell and Molecular Biology (3)
BI 311. Genetics (4)
BI 370. General Ecology (3)
CH 331, CH 332. Organic Chemistry (8)
MTH 252. Integral Calculus (4)
Math, Statistics, or Computer Science (4)
Additional required courses/electives (14)[18]

Junior Year

BB 450, BB 451. Biochemistry (4,3)[20]
BI 445. Evolution (3)
PH 201, PH 202. General Physics (10)
Z 361, Z 362. Invertebrate Biology and Lab (5)[19]
Additional required courses/electives (20)[21]

Senior Year

BI 460, BI 461. Cell Biology (3,2)
Z 414. Research Perspectives (WIC) (2)
Z 425. Embryology and Development (5)
Z 430. Principles of Physiology (4)
Z 436. Animal Physiology Laboratory (2)
Required courses and/or electives (27)[21]

MINOR

The zoology minor is designed for students from other majors who have an additional interest in zoology. Students are strongly encouraged to identify a minor adviser in the Department of Zoology. Completion of the minor is certified on the student's academic transcript.

Core Requirements

BI 211, BI 212, BI 213, BI 214. Intro Biology (15)
Z 361, Z 362. Invertebrate Biology (5).
Z 371, Z 372. Vertebrate Biology (5)
Add two or more courses from the following list:
BI 350, Z 438, BI 360, Z 422, BI 370, Z 425, Z 423, BI 311, Z 473, Z 461, Z 351, Z 427, Z 456, Z 430, BI 445.

COURSES

Lower Division

Z 110. ZOOLOGY TUTORIAL (1). New student orientation. Weekly discussion of material students have read and other agreed topics relating to the zoology major.

Upper Division

Z 331, Z 332, Z 333. HUMAN ANATOMY AND PHYSIOLOGY (3,3,3). Lecture course on structure and functions of human body. Tissues, organ systems, homeostatic mechanisms, patho-physiology and pathomorphology. Z 331 is a prerequisite for Z 332, Z 333.

Z 341, Z 342, Z 343. HUMAN ANATOMY AND PHYSIOLOGY LABORATORY (2,2,2). Dissection of preserved cat specimens and study of prepared human prosection materials. Physiology demonstrations illustrate functions of organ systems. F-skeleto-muscular; W-neural; S-gastric, vascular, renal. Lab fee of $5.00. COREQ: Z 331, Z 332, Z 333.

Z 345. *INTRODUCTION TO EVOLUTION (3). Elements of evolutionary theory; origin and history of life; evolutionary controversy; origins of species, sex, and humans. Lec.

Z 348. *HUMAN ECOLOGY (3). The impact of humans on the environment, including the political, sociological, and ecological consequences of human population growth. Topics of current critical importance will include global warming trends, destruction of the ozone layer, consequences of pollution, habitat destruction, the loss of biodiversity, and conservation biology. Lec.

Z 351. MARINE ECOLOGY (3). Ecological interactions and principles in different marine habitats. Topics include the organisms (plants, invertebrates, vertebrates) found in major habitats and interactions between organisms. Habitats discussed include coral reefs, rocky shores, kelp forests, near-shore waters, open-ocean waters, and the deep sea. Emphasis is placed on how organism-organism interactions produce varying patterns of distribution, abundance, body size, diversity, stability, and succession. PREREQ: One year of biology. May be taken alone or concurrently with Z 352. Lec.

Z 352. MARINE ECOLOGY LABORATORY (2). Laboratory and field exposure to many of the organisms and processes discussed in Z 351. Research projects provide students with the opportunity to experience the process by which information about marine ecology is obtained. PREREQ: Z 351 or concurrent enrollment. Field trip fee. Lab.

Z 361. INVERTEBRATE BIOLOGY (3). Phylogeny of invertebrates; structure, function, life histories, evolution of aquatic and terrestrial species. Interdependence of form, ecology, physiology and behavior. May be taken alone or concurrently with Z 362. PREREQ: One year of biology. Lec.

Z 362. INVERTEBRATE BIOLOGY LABORATORY (2). Morphology and anatomy of representative invertebrates introduced in Z 361; diversity within phyla. Study is by dissections and both microscopic and macroscopic examination; field trip fee. PREREQ: Z 361 or concurrent enrollment. Lab.

Z 371. VERTEBRATE BIOLOGY (3). Overview of vertebrate origins and phylogeny, structural and functional adaptations, behavior, and ecology. PREREQ: One year of biology. May be taken alone or concurrently with Z 372. Lec.

Z 372. VERTEBRATE BIOLOGY LABORATORY (2). Classification, identification, and natural history of vertebrates. Includes laboratory examination of specimens and frequent field trips (fee charged) emphasizing Oregon fauna. PREREQ: Z 371 or concurrent enrollment. Lab.

Z 401. RESEARCH (1-16). Undergraduate research, completed under faculty supervision. Department approval required.

Z 403. THESIS (1-16). Undergraduate thesis, completed under faculty supervision. Required of honors students. Department approval required.

Z 405. READING AND CONFERENCE (1-16). For undergraduates, to be arranged with individual faculty. Readings and discussions on topics of mutual interests. Department approval required.

Z 407. SEMINAR (1-16). Undergraduate seminars, as offered by faculty. Graded P/N.

Z 410. OCCUPATIONAL INTERNSHIP (1-16). Graded P/N. Practical experience working with professionals.

Z 414. ^RESEARCH PERSPECTIVES (2). For zoology majors of junior or senior standing, this Writing Intensive Course explores biological research done locally. Emphasis is on the communication of biological information.

Z 422/Z 522. COMPARATIVE ANATOMY (5). Descriptive, experimental and evolutionary approach to the study of development and anatomy of all organ systems of vertebrates. Laboratory emphasizes vertebrate anatomy. PREREQ: One year of biology. Lec/lab.

Z 423/Z 523. ENVIRONMENTAL PHYSIOLOGY (4). Comparative environmental physiology of vertebrates with emphasis on adaptations to such aspects of the physical environment as temperature, water, ions, and gases. Consideration given to interactions between physiology and environment that influence the local and geographic distribution of animals. PREREQ: One year of biology. Lec/rec.

Z 425/Z 525. EMBRYOLOGY AND DEVELOPMENT (5). An integrated molecular, cellular and whole organism approach. Sequential embryonic events from gametogenesis through organogenesis. Discussion of experiments into mechanisms of these events; cellular interactions, pattern formation, regulation of gene expression, and cellular differentation. Lab emphasizes descriptive vertebrate embryology with introduction to experimental methods. PREREQ: BI 460. Lec/lab.

Z 427/Z 527. PALEOBIOLOGY (3). Considers those aspects of the fossil record of potential use to life scientists, including the following topics: community history, biogeographic history, rates of evolution (taxonomic, phyletic, cladogenetic, behavioral, quantum), species problem as viewed with fossils, coevolution, overall history of life, speciation mechanisms. PREREQ: One year of biology. Lec.

Z 430/Z 530. PRINCIPLES OF PHYSIOLOGY (4). Concepts and mechanisms of physiology with examples from neural integration, sensory perception, muscle function, circulation, respiration, osmoregulation, kidney function and digestion. PREREQ: BI 213 and CH 332 or equivalent. Lec.

Z 431/Z 531, Z 432/Z 532. VERTEBRATE PHYSIOLOGY (4). Physiology of organ systems in vertebrates with emphasis on mammals. Systems to be considered include the nervous, excretory (renal), endocrine, reproductive, respiratory, and circulatory. Courses may be taken in any order. PREREQ: Z 430/Z 530. Lec/rec.

Z 436/Z 536. ANIMAL PHYSIOLOGY LABORATORY[18] (2). Laboratory experience with concepts and procedures of modern physiology. Lab fee of $10. PREREQ: Z 430.

Z 438/Z 538. BEHAVIORAL NEUROBIOLOGY (3). Advanced study of neural and endocrine systems as regulators of behavior. Cellular mechanisms, neural circuitry and chemical messengers of simple and complex behaviors. Offered alternate years. PREREQ: Two years of biology, including physiology. Lec.

Z 441, Z 442, Z 443. ADVANCED HUMAN ANATOMY AND PHYSIOLOGY LABORATORY (2,2,2). Dissection of preserved cat specimens and study of prepared human prosection materials. Functions illustrated by physiology exercises. Organ systems emphasized: F-skeleto-muscular; W-neural; S-gastric, vascular, renal. Lab write-ups required. Lab fee of $5.00. COREQ: Z 430, Z 431, Z 432.

Z 456/Z 556. PARASITOLOGY (4). Morphology, life cycles, physiological adaptations, evolution, and distribution of parasitic animals. Offered alternate years. PREREQ: Two years of biology. Lec/lab.

Z 461/Z 561. HISTOLOGY (5). Microscopic study of tissues and organs, emphasizing functional adaptations. Offered alternate years. PREREQ: Two years of biology. Lec/lab.

Z 465/Z 565. SELECTED TOPICS IN ZOOLOGY (1-16). Topics and credits vary. May be repeated for credit. Grading method TBA.

Z 471/Z 571. ORNITHOLOGY (4). Current developments in research and theory of birds. Covers systematics, evolution, ecology, behavior, physiology, and distribution, with emphasis on field studies. Field trip fee. PREREQ: Z 371 or equivalent course in vertebrate biology. Not offered every year, TBA.

Z 473/Z 573. HERPETOLOGY (4). World families and distribution of amphibians and reptiles; population biology, life histories, current literature. Field trip fee. PREREQ: Z 371 or equivalent course in vertebrate biology. Offered alternate years. Lec/lab.

Graduate

Z 501. RESEARCH (1-16). Graduate-level research, completed under faculty supervision. Departmental approval required. Graded P/N

Z 503. THESIS (1-16). Masters thesis, completed under faculty supervision.

Z 505. READING AND CONFERENCE (1-16). For graduate students working towards Masters degree. After arrangements with individual faculty, readings and discussions on topics of mutual interest. Departmental approval required.

Z 507. SEMINAR (1). Graded P/N.

Z 537. ENDOCRINOLOGY (4). Influence of endocrine glands on the physiology of the animal body, with emphasis on mammals. PREREQ: Graduate status or consent of instructor. Offered alternate years.

Z 541. NEUROBIOLOGY (3). Structure and function of vertebrate and invertebrate nervous systems: biophysical properties of excitable membranes: synaptic transmission and neurohormonal communication; receptor physiology and sensory integration; cellular mechanisms of behavior and simple learning; development of structure and synaptogenesis. Offered alternate years. PREREQ: Advanced course work in biological sciences.

Z 581. BIOGEOGRAPHY (3). Covers the principles on which biogeography, past and present, is based, plus an historical account of changing biogeography from the past to the present. Marine and nonmarine aspects are dealt with, involving what is known concerning both plants and animals. Offered alternate years. PREREQ: Graduate status or consent of instructor.

Z 591. POPULATION BIOLOGY (5). Population biology from an evolutionary perspective; emphasis on both theoretical and empirical approaches. Offered alternate years. PREREQ: courses in genetics and ecology equivalent to BI 311 and BI 370 or consent of instructor.

Z 593. BEHAVIORAL ECOLOGY (5). Behavioral Ecology with emphasis on both theoretical and empirical approaches. Offered alternate years. PREREQ: Graduate status or consent of instructor.

Z 594. COMMUNITY ECOLOGY (5). Theory and analysis of multispecies associations. Emphasis on extent to which existing ecological theory is supported by natural phenomena. Course considers how biotic and abiotic mechanisms interact to regulate community organization and stability in marine, freshwater, and terrestrial habitats. Offered alternate years. PREREQ: Courses in ecology, statistics, and math equivalent to BI 370, ST 452, and MTH 113 or consent of instructor.

Z 601. RESEARCH (1-16). Doctoral-level research under faculty supervision. Graded P/N.

Z 603. THESIS (1-16). Doctorate thesis, completed under faculty supervision.

Z 605. READING AND CONFERENCE (1-16). For graduate students working toward doctoral degree. After arrangements with individual faculty, readings and discussions on topics of mutual interest..

FOOTNOTES

*Baccalaureate Core Course

^Writing Intensive Course (WIC)

[1]A list of approved courses is available at the College of Science office. Fifteen of these credits can also fulfill part of the Baccalaureate Core requirements.

[2]At least one course with significant computer science content approved by the major department; credits are not shown since the course may be part of one already included.

[3]At least one term in biological science and one term in physical and earth science. Must include a two-term sequence in one of these sciences.

[4]For courses listed in the required curricula, equivalent courses taken at other institutions may be substituted. All substitutions must be approved by the student's academic adviser.

[5]Electives must include enough upper division courses (400 or 500-level) to meet University graduation requirements of 60 upper division credits.

[6]Including at least one term of calculus (MTH 241 or 251), and computer science (CS 101 or higher). See also Individualized (Elementary Education) which has a different requirement.

[7]Courses may be taken from departments outside of the College of Science; however, students must take a total of 24 credits of upper division science from departments in the College of Science.

[8]Students take the courses required by the BSN program selected for future transfer.

[9]Credits of applied art (ceramics, woodworking, etc.) and 18 credits of humanities are required.

[10]Work experience with an occupational therapist is strongly recommended.

[11]Required courses include the Baccalaureate Core requirements and the College of Science requirements. A pretherapy program with somewhat less emphasis on science is offered through the College of Health and Human Performance.

[12]Required courses and/or elective credits should be used to meet Baccalaureate Core requirements.

[13]Marine biology (BI 450, BI 451) is an acceptable alternative to invertebrate biology (Z 361, Z 362) animal physiology laboratory (Z 436), and ecology (BI 370).

[14]As an alternative for 1995-96, juniors and seniors may take BB 351 with the approval of your Zoology academic adviser.

[15]At least 9 of these credits must be from a list of approved courses in the biological sciences. The list is obtainable from your Zoology academic adviser

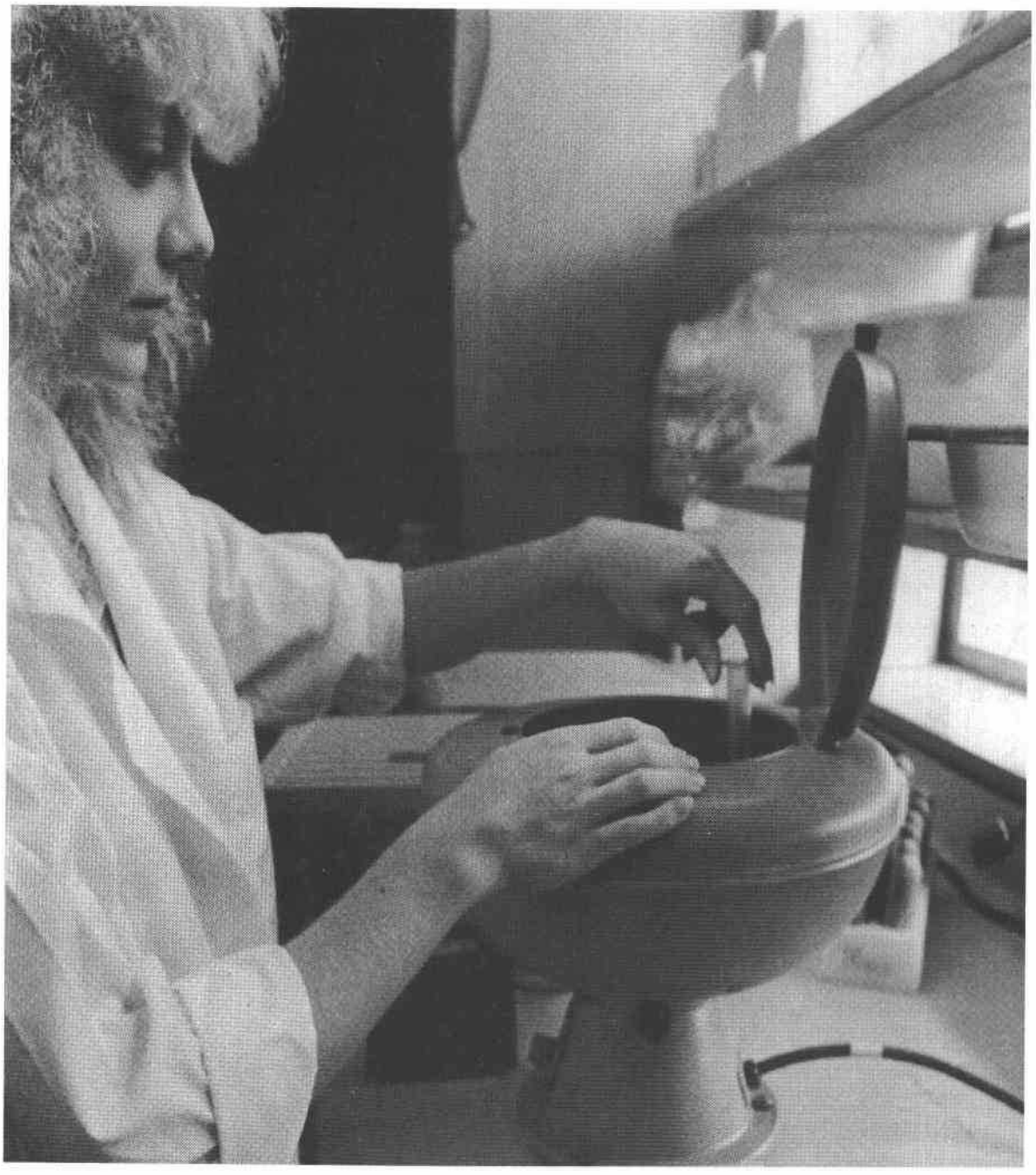
[17] Students with weaker chemistry background should take CH 121, CH 122, CH 123 and CH 219. The latter may be taken during the sophomore year.

[18] Unchanged

[19] Unchanged

[20] As an alternative for 1995-96 juniors and seniors may take BB 351 with the approval of the zoology academic adviser.

[21] At lest 9 of these credits must be from a list of approved courses in the biological sciences. The list is obtainable from the zoology acvademic adviser.



In an increasingly complex world, solutions to issues of emerging societal importance often require crossing traditional boundaries. Recognizing that students will need information from many available sources, Oregon State University offers a variety of opportunities for interdisciplinary exploration and enrichment.

Interdisciplinary programs depend fundamentally upon the existence of strong disciplinary programs and place significant responsibility upon students to integrate and synthesize information.

Because there are so many choices of subjects and so many ways to approach a given interest, it is crucial that students obtain guidance in order to understand the advantages and the limitations of particular disciplinary and interdisciplinary alternatives. Students are encouraged to contact the individuals identified at the beginning of each certificate, department, and degree listing for more information and advice.

INTERDISCIPLINARY PROGRAMS

Although OSU has offered interdisciplinary programs for many years, new and innovative interdisciplinary baccalaureate degree programs are continually being approved.

At the undergraduate level, students have a variety of opportunities to pursue interdisciplinary interests.

- **Combine a major with one or more minor or option in other disciplines.** Undergraduate minors and options are listed on pages 17-19; consult the appropriate departmental catalog section for requirements.
- **Complete a certificate program.** These programs may be completed in conjunction with any baccalaureate degree program. Certificates in Human Services, Latin American Affairs, Peace Studies, Russian Studies, Twentieth Century Studies, and Women Studies are available through the College of Liberal Arts; a certificate in Science, Technology, and Society is available through the College of Science; the College of Home Economics and Education offers a certificate in Gerontology. Consult the appropriate college section of this catalog for further information on particular certificate programs.
- **Earn a baccalaureate degree.** Baccalaureate degrees in American Studies and Liberal Studies are offered through the college of Liberal Arts. These programs allow students considerable flexibility in tailoring course work to particular interdisciplinary interests in the liberal arts and the sciences.
- The **Bioresource Research** degree provides students with broad academic training, focused course work in a specific bioresource option, and a research/mentorship opportunity unmatched in any other OSU undergraduate degree program.
- The **Earth Information Science and Technology** undergraduate minors and undergraduate options provide strong background in geosciences, forestry, environmental science, natural resources, bioscience engineering, and civil engineering.
- The **Environmental Sciences** major combines strong interdisciplinary preparation in the physical, biological, and social sciences with a core of environmental courses and a specialization in one science discipline relevant to the environment.
- The **Natural Resources** baccalaureate, drawing upon a broad curriculum based in the Colleges of Agricultural Sciences, Forestry, Liberal Arts, and Science, provides understanding of the social and scientific dimensions of a broad range of natural resource management challenges.
- The **International Degree**, earned concurrently with any other baccalaureate degree, allows students—through experience abroad, advanced course work in language and culture, and an individualized project—to bring an international dimension to any major.

Graduate Programs

At the graduate level, Oregon State University offers a flexible Master of Arts in Interdisciplinary Studies and interdisciplinary masters and doctoral programs in Economics, Genetics, Molecular and Cellular Biology, Plant Physiology, Scientific and Technical Communication, and Toxicology.

In addition, a graduate minor in Earth Information Science and Technology is offered.

For more information about the interdisciplinary programs listed above, see the listings in this section of the catalog, or see the appropriate college or departmental listing.

BIORESOURCE RESEARCH

Anita Azarenko and John Hays, Directors
Agricultural and Life Sciences Building
Oregon State University
Corvallis, OR 97331-2911
(503) 737-5457 and 737-1777

Faculty:

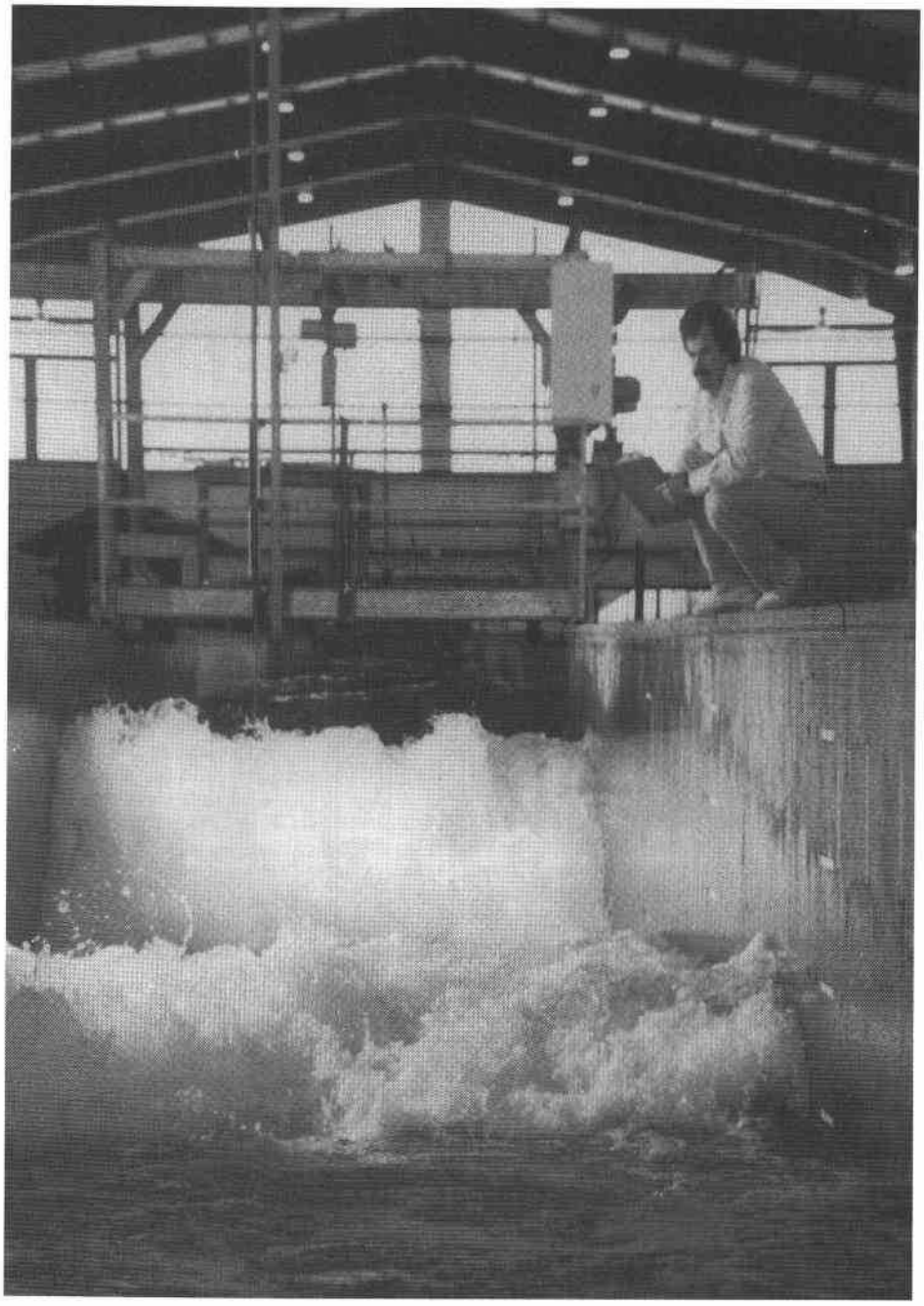
There are over one hundred Bioresource Research faculty mentors, from fifteen departments in the Colleges of Agricultural Science, Forestry, and Science: Agricultural Chemistry, Animal Science, Bioresource Engineering, Botany and Plant Pathology, Chemistry, Crop and Soil Science, Entomology, Fisheries and Wildlife, Food Science and Technology, Forest Resources, Forest Science, Horticulture, Microbiology, Rangeland Resources, and Zoology. The faculty are organized into ten interdepartmental option groups according to their research interests.

Undergraduate Major

Bioresource Research (B.S.)
Options
Animal Reproduction and Development
Applied Genetics
Biosystems Modeling
Biotechnology

Footnotes for this section on page 157.

Environmental Chemistry
Food Quality
Pest Biology and Management
Plant Growth and Development
Sustainable Ecosystems
Toxicology



Bioresource Research students acquire research experience and broadly-based knowledge in interdisciplinary fields of agricultural, environmental, food, and forest sciences. Students determine their fields of study by choosing among ten different option areas. After two years of research in the program of a faculty mentor, each students writes a senior thesis. In addition to research expertise, students graduate with strong basic science backgrounds and problem-solving and communication skills. Many will become industrial or academic research professionals in areas of science where there will be a shortage of qualified individuals for the foreseeable future. Others will enter graduate and professional schools in the life sciences or become highly effective secondary school science teachers.

CURRICULA

BACCALAUREATE CORE REQUIREMENTS (48)

Bioresource Research Core (25-27)
BRR 100. Great Experiments in Bioresource Sciences (1-twice)
BRR 401. Research (14)
BRR 403. Thesis (4)
BRR 406. Projects-Data Presentation (1)
BRR 407. Seminar (1-twice)

Select one of the following:
AG 111. Computer Applications in Agriculture (3)
CS 101. Computer Applications and Implications (4)
F 190. Introduction to Computer Applications in Forestry (2)

Physical Sciences and Mathematics (60)
CH 221-223. General Chemistry with Lab (15)
CH 334-336. Organic Chemistry (9)
CH 337. Organic Chemistry Lab (2)
BB 450, BB 451. General Biochemistry (7)
PH 201-203. Physics (15)
MTH 251, MTH 252. Calculus (8)
ST 351. Statistics (4)

Biological Sciences (16)
BI 211-213. Biology (12)
BI 311. Genetics (4)

Communication (6)
WR 327. Technical Writing (3)
COMM 111. Public Speaking (3)

Western Culture (4)
PHL 205. Ethics (4)

Unrestricted Electives (24-25)

Specialization and Breadth Electives (29)
These electives must include 18 upper-division credits in Specialization Courses related to the area of the student's research, as specified in the option descriptions below, and at least 11 credits (4 credits upper-division) in Breadth Courses, in the agricultural, environmental, food, and forest sciences. Required or Specialization Courses listed below in the option sections may be used to satisfy either the 18-credit upper-division or the 11-credit breadth requirement, but not both.

OPTIONS

ANIMAL REPRODUCTION AND DEVELOPMENT

Research in this option entails the study of life processes in cells, organs, and whole animals to enhance efficient production of high quality animal food products. Students use antibody-based assays, molecular genetics, protein chemistry, embryo and tissue culture, electron chemistry, or other modern laboratory techniques to study various aspects of reproduction, development, and growth.

Required Courses
AC 460. Biotechnology: Perspectives and Case Studies (3)
ANS 121. Introductory Animal Science (4)
ANS 316. Reproduction in Domestic Animals (4)
ANS 317. Reproduction in Domestic Animals Lab (1)
ANS 314. Animal Physiology (4)
CSS 300. Intro. to Crop Production (4)
Select one of the following courses:
AC 450. Environmental Toxicology (3)
BOT 331. Plant Physiology (5)
CSS 305. Principles of Soil Science (5)

ENT 311. Introduction to Insect Pest Management (5)
MB 302. General Microbiology (3)
RNG 341. Rangeland Resources (3)

Specialization and Breadth Courses
Four to six credits approved by option faculty and research mentor.

APPLIED GENETICS OPTION

Applied Genetics is a field of science directed at changing the genome of a variety of organisms, in order to increase their utility to humankind. This is accomplished through a variety of techniques derived from cytogenetics, molecular biology, and Mendelian and quantitative genetics. Typically, applied geneticists have expertise in one or more related fields of study. These include agronomy, biochemistry, botany, entomology, food processing, forestry, microbiology, pathology, physiology, and statistics. The goals of applied geneticists include: 1) improving the quality of food and fiber products, 2) improving the cost efficiency of any given product, and 3) minimizing adverse environmental effects of food or fiber production.

Required Courses
AC 460. Biotechnology: Perspectives and Case Studies (3)
BI 411. Genetics Laboratory (2)
ST 411. Methods of Data Analysis (4)
CSS 430 and CSS 450. Plant Genetics, Plant Breeding (3,4) or ANS 378. Animal Genetics (4) or FS 444. Forest Genetics (4) or FW 455. Fishery Genetics (4)

Specialization and Breadth Courses
Thirteen to sixteen credits approved by option faculty and research mentor.

BIOSYSTEMS MODELING OPTION

Biosystems Modeling involves the application of general systems theory to the analysis of agricultural and environmental systems. Systems theory provides a method of analyzing overall system behavior by examining relations among—and the behavior of—individual components, and synthesizing these relationships into a mathematical framework that can describe the total system. Computer simulation using this mathematical framework can predict and analyze the response to various changes in the inputs to, and/or structure of, the system. Systems modeling is a powerful tool in the development of comprehensive solutions to problems. Examples are the responses of salmon in natural and hatchery environments to such factors as water flow, oxygen levels, and temperature; interactions between crops, such as sweet corn, filberts, and apples, with pests, such as corn earworm, filbert moth, and codling moth, with respect to use of pesticides and crop yields.

Required Courses
BRE 471. Biosystems Modeling Techniques (3)
CS 131. Introduction to Fortran Programming (4) or CS 161. Introduction to Programming Methodology (4)
ST 411, ST 412. Introduction to Mathematical and Statistics (3,3)

Specialization and Breadth Courses
Fourteen to sixteen credits approved by option faculty and research mentor.

BIOTECHNOLOGY OPTION

Biotechnology involves genetic engineering of organisms to make or modify products, to improve plants or animals, or to develop useful microorganisms. Examples include: gene transfer to increase plant yield and disease resistance; cell and tissue culture to clonally propagate plants or animals; manipulation of microorganisms or cultured cells for the production of fermented food and beverages, or for development of vaccines; production of antibodies for detection of animal and plant diseases. Students will gain laboratory and/or field experience in modern techniques of biotechnology.

Required Courses
MTH 254. Vector Calculus I (4)

Specialization and Breadth Courses
Twenty-five credits approved by option faculty and research mentor.

ENVIRONMENTAL CHEMISTRY OPTION

Environmental Chemistry focuses on the basic principles that control the fate of chemicals in the environment. A bewildering variety of chemicals, an inevitable result of modern industrial civilization, are released daily; some of them persist in soil, water, or air. The extent to which these chemicals are a health hazard depends in part on where, how much, and in what form they accumulate. OSU scientists use state-of-the-art methods to detect trace amounts of chemicals in the environment, at levels as low as one part per trillion, and track their movement and transformations. Students will acquire laboratory skills that will be in high demand as worldwide public concern with environmental quality increases.

Substituted Courses
PH 211-213. General Physics with Calculus (4,4,4) for PH 201-203

Required Courses
AC 430. Chemical Behavior in the Environment (3) or CSS 435. Soil Ecosystem Properties (4)
CH 421, CH 422. Analytical Chemistry (3,3) or CH 425. Analytical Chemistry (4) or CH 440. Physical Chemistry (3)
CH 428. Instrumental Analysis (4) or AC 428. Chemical Analysis of Environmental Residues (3)
CSS 305. Principles of Soil Science (5)
MTH 254. Vector Calculus I (4)

Specialization and Breadth Courses
Six to nine credits approved by option faculty and research mentor.

FOOD QUALITY OPTION

Food Quality research includes a broad range of studies involving food and beverages in four categories: sensory appeal, convenience, safety, and nutrition. The sensory aspects of food quality emphasize taste, texture, aroma, and appearance. The convenience aspects of food quality include shelf-life, ease of preparation, and improved functional properties. Food safety is concerned with acute and chronic responses of consumers to microorganisms and chemicals that occur naturally or are added to foods. Nutritional aspects of food quality are related to the nutrient content of foods and the role of nutrients in human health. Research in these areas is grounded in the application of basic sciences, including biology, chemistry, microbiology, molecular biology, psychology and engineering. Students will acquire skills appropriate for laboratory, industrial, or regulatory positions.

Required Courses
FST 411-412. Food Chemistry (4,4)
MB 302. General Microbiology (3)

Specialization and Breadth Courses
18 credits approved by option faculty and research mentor.

PEST BIOLOGY AND MANAGEMENT OPTION

Pest Biology and Management involves the study of living organisms, such as insects, pathogens, vertebrates, and weeds, that limit agricultural productivity. Research approaches range from basic laboratory studies to field experiments. Students will develop research skills in pest biology, in development of management strategies, and in assessment of pest impact on plants or livestock.

Required Courses
BOT 350. Introductory Plant Pathology (4)
CSS 440. Weed Control (5)
ENT 311. Introduction to Insect Pest Management (5)

Specialization and Breadth Courses
Fifteen credits approved by option faculty and research mentor.

PLANT GROWTH AND DEVELOPMENT OPTION

Research in this option is concerned with the control and coordination of processes in cells, organs, and/or whole plants. Students will develop research skills and knowledge in studies of the regulation of plant growth and development, metabolism, structure and function of macromolecules (i.e., enzymes, storage proteins, and nucleic acids), and whole-plant physiology.

Required Courses
BOT 331. Plant Physiology (5)
BOT 413. Plant Anatomy (4)
Select two of the following:
BOT 433. Hormonal Regulation of Plant Growth and Development (3)
CSS 305. Principles of Soil Science (5)
HORT 416. Plant Nutrition (4)

Specialization and Breadth Courses
Eleven to fourteen credits approved by option faculty and research mentor.

SUSTAINABLE ECOSYSTEMS OPTION

Sustainable Ecosystems research addresses the sustainability of crop, forest, rangeland, wildlife, fishery, and native ecosystems. The programs aim to define and develop natural and managed ecosystems in which environmental soundness is a result of the conscientious interaction of human beings with

wildlife and other components of the systems. Innovative links among scientific and humanistic disciplines will bring about increased understanding of the present and future health of natural and managed ecosystems and associated human communities. Thus the research is multi-disciplinary; insights from sociology, political science, anthropology, or philosophy may be combined with basic concepts from biology, chemistry, and physics to support research rooted in agricultural, forestry, rangeland management, or wildlife management. Students will acquire perspective by choosing among a broad variety of courses, and will participate in field, laboratory, or systems-analysis projects.

Required Courses
BI 370. General Ecology (3)
BI 371. Ecological Methods (3)
ANTH 481. Natural Resources and Community Values (3) or PHL 440. Environmental Ethics (4)
PS 475. Politics of Environmental Problems (4)
Select one of the following:
- ANTH 482. World Food and Cultural Implications (3)
- BA 463. Family Business Management (4)
- CSS 480. Crop Systems and Decision-Making (4)
- FS 450. Integrated Forest Protection (4)
- FW 325. Global Crises in Resource Ecology (3)
- NFM 415. Global Food Resources and Nutrition (3)
- RNG 421. Rangeland Improvements and Restoration (4)
- RNG 477. Agroforestry (3)
- Z 348. Human Ecology (3)

Specialization Courses
Eleven to fourteen credits approved by option faculty and research mentor.

TOXICOLOGY OPTION

Toxicology concerns itself with potentially hazardous chemicals in our food and feed supply, and in our environment. Toxic chemicals include not only pesticides and herbicides, but compounds that exist naturally as basic components of edible plants, those that contaminate foods as a result of fungal growth, and even some that are produced in the preparation and cooking of foods. Potential health effects from toxin exposures can range from immediate impairment of breathing or nerve function to chronic diseases, cancer, birth defects, and immune disorder. Toxicological research focuses on understanding mechanisms by which such compounds exert toxicities, on attempting to more clearly understand the human and environmental risks from given levels of exposure, and on identifying acceptable means for reducing risks. Students will acquire laboratory skills in applied biochemistry and molecular, cellular, and organismic biology.

Required Courses
AC 430. Chemical Behavior in the Environment (3)
AC 450. Environmental Toxicology (3)

Specialization and Breadth Courses
Twenty-three credits approved by option faculty and research mentor.

COURSES

BRR 100. GREAT EXPERIMENTS IN BIORESOURCE SCIENCES (1). Examples of how the scientific method has been applied to answer major research questions of direct relevance to the biological and physical resource sciences.

BRR 401. RESEARCH (1-16).

BRR 403. ^THESIS (1-16). (Writing Intensive Course)

BRR 406. PROJECTS/DATA PRESENTATION (1). Methods of effectively communicating hypotheses, results and conclusions of biological studies are covered in lecture format and then utilized in student presentations.

BRR 407. SEMINAR (1).

EARTH INFORMATION SCIENCE AND TECHNOLOGY (EIST)

A. Jon Kimerling
(Geosciences)
Wilkinson 257
Oregon State University
Corvallis, OR 97331
(503) 737-1225

Ward W. Carson
(Forest Resources)
Peavy 275
Oregon State University
Corvallis, OR 97331
(503) 737-4451

Robert J. Schultz
(Civil Engineering)
ECE 215
Oregon State University
Corvallis, OR 97331
(503) 737-4579

Undergraduate Minor

Earth Information Science and Technology
Option
Earth Information Science and Technology

Graduate Minor

Earth Information Science and Technology

UNDERGRADUATE MINOR

The undergraduate Earth Information Science and Technology minor is designed to give students a basic understanding of four component fields—geographic information systems (GIS), remote sensing, cartography, and surveying—while allowing advanced study in a particular field. The EIST minor may be attractive to students interested in geoscience, forestry, environmental science, natural resources, bioresource engineering, civil engineering, and other students needing a strong background in these fields. Civil Engineering students completing the surveying track minor will be prepared to take the Fundamentals of Land Surveying (FLS) examination.

The EIST minor is offered by three participating departments—civil engineering, forest resources, and geosciences—for their own majors and students from other departments. Courses have been coordinated so that students completing the required core courses will be able to take any of the advanced courses, provided the mathematics and/or physics requirements of each have been met. Interested students should contact the appropriate participating department, where an adviser will be assigned.

Contact A. Jon Kimerling, Department of Geosciences, 257 Wilkinson Hall, (503) 737-1225 for information.

Required Core Courses
GEO 360. Cartography (4)
CEM 263, FE 210 or CE 361. Surveying (3)
FOR 220, GEO 418, or CE 466. Photo Interpretation (3)
GEO 444. Remote Sensing (3)
GEO 465. Geographic Information Systems (3)
Minimum mathematics: MTH 112 or equivalent high school course, ST 201, ST 202, or ST 351, ST 352.

Advanced Courses
Four upper division courses selected from the following:
CE 365. Highway Location and Design (3)
CE 461. Photogrammery (3)
CE 463. Control Surveying (4)
CE 465. Oregon Land Survey Law (3)
CE 469. Property Surveys (3)
FOR 420. Advanced Air Photos and Remote Sensing (3)
FOR 421. Advanced GIS Applications in Forestry (3)
GEO 460. Map Design and Production (4)
GEO 462. Field Research Techniques (4)
GEO 445. Computer-Assisted Cartography (3)
GEO 466. Digital Image Processing (3)

The four advanced courses may be in one of several tracks, with the exact courses to be taken determined in consultation with the student's faculty adviser. Typical tracks are listed below, but many other combinations are possible.

Cartography
CE 461, GEO 460, GEO 445, GEO 466, or GEO 462
Remote Sensing
CE 461, F 420, F 421, GEO 466
Geographic Information Systems
CE 469, F 420 or GEO 466, F 421, GEO 445
Surveying
CE 461, CE 463, CE 465, CE 469

UNDERGRADUATE OPTION

(21 credits, including 15 upper division)

Students electing the undergraduate option must take the required core courses listed for the undergraduate minor, plus two advanced courses from the above list. The two advanced courses are selected in consultation with a faculty adviser to best meet the student's professional interests.

GRADUATE MINOR

REQUIRED CORE COURSES

CE 566/GEO 518. Photo Interpretation (3)
GEO 544. Remote Sensing (3)
GEO 565. Geographic Information Systems (3)

ADVANCED COURSES

Two advanced courses from the following, as determined in consultation with the student's graduate adviser. These courses, plus the minor core, must form a coherent minor program.

BRE 583. Adv Digital Image Analysis (4)
CE 561. Photogrammetry (3)
CE 563. Control Surveying (4)
CE 565. Oregon Land Survey Law (3)
CE 569. Property Surveys (3)
FOR 520. Adv Air Photos and Remote Sensing (3)
FOR 521. Adv GIS Applications in Forestry (3)
FS 691. Use of Remote Sens in Land Ecol (2)
GEO 559. GIS Applications (3)
GEO 560. Map Design & Production (4)
GEO 562. Field Research Techniques (4)
GEO 545. Computer-Assisted Cartography (3)
GEO 566. Digital Image Processing (3)
OC 678. Satellite Oceanography (3)

ENVIRONMENTAL SCIENCES

Patricia Muir, Program Director
2088 Cordley Hall
Oregon State University
Corvallis, OR 97331-2902
(503) 737-2404

Undergraduate Major
Environmental Sciences (B.S.)
Minor
Environmental Sciences

Environmental Sciences consists of curricula that foster interdisciplinary education for students seeking to better understand earth systems. The undergraduate curriculum leads to a B.S. degree in Environmental Science and requires students to complete courses that develop a broad base of knowledge in basic science disciplines, social sciences, and an area of specialization. A minor in Environmental Sciences is also available for those undergraduate students completing their degrees in other fields. The theme of the Environmental Science program is central to the mission of OSU and reflects the strengths of OSU and other agencies and institutions in Corvallis and throughout the State of Oregon. The B.S. degree in Environmental Science provides excellent training for careers with agencies responsible for environmental protection and natural resource use, consulting firms, and those seeking opportunities for graduate studies.

MAJOR CURRICULUM

The Environmental Sciences degree requires credits in five categories: 48 credits of baccalaureate core; 70 credits of basic science, humanities and skills core; 25-26 credits of environmental sciences and humanities; 27-31 credits of specialization; and 32-37 credits of elective courses.

BACCALAUREATE CORE (48)

The University Baccalaureate Core Course (BCC) requirement is met with 48 credits and a writing intensive course (WIC). The Environmental Sciences student satisfies the general education requirement by selecting 27 unrestricted credits from the general list of approved courses and 21 credits from a restrictive list of BCC courses which simultaneously satisfy requirements for the Environmental Sciences major. The WIC and Synthesis requirements are satisfied by courses in the Environmental Sciences and Humanities Core. Courses shown with an asterisk (*) below are to be chosen from the list of Basic Science, Humanities and Skills Courses.

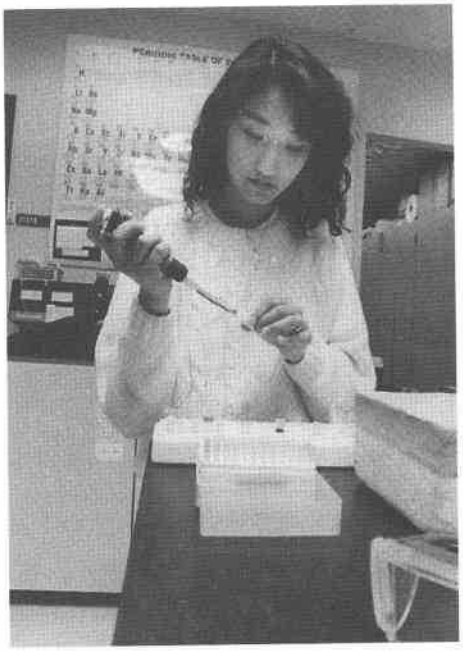
Skills (15)
Writing I (3)
Writing II (3)
Writing III/Speech (3)
Mathematics (MTH 105 or higher level mathematics) (3)
Fitness (3)
WIC (within major)

Perspectives (27)
*Physical science with lab (4)
*Biological science with lab (4)
*Choice of biological or physical science with lab (4)
Western Culture (3)
Cultural Diversity (3)
Literature and the Arts (3)
Social Processes and Institutions (3)
Difference, Power, and Discrimination (3)

Synthesis (6)
One course in Science, Technology and Society and one in Contemporary Global Issues, chosen from list of approved courses under "Humans and the Environment," below.

BASIC SCIENCE, HUMANITIES AND SKILLS CORE (70)
Basic Sciences (50)
BI 211, BI 212, BI 213 (12)
CH 221, CH222, CH223 or CH 121, CH122, CH123, CH 219 (15)
MTH 251, MTH 252 (8)
PH 201, PH202, PH 203 or PH 211, PH 212, PH 213 (15)

Social Science and Humanities (10)
EC 201, EC 202 (6)
PHL 205 (4)



Technical Skills (10)
ST 201, ST 202 or higher (6)
CS 101 or higher (4)

ENVIRONMENTAL SCIENCES AND HUMANITIES CORE (25-26 + WIC)
Natural Environmental Systems (13-14)
BI 370 (3)
GEO 202 or CSS 305(4-5)
OC 311 (3)
ATS 210 (3)

Humans and the Environment (12 or more)
GEO 321, HSTS 416, HSTS 421, HST 481 or SOC 456 (3-4)
ANTH 481, H 491, PHL 440, PHL 443, PS 474, PS 475 or PS 476 (3-4)
AREC 351, FOR 365, GEO 300, GEO 350, GEO 422, PH 313 or RNG 468 (3-4)
BI 301, BI 333, BI/BOT 489, CE 356, CH 374, FW 325, H 344, H 441 or Z 348 (3)

Writing Intensive course
Choose one course from approved list (available from Program Director or advisers).

SPECIALIZATION AREA (27-31)

This requirement can be met by completing an approved minor from a participating program in the environmental or closely related sciences, choosing an approved option, or working with advisers to develop an innovative course cluster to analyze environmental systems.

Approved minors are: agricultural business management, agricultural economics, botany earth information science and technology, entomology, environmental geosciences, environmental health, fisheries and wildlife, forest recreation resources, horticulture, insect pest management, international agricultural economics, oceanography, political science, rangeland resources, resource economics, sociology, soil science, and zoology. Approved options in environmental sciences include: aquatic biology, aquotic chemistry, aquatic physics, atmospheric processes, environmental

chemistry, environmental engineering, environmental policy, forest ecology, ocean-atmosphere-land systems, and terrestrial ecosystems.

ELECTIVE COURSES (32-37)
These courses are unrestricted.

OBSERVATIONAL EXPERIENCE REQUIREMENT (3)
The program must contain at least one course, internship or research experience which provides opportunities for hands-on experience in design and collection of observations in the physical , biological or social environment. Students are urged with work with advisers at an early stage in their study to identify courses or experiences which are appropriate.

MINORS

The minor in Environmental Sciences is available to students from all departments and programs at Oregon State University. A year of physical sciences, general biology, and one course each in calculus and statistics are prerequisites. The 28-29 credits required for the minor are in addition to the credits required for the student's major. Course substitutions must be selected in consultation with an environmental sciences adviser; substitutions must cover material in the same course category (natural environmental systems or humans and the environment) at a similar or higher level.

Natural Environmental Systems (13-14)
BI 370. Biosphere (3)
GEO 202 or CSS 305. Lithosphere (4-5)
OC 331. Hydrosphere (3)
ATS 210. Atmosphere (3)

Humans and the Environment (15)
HSTS 416, HSTS 421 or SOC 456. History of Science and Society (3)
PHL 440, PS 474 or PS 475. Environmental Ethics and Politics (3)
F 415, FW 251 or GEO 300. Conservation and Management (3)
BI 301, H 344 or Z 348. The Human Environment (3)
BI 333 or BI 489/BOT 489. Problem Analysis (3)

NATURAL RESOURCES

Bo Shelby, Director
Peavy Hall 113
Oregon State University
Corvallis, OR 97331-5703
(503) 737-4951

Undergraduate Major

Natural Resources (B.S.)
Specialties:
Natural Resource Administration/Finance
Agroforestry
Aridland Ecology
Resource Policy
Recreation Ecosystem Planning
Geosciencews and Natural Resources
Natural Resource Education
Water Conservation and Utilization
Water Quality
Other specialities are possible

Graduates in Natural Resources will have an understanding of a broad range of natural resource problems. The program is a broad-based curriculum involving studies from the Colleges of Agricultural Sciences, Forestry, Liberal Arts, and Science, organized around a natural resources theme. This degree will give students the ability to work with issues and experts in a variety of resource fields, and the capability to deal with social and political components of resource management.

MAJOR CURRICULUM

The Natural Resource degree requires all students to complete a minimum number of credits in three areas: 51 credits of core courses, 21 credits of breadth requirements, and 50 credits of specialty.

CORE REQUIREMENTS (48)
Students must satisfy the University Baccalaureate Core Requirements (48 + WIC), *plus* the Natural Resources Core which is listed below.
MTH 112, or MTH 241, or MTH 251. Mathematics (4)
BI 101, BI 102, BI 103. Biology (12)
ST 351, ST 352. Statistics (8)
BI 370. General Ecology (3)
FE 430, RNG 355, OC 331, or OC 332. Water Science (3)
CSS 105, GEO 101, or GEO 202. Earth Science (3)
ATS 210, Atmospheric Science (3)
PS 474, RNG 490, or F 415. Natural Resource Policy (4)
FOR 434, AREC 351, or FOR 462. Resource Economics (4)
FOR 455. Natural Resource Decision Making (3)
Seminars in Natural Resources (1 credit per year) (4)
EC 213. Microeconomics (3)
ST 351, ST 352. Statistics (8)
Computer Intensive Course (May simultaneously meet other degree requirements.)
NOTE: Particular specialty programs may specify additional core courses to assure that students meet prerequisites for specialty courses, or develop background in fields important for the specialty of study. **Students should not assume that the core courses listed above include all of the necessary background in science or math for every specialty.** Consult specialty advisers for details.

BREADTH REQUIREMENTS (21)
Students must complete one upper division course from each of the following groups:

Fisheries & Wildlife (3)
FW 320. Population Dynamics (4)
FW 321. Fisheries and Wildlife Resource Ecology (3)
FW 451. Biology of Game Birds (5)
FW 454. Fisheries Biology (5)
FW 458. Management of Big Game Animals (4)
FW 465. Marine Fisheries (4)
FW 473. Fish Ecology (4)
FW 481. Wildlife Ecology (3)
FW 485. Wildlife Behavior (4)
FS 451. Managed Forests and Wildlife Interactions (4)

Range (3)
RNG 347. Arid Land Biomes (3)
RNG 350. Grass Ecosystems (3)
RNG 421. Rangeland Improvements & Restoration Ecology (4)
RNG 436. Fire Ecology (3)
RNG 441. Rangeland Analysis (4)

Forestry (3)
FOR 341. Forest Ecology (5)
FOR 415. Forest Policy (4)
FOR 431. Silviculture Principles (3)
FS 450. Integrated Foresty Protection (4)

Resource Values/Philosophy (3)
PHL 440. Environmental Ethics (3)
PHL 443. Values and Human Ecology (3)
PHL 445. World-Views, Values, and Contemporary Global Issues (3)
ANTH 481. Natural Resources and Community Values (3)
ANTH 482. World Food and the Cultural Implications of Development (3)
GEO 420. Geography of Resource Use (3)

Social and Political (3)
PS 474. Bureaucratic Politics and Policy[2] (4)
PS 475. Politics of Environmental Policy (4)
PS 476. Science and Politics (4)
PS 472, 473. Public Administration (4, 4)
PS 452. Alternative International Futures (4)
HST 368. Environmental History of the U.S. (3)
HST 421. Technology and Change (4)
BA 432. Environmental Law: Water and Air (4)
SOC 456. Science and Technology in Social Context (3)
SOC 475. Rural-Urban Sociology (3)

Land and Water (3)
CSS 425. Sustaining Soil Productivity (3)
CSS 475. Agricultural Management of Oregon Soil Resources (2)
CSS 485. Environmental Applications of Soil Science (4)
RNG 355. Desert Watershed Management (3)
RNG 455. Riparian Ecology & Management (3)
GEO 306. Earth Resources & Hazards (3)
GEO 423. Land Use (3)
GEO 424. Water Resources Geography (3)
GEO 425. Water Resources Management in U.S. (3)

Amenity Uses of Natural Resources (3)
FOR 321. Recreation Behavior and Management (4)
FOR 342. Wilderness Management (3)
FOR 344. Amenity Resource Management (3)
FOR 439. Forest Resource Plan and Decisionmaking (4)
FOR 440. Cultural Resources Planning (3)
FOR 443. Tourism and Outdoor Recreation (3)
FOR 451. Ecological Aspects of Park Management (3)
FOR 493. Environmental Interpretation (4)

SPECIALTY REQUIREMENTS (50)
The Specialty is a preapproved set of courses organized around a natural resource theme from at least three departments with no more than 25 credits from one department. In cases where separate curricular programs are housed within a single department, the credit limit applies to the program's courses, not the department's.

Optionally, a student may propose a set of courses around a natural resource theme and seek approval of the Natural Resources Program Committee. This option is intended to allow for degree paths not anticipated by preapproved specialty course lists. Student proposed specialties must meet the three department criterion. All proposals are submitted to the Natural Resources Program Committee.

Minimum upper division credits: 60
Total number of credits required: 192

INTERNATIONAL DEGREE

John Van de Water, Dean
Office of International Education
Snell Hall 444
Oregon State University
Corvallis, OR 97331-1642
(503) 737-3006

Undergraduate Major

International Studies (B.A.)

Oregon State University offers a unique undergraduate International Degree that is designed to prepare students in all disciplines for our increasingly integrated world. Unlike traditional international studies departments, the International Degree enables students to study a specific field and then add an international component. The course of study includes general international courses and international content courses in the student's major, foreign language study, and an experience overseas.

This baccalaureate degree is obtainable only in conjunction with another undergraduate degree offered by the University. For example, a student could earn both a B.S. in Forestry and a concurrent or subsequent B.A. in International Studies in Forestry. Undergraduate students in any major are eligible for the program.

Students must meet the following requirements to apply for admission:

- A minimum 2.75 cumulative GPA after completing at least 32 credits of college-level courses in good standing within the department and the University.
- Proficiency in a foreign language equivalent to that attained by the end of a second-year language sequence at OSU.
- Any additional requirements established by the major department.

LANGUAGE ENTRANCE REQUIREMENTS

To be admitted, students must provide evidence of proficiency in a foreign language by completing one of the following:

- Four or more years of consecutive study of the same foreign language at the high school level preceding admission to Oregon State University.
- AP College Board test in a foreign language with a score of 4 or 5.
- Completion of the third term of a second-year foreign language sequence at OSU or at another accredited university with a GPA of 3.00 or better. This course must constitute a minimum of 4 quarter or 3 semester credits.
- One term of a third-year foreign language course (any course designated 311, 312 or 313) at OSU or another accredited university with a GPA of 3.00 or better. This course must constitute a minimum of 3 quarter or 2 semester credits.

A foreign student whose native language is not English who wishes to use English to satisfy the foreign language entrance requirement, will have satisfied the requirement upon admission to OSU.

Students who change majors after admission to the International Degree Program must reapply for admission to the International Degree Program in the new department. Those pursuing two degrees in addition to the International Degree, need apply to only one department.

GENERAL INTERNATIONAL DEGREE REQUIREMENTS

All departmental, college, and institutional requirements for the primary degree must be completed successfully.

Students must complete at least 32 credits in residence beyond the minimum 180-192 credits required for the primary degree. Courses taken through an OSU-sponsored study abroad program are considered in-residence credits. Depending on the level of previous foreign language study and experience abroad, students may need to earn a minimum of 32 credits or a maximum of 70+ additional credits.

Additional International Degree requirements may be established by the primary department. Students should check with their adviser.

ADDITIONAL BACCALAUREATE CORE COURSES

Students must include in the 32 extra credits the successful completion of a minimum of four courses selected from the Baccalaureate Core Curriculum. *These courses are in addition to the University's Baccalaureate Core requirements. (See the current* Schedule of Classes *for the most up-to-date list.)*

Western Culture (2-4)
Select one course from the following:

AIHM 379, 380. The Built Environment of Western Cultures (3,3)
ART 204, 205, 206. Intro to Art History–Western (4, 4, 4)
EC 319. Economic History & Development of the U.S. (3)
ENG 110. Introduction to Film Studies (3)
ENG 125. Film comedy (3)
ENG 201, 202, 203. Shakespeare (3, 3, 3)
ENG 204, 205, 206. Survey of English Literature (3, 3, 3)
ENG 207, 208, 209. Literature of Western Civilization (3, 3, 3)
ENG 215. Mythology (3)
ENG 253, 254, 255. Survey of American Literature (3, 3, 3)
ENG 317, 318, 319. The American Novel (3, 3, 3)
ENG 368. Homer and Company: The Epic Tradition (3)
FR 331, 332, 333. French Culture and Society Since the Revolution (3, 3, 3,)
FW 201. Nature and the Western Mind (3)
GEO 106. Geog of the Western World (3)
GEO 326. Geography of Europe (3)
GEO 329. Geog of the U.S. and Canada (3)
GER 331, 332. German Culture (3,3)
HST 101, 102, 103. History of Western Civilization (3, 3, 3)
HST 201, 202, 203. History of the United States (3, 3, 3)
HST 260, 261, 262. American Lives (2, 2, 2)
MUS 102. Sound and Silence (3)
PHL 150. Great Ideas of Philosophy (3)
PHL 201. Introduction to Philosophy (4)
PHL 205. Ethics (4)
PHL 207. Political Philosophy (4)
PHL 220. World Views and Values in the Bible (4)
PHL 221. World Views and Values, New Testament (4)
PHL 230. Christianity & Western Culture (4)
PHL 301, 302, 303. History of Western Philosophy (4, 4, 4)
PHL 360. Philosophy and the Arts (4)
PHL 365. Law in Philosophical Persp (4)
PS 206. Introduction to Political Thought (4)
RUS 331, 332, 333. Russian Culture (3, 3, 3)
SPAN 331, 332, 333. The Culture of Spain and Portugal (3, 3, 3)
SPAN 336, 337, 338. Latin American Culture (3, 3, 3)
TCS 200. Twentieth Century American Realities (3)
TCS 201. Twentieth Century American Dreams (3)

Cultural Diversity (6-8)
Select two courses from the following:

ANTH 210. Comparative Cultures (3)
ANTH 311, 313, 314, 315, 316, 317, 318, 319. Peoples of the World (3 each)
ART 207. Indigenous Art of the Americas (3)
CHN 331, 332, 333. Chinese Culture (3, 3, 3)
ENG 210, 211, 212. Literature of Non-European Civilization (3, 3, 3)
ENG 360. Native American Literature (3)
GEO 105. Geography of the Non-Western World (3)
GEO 325. Geography of Africa (3)
GEO 327. Geography of Asia (3)
GEO 328. Geography of Latin America (3)
HST 320. Ancient Near East (4)
HST 350,351. Modern Latin America (4,4)
HST 381,382. History of Africa (4,4)
HST 387, 388, 389. History of the Middle East (3, 3, 3)
HST 391,392. East Asia (4,4)
JPN 331, 332, 333. Japanese Culture (3, 3, 3)
MUS 108. Musical Cultures of the World (3)
NFM 216. Food in Non-Western Culture (3)
PHL 160. Quests for Meaning: World Religions (4)
PHL 311, 312, 313. History of Non-Western Religious Ideas (3-4 each)

PHL 371. Philosophies of China (4)
PHL 372. Philosophies of India (4)
PHL 373. Philosophies of Japan (4)
RUS 331, 332, 333. Russian Culture (3)

Additional Course (3-4)
Select one course from:
The Western Culture, Cultural Diversity, and/or Contemporary Global Issues categories that does not focus on the same culture(s) used in meeting the requirement in the Western Culture or Cultural Diversity group above

Contemporary Global Issues
ANTH 380. Cultures in Conflict (3)
ANTH 482. World Food & the Cultural Implication of International Agricultural Development (3)
ANTH 483. Medical Anthropology (3)
ANTH 484. Wealth & Poverty (3)
ANTH 487. Language in Global Context (3)
ANTH 488. Business & Asian Culture (3)
AREC 351. Natural Resource Management (4)
AREC 433. International Agricultural Development (4)
AREC 461. Ag and Food Policy Issues (4)
BA 330. The Global Environment of Business (3)
BA 475. System Thinking (3)
ENG 414. Criticism, Culture, and World Community (3)
ENG 416. Power and Representation (3)
ENG 498. Women and Literature (3)
FOR 365. Issues in Natural Resources Conserv (3)
HDFS 471. The World Consumer (3)
FW 325. Global Crises in Resource Ecology (3)
GEO 300. Environmental Conservation (3)
GEO 350. Population Geography (3)
GEO 411. Develop of Geologic Thought (3)
BI 301. Human Impacts on Ecosystems (3)
H 312. Aids & Sexually Transmitted Diseases in Modern Society (3)
HDFS 450. Families & Quality of Life in the Developing World (3)
HST 317. Why War? A Historical Perspective (4)
NFM 415. Global Food Resources and Nutr (3)
PHL 443. Values and Human Ecology (3)
PS 345. The Politics of Developing Nations (4)
RNG 468. International Rangeland Resource Management (3)
TCS 300. World Community in the Twentieth Century: Development (3)
TCS 301. World Community in the Twentieth Century: Underdevelopment (3)
WS 480. International Women (3)

Foreign Language Requirements

Students must demonstrate advanced level achievement or proficiency in a single foreign language in one of the following ways:

- Completion of a fourth-year foreign language sequence (designated 411, 412, 413) at OSU with a minimum 3.00 GPA.
- Completion of a fourth-year foreign language sequence at another accredited university with a minimum 3.00 GPA, in a program in which the combined third-year and fourth-year language courses constitute a minimum of 18 quarter or 12 semester credits.
- Completion of a minimum of 9 quarter (6 semester) credits with a minimum 3.00 GPA, at Oregon State University or another accredited university, of any 400-level course work (in any discipline) taught in a foreign language, if approved by the student's primary degree department.
- Demonstration of end of fourth-year level proficiency in a foreign language by successful completion of an achievement test administered by the Department of Foreign Languages and Literatures at OSU.
- Demonstration of oral proficiency in a foreign language as evidenced by an oral proficiency test administered by a certified foreign language proficiency tester, with the following Georgetown Language Roundtable Rating (used by the Defense Language Institute and the Foreign Service Institute): Romance Languages, Superior; Germanic and Slavic Languages,Advanced Plus; Other Languages, Advanced.
- For languages not offered at OSU, the requirement may also be completed by a minimum of nine-months' residency (study, research, work), after fulfilling the foreign language entrance requirement, in a country in which the language is spoken.

Ten Weeks Abroad

Students must spend a minimum of 10 weeks in another country engaged in one of the following:

- A study-abroad program offered by OSU, another university, or a program designed by the student. Programs administered by other universities or those designed by students must be approved by the Coordinators of the International Degree. Currently OSU has University-sponsored programs in 20 countries.
- An international internship or work program which receives academic credit.
- A pre-approved research project abroad.
- Previous international experience such as the Peace Corps approved by the primary academic department.

Senior Project

The final requirement for the degree is to prepare a rigorous and integrative senior project, such as a thesis or research project, that demonstrates a fundamental and comprehensive understanding of global issues and of the international dimensions of the primary degree.

AGRICULTURE

Graduate School
AdS A300
Oregon State University
Corvallis, OR 97331-2121
(503) 737-4881

Graduate Major
Master of Agriculture (M.Agr.)

See the Graduate School section of this catalog.

AMERICAN STUDIES

David Robinson, Director
Moreland Hall 224
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(503) 737-1641

Undergraduate Major
American Studies (B.A., B.S.)
Options
Ethnic Studies
Women Studies

See the College of Liberal Arts section of this catalog.

GERONTOLOGY

Clara C. Pratt, Director
Milam 321
Oregon State University
Corvallis, OR 97331-5102
(503) 737-4765

Certificate Program
Gerontology
Graduate Minor
Gerontology

See the College of Home Economics and Education section of this catalog.

INTERDISCIPLINARY STUDIES

Graduate School
AdS A300
Oregon State University
Corvallis, OR 97331-2121
(5030737-4881

Master of Arts
Interdisciplinary Studies (M.A.I.S.)

See the Graduate School section of this catalog,

LATIN AMERICAN AFFAIRS

Robert Kiekel, Director
Kidder Hall 224
Oregon State University
Corvallis, OR 97331-4603
(503) 737-3940

Certificate Program
Latin American Affairs

See the College of Liberal Arts section of this catalog.

PEACE STUDIES

C/O Speech Communication
Shepard Hall 104
Oregon State University
Corvallis, OR 97331-6199
(503) 737-2461

Faculty
Associate Professor Gregg Walker

Certificate Program
Peace Studies

See the College of Liberal Studies section of this catalog.

PLANT PHYSIOLOGY

Graduate School
AdS A300
Oregon State University
Corvallis, OR 97331-2121
(503) 737-4881

Graduate Major
Plant Physiology (M.S., Ph.D.)

See the Graduate School section of this catalog.

RUSSIAN STUDIES

Vreneli Farber, Director
Kidder Hall 34
Oregon State University
Corvallis, OR 97331-4603
(503) 737-3957

Certificate Program
Russian Studies

See the College of Liberal Arts section of this catalog.

SCIENCE, TECHNOLOGY, AND SOCIETY

Paul Farber, Director
Milam Hall 306
Oregon State University
Corvallis, OR 97331
(503) 737-1273

Certificate Program
Science, Technology, and Society

See the College of Liberal Arts section of this catalog.

SCIENTIFIC AND TECHNICAL COMMUNICATION

Simon Johnson, Director
Moreland Hall
Oregon State University
Corvallis, Oregon 97331-5302
(503) 737-0650

Graduate Major
Scientific and Technical Communication (M.A., M.S.)

Minors
Communication Studies
Technical Field
Writing Education

See the College of Liberal Arts section of this catalog.

TOXICOLOGY

Graduate School
AdS A300
Oregon State University
Corvallis, OR 97331-2121
(503) 737-4881

Graduate Major
Toxicology M.S., Ph.D

See the Graduate School section of this catalog.

TWENTIETH CENTURY STUDIES

Center for the Humanities
Oregon State University
811 S.W. Jefferson Ave.
Corvallis, OR 97333-4506
(503) 737-2450

Certificate Program
Twentieth Century Studies

See the College of Liberal Arts section of this catalog.

WOMEN STUDIES

Janet Lee, Director
Social Science Building 200
Oregon State University
Corvallis, OR 97331-6208
(503) 737-2826

Faculty
Associate Professor Lee
Program faculty in departments throughout the university.

Certificate Program
Women Studies

See the College of Liberal Arts section of this catalog.

The College of Agricultural Sciences performs four vital services—instruction, research, extension, and international agriculture—which are closely tied to the human and natural resources of the state of Oregon and which support the economic development of the state and of the Pacific Northwest.

The Student Advancement Office administers educational programs to serve the needs of individuals interested in pursuing careers in environmental and resource management; animal, plant and food systems; agribusiness and economics; agriculture; international education; and research. The college offers a B.S. degree at the undergraduate level. The faculty realizes the importance of individual aims and abilities and, through course work, internships, advising, and extracurricular activities, tries to help each student discover and develop social, aesthetic, and ethical values as well as professional competence.

Students choose their majors from among the curricula of the Departments of Agricultural Education and General Agriculture, Agricultural and Resource Economics, Animal Sciences, Bioresource Research, Crop and Soil Science, Fisheries and Wildlife, Food Science and Technology, Horticulture, Preveterinary Medicine, and Rangeland Resources.

In cooperation with the College of Science, degrees are offered in the Departments of Botany and Plant Pathology, Entomology, Microbiology, and Statistics. The M.S. and Ph.D. degrees in Bioresource Engineering are offered through the College of Engineering but are administered by the Department of Bioresource Engineering in the College of Agricultural Sciences.

Most departments offer the Master of Agriculture (M.Agr.), Master of Science (M.S.) and the Ph.D. degrees and participate in the Master of Arts in Interdisciplinary Studies (M.A.I.S.) degree program.

International Degree

Undergraduates with majors in the College of Agricultural Science can earn a second degree in International Studies. (See the Interdisciplinary Studies section of this catalog for more information.)

High School Preparation

Advances in technology and sciences in agriculture make the study of physical, biological, and social sciences and communications a vital necessity. High School Agricultural Science and Technology (AST) courses also help prepare students for college. The following preparation in high school is strongly recommended for students who plan to major in agriculture: English, 4 units; mathematics, 3 units; physics, chemistry, and biology, 1 unit each; social studies, 3 units; and other college preparation, 2 units (including AST).

Individual Advising

Each student is considered an important individual. His or her study program is developed in personal consultation with a faculty adviser in the department in which the student has expressed a major interest. As early as possible, students select a subject area and become associated with instructors and other students having similar interests. Initial or early advising is based upon the student's high school record and placement test scores. When preparation is found to be inadequate, the student is encouraged to enroll in courses providing the education, training, and experience necessary to help assure success at the university level, even though such work may require the student to take one or more additional terms to complete a prescribed four-year curriculum.

Minor Programs

Minors are offered through most departments of the College of Agricultural Sciences. Students interested in pursuing a minor must first contact the key adviser in the area of interest and meet the following requirements.

1. The minor must consist of a minimum of 27 designated credits of related course work, including 12 in upper division courses.
2. Courses required for the student's major may not count toward a minor.
3. An individual course may not count toward more than one minor.

Internships

The College of Agricultural Sciences in cooperation with the Cooperative Education Coordinator offers academic credit for supervised work experience. Internships are available in all facets of agriculture, through individual departmental offerings. Applications for internships must be approved prior to placement. Details are available from advisers or from the College of Agricultural Sciences Student Advancement Office.

Job Opportunities

The diverse professional and occupational areas in agriculture include production, processing, and marketing of food and fiber; and management of human and natural resources. Opportunities have expanded.

Graduation Requirements

To be eligible for a Bachelor of Science (B.S.) degree, a student must complete a minimum of 180 credits including:

1. University requirements (see Baccalaureate Core Requirements)
2. Courses in agriculture: 36 credits including 24 credits at the upper division level. Some majors require up to 192 credits.

Scholarships

The College of Agricultural Sciences offers a variety of scholarships to deserving students. Several are reserved for incoming high school or transfer students. Additional information and application forms are available from the Student Advancement Office. For more information see the Scholarship section in the front of this catalog.

Faculty

College of Agricultural Sciences

Thayne R. Dutson, *Dean;* Michael J. Burke,

ADMINISTRATION

Thayne R. Dutson
Dean

Michael J. Burke
Associate Dean

L. J. Koong
Associate Dean

R. Lee Cole
Lead Adviser

Footnotes for this section on page 183.

Associate Dean; L.J. Koong *Associate Dean;* R. Lee Cole, *Lead Adviser*

Research and Extension Centers
Professors Bullock, Chen, Facteau, Hemphill, Klepper, Lannan, Mate, McNeil, Mielke, Miller, Reed, Shock, Smiley, Spotts, Stanger, Ticknor, Vavra, Weber, Westigard; *Associate Professors* Crowe, Langdon, Mobley, Morrisey, Olson, Reno, Rickman, Riedl, Rykbost, Turner, Wilkins, Wysocki; *Assistant Professors* An, Angell, Ball, Clough, DelCurto, Douglas, Dovel, Ganskopp, Miller, Mitchell, Rasmussen, Roseberg, Sampson, Sugar, Svejcar, Sylvia, Van Buskirk, Wysocki, Zwer; *Senior Instructor* Kolding; *Instructors* Hane, Zuzel
Laboratory for Nitrogen Fixation
Associate Professor and Director Arp; *Senior Instructor* Russell; *Research Associates* Ensign, Hyman, Sayavedra-Soto

Extension
Lyla Houglum, *Dean and Director of Extension Service;* Owen Osborne, *Associate Director;* Roger Fletcher, *Associate Director;* Orin Smith, *Program Leader, Community Resources;* Fielding Cooley, *Staff Development Coordinator*

AGRICULTURAL AND RESOURCE ECONOMICS

William G. Boggess, Head
Ballard Extension Hall 213
Oregon State University
Corvallis, OR 97331-3601
(503) 737-2942

Faculty
Professors Adams, Boggess, Buccola, Castle, Cornelius, Eisgruber, Ervin, Johnston, Miller, Obermiller, Rettig, Stevens, Weber; *Associate Professors* Burt, Eleveld, Hanna, Lev, Perry, Polasky, Schmisseur, Tanaka; *Assistant Professors* Diebel, Emami, Greer, Lindsey, Sylvia; *Instructors* Corcoran, Kolbe

Undergraduate Majors

Agricultural and Resource Economics (B.S.)
Agricultural Business Management (B.S.)

Minors

Agricultural Business Management
Agricultural Economics
International Agricultural Economics
Resource Economics

Graduate Majors

Agricultural and Resource Economics (M.S., Ph.D.)
Economics (M.A., M.S., Ph.D.)
Graduate Areas of Concentration
Production Economics
Economics of Development
Food Markets and Trade
Resource and Environmental Economics

The Department of Agricultural and Resource Economics offers two baccalaureate (Bachelor of Science) degrees. They open doors to exciting careers in traditional areas of commercial agriculture, agricultural business management, agricultural policy, and in new career opportunities in natural resource and environmental management, marine resources, international trade and development, and rural growth and change.

The **Agricultural and Resource Economics (AREC)** degree emphasizes development and application of analytical skills to address a broad and diversified spectrum of economic issues in agriculture, natural resources and rural communities. Examples include natural resource management (water, recreation, wildlife, farmland and timber), environmental quality, marine resources, rural poverty, and international trade and development. Flexibility is provided to match program focus with student interest. The degree prepares students for a wide range of careers including public service with federal, state, and local agencies, international groups, and private businesses plus graduate study.

The **Agricultural Business Management (ABM)** degree prepares students for the unique challenges and opportunities in agricultural business careers. The degree combines economic and business principles and their application to farms and ranches, companies processing and marketing farm products, and companies supplying goods and services to farmers and other businesses. The curriculum combines skills in marketing, business management, accounting, and economic analysis with a technical minor from one of eight fields offered within the College of Agricultural Sciences.

CAREERS

Following graduation, majors may pursue a number of attractive career opportunities. Many move directly into professional jobs with agribusiness firms, financial and insurance institutions, agricultural or natural resource management agencies of state and federal government, planning institutions in both the private and public sectors, and the like. Others complete graduate programs, generally with M.S. or M.B.A. degrees.

CURRICULUM

AGRICULTURAL AND RESOURCE ECONOMICS

The curriculum leading to the B.S. degree in agricultural and resource economics is designed to develop the skills of students in agricultural economics, resource economics, economic development, marine economics, international agricultural trade, and in related fields. Along with the baccalaureate core of required courses in the sciences and humanities, students may select a broad range of electives with the help of a faculty adviser. This program provides flexibility to meet a wide variety of educational and career goals.

Baccalaureate Core (48)
Agricultural Core Courses (40)
AREC 101. Orientation to Ag and Resource Econ (1)
AG 111. Computer Apps in Agriculture (3)
AREC 211. Management in Agriculture (4)
AREC 221. Marketing in Agriculture (3)
AREC 311. Intermediate Microeconomic Theory I (3)
AREC 312. Intermediate Microeconomic Theory II (3)
AREC 351. Natural Resource Management (4)
AREC 447. Agrl Price and Mkt Analysis (4)
AREC 461. Agricul and Food Policy Issues (4)
BA 215. Fundamentals of Accounting (4)
Select a minimum of 6 credits from the following:
AREC 370. Agricultural Marketing (3)
AREC 432. Economics of Rural Development (3)
AREC 433. International Ag Development (3)
AREC 441. Ag Financial Management (4)
AREC 442. Ag Business Management (4)
AREC 452. Marine and Fisheries Economics (3)
AREC 477. Econ, Politics, & Government (3)

Communication (3)
Writing (WR 323 or WR 327) (3)

Liberal Arts and Social Sciences (9)
EC 201. Intro to microeconomics (3)
EC 202. Intro to macroeconomics (3)
EC 315. Macroeconomic Theory and Policy (3)

Physical Sciences (16)
MTH 111. College Algebra (4)
MTH 241. Calculus (4)
ST 351. Statistics (4)
ST 352. Statistics (4)

Electives (76)

Total (192)

AGRICULTURAL BUSINESS MANAGEMENT

The B.S. curriculum in agricultural business management blends course work in agricultural economics, business, agricultural sciences, computer science, arts, and humanities so that graduates can respond to the unique challenges and opportunities in agribusiness vocations. Skills are developed in agribusiness finance, agribusiness management, and agribusiness marketing and export trade. Students select a minor within the College of Agricultural Sciences. An internship or project is required to integrate course work with business-oriented experiences.

Baccalaureate Core (48)

Agricultural Core Courses (51)
AREC 101. Orientation to Ag and Resource Econ (1)
AG 111. Computer Apps in Agriculture (3)
AREC 211. Management in Agriculture (4)
AREC 221. Marketing in Agriculture (3)
AREC 311. Intermediate Microeconomic Theory I (3)
AREC 370. Agricultural Marketing or BA 390. Marketing (3-4)
AREC 410. Internship (or AREC 406. Project) (6)
AREC 441. Ag Financial Management (4)
AREC 442. Ag Business Management (4)
AREC 461. Agricul and Food Policy Issues (4)

BA 215. Fundamentals of Accounting (4)
BA 230. Business Law (4)
BA 340. Finance (4)
BA 352. Organizational Behavior (3)

Minors (27-30)
See departmental sections in this catalog for required courses: Agricultural Sciences, Animal Science, Crop Science, Equine Science, Fisheries and Wildlife, Food Science, Food Technology, International Agricultural Development, Horticulture, Poultry Science, Rangeland Resources, Soil Science

Liberal Arts and Social Sciences (6)
EC 201. Intro to Microeconomics (3)
EC 202. Intro to Macroeconomics (3)

Communication (3)
Writing (WR 323 or WR 327) (3)

Physical Sciences (16)
MTH 111. College Algebra (4)
MTH 241. Calculus (4)
ST 351. Statistics (4)
ST 352. Statistics (4)

General and Electives (41)

Total (192)

Minor Programs

Minors in Agricultural Economics, Resource Economics, and Agricultural Business Management are available to any undergraduate student except AREC and ABM majors.

AGRICULTURAL ECONOMICS (27)

Requirements
EC 201. Intro to Microeconomics (3)
EC 202. Intro to Macroeconomics (3)
AREC 211. Management in Agriculture (4)
AREC 221. Marketing in Agriculture (3)
AREC 311. Intermediate Microeconomic Theory I (3)
AREC 461. Agricul and Food Policy Issues (4)

Electives
Select 7 or more credits from the following, subject to approval by the AREC head adviser:
AREC 370. Agricultural Marketing (3)
AREC 433. Intnatl Agrl Development (3)
AREC 441. Agr Finance Management (4)
AREC 442. Ag Business Management (4)
AREC 447. Agrl Price and Mkt Analysis (4)

RESOURCE ECONOMICS (27)

Requirements
EC 201. Intro to Microeconomics (3)
EC 202. Intro to Macroeconomics (3)
AREC 311. Intermediate Microeconomic Theory I (3)
AREC 351. Natural Resource Management (4)
AREC 452. Marine and Fishery Economics (3)
AREC 461. Agricul and Food Policy Issues (4)

Electives
Select 7 or more credits from the following, subject to approval by the AREC head adviser:
AREC 370. Agricultural Marketing (3)
AREC 432. Econ of Rural Development (3)
AREC 447. Agrl Price and Mkt Analysis (4)
EC 315. Intermediate Macroeconomic Theory I (3)
EC 435. The Public Economy (3)
PS 475. Politics of Environmental Problems (4)

AGRICULTURAL BUSINESS MANAGEMENT (28)

Requirements
EC 201. Intro to Microeconomics (3)
BA 215. Fundamentals of Accounting (4)
AREC 211. Management in Agriculture (4)
AREC 221. Marketing in Agriculture (3)
AREC 441. Agricul Financial Management (4)
AREC 442. Agricul Business Management (4)

Electives
Select 6 or more credits from the following, subject to approval by the AREC head adviser:
AREC 311. Intermediate Microeconomic Theory I (3)
AREC 370. Agricultural Marketing (3)
EC 437. Econ Forecstg & Business Conditions Analysis (3)
BA 350. Managing Organizations (4)
BA 352. Organizational Behavior (3)
BA 390. Marketing (4)

INTERNATIONAL AGRICULTURAL ECONOMICS (27)

For departmental undergraduate majors who may be interested in a career in international trade and finance or a career in international development.
AREC 433. Intnatl Agrl Development (3)
EC 440. International Trade Theory & Policy (3)
Foreign language (2nd year) (12)
Approved upper division electives (8)

Graduate Studies

The department offers graduate work leading to the M.S. and Ph.D. degrees in Agricultural and Resource Economics and offers courses supporting the M.Agr. and M.A.I.S. graduate degree programs. The Department also participates in the University Graduate Faculty of Economics to offer the M.A., M.S., and Ph.D. degrees in Economics. Through these programs, the Department strives to develop applied economists who are well trained in economic theory and quantitative methods with specialized research experience in the fields of (a) Production Economics; (b) Resource and Environmental Economics; (c) Economics of Development; and (d) Food Markets and Trade. Opportunities for policy analysis exist in each of these fields of study. The University graduate faculty of economics coordinates the core course work in economic theory and quantitative methods. Detailed information on graduate programs offered by the department and the University graduate faculty of economics is available on request.

Many students who receive the M.S. degree continue their studies towards the Ph.D. degree. Others enter a wide range of occupations, such as positions with the Cooperative Extension Service, U.S. Department of Agriculture, international organizations (such as F.A.S. and U.S.A.I.D.), consulting firms, and state government. Ph.D. recipients take professorial (teaching/research/extension) positions in universities around the world. Others are employed in federal and state agencies.

More detailed information on the M.S. and Ph.D. degree programs may be obtained by contacting the department's graduate program coordinator. Further information on the M.Agr. and M.A.I.S. degree programs may be obtained from the Academic Program Offices of the Colleges of Agricultural Sciences and Liberal Arts, respectively.

Courses

Lower Division

AREC 101. ORIENTATION TO AGRICULTURAL AND RESOURCE ECONOMICS (1). Introduction to department, college, and university programs and to the fields of study in agricultural and resource economics; academic guidance and career planning. PREREQ: Freshman, new major, or minor.

AREC 111. COMPUTER APPLICATIONS IN AGRICULTURE (3). Computer use in agriculture and agribusiness; practical experience with computer progrms applicable to all agricultural disciplines. CROSSLISTED as AG 111.

AREC 211. MANAGEMENT IN AGRICULTURE (4). Economic and business principles applied to the management of agribusiness firms, including farms and ranches; goal-setting and management information; planning and decision-making tools; acquiring, organizing, and managing land, labor, and capital resources. PREREQ: EC 201.

AREC 221. MARKETING IN AGRICULTURE (3). Organization and functions of domestic and international markets; market channels for various agricultural commodities; role of agribusiness, cooperatives, and government in marketing decisions. PREREQ: EC 201.

Upper Division

AREC 311. INTERMEDIATE MICROECONOMIC THEORY I (3). An examination of the theories of consumer behavior and demand, production cost, the firm, supply, and competitive and monopoly market structures. PREREQ: EC 201, EC 202, and MTH 241 or MTH 251. CROSSLISTED AS EC 311

AREC 312. INTERMEDIATE MICROECONOMIC THEORY II (3). Examination of the theories of imperfect competition; input markets, general equilibrium and welfare economics. PREREQ: AREC 311. CROSSLISTED AS EC 312.

AREC 351. *NATURAL RESOURCE MANAGEMENT (4). Application of principles of economics to problems of natural resource use, particularly to current and historical conflicts among water uses in Oregon and other western states: these use include irrigation, hydropower, municipal and industrial, navigation, and fisheries habitat. PREREQ: EC 201, MTH 111.

AREC 352. ENVIRONMENTAL ECONOMICS AND POLICY (3). Analysis of the interrelationships among economic activity, government policies, and the environment; benefits and costs of economic growth; economics of environmental quality and the social costs of pollution. Three to five case studies, selected by the instructor, introduce students to the way economists analyze environmental policies. PREREQ: EC 201. CROSSLISTED as EC 352.

AREC 370. AGRICULTURAL MARKETING (3). Marketing functions; economics of agricultural markets; marketing firms and their services; price determining forces; marketing problems; cooperatives; futures markets. PREREQ: AREC 311.

AREC 401. RESEARCH (1-16).

AREC 402. INDEPENDENT STUDY (1-16).

AREC 403. THESIS (1-16). PREREQ: Senior standing.

AREC 405. READING AND CONFERENCE (0-16).

AREC 406. PROJECTS (1-16).

AREC 407. SEMINAR (1-16). AREC 407 A: Natural Resources and Environmental Policy Issues

AREC 408. WORKSHOP (1-16).

AREC 410. INTERNSHIP (1-6). Graded P. Practical on-the-job training in agricultural business, marketing, commercial agricultural production, or related private or public organizations. PREREQ: Junior or senior standing. Submission and approval of pre-internship work plans. PREREQ: Consent of Internship Program Coordinator.

AREC 432/AREC 532. ECONOMICS OF RURAL DEVELOPMENT (3). Theories of economic change in developed and less-developed economies; natural resource sectors and the development of rural regions, with emphasis on growth, diversification and instability; resource mobility and the spatial aspects of development; poverty and inequality; rural development policy. PREREQ: EC 315. Offered alternate years. Not offered 1995-96.

AREC 433/AREC 533. *INTERNATIONAL AGRICULTURAL DEVELOPMENT (3). Role of agriculture in economic development; theoretical and policy issues in agricultural development; supply of and demand for agricultural resources and products; population pressure on land; value and use of resources; agricultural development policy. PREREQ: AREC 311. Senior or graduate standing. (Bacc Core Course)

AREC 441/AREC 541. AGRICULTURAL FINANCIAL MANAGEMENT (4). Principles of financial management in production agriculture and agribusiness; financial statements, budgets, and capital investment analysis; risk management; legal aspects of borrowing; sources and terms of agricultural credit; taxation. PREREQ: AREC 211; BA 215.

AREC 442/AREC 542. AGRICULTURAL BUSINESS MANAGEMENT (4). Application of economic, business, and management principles to the analysis, planning and organization of agricultural firms; use of analytical tools including mathematical programming and forecasting; marketing, pricing, and competitive strategies; management information systems; decision making under risk and uncertainty. PREREQ: AREC 311 or consent, BA 215.

AREC 447. AGRICULTURAL PRICE AND MARKET ANALYSIS (4). Price determination for agricultural commodities and factors; quantitative analysis of prices, factors and markets; agricultural market structures, performance, and roles of institutions. PREREQ: AREC 311; ST 351; EC 325 or ST 352.

AREC 452. MARINE AND FISHERY ECONOMICS (3). Economic aspects of marine resource utilization and management; the "open access" aspect of marine resources; conflict and allocation of marine resources; marine resource markets. Includes marine recreation, pollution, and aquaculture, with special emphasis on commercial fisheries. PREREQ: AREC 351 or AREC 311. Offered alternate years. Offered 1995-96.

AREC 461/AREC 561. ^AGRICULTURAL AND FOOD POLICY ISSUES (4). Principles of agricultural and food policy formulation; agricultural adjustment processes; agricultural price and income policies in relation to land use, water, and rural development policies; interrelationships among U. S. and foreign agriculture land use, water, and rural development policies; interrelationships among U. S. and foreign agriculture and trade policies. PREREQ: EC 201, EC 202. (Writing Intensive Course)

AREC 477. ECONOMICS, POLITICS, AND GOVERNMENT (3). Why and how governments tax, spend, subsidize, regulate, and deregulate; applications of economic and public choice theory. PREREQ: EC 201, EC 202. CROSSLISTED as EC 477, PS 477.

Graduate

AREC 501. RESEARCH (1-16).

AREC 503. THESIS (1-16).

AREC 505. READING AND CONFERENCE (0-16).

AREC 507. SEMINAR (1-16). AREC 507 A: Natural Resources and Environmental Policy Issues

AREC 508. WORKSHOP (1-16). Application of economics to agricultural and resource problems. Terms and credits to be arranged.

AREC 511. OPTIMIZATION IN ECONOMICS (3). Matrix algebra; application of derivatives, differentials, and the implicit function theorem to comparative statics; unconstrained optimization of functions with single and multiple ariables; constrained optimization. PREREQ: EC 312, MTH 251. CROSSLISTED as EC 511.

AREC 512. MICROECONOMIC THEORY I (3). Economic theories of consumer behavior and demand, production, cost, the firm, supply, and competitive and monopoly market structures. PREREQ: AREC 511. CROSSLISTED AS EC 512.

AREC 513. MICROECONOMIC THEORY II (3). Economic theories of imperfect competition, input markets, general equilibrium and welfare economics. PREREQ: AREC 512. CROSSLISTED AS EC 513.

AREC 519. PRODUCTION ECONOMICS (3). Application of production economics in agricultural and resource economics, including production functions, optimization over time, risk and uncertainty, programming models of the firm and capital budgeting. PREREQ: AREC 512, ST 548 or equivalent.

AREC 525. ECONOMETRIC METHODS (3). The use of multiple regression under generalized assumptions, specification problems, an introduction to simultaneous equation estimation, the classical linear model using matrices. Emphasis on the analysis of data and communication of findings. PREREQ: EC 325 and AREC/EC 511. CROSSLISTED as EC 525.

AREC 526. APPLIED ECONOMETRICS (3). Model building, hypothesis testing, and appropriate estimation procedures including generalized least squares, seemingly unrelated regressions, simultaneous equations, maximum likelihood, and limited dependent variables. Emphasis on applications and interpretation of results. PREREQ: AREC 511 AND AREC 525. CROSSLISTED AS EC 526.

AREC 546. INTERNATIONAL FOOD TRADE POLICY (3). National and world production of and demand for agricultural and marine commodities; trade in these commodities emphasizing causal factors; national and international policies relating to trade in agricultural, aquacultural, and commercial fishing products. PREREQ: EC 440/EC 540. COREQ: AREC 513/EC 513. May not be offered every year.

AREC 550. ENVIRONMENTAL ECONOMICS (3). Historical development of environmental management and environmental economics; economics of environmental pollution, including the concept of economic efficiency, the optimal level of pollution, and alternative pollution control approaches; measuring environmental values and damage, including the contingent valuation methods, revealed preference models, and the transfer of such values; and time, discount rates, uncertainty and sustainable development. PREREQ: AREC/ EC 512.

AREC 551. NATURAL RESOURCE ECONOMICS (3). Brief introduction to welfare economics with emphasis on defining economic efficiency, intertemporal efficiency, and other criteria for economic policy; property rights and natural resource use; sources of inefficient allocation of natural resources; benefit-cost analysis with full and limited information; exhaustible resources; renewable resources; conservation and preservation. PREREQ: AREC 311, EC 311 or equivalent; AREC 312, EC 312 or consent of instructor.

AREC 581. SPECIAL TOPICS (1-3). Graded P. Various topics in agricultural and resource economics of special and current interest not covered in other courses. May be repeated for credit.

AREC 592. AGRICULTURAL CREDIT ANALYSIS (4). Current situation and outlook for development of agricultural lending policies; financial statements and cash flow analysis; tax management; risk management; bankruptcy; forms of business and estate planning; investment analysis, leasing, and marketing strategies. REQ: Consent of instructor. Must be taken in order.

AREC 593. AGRICULTURAL CREDIT ANALYSIS (4). Current situation and outlook for development of agricultural lending policies; financial statements and cash flow analysis; tax management; risk management; bankruptcy; forms of business and estate planning; investment analysis, leasing, and marketing strategies. REQ: Consent of instructor. Must be taken in order.

AREC 601. RESEARCH (1-16).

AREC 603. THESIS (1-16).

AREC 605. READING AND CONFERENCE (1-16).

AREC 607. SEMINAR (1-16).

AREC 608. WORKSHOP (1-16). Application of economics to agricultural and resource problems.

AREC 611. ADVANCED MICROECONOMIC THEORY: PRODUCTION AND CONSUMPTION (3). A rigorous development of the theory of production and consumption behavior, with emphasis on duality. PREREQ: AREC 513, MTH 254. CROSSLISTED AS EC 611.

AREC 612. ADVANCED MICROECONOMIC THEORY: OUTPUT & INPUT MARKETS (3). Competitive, monopoly, and imperfectly competitive input and output market structures; game theory. PREREQ: AREC 611. CROSSLISTED AS EC 612.

AREC 613. ADVANCED MICROECONOMIC THEORY: GENERAL EQUILIBRIUM AND WELFARE (3). A rigorous treatment of general equilibrium and welfare theory; risk, uncertainty, and imperfect information; social choice theory. PREREQ: AREC 612. CROSSLISTED as EC 613.

AREC 617. RESEARCH METHODOLOGY (3). An examination of what constitutes reliable knowledge in economics; philosophy of science and economic research; fundamental economic concepts affecting economic research; quantitative techniques and empirical investigation. PREREQ: Completion of one academic year of graduate work in economics or related field. CROSSLISTED AS EC 617.

AREC 619. ADVANCED PRODUCTION ECONOMICS (3). Extension of theory and applications in production economics, with particular emphasis on the dual approach. Topics include history of production economics, flexible functional forms, technical change, multi-output technologies, stochastic dominance, capital assets. PREREQ: AREC 611, AREC 519 or equivalent. May not be offered every year.

AREC 625. ADVANCED ECONOMETRICS I (3). Statistical foundations of econometrics; the general linear statistical model with autocorrelation and heteroscedasticity; maximum likelihood estimation; hypothesis testing; multicollinearity; errors in variables; asymptotic distribution theory. PREREQ: AREC 526, ST 522. CROSSLISTED AS EC 625.

AREC 626. ADVANCED ECONOMETRICS II (3). Systems of equations; seemingly unrelated regression models; identification and estimation of simultaneous equation models; time series analysis; distributed lag models; forecasting and model evaluation. PREREQ: AREC 625. CROSSLISTED AS EC 626.

AREC 642. AGRICULTURAL AND FOOD MARKETS (3). Allocative efficiency of agricultural and food product markets; market structure and conduct; types of market coordination and their performance; marketing research methods. PREREQ: AREC 513. Offered alternate years.

AREC 643. APPLIED INTERNATIONAL TRADE ANALYSIS (3). Theoretical and empirical approaches to the analysis of international trade in food and fiber products and of related trade, macroeconomic and agricultural policies; interdependencies between international trade and natural resource use. PREREQ: AREC 513, AREC 526, EC 640. Offered alternate year.

AREC 651. ADVANCED NATURAL RESOURCE ECONOMICS (3). Dynamic allocation of scarce exhaustible and renewable natural resources, social versus private decisions; market and non-market considerations; technological change; regulation; dynamics and uncertainty. PREREQ: AREC 513, AREC 526. Offered alternate years. Offered 1995-96.

AREC 652. ADVANCED ENVIRONMENTAL ECONOMICS (3). Interrelationships of natural resource use and the environment; applied welfare and benefit-cost analysis; externalities and pollution abatement; non-market valuation of resources; property rights; legal and social constraints; policy approaches. PREREQ: AREC 513, AREC 526. Offered alternate years. Not offered 1995-96

AREC 663. MATHEMATICAL PROGRAMMING IN APPLIED ECONOMICS (4). Formulation of economic problems as mathematical programming models; linear, nonlinear, and integer programming; solution and interpretation of mathematical programming problems; application to research problems in agricultural and resource economics. PREREQ: ST 581, AREC 511. May not be offered every year.

AREC 681. SPECIAL TOPICS (1). Various topics in agricultural and resource economics of special and current interest not covered in other courses. May be repeated for credit.

AGRICULTURAL CHEMISTRY

Ian Tinsley, Head
Agricultural and Life Sciences 1007
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Corvallis, OR 97331-7301
(503) 737-3791

Faculty

Professors Barofsky, Buhler, Deinzer, Hays, Rohrmann, Tinsley, Wagner, Whanger; *Associate Professors* Dreher, Jenkins, Kerkvliet, Miller, Mosbaugh, Ream; *Assistant Professors* Field, Laramee, Miranda, Pearson; *Research Associates* Chen, Eichinger, Funk, Gilmer, Harwood, Leisy, Reed, Skuzeski, Vendeland, Wang

Major

Agricultural Chemistry (no degree offered)

The Department of Agricultural Chemistry offers both upper division and graduate courses as well as research opportunities in applied chemistry and molecular biology; particular emphasis is given to environmental problems.

The definition and solution of problems associated with the impact of chemical and biological technology on the environment require the application of fundamental concepts in chemistry, toxicology, and molecular biology. Course and laboratory work in these areas provide valuable perspectives for students in the physical, engineering, and biological sciences who have interests in environmental science, resource management, or biotechnology.

COURSES

Upper Division Courses

Courses numbered 500 and above may be taken for graduate credit.

AC 401/AC 501. RESEARCH (TBA).

AC 405/AC 505. READING AND CONFERENCE (TBA).

AC 420/AC 520. COMPARATIVE METABOLISM OF FOREIGN COMPOUNDS (3). Metabolism of exogenous chemicals by animals and relation to environmental problems; comparative aspects of metabolic processes; interacting effects of other chemicals, nutritional and environmental variables; metabolic aspects of selective toxicity. PREREQ: BB 450, BB 451. Offered alternate years. CROSSLISTED as TOX 420/TOX 520.

AC 428/AC 528. CHEMICAL ANALYSIS OF ENVIRONMENTAL RESIDUES (3). Separation and analysis of chemical pollutants in the environment; considerations in sampling, separation techniques, instrumentation and methods used for chemical analysis and confirmation of trace levels of organic chemicals and heavy metals. PREREQ: CH 331 and CH 332 or equivalent. CROSSLISTED as TOX 428/ TOX 528.

AC 430/AC 530. CHEMICAL BEHAVIOR IN THE ENVIRONMENT (3). Application of chemical concepts in the definition and solution of pollution problems; analytical considerations, thermodynamic factors influencing movement of chemicals, physical and metabolic transformations occurring in the environment. PREREQ: CH 106, CH 331; senior standing. CROSSLISTED as TOX 430/TOX 530.

AC 445/AC 545. ON-LINE TOXICOLOGY DATA SYSTEMS (3). Use of on-line systems (Toxline, CAS-Online, etc.) to obtain bibliographic and other data relating to toxicology and application of PROPHET system for toxicological data analysis. PREREQ: BB 450, BB 451. CROSSLISTED as TOX 445/TOX 545.

AC 450/AC 550. ENVIRONMENTAL TOXICOLOGY (3). Principles of environmental toxicology including exposure, uptake, and distribution of environmental chemicals; quantitative assessment of toxicity; nature of toxic effects; epidemiological studies; and risk assessment. PREREQ: Organic chemistry and introductory biology.

AC 460/AC 560. BIOTECHNOLOGY: PERSPECTIVES AND CASE STUDIES (3). Theory and application of biotechnology in research, agriculture, and medicine. PREREQ: One year of biology, chemistry, and physics; GEN 311 or BB 331/BB 332; BB 350 or BB 351/BB 352 or BB 450/BB 451. Offered alternate years.

Graduate Courses

AC 601. RESEARCH (TBA).

AC 603. THESIS (TBA).

AC 605. READING AND CONFERENCE (TBA).

AC 606. PROJECTS (TBA).

AC 607. SEMINAR (TBA).

AC 637. MASS SPECTROMETRY OF ORGANIC COMPOUNDS (3). Physical principles of mass spectrometric instrumentation and interpretation of the mass spectra of organic compounds. PREREQ: CH 336, CH 442. CROSSLISTED as CH 537. Offered alternate years.

AGRICULTURAL EDUCATION AND GENERAL AGRICULTURE

R. L. Cole, Head
Strand Agriculture Hall 112
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(503) 737-2661

Faculty

Professor Cole; *Assistant Professor* Weeks; *Instructor* Fanno

Undergraduate Major

General Agriculture (B.S.)

Minors

Agricultural Sciences
International Agricultural Development

Graduate Major

Agricultural Education (M.S., M.Ag., M.A.T.)

Graduate Areas of Concentration
Agricultural Education
Agricultural Extension
International Agriculture

The Department of Agricultural Education and General Agriculture combines two programs. The General Agriculture program is an undergraduate studies program which provides maximum flexibility in designing and structuring a course of study to meet the students' individual needs. General Agriculture should be seriously considered by, students desiring programs of study not currently available in any other agricultural subject matter department (such as those involving a minor in communications, recreation, or environmental studies in agriculture); students wishing to pursue two or more areas of specialization (such as students who are returning to farms or ranches and who need substantial background in animal science, crops, and agricultural business management); students preparing for leadership positions in agriculture which require excellent communication and leadership skills as well as breadth of agricultural background (such as teachers of agriculture, lobbyists, commodity liaison persons, and extension staff); or students who have not selected a departmental major in the College of Agricultural Sciences but who know they are interested in an agricultural career.

The goal of the General Agriculture program is to help students identify the agricultural career in which they are most interested and build a course of study that will qualify each student for his or her chosen profession. Advising is of paramount importance in this process and major emphasis is placed on career advising.

Agricultural Education offers course work that serves teachers and leaders in agriculture. The M.S., M.Agr., M.A.T., and M.A.I.S. degrees may be pursued with an emphasis in leadership, communication, pedagogy, extension and/or technical agriculture. Candidates work with an adviser to develop programs that meet their specific needs as indicated by their occupational objectives.

Two minors are available in the Agricultural Education and General Agriculture Department. The International Agricultural Development minor is available for both undergraduate and graduate students who are interested in agricultural development abroad. The minor requires foreign language proficiency as well as appropriate agricultural and sociological course work.

The second minor, Agricultural Science, is available for undergraduate students who have majored in an area that requires the addition of breadth in agriculture to their major program. The Agricultural Science minor will provide appropriate technical agriculture background for a person interested in agricultural management, communication, environmental studies, etc.

UNDERGRADUATE STUDIES

High school and college transfer students who are admitted to Oregon State University as an undergraduate are eligible to participate in the General Agriculture program. General Agriculture majors, in consultation with their departmental academic adviser, may plan elective course work to emphasize personal interests, abilities and career objectives.

A leadership and communication area of emphasis is available and was especially designed for those students who will need breadth in their technical agriculture background and excellence in communication and leadership skills. The intent of this area of emphasis within the General Agriculture major is to prepare agriculture's future leaders in education, extension, government, and business.

Career opportunities for General Agriculture majors are unlimited because of the unlimiting nature of the program structure. Students can return to home farms or ranches, move into agricultural middle management, become extension staff, move into political positions, work in marketing or international agriculture, take the Fifth-Year Teacher Preparation program and become high school teachers of agriculture, teach agriculture in community colleges or what ever they decide to plan a program to accomplish. Salaries vary depending on the position a student may strive to achieve.

GENERAL AGRICULTURE

Baccalaureate Core (48)

Agricultural Core
AG 111. Computer Apps in Agriculture (3)
AG 199. Special Studies (1)
AREC 211. Management in Agriculture (4)
AG 407. Senior Seminar (1)
AG 421. Leadership Development (WIC) (3)
AG 492. Technology Transfer in Agriculture (3)
Agricultural Electives (a minimum of 36 credits of technical agriculture, 24 credits of which must be upper division is required) (36)

Business
BA 215. Fundamentals of Accounting (4)
BA 230. Business Law I (4)

Communication
Communications elective (3)

Humanities, Arts and Social Sciences
EC 201. Principles of Economics (4)

Sciences—Physical and Biological
Physical science—chem (10-15)
Biological sciences—one-year series (12)

Math
Math 105. (3)

Electives (48-52)

Total (180)

LEADERSHIP AND COMMUNICATION CURRICULUM

The General Agriculture Curriculum plus the following:
COMM 111. Public Speaking (3)
COMM 114. Argumentation and Critical Discourse (3)
COMM 218. Interpersonal Communication (3)
Communication elective (6)

Minors

AGRICULTURAL SCIENCES MINOR (27)

Lower Division Core

AG 111. Computers in Agriculture (3)
One Agricultural Resource Mgmt. Course (3-4)
One Production Agriculture Course (3-4)

Upper Division Core

Two courses from selected department 1 (6-8)
Two Courses from selected department 2 (6-8)

Electives (0-9)

INTERNATIONAL AGRICULTURAL DEVELOPMENT MINOR (27)

Undergraduate Curriculum

AG 407. Seminar: International Agriculture (1)
AREC 433. Intl Agricul Development (3)
AG 492. Technology Transfer in Agriculture (3)
AG 421. Leadership Development (3)
Language competency
Technical electives in agriculture (9)
Social, cultural and economic electives (5)
Minimum of 27 credits of which 12 credits must be upper division.

GRADUATE CURRICULUM

AG 507. Seminar: International Agriculture (1)
AREC 533. International Ag Development (3)
AREC 592. Technology Transfer in Agriculture (3)
AG 521. Leadership Development (3)
Language competency
Technical electives in agriculture (5 masters, 9 doctorate)
Social, cultural and economic electives (5)
Minimum of 21 credits for masters, 25 for doctorate.
Note: A graduate international agricultural development minor is not available to a student who took an undergraduate international agricultural development minor at Oregon State University.

Graduate Studies

Students who have earned a baccalaureate degree and meet Graduate School entrance requirements may apply for participation in the Agricultural Education master degree programs.

Careers available to people who complete graduate work in Agricultural Education include teaching agriculture at the high school and community college level, extension staff, agricultural industry personnel, agricultural government personnel, and agricultural lobbyists. A student can complete a graduate program in Agricultural Education without being involved in the Teacher Certification program.

Courses

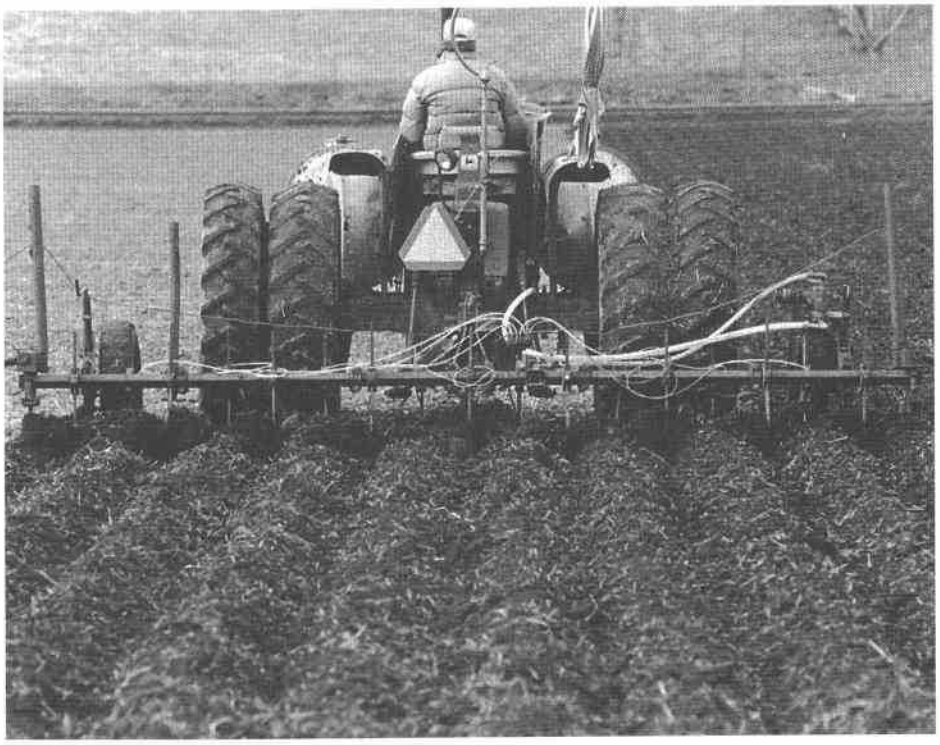
■ GENERAL AGRICULTURE

Lower Division

AG 111. COMPUTER APPLICATIONS IN AGRICULTURE (3). Computer use in agriculture and agribusiness; practical experience with computer programs applicable to all agricultural disciplines.

AG 199. SPECIAL STUDIES (1-16).

AG 211. SURVEY AND CONSTRUCTION (3). Land measurement and leveling as applied to agricultural uses. Concrete and agricultural building construction including the use of construction power tools, selection of materials and cost estimating.



AG 221. METALS AND WELDING (3). Practices of metal working including the use of metal working machines, metal identification, heat treating and metal properties are included. Fabrication of metals including arc and oxy-acetylene welding and cutting are covered.

Upper Division

AG 301. *ECOSYSTEM SCIENCE OF PACIFIC NORTHWEST INDIANS (3). Designed and presented in partnership with Pacific Northwest Indians and Alaska Natives, focusing on Natural Ecosystems, differing views, power relationships, policymaking, and gender roles. (Bacc Core Course)

AG 312. ENGINE THEORY AND OPERATION (3). Engine construction, operational theories and principles, lubrication, fuels and oils, emissions and preventive maintenance are taught through the process of small engine application. Engine efficiency theories and measurement are presented.

AG 391. FARM IMPLEMENTS (3). Power farming implements including operation, maintenance, adjustments, calibration and use are covered. Field trips may be required.

AG 401. RESEARCH (1-16).

AG 405. READING AND CONFERENCE (1-16).

AG 407. SEMINAR (1-16).

AG 410. INTERNSHIP (1-15). A work-internship to give students practical on-the-job preparation in any of the many facets of agriculture or related industries. PREREQ: College and instructor approval.

AG 421/AG 521. ^LEADERSHIP DEVELOPMENT (3). Principles of leadership development, leadership analysis and style, record keeping procedures, youth organizations, and activities in leadership for youth. PREREQ: Senior standing. (Writing Intensive Course)

AG 425/AG 525. DEVELOPMENTS IN AGRICULTURAL MECHANICS (3). Emphasis on the development of instructional units for agricultural instruction programs. Wide applications to agricultural mechanication. PREREQ: Senior standing.

AG 492/AG 592. *TECHNOLOGY TRANSFER IN AGRICULTURE (3). Examination of processes by which formal and informal agricultural instructional program influence the introduction and acceptance of technology in agriculture. An emphasis in the international arena will be maintained. The focus throughout the course will be on the role of a professional change agent working with technological change. PREREQ: Senior standing. (Bacc Core Course)

Graduate

AG 507. SEMINAR (1-16).

AG 518. EXTENSION COURSE IN TEACHER EDUCATION (1-3). Enables present and prospective teachers of agriculture to continue their professional development in technical agriculture subjects of current importance.

AG 541. COMMUNITY PROGRAMS IN AGRICULTURE (3). Evaluating agricultural education program effectiveness and technical appropriateness. Development of long-range plans for agricultural programs to meet the technical needs of a community. PREREQ: Teaching or Extension experience.

■ AGRICULTURAL EDUCATION

Upper Division

AED 313. THEORY AND PRACTICUM III: FIELD (4). Field based experience for students preparing to be agricultural teachers. Focus on teaching models. PREREQ: Sophomore standing.

Graduate

AED 501. RESEARCH (1-16).

AED 503. THESIS (1-16).

AED 505. READING AND CONFERENCE (1-16).

AED 507. SEMINAR (1-16).

AED 508. WORKSHOP (1-16).

AED 509. PRACTICUM (1-16).

AED 510. PROFESSIONAL INTERNSHIP: AGRICULTURE EDUCATION (1-16). A field experience in which the intern will integrate academic study with classroom teaching experience to learn specific competencies relating to functioning well in the context of the classroom and the school, and demonstrate this competency through the assessment of work by supervisors and by evidence collected and presented in work samples. PREREQ: Admission to MAT Program.

AED 518. EXTENSION COURSE IN TEACHER EDUCATION (1-3). Enables present and prospective teachers of agriculture to continue their professional development on pedagogical topics of current importance.

AED 533. RURAL SURVEY METHODS (3). Technique; analyzing, interpreting, and using results of survey data; identifying and utilizing community resources; develop and organize agriculture programs to meet community needs.

AED 552. PROGRAM ORGANIZATION AND MANAGEMENT (3). Explores the foundations of vocational education, essential learning skills, advisory committees, and development of a vocational education philosophy. Students will study the elements of educational reform as they apply to specific service areas. Resource analysis, student organizations, and school-to-work transitions will also be studied.

AED 553. APPLIED INSTRUCTIONAL STRATEGIES (3). Helps students in the identification and development of goals, objectives and units. The course includes the development and application of subject area instructional strategies/ models, including applied math, writing, communication skills, measurement and evaluation of achievement, and delivery of instruction to at-risk students.

AED 554. MICRO-TEACHING (3). Planning, presenting and evaluating lessons in a micro-teaching lab. It includes application of content pedagogy strategies, subject matter principles and media technology.

AED 556. LINK RESEARCH TEACH/PRACT (3). This course links research to teaching. Students will work with cooperating teachers to identify and apply research to teaching.

AED 557. ISSUES AND TRENDS IN CURRICULUM AND INSTRUCTION (3). Emphasizes trends related to subject matter curriculum issues unique to Agricultural Education at the secondary level.

AED 558. IMPROVING VOCATIONAL EDUCATION PROGAMS (3). Stresses evaluation of programs and students, standardization and accreditation, legislation and state criteria for improving programs. Students will complete work samples, review applied research, and apply criteria for improving service area program.

ANIMAL SCIENCES

J. Fitzgerald Head
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Corvallis, OR 97331-6702

Faculty

Professors Cheeke, Davis, Gamroth, Holleman, Koong, Nakaue, Savage, Stormshak, Swanson, Weber; *Associate Professors* Forsberg, Froman, Hermes, Holtan, Hu, Menino, Meyer, Thompson, Turner, Zollinger; *Assistant Professors* Brodie, Carroll, DelCurto; *Senior Instructors* Coates-Markle, Hill; *Instructor* Turi Boire; *Senior Research Assistant* Mirosh; *Research Assistants* Dickson, Downing, Keller, Miller, Painter, Taylor; *Adjunct Faculty*: Carr, Chamberlain, Hathaway, Howell, Mills, Mobley, Pirelli, Vavra

Undergraduate Major

Animal Sciences (B.S.)

Options

Science/Preveterinary Medicine
Animal Production
- Beef Emphasis
- Dairy Emphasis
- Poultry Emphasis
- Sheep Emphasis

Equine Science
Business

Minor

Animal Sciences
Equine Science

Graduate Major

Poultry Science (M.S., Ph.D.)
Animal Sciences (M.S., Ph.D.)

Graduate Areas of Concentration

Dairy Production
Endocrinology
Genetics
Growth and Development
Livestock Management
Nutrition
Nutritional Biochemistry
Reproductive Physiology

Programs in animal science provide up-to-date information on methods of rearing domestic livestock and poultry and of producing meat, milk, eggs, wool, and other animal products. Essential to this information is knowledge generated in genetics, nutrition, and physiology. The various teaching and research programs explore modern areas of animal biotechnology and data processing and how they apply to present day livestock and poultry production. Study in these areas provides the core around which various curricula leading to the B.S. degree in agriculture can be developed. To allow students flexibility in course arrangement, four specialized program options are offered.

Increasing demands for livestock and poultry products by a rapidly expanding human population mean potential employment for well-trained individuals in such areas as farm, ranch, feedlot operation; meat, poultry, egg and milk processing, meat grading with the USDA; Federal Cooperative Extension Service county and 4-H work; sales or technical employment with commercial feed, seed, and chemical companies and pharmaceutical houses; agricultural loan offices in banks and credit agencies; and the Peace Corps.

Graduate students may pursue research projects through the Agricultural Experiment Station as part of their programs for M.S. or Ph.D. degrees. Graduate majors are offered in animal genetics, animal nutrition, and animal physiology.

CURRICULUM[1]

Baccalaureate Core (48)

Animal Sciences Core

ANS 100. Orientation to Animal Sciences (2)
ANS 121. Introduction to Animal Sciences (4)
ANS 207. Sophomore Seminar (1)
ANS 210. Feeds and Feed Processing (3) or ANS 211. Applied Animal Nutrition (3)
ANS 311. Animal Nutrition (3)
Two Animal Industries courses from ANS 215, ANS 216, ANS 217, ANS 220 (6)
ANS 314. Animal Physiology (4)
ANS 315. Animal Production Issues of Concern to Society (3)
ANS 316. Reproduction in Domestic Animals (4)
ANS 317. Reproduction in Domestic Animals Laboratory (1)
ANS 378. Animal Genetics (4)
Two production courses (from ANS 430, ANS 433, ANS 436, ANS 439, ANS 443) (6)

Physical and Biological Sciences

CH 121, CH 122, CH 123. Gen Chem (15) or CH 221, CH 222, CH 223. Gen Chem (15)
BI 211, BI 212, BI 213. Introductory Biology (12)
MTH 111. College Algebra (4)
EC 201. Principles of Economics (3)
An microbiology course (3)

Health Education

H 386. Advanced First Aid/First Responder (3)

OPTIONS

SCIENCE/PREVETERINARY MEDICINE

This option is designed for students interested in fulfilling requirements for admission to the OSU College of Veterinary Medicine. It allows students who are admitted to the college, upon completion of three years of undergraduate study, to apply credit earned during the first year of professional study toward the B.S. degree in Animal Sciences.

Students not admitted to veterinary school after completing the three-year program may complete additional requirements to qualify for the B.S. degree in Animal Sciences. Those with training in poultry who also earn a D.V.M. degree have an additional advantage; only a very small percentage of veterinary school graduates have the appropriate academic background to qualify for poultry veterinary positions.

The option is also offered for students preparing for professional careers in animal science teaching and research. More intense training is provided in the biological and physical sciences, offering an excellent foundation for graduate study. Requirements: Core curriculum and additional credits as required by the College of Veterinary Medicine.

ANIMAL PRODUCTION

Provides background for making decisions in the production and management of poultry, dairy cattle and meat animal enterprises which include beef cattle, sheep and swine; includes basic sciences and animal sciences with less intense training in crops, soils and business. With this option,

there are four areas of emphasis. Requirements: Core curriculum and additional credits in consultation with the adviser.

Beef Emphasis: Designed for students whose major interest is in commercial or purebred cow-calf production or feedlot operations. The Department of Animal Sciences owns two small herds of purebred beef cattle which are used as instructional resources for those interested in the purebred beef cattle industry.

Dairy Emphasis: Designed specifically for students whose primary interest is in dairy management and production. Requirements include courses relevant to dairy operations.

Poultry Emphasis: Designed for students whose primary interest is in the poultry industry. Poultry science involves the study of domestic birds and how they are used to serve people. During the twentieth century, poultry science has helped transform poultry production from a simple small-scale enterprise into a complex multibillion dollar agribusiness. The complexity and continuing growth of the poultry industry is reflected in a wide variety of jobs for graduates with an interest in poultry. Oregon State University offers the only poultry program in the Pacific Northwest.

Sheep Emphasis: Designed especially for students who have an interest in the sheep industry. Courses are similar to the other animal production emphases except for courses relevant to sheep production.

EQUINE SCIENCE

The equine science option emphasizes a well-rounded education in equine production, management, training and marketing. Students have an opportunity for extensive hands-on practical experience in all areas. In addition, the program offers a unique equestrian coaching program and a diverse recreational riding program with credit courses in both English and Western disciplines. Requirements: Core curriculum and additional credits in consultation with the adviser.

BUSINESS

The business option is intended for students who desire an understanding of business principles as applied to the complex operation of livestock production and related enterprises. The curriculum includes the Agricultural Business Management minor (28 credits) with courses in business administration, economics, and agricultural economics. When coupled with a good background in animal sciences, this combination is desirable for students pursuing careers in agriculture or related industries. Requirements: Core curriculum and additional credits in consultation with the adviser.

COOPERATIVE PROGRAMS

Residents of Washington and Idaho, who are interested in poultry science, may begin their undergraduate training within the Department of Animal Sciences at Washington State University or the University of Idaho. Following their sophomore year, these students may transfer to the OSU Department of Animal Sciences without paying out-of-state tuition. Students transferring after one or two years at a community college should also be able to complete the requirements for a B.S. after three or two years, respectively.

Undergraduate and graduate students of the participating Western Undergraduate Exchange (WUE) or Western Interstate Commission for Higher Education (WICHE) states (Alaska, Arizona, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, Utah, Washington, and Wyoming), who are interested in studying poultry science can matriculate at Oregon State University as in-state students. Arrangements for admittance to these programs must be made with the respective state coordinators.

MINORS

ANIMAL SCIENCES MINOR (27-28)

The following *four* courses:
ANS 121. Introduction to Animal Sciences (4)
ANS 211. Applied Animal and Poultry Nutrition (3)
ANS 316. Reproduction in Domestic Animals (4)
ANS 378. Animal Genetics (4)
Select *one* of the following four courses:
ANS 215. Beef/Dairy Industries (3)
ANS 216. Sheep/Swine Industries (3)
ANS 217. Poultry Industries (3)
ANS 220. Introductory Horse Science (3)
NOTE: The 200 level course listed above is a prerequisite for the corresponding 400 level Production Systems course.
Select *one* course from the following:
ANS 210. Feeds and Feed Processing (3)
ANS 311. Animal Nutrition (3)
ANS 314. Animal Physiology (4)
ANS 321. Avian Embryology (4)
ANS 351. Principles of Animal Foods Technology (3)
Select *one* course from the following:
ANS 430. Horse Production Systems (3)
ANS 433. Poultry Production Systems (3)
ANS 436. Sheep Production Systems (3)
ANS 439. Dairy Production Systems (3)
ANS 443. Beef Production Systems (3)
NOTE: complete the second course in the sequence of the systems course taken.
All courses must be taken on a graded basis only.

EQUINE SCIENCE MINOR (27-29)

ANS 121. Introduction to Animal Sciences (4)
ANS 210. Feeds and Feed Processing (3)
ANS 220. Introductory Horse Science (3)
ANS 316. Reproduction in Domestic Animals (4)
ANS 430. Horse Production Systems (3)
Select 10-12 credits from the following:
ANS 191, ANS 192, ANS 193, ANS 194 or PAC 191, PAC 192, PAC 193, PAC 194. Horsemanship (1,1,1,1)
ANS 221. Equine Industries (2)
ANS 222. Young Horse Training (2)
ANS 223. Equine Marketing (2)
ANS 322. Equestrian Coaching (2)
ANS 431. Horse Production Systems (3)
PSY 430. Animal Behavior (3)
Note: 12 credits must be upper division level.

COURSES

Lower Division

ANS 100. ORIENTATION TO ANIMAL SCIENCES (2). Orientation of incoming animal sciences students to college life with emphasis on faculty, facilities, services and curricula of the Department of Animal Sciences. Case study approach to decision making will be introduced.

ANS 121. INTRODUCTION TO ANIMAL SCIENCES (4). Principles of breeding, physiology, nutrition, and management as they apply to modern livestock and poultry production.

ANS 191. BEGINNER RIDING I (1). This course is designed for beginning riders or those wishing to improve their basic skills. It offers an introduction to the basic Western riding position and control of the horse at the walk, trot, and lope. Upon completion of the course, the student will be familiar with handling and leading a horse, grooming, tacking-up and riding simple school figures in an indoor arena. Instructors for this course will be OSU-certified coaching students or graduates. May be repeated. CROSSLISTED as PAC 191.

ANS 192. BEGINNER RIDING II (1). Designed for beginning riders who can comfortably walk, trot and canter on a trained horse. It offers a review of the basics, and opportunity to improve riders position and control at the trot and canter, and also introduces riding over fences. Upon completion of the course, the student will be a more effective rider at all three gaits. This course is recommended for riders who have NOT had formal instruction or who are making a transition from the Western to English style of riding. Instructors for this course will be OSU-certified coaching students or graduates. PREREQ: ANS 191 or PAC 191 or equivalent. May be repeated. CROSSLISTED as PAC 192.

ANS 193. INTRODUCTORY DRESSAGE (1). This course is designed for riders who have taken Beginner Riding I and II (or the equivalent) and are interested in discovering and/or pursuing the art of dressage. Riders will be gently introduced to the terminology and techniques of dressage training through 2nd Level with ample demonstrations and hands-on experience. Upon completion of the course, riders will feel competent in riding a training level test for competition. PREREQ: ANS 191 or PAC 191 and ANS 192 or equivalent. CROSSLISTED as PAC 193.

ANS 194. INTRODUCTORY JUMPING (1). This course is designed for riders who have taken Beginner Riding I and II (or the equivalent) and are interested in improving their position and control of the horse over fences. Riders will be coached through. several exercises designed to improve their abilty to establish pace, rhythm and balance, adjust stride, and direct and control the horse over trotting and cantering poles, gymnastics, single fences, combinations, and an eight-fence hunter course. Aspects of course design will also be covered for interested students. PREREQ: ANS 191 or PAC 191 or ANS 192 or equivalent. May be repeat CROSSLISTED as PAC 194.

ANS 199. SPECIAL STUDIES (1-16). Graded P/N.

ANS 207. SOPHOMORE SEMINAR (1). Examination of career opportunities in animal science. PREREQ: Sophomore standing.

ANS 210. FEEDS AND FEED PROCESSING (3). Characteristics of feedstuffs available for livestock use. Major feed processing methods and their effects on the bioavailability of feed nutrients. PREREQ: ANS 121.

ANS 211. APPLIED ANIMAL AND POULTRY NUTRITION (3). Nutrient requirements of poultry and livestock, ration formulation, and feeding recommendations. PREREQ:ANS 210, MTH 111 and AG 111. No Freshmen.

ANS 215. BEEF/DAIRY INDUSTRIES (3). Introduction to beef and dairy industries; history, current industry status, and demonstration and practice of basic husbandry skills. PRERQ: ANS 121.

ANS 216. SHEEP/SWINE INDUSTRIES (3). Introduction to the sheep and swine industries including history, current status and production practices, with demonstration and hands-on experience of basic husbandry practices. PREREQ: ANS 121.

ANS 217. POULTRY INDUSTRIES (3). Familiarization of the organizational structure and marketing arrangement of poultry industries; hands-on managerial techniques, practices and procedures carried out by the poultry industries.

ANS 220. INTRODUCTORY HORSE SCIENCE (3). Introduction to horses, their history, breeds, form and function, performance evaluation, current industry status, and general management.

ANS 221. EQUINE INDUSTRIES (2). Instruction and practice of management skills involved in the feeding, handling and health care of horses. Course to provide valuable industry contacts through guest speakers and field trips. PREREQ: ANS 121.

ANS 222. YOUNG HORSE TRAINING (2). Practical "hands on" instruction in all phases of training the young horse, including: weaning, haltering, grooming, leading, use of obstacle course and round corral, tying techniques, clipping, trailering, fitting and conditioning, bitting, rigging, ground-driving and lunging. Course work to advance through the second year if applicable. PREREQ: ANS 220.

ANS 223. EQUINE MARKETING (2). Course covers practical concepts of equine marketing. Emphasis on market assessment, targeting buyers, marketing and advertising strategies, product preparation and presentation, marketing legalities. PREREQ: ANS 121 and ANS 220.

ANS 224. PUREBRED BEEF CATTLE MANAGEMENT (1-2). Practical hands-on and decision making experience in the management of purebred beef cattle. Field trips are required for which an extra fee may be charged. PREREQ: ANS 121. Course may be repeated.

ANS 231. LIVESTOCK EVALUATION (2). Visual appraisal of market and breeding classes of beef cattle, sheep, and swine. Live animal and carcass comparisons. PREREQ: ANS 121.

Upper Division

ANS 311. ANIMAL NUTRITION (3). Classification, digestion, absorption and metabolism of nutrients in animals; consequences of nutritional deficiencies and toxicities. PREREQ: CH 123 or 223; organic chemistry is desired but not required.

ANS 314. ANIMAL PHYSIOLOGY (4). Biological basis of animal performance; describes how networks of cells act cooperatively to enable locomotion, provide a stable internal environment, allocate resources, remove metabolic end-products, and counteract microorganisms. PREREQ: General Biology. No freshman.

ANS 315. *ANIMAL PRODUCTION ISSUES OF CONCERN TO SOCIETY (3). Discussion of contemporary issues relating to interrelations between humans and domestic animals. Topics include consumption of animal products and human health; animal welfare; biotechnological implications including feed additives, hormones, genetic engineering; role of international animal agriculture in meeting world food and fiber needs; and ecological implications of livestock production. (Bacc Core Course).

ANS 316. REPRODUCTION IN DOMESTIC ANIMALS (4). Anatomy and physiology of mammalian and avian reproductive systems; fertilization, embryonic and fetal development, placentation and parturition; reproductive technologies. PREREQ: ANS 121, BI 211, CH 121, or CH 221. No Freshmen.

ANS 317. REPRODUCTION IN DOMESTIC ANIMALS LABORATORY (1). Gross and microscopic anatomy of the reproductive tract; semen collection, evaluation and extension; evaluation of fertilization, embryo and fetal development and placentation. PREREQ: ANS 316 or concurrent enrollment in ANS 316.

ANS 321. AVIAN EMBRYO (4). Discussion and experimentation involving the development and the environmental requirements for the artificial incubation of avian embryos. PREREQ: ANS 121, BI 211. Offered even-numbered years.

ANS 322. EQUESTRIAN COACHING (2). Practical development of "coaching" skills with novice to intermediate English/Western riders. Emphasis on knowledge of basic riding principles and stable management skills, teaching ability and sport safety. Students required to enroll in a 1 credit internship program the following term for advanced teaching experience. PREREQ: PAC 193 or ANS 193,ANS 194; ANS 221.

ANS 327. APPLIED PHYSIOLOGY OF REPRODUCTION (4). Principles, techniques and recent development in semen collection, evaluation, extension and preservation; artificial insemination, estrus detection and synchronization; pregnancy diagnosis and embryo transfer. PREREQ: ANS 316 and ANS 317.

ANS 331. ADVANCED LIVESTOCK EVALUATION (4). Aspects of an individual animals economic merit are compared to a sample group. Emphasis is placed on beef, swine and sheep. Visual appraisal, performance data and carcass merit are stressed. Designed to prepare students for the intercollegiate livestock judging team. PREREQ: ANS 23l. No Freshmen.

ANS 351. PRINCIPLES OF ANIMAL FOODS TECHNOLOGY (3). Processing of meat, milk and eggs into human food products. Topics include humane slaughter of animals, packaging, animal food chemistry, muscle physiology, nutrient values, functional properties, sausage making, fermentation, curing, smoking, milk and egg pasteurization inspection, grading, quality control. PREREQ: BI 211 or ANS 121. No Freshmen, Sophomores.

ANS 378. ANIMAL GENETICS (4). Fundamentals of inheritance, principles of genetic segregations, population and quantitative genetics, response to natural selection and artificial manipulation of populations. PREREQ: ANS 121.

ANS 401. RESEARCH (1-16). Graded P/N.

ANS 405. READING AND CONFERENCE (1-16). Graded P/N.

ANS 410. ANIMAL SCIENCE INTERNSHIP (1-12). On or off-campus, occupational work experience supervised by the department. Graded P/N.

ANS 411/ANS 511. DIGESTIVE PHYSIOLOGY AND NUTRITION OF RUMINANT ANIMALS (4). Anatomy and physiology of the ruminant digestive tract including rumen microbiology and digestive processes. Nutritional biochemistry and physiology of ruminants. Feed chemistry, feed intake principles and ration balancing. Theory of energy and protein metabolism. PREREQ: ANS 211 or ANS 311.

ANS 412/ANS 512. MONOGASTRIC NUTRITION (3). Comparative monogastric nutrition and metabolism, physiological and anatomical differences in the digestive tracts of monogastrics, methodologies to determine nutrient requirements, availability and utilizaiton with monogastrics. REREQ: ANS 211 and ANS 311.

ANS 415. LIVESTOCK JUDGING TEAM (3). Designed to train students for participation in the intercollegiate livestock judging team. PREREQ: ANS 331.

ANS 430/ANS 530. HORSE PRODUCTION SYSTEMS (3). Fundamentals of nutrition, reproductive physiology and health programs and their applications in the care and management or horses and horse production. PRERQ: ANS 211, ANS 220, ANS 316, ANS 378.

ANS 431/ANS 531. HORSE PRODUCTION SYSTEMS (3). Practical application of production techniques in a laboratory and by study of management decision analysis. PREREQ: ANS 430/ANS 530.

ANS 433/ANS 533. POULTRY MEAT PRODUCTION SYSTEMS (3). Fundamental applications and the analysis of managerial principles applied to brooding, rearing, feeding and housing meat-type chickens and turkeys and their respective breeders. Decision case studies and practical management problems are incorporated into the course. Offered odd number years. PREREQ: ANS 211, ANS 217, ANS 316 or instructor's approval.

ANS 434/ANS 534. EGG PRODUCTION SYSTEMS (3). Applications and analyses of egg production systems as brooding, rearing, feeding and housing egg producing chickens. Decision case studies and practical management problems are incorporated into the course. Offered even-numbered years. PREREQ: ANS 211, 217, ANS 316 or instructor's approval.

ANS 436/ANS 436. SHEEP PRODUCTION SYSTEMS (3). Integration of nutrition, genetics, reproduction, behavior, and health principles into management systems for production and marketing of lamb and wool. PREREQ: ANS 211, ANS 216, ANS 316, ANS 378.

ANS 437/ANS 537. ^ADVANCED SHEEP PRODUCTION SYSTEMS (3). Examination and analysis of resource utilization and decision-making in different sheep production systems; course will include visits to operating sheep ranches for data collection and a return visit to present findings and recommendations to managers. PREREQ: 436. (Writing Intensive Course).

ANS 439/ANS 539. DAIRY PRODUCTION SYSTEMS (4). Fundamentals of nutrition, breeding, reproductive physiology and health programs and their applications in the care and management of dairy cattle. PREREQ: ANS 211, ANS 215, ANS 316, ANS 378.

ANS 440/ANS 540. ^DAIRY PRODUCTION SYSTEMS (3). Decision case analysis or special topics in application of dairy management principles. PREREQ: ANS 439. (Writing Intensive Course)

ANS 443/ANS 543. BEEF PRODUCTION SYSTEMS (3). Fundamentals of nutrition, reproductive physiology and health programs and their applications in the care and management of beef cattle. PRERQ: ANS 211, ANS 215, ANS 316, ANS 378.

ANS 444/ANS 544. ^BEEF PRODUCTION SYSTEMS (3). Continuation of the study of beef cattle management. Students will practice decision making processes using area beef cattle operations as case studies. Overnight field trip with extra fee charged. PRERQ: ANS 443/ANS 543. (Writing Intensive Course)

ANS 445/ANS 545. BEEF PRODUCTION SYSTEMS (3). Discussion of the feedlot industry including the types of operations, nutrition, management, diseases, parasites and marketing. Practical feedlot management decisions are made by the students through the "Steer-A-Year" project. PREREQ: ANS 444/ANS 544.

ANS 465. FOODBORNE DISEASE (3). Examines ways pathogenic bacteria can enter the human diet via animal products, discusses rationale for and the limitations of government meat inspection, explains disease symptoms in terms of intestinal physiology, and discusses food processing technology and food handling techniques that serve to minimize the risk of infection.

ANS 478/ANS 578. (3). Application of genetic principles to selection and improvement of livestock. Topics include breeding value and heritability estimation, mating systems and selection strategies. Emphasis on quantitative traits of importance in domestic livestock. PREREQ: ANS 378.

ANS 480/ANS 580. ANIMAL GROWTH (3). A thorough discussion and analysis of growth and development of skeletal, muscle and adipose tissue in the domestic meat animal. Topics include synthesis and degradation (turnover) of skeletal muscle, adipose tissue, and factors regulating these processes. In addition, biotechnological applications to modulate growth will be discussed. PREREQ: ANS 311 OR ANS 411 and ANS 314. No Freshmen or Sophomores.

ANS 490/ANS 590. TOXICANTS AND POISONOUS PLANTS (4). Natural toxicants and their biological effects, metabolism of toxicants, impacts of toxicants on livestock production, and consideration of the chemical structure, plant sources, toxicity problems, metabolism and metabolic effects, toxicity signs, and prevention of toxicoses. PREREQ: ANS 311.

Graduate

ANS 501. RESEARCH (1-16). Graded P.

ANS 503. THESIS (1-12). Graded P.

ANS 505. READING AND CONFERENCE (1-16). Graded P.

ANS 507. GRADUATE SEMINAR (1). ANS 507 Section 1: Seminar/General for all graduate students. ANS 507 Section 2: Seminar/Endocrinology, for graduate students interested in physiology.

ANS 532. BIOLOGY OF LACTATION (3). Physiological and environmental factors affecting mammary gland development and function. PREREQ: Z 431/Z 531. Offered alternate years. CROSSLISTED as BI 532. Offered 1996-97.

ANS 550. TOPICS IN ANIMAL NUTRITION (3). Recent advances. Different topic each term. PREREQ: ANS 411/ANS 511, ANS 412/ANS 512.

ANS 560. LIPID METABOLISM (3). Digestion, absorption and metabolism of lipids with emphasis on lipoprotein metabolism, regulation of lipid metabolism in various tissues and metabolism of eicosacoids. PREREQ: BB 452, BB 492 or equivalent. Offered alternate years.

ANS 601. RESEARCH (1-16). Graded P/N.

ANS 603. THESIS (1-16).

ANS 605. READING AND CONFERENCE (1-16).

ANS 606. SPECIAL PROJECTS (1-16).

ANS 607. GRADUATE SEMINAR (1).

ANS 655. REGULATION OF METABOLISM (3). Principles of metabolic regulation including transcription, RNA processing, mRNA stability, protein degradation and post-translational modification. Endocrine control of these processes. Application of principles of regulation to understanding of animal growth and disease. PREREQ: BB 451 and ANS 411 or equivalent. Offered alternate years. Offered 1996-97.

ANS 662. HORMONE ACTION (3). Recent advances in the biochemistry of hormone action at the cellular level in mammals. Offered alternate years. Offered 1994-95. PREREQ: Z 537; BB 451. CROSSLISTED as BB 662.

ANS 673. BIOLOGY OF MAMMALIAN REPRODUCTION (4). Physiological, neuroendocrine, endocrine and environmental factors that regulate reproduction of mammals. PREREQ: ANS 316 or equivalent; BB 350. Offered alternate years. Offered 1995-96. CROSSLISTED as BI 673.

BIORESOURCE ENGINEERING

Degrees in bioresource engineering are granted through the College of Engineering; see College of Engineering for curricula and course descriptions.

BIORESOURCE RESEARCH

Bioresource Research students acquire research experience and broadly-based knowledge in interdisciplinary fields of agricultural, environmental, food, and forest sciences. Students determine their fields of study by choosing among ten different option areas. After two years of research in the program of a faculty mentor, each student writes a senior thesis. In addition to research expertise, students graduate with strong basic science backgrounds and problem-solving and communication skills. Many will become industrial or academic research professionals, in areas of science where there will be a shortage of qualified individuals for the foreseeable future. Others will enter graduate and professional schools in the life sciences, or become highly effective secondary school science teachers. There are over one hundred Bioresource Research faculty mentors, from fifteen departments in the colleges of Agricultural Science, Forestry, and Science: Agricultural Chemistry, Animal Science, Bioresource Engineering, Botany and Plant Pathology, Chemistry, Crop and Soil Science, Entomology, Fisheries and Wildlife, Food Science and Technology, Forest Resources, Forest Science, Horticulture, Microbiology, Rangeland Resources, and Zoology. The faculty are organized into ten interdepartmental option groups according to their research interests. See complete description under Interdisciplinary Studies.

BOTANY AND PLANT PATHOLOGY

See College of Science.

CROP AND SOIL SCIENCE

Sheldon Ladd, Head
Crop Science 109B
Ag and Life Sciences 3017
Oregon State University
Corvallis, OR 97331-3002
(503) 737-2821 and (503) 737-2441

Faculty

Professors Boersma, Bottomley, Christensen, Huddleston, Jolliff, Kronstad, Ladd, Morris, Moss, Shock, Smiley, Warkentin; *Associate Professors* Baham, Dick, Hannaway, Hart, Hayes, Huber, Karow, Kling, Knapp, Mosley, Myrold, Kiemnec, Rykbost, Schrumph, Wysocki; *Assistant Professors* Ball, Bolte, Chastain, Cook, Dovel, Gutbrod, Henderson, Mallory-Smith, Mitchell, Motazedian, Roseburg, Shenk, Young, Zwer; *Senior Instructors* Brewster, Clark, Danielson, Scott; *Instructors* Caputo, Peters, Shafabakhsh, Verhoeven

Courtesy Faculty

Professors Barker, Elliott, Haunold, Metzger, Olszyk, Trione, Young; *Associate Professors* Holdren, Rickman, Steiner; *Assistant Professors* Douglas, Griffith, Johnson, Marrett, Mueller-Warrant, Rasmussen

Undergraduate Major

Crop and Soil Science (B.S.)

Options
Crop Science
Soil Science

Minor

Crop Science
Soil Science

Graduate Majors

Crop Science (M.S., Ph.D.)

Graduate Areas of Concentration
Cereal Breeding and Genetics
Crop Modeling
Crop Physiology
Crop Production
Forage and Pasture Management
Grass Breeding & Genetics
New Crops
Oilseed Crop Breeding and Genetics
Potato Production
Seed Production and Technology
Weed Control

Soil Science (M.S., Ph.D.)

Graduate Areas of Concentration
Forest Soils
Soil and Clay Mineralogy
Soil Chemistry
Soil Fertility and Plant Nutrition
Soil Genesis and Classification
Soil Microbiology
Soil Physics
Soils and Land Use

Crop Science instruction is involved primarily in the production and improvement of field crop species—in growing, protecting, developing, and improving plants which supply the world population's food, livestock feed, seed industrial raw materials, soil and watershed protection, lawns, turf, and wildlife crops. Courses integrate the scientific principles of soil science, physics, chemistry, botany, and genetics as the student deals with theories and practices of crop management and improvement.

Soils are one of our most diverse and fascinating natural resources. We use them daily to grow our food and fiber, dispose of our wastes, build our houses and roads, landscape our lawns and gardens, and exercise on in the outdoors. But we rarely see it because it is hidden beneath our feet. There is a whole new world down there, a world of complex chemical, physical, and biological interactions waiting to be explored.

Soil Science is an applied science that builds upon a strong foundation in biology, geology, chemistry, and physics. Students who like science, and the challenge of solving scientific problems can do it all in soil science. They study chemical processes that affect plant nutrition and toxic metal mobility, biological processes involved in nutrient cycling and waste disposal, physical process of water movement into and within the soil, and geological processes related to soil development and soil mapping. Soil scientists help solve problems related to forest management, groundwater contamination, erosion and sedimentation, land reclamation, crop production, land use planning, and many others.

Careers

Careers for crop scientists are available in business, industry, farming, research, agricultural chemical industries, seed production, seed technology, communications, conservation, and education. Positions are available in agricultural experiment stations and extension services, state departments of agriculture, food processing companies, insurance agencies, lending institutions, and commercial firms dealing in the processing and sale of farm products, chemicals, and seed.

Careers for soil scientists are available in agriculture, forestry, education, state and federal resource agencies, private consulting, and research. Farms, ranches, and agricultural supply companies employ soil scientists as managers or field representatives. Soil scientists may become teachers of vocational agriculture or environmental education, or they may become County Extension Agents in agriculture or natural resources. The USDA Forest Service and Natural Resource Conservation Service often employ soil scientists, as do private consulting firms in environmental engineering or land use planning.

Academic Advising

Undergraduate curricula in crop and soil science are flexible enough to provide for the student's individual professional needs and interest and for a broad-based general education by allowing electives in other colleges throughout the university. Undergraduate advising is a vital part of the program, and the department is well known for excellence in advising. Advisers and faculty provide curricular guidance and aid in professional extracurricular activities, career decisions, and job placement.

Scholarships

The Department of Crop and Soil Science administers a number of scholarships that are available only to undergraduates majoring in the department. The department also supports a Crop and Soil Science Club that provides valuable co-curricular professional development, and a collegiate soil judging team that participates in both regional and national competition. See the Scholarships section in the front of this catalog.

Curricula

Crop Science Option

Baccalaureate Core Requirements (48)

Crop Science Core

CSS 100. Orientation/Career Plan (1)
CSS 300. Intro to Crop Prod. (4)
CSS 302. Applied Prin. of Prod. (4)
CSS 407. Sem/Senior (1)
CSS 410. Internship (1-6)
CSS 430. Plant Genetics (3)
CSS 440. Weed Control (5)
CSS 450. Plant Breeding (4)
CSS 475. Ag. Mngt. Ore. Soil Res. (2)
CSS 480. Crop. Systems/Dec. Making (4)
Electives to total 27 credits in CSS : (Crops)

Other Agriculture

AG 111. Computer App/Agric. (3)
AREC 211. Mgt. in Agriculture (4)
CSS 305. Prin. of Soil Sci. (5)
CSS 315. Nutrient Mgt. & Cycling (4)
ANS 210. Feed Prcessing (3)

Biological Sciences

BI 101/BI 211. Introductory Biology (4)
BI 102/BI 212. Introductory Biology (4)
BI 103/BI 213. Introductory Biology (4)
BOT 221. Systematic Botany (4)
BOT 331. Plant Physiology (5)
BOT 350. Intro. Plant Path. (4)
ENT 311. Intro. Insect Pest Mgt (5)

Physical Sciences

CHEM 121/CHEM 201. General Chemistry (5-3)
CHEM 122/CHEM 202. General Chemistry (5-3)
CHEM 123/CHEM 203. General Chemistry (5-3)
CHEM 331. Organic Chemistry (3) & CHEM 332 (3)
ST 351. Intro. Stat. Methods (4)
MTH 105. Intro to Contemporary Math (3)

Soil Science Option

Baccalaureate Core Requirements (51)

Soil Science Core

CSS 100. Orientation/Career Plan. (1)
CSS 305. Prin. Soil Science (5)
CSS 315. Nutrient Mgt and Cycling (4)
CSS 407. Sem/Senior (1)
CSS 410. Internship (1-6)
CSS 435. Soil Ecosystem Properties (4)
CSS 446X. Geochemistry of Soil Ecosystems (3)
CSS 455. Biology of Soil Ecosystems (4)
CSS 465. Soil Morphology/Survey (4)
CSS 475. Ag. Mngt. Ore. Soil Res. (2)
Electives to total 27 credits in CSS: (Soils)

Other Agriculture

AG 111. Computer App/Agric. (3)
CSS 300. Intro. to Crop Prod. (4)
RNG 341. Rangeland Resources (3)
CSS 480. Crop Systems/Dec. Making (4)

Biological Sciences

BI 101/BI 211. Introductory Biology (4)
BI 102/BI 212. Introductory Biology (4)
BI 103/BI 213. Introductory Biology (4)
BOT 331. Plant Physiology (5)
MB 302. General Microbiology (3)
MB 303. General Microbiology Lab (2)

Physical Sciences

CHEM 121/CHEM 201. General Chemistry (5-3)
CHEM 122/CHEM 202. General Chemistry (5-3)
CHEM 123/CHEM 203. General Chemistry (5-3)
CHEM 331. Organic Chemistry (3)
CHEM 332. Organic chemistry (3)
PH 201/PH 211. General Physics (5-4)
PH 202/PH 212. General Physics (5-4)
STAT 351. Intro. Stat. Methods (4)
MTH 241. Calc for Mgt and Social Sci (4)
MTH 245. Math for Mgt, Life, & Social Sci (4)
GEO 201. Geology of Interior Earth (4)
GEO 202. Geology Surface Earth (4)
GEO 203. Geologic Evolution North America (4)

Minors

Crop Science Minor (27)

Requirements

CSS 300. Intro to Crop Prod (4)
CSS 305. Principles of Soil Science (5)
CSS 407. Seminar (1)

Electives

Select two or more of the following
- CSS 302. Applied Principles of Production (4)
- CSS 310. Forage Production (4)
- CSS 460. Seed Production (3)

Select any of the following to bring total to a minimum of 27 credits
- CSS 420. Seed Science and Technology (5)
- CSS 430. Plant Genetics (3)
- CSS 450. Plant Breeding (4)
- CSS 440. Weed Control (5)
- CSS 480. Cropping Systems and Decision Making (4)
- CSS 475. Agricultural Management of Oregon Soil Resources (2)

Soil Science Minor (27)

Requirements

CSS 305. Principles of Soil Science (5)
CSS 315. Nutrient Management and Cycling (4)
Physical science elective (5)
Biological science elective (4)
Select a minimum of 9 credits from
- CSS 401. Research (1-3)
- CSS 405. Reading and Conference (1-3)
- CSS 407. Seminar (1)
- CSS 408. Workshop (1)
- CSS 415. Soil Fertility Management (3)
- CSS 425. Sustaining Soil Productivity (3)
- CSS 435. Soil Ecosystem Properties (4)
- CSS 446X. Geochemistry of Soil Ecosystem (4)
- CSS 455. Biology of Soil Ecosystems (4)
- CSS 465. Soil Morphology and Survey (4)
- CSS 475. Agr Mgmt of Oregon Soil Resources (2)
- CSS 485. Environmental Applications of Soil Science (4)
- CSS 495. Topics in Soil Management (3)

Courses

Lower Division

CSS 100. ORIENTATION/CARER PLANNING (1).

CSS 105. SOILS AND MAN (3). Soil Resources in relation to environmental planning and sound ecological principles of land use. Examples and case studies involving soil problems and limitations in land use, pollution control and ecological aspects of production. One field trip.

CSS 199. SPECIAL STUDIES (1-16).

Upper Division

CSS 300. INTRODUCTION TO CROP PRODUCTION (4). Principles, practices and issues relating to the production, marketing and improvement of horticultural and agronomic crops. Comparison of crop production systems; geography of crop production; cropping calendars. PREREQ: Year of General Biology or equivalent. CROSSLISTED as HORT 300.

CSS 302. APPLIED PRINCIPLES OF PRODUCTION (4). Importance of and current production practices for cereal crops. PREREQ: CSS 300 or equivalent; CSS 305. Lec/lab.

CSS 305. PRINCIPLES OF SOIL SCIENCE (5). Origin, formation, classification, physical, chemical, and biological characteristics; effects of soil management or agricultural and forest crop production. Field trips. PREREQ: CH 122.

CSS 310. FORAGE PRODUCTION (4). Importance of and current production practices for forage crops. PREREQ: CSS 300 or equivalent; CSS 305.

CSS 315. ^NUTRIENT MANAGEMENT AND CYCLING (4). Nutrient forms, transformations, and plant availability as influenced by chemical and biological reactions in soils; soil pH and management of acid and alkaline soils; characteristics and use of fertilizers, soil amendments and organic wastes. Labs include routine soil testing procedures, computer applications for soil fertility management, and field trips. PREREQ: CSS 305, CH 122. REC: Courses in computers. (Writing Intensive Course)

CSS 335. *WATER RESOURCE SCIENCE (3). An introduction to water science and water uses, including the components of the hydrologic cycle, water as a biological habitat, different uses of water, and water quality for beneficial uses. PREREQ: BAsic Chemistry and Physics. (Bacc Core Course)

CSS 395. WORLD SOIL RESOURCES (3). The properties, global distribution, and agricultural productivities of major world soil groups are described. Potentials for human- accelerated soil degradation are introduced for each soil group, and reasons for conflicting assessments of degradation are discussed. PREREQ: CH 121.

CSS 401. RESEARCH (1-16).

CSS 403. THESIS (1-16). Independent, original study and preparation of a senior thesis. PREREQ: Senior standing.

CSS 405. READING AND CONFERENCE (1-16). CSS 405A: Reading and Conference/Computer App/CSS CSS 405C: Reading and Conference/Pest. Risk and Benefit Selected readings, lecture, and discussion on the difficult challenge of evaluating conflicting data and opinions on pesticides. Emphasis will be on social judgments and developing perspectives; any science will be elementary.

CSS 407. SEMINAR (1). Senior seminar intended to instruct students on proper techniques for presentation of scientific material. Each student is expected to prepare and present a scientific seminar and to submit written documentation supporting that seminar. Graded P/N.

CSS 408. WORKSHOP (1-16). Evaluation and judging of soils in Oregon and other states; directed studies of soil morphology, soil survey, soil fertility, soil physics, soil chemistry, soil biology, and soil information systems.

CSS 410. INTERNSHIP (1-6). Professional work experience previously approved and supervised by the department, written report required. PREREQ: Junior standing.

CSS 415/CSS 515. SOIL FERTILITY MANAGEMENT (3). Management of plant nutrients in agronomic systems; diagnosis of nutrient availabiity and prediction of crop response to fertilizers; interactions between nutrient response and chemical, physical and biological properties of soils. PREREQ: CSS 315. REQ: Courses in statistics, chemistry and plant physiology. Offered alternate years.

CSS 420/CSS 520. SEED SCIENCE AND TECHNOLOGY (5). Seed certification; seed testing; labeling and labeling laws; marketing; industry organizations; seed identification; seed biology (including: seed development, physiology of germination, dormancy, longevity, and deterioration). PREREQ: CSS 300 or equivalent.

CSS 425/CSS 525. SUSTAINING SOIL PRODUCTIVITY (3). Explores long-term impact of agriculture on soil physical, chemical and biological parameters; potential and limitations on management systems that emphasize cover crops and polycultures in relation to nutrient cycling and plant nutrition; management practices that maximize nutrient efficiency from inorganic sources, organic wastes, and plant residues. PREREQ: CSS 305.

CSS 430/CSS 530. PLANT GENETICS (3). Theories and principles; polyploidy; qualitative and quantitative inheritance. PREREQ: CSS 300, HORT 201, BI 203. CROSSLISTED as HORT 430/530.

CSS 435/CSS 535. SOIL ECOSYSTEM PROPERTIES (4). An advanced treatment of soils, stressing the prominent physical, chemical, and biological soil properties. Develops the basis for an integrated view of soil processes in terrestrial ecosystems. Weekly laboratory emphasizing the measurement of soil properties. PREREQ: CSS 305, REC: MTH 242, CH 123. PH 201.

CSS 440/CSS 540. WEED CONTROL (5). Principles of weed control by cultural, biological, and chemical means; weed identification; introduction to herbicides and factors influencing their use. Field trip. PREREQ: One year of biological science, one course in organic chemistry; BOT 331 strongly recommended.

CSS 445/CSS 545. SOIL ECOSYSTEM PROCESSES (4). Transport of water, heat, and chemical solutes in soils and their uptake by plants. Kinetic and equilibrium treatments of chemical and biological processes important to nutrient cycling and soil genesis. Integration of physical, chemical, and biological processes through conceptual models. Weekly laboratory for using on the measurement of soil processes. PREREQ: CSS 435/CSS 535.

CSS 450/CSS 550. PLANT BREEDING (4). An introduction to the genetic improvement of self-pollinated, cross-pollinated, and asexually propagated species and the genetic principles on which breeding methods are based. Examples are drawn from a wide range of crops, including cereal grains, grasses, fruits, nuts, and vegetables; guest lecturers discuss their breeding programs. Additional topics include crop evolution, germplasm preservation, disease resistance, and biotechnology. PREREQ: BI 311 or CSS 430/CSS 530. CROSSLISTED as HORT 450/HORT 550.

CSS 455/CSS 555. BIOLOGY OF SOIL ECOSYSTEMS (4). A detailed study of the organisms that live in the soil and their activities in the soil ecosystem, soil as a habitat or organism, taxonomy and biology of soil organisms, fundamentals of nutrient cycles, special topics in soil biology, review basis of soil microbial and ecological principles. PREREQ: CSS 305. Recommend courses in chemistry, physics, and microbiology.

CSS 460/CSS 560. SEED PRODUCTION (3). Examination of principles and management systems required to produce high quality seed. Fundamentals of seed crop biology and production methods are stressed. Concepts are illustated using Pacific Northwest seed crops. One Saturday field trip required. PREREQ: CSS 300 or equivalent.

CSS 465/CSS 565. SOIL MORPHOLOGY AND SURVEY (4). Soil profile descriptions; soil landscape patterns, morphology and nomenclature of major soil groups; soil survey techniques and uses. PREREQ: CSS 305 and a course in geology. Saturday field trips.

CSS 475/CSS 575. AGRICULTURAL MANAGEMENT OF OREGON SOIL RESOURCES (2). Field trips to study soil and crop management for agriculture and forestry through the experiences of Oregon farmers, ranchers, and foresters. Trips visit both dryland and irrigated enterprises in eastern Oregon. Irrigated and nonirrigated operations in western Oregon, and managed forests and rangelands throughout Oregon. Field trip fee may be charged. PREREQ: Senior standing. CROSSLISTED as HORT 475/HORT 575.

CSS 480/CSS 580. CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT (4). Decision cases involving the production of field and horticultural crops; individual and group activities; discussion of the decision-making process. Multiple field trips required. PREREQ: HORT/CSS 300, Senior standing in Agriculture. CROSSLISTED AS HORT 480/HORT 580. (WIC course)

CSS 485/CSS 585. ENVIRONMENTAL APPLICATIONS OF SOIL SCIENCE (4). Applications of the principles of soil science to the understanding of and solutions to environmental problems. Topics covered include use of soil surveys, development of soil survey interpretations, use of soils as a medium for disposal and treatment of municipal and industrial wastes, groundwater contamination related to soil management, effects and control of erosion and sedimentation, soil evaluation models used in land use planning. PREREQ: CSS 305, CSS 435 recommended. Offered alternate years.

CSS 495/CSS 595. TOPICS IN SOIL MANAGEMENT (3). Graded P. Recent issues and developments in soil management. Topics vary, but include topics such as soil management in arid regions, tropical soil management, soil tilth and residue management, soil management for environmental quality. Course can be repeated for credit. PREREQ: CSS 315.

Graduate

CSS 501. RESEARCH (1-16).

CSS 503. THESIS (1-16).

CSS 505. READING AND CONFERENCE (1-16).

CSS 508. WORKSHOP (1-16).

CSS 509. PRACTICUM IN TEACHING (1-3). Developing skills and competence in teaching soil science under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures.

CSS 590. FIELD-PLOT TECHNIQUE (3). Field experiments and field plots, optimum plot size and shape; basic experimental designs; agronomy trials; factorial experiments; contrasts among means and totals; yield trials; separation of means; augmented designs; lattice designs; stability analysis. PREREQ: ST 351.

CSS 601. RESEARCH (1-16).

CSS 603. THESIS (1-16).

CSS 605. READING AND CONFERENCE (1-16).

CSS 607. SEMINAR (1).

CSS 608. WORKSHOP (1-16).

CSS 615. PLANT NUTRIENT AVAILABILITY (3). Chemical physical, and biological processes influencing nutrient availability and uptake by plants; development and verification of a mechanistic model describing nutrient uptake; application of basic principles to soil fertility and plant nutrition research. PREREQ: CSS 315. Offered alternate years.

CSS 630. ADVANCED PLANT BREEDING (3). Theory and practice of plant breeding in population, inbred, hybrid, and clone improvement; manipulation of male sterility, self-incompability, and polyploidy; molecular marker-assisted selection and application of tissue culture techniques to plant breeding. PREREQ: CSS 430/CSS 530 or equivalent. Offered alternate years.

CSS 635. CHEMICAL PROCESSES IN SOIL SYSTEMS (3). Application of equilibrium thermodynamics and chemical kinetics to reactions in soil systems; solubilities, complexation, cation exchange equilibria, surface chemistry, chemical modeling, and chemical transport as applied to weathering, genesis, nutrient availability, and the nature of soil acidity. PREREQ: CSS 445; CH 442 or equivalent. Offered alternate years.

CSS 640. WEED ECOLOGY AND MANAGEMENT (4). Aspects of plant ecology and physiology that are associated with agricultural and forest weeds. PREREQ: BOT 330, BOT 33, or BOT 341. Offered alternate years.

CSS 645. SOIL BIOLOGY AND BIOCHEMISTRY (3). Biogeochemical cycling of N, P, and S; soil microbial biomass; soil enzymes; rhizosphere biology; applications of stable isotopes in soil science; biodegradation of organic wastes; applications of molecular biology to soil microbiology; models of microbial activity in soil. PREREQ: CSS 445, MB 448; biochemistry. Offered alternate years.

CSS 650. ADVANCED PLANT BREEDING II (3). Pedigree, bulk, single-seed-descent, doubled haploid, backcross, testcross, mass, and half-sib, full-sib, S~1~, and S ~2~ family breeding methods; breeding hybrids and selecting sources of alleles for developing superior hybrids; the nature and consequences of genotype by environment interactions; marker-assisted backcross and inbread line breeding; quantitative trail locus mapping; random linear models; designing and analyzing cultivar, line, and family selection experiments. PREREQ: GEN 311 or CSS 430/CSS 530, CSS 450/CSS 550, ST 411/ST 511, ST 412/ST 512, and ST 413/ST 513. Offered alternate years.

CSS 655. PLANT-WATER RELATIONS (3). Quantitatie aspects of the distribution, movement, and function of water in the soil/plant/atmosphere continuum. PREREQ: CSS 445, CH 442. Offered alternate years.

CSS 660. HERBICIDE SCIENCE (4). Absorption, movement, and mechanism of action of herbicides in plants; behavior of herbicides in soil. PREREQ: CSS 440/CSS 540, BOT 331. Offered alternate years.

CSS 665. SOIL GENESIS AND CLASSIFICATION (3). Soil development; soil forming factors and processes as related to soil landscape formation and soil classificaton; interpretation of X-ray data for soil genesis. Offered alternate years.

CSS 670. PHYSIOLOGY OF CROP YIELD (3). Concepts of crop growth and production in relation to environmental and physiological factors and their interactions; current literature. PREREQ: BOT 441 or equivalent. Offered alternate years.

EXTENSION SERVICE

Lyla Houglum, Dean of Extended Education and Director of Extension Service
Ballard Extension Hall 101
Corvallis, OR 97331-3606
(503) 737-2713

Oregon State University's Extension Service provides education and information based on timely research to help Oregonians solve problems and develop skills related to youth, family, community, farm, forest, energy, and marine resources. It carries out its mission by extending the research knowledge base of the university to people who need the information, and provides leadership in applying this knowledge to the problems people have identified.

Anyone may take part in Extension Service offerings and the Extension staff is actively involving Oregonians who may not previously have used Extension Service programs. Thousands of Oregon citizens volunteer to assist in Extension programs by leading and teaching groups.

Extension educational programs are developed in response to needs of people in Oregon. Needs are identified by Extension's staff of county agents (OSU faculty), who are located throughout the state in all of Oregon's 36 counties. Agents, who work with people to assess their needs, tell members of Extension's on-campus specialist staff what needs they have identified. Specialists then prepare useful educational programs for delivery by the agents. More than half of Extension's faculty are located off-campus in field offices. Financial support is broadly based from county, state, federal, and other sources.

For efficiency and for program quality, the Extension Service conducts its work on the basis of planned programs approved by the University and the U.S. Department of Agriculture. There are seven major Extension education programs:

Agriculture
Extension's agricultural program provides education, training, and technical assistance to people with agriculturally related needs and interests. Major program emphasis is on food and fiber production, farm business management, marketing and processing of agricultural products, and resource use and conservation.

Home Economics
Extension's home economics program offers educational opportunities to help individuals and families manage their resources to meet needs for food, clothing, finance, shelter, parenting, and human relationships.

Forestry
Extension's forestry program improves Oregonians' knowledge of forest resources and their options for expanding benefits from these resources. This educational program assists forest owners, managers, processors, and users in understanding small woodland production and management and use of all forest lands. Priority subjects are reforestation, growth, management, harvesting, processing and use of wood, protection of soil and water, and other multiple uses and values.

Extension/Sea Grant Program
Extension's Sea Grant Program provides education, training, and technical assistance to people with ocean-related needs and interests. Major efforts are concentrated in the areas of fisheries and wildlife, marine engineering, food science and technology, economics, business, resource management, education, and recreation. The program is partially supported by the OSU Sea Grant College.

Community Development
Extension's community development program helps Oregonians to resolve locally determined problems by providing objective information and assistance on issues concerning economic development and management of local government, land, and natural resources.

4-H Youth
Extension is the parent organization for all 4-H youth activities in Oregon. Its 4-H program assists young people, their families, and adult volunteers to become productive and self-directing by developing their practical skills and knowledge. Professionals and volunteers together provide educational projects and activities in animal science, plant science, home economics, communications, cultural and performing arts, natural science, and mechanical science.

Energy
Extension's energy program—supported in part by grants from Bonneville Power Administration and the U.S. and Oregon Departments of Energy—offers education, training, and technical assistance on conservation and renewable resources to help Oregonians solve energy-related problems.

FISHERIES AND WILDLIFE

Erik K. Fritzell, Head
Nash Hall 104
Oregon State University
Corvallis, OR 97331-3803
(503) 737-4531

Faculty
Professors Coblentz, Crawford, Curtis, Fritzell, Gregory, Jarvis, Malouf, Markle, Mate, Weber; *Associate Professors* Bayley, Ford, Kaufmann, Langdon, Liss, Olson, Wolff; *Assistant Professors* Edge, Fitzpatrick, Herlihy, J. Li, Robinson, Sampson; *Senior Instructor* Seim

Courtesy Faculty
Professors Anthony, Aron, Collopy, Fisher, Gentry, Henny, Lackey, H. Li, Meslow, Schoning, Schreck, Sedell, Thomas; *Associate Professors* Bennett, Bisson, Ewing, Irwin, Haig, Hughes, Kendall, Landers, Larson, Loughlin, Noss, Stauffer, Starkey, Stoddard; *Assistant Professors* Amandi, Carey, Forsman, Koprowski, Lamberti, Maule, Reeves, Ryer

Adjunct Faculty
Professors Buhler (Agricultural Chemistry), Hixon (Zoology), Pearcy (Oceanography), Smith (Anthropology); *Associate Professors* McComb (Forest Science)

Undergraduate Majors

Fisheries Science (B.S.)
Wildlife Science (B.S.)
Options
Fisheries/Business
Fishery Science
Marine Resources
Public Education/Extension

Wildlife Science
Individual Studies

Minor

Fisheries and Wildlife

Graduate Majors

Fisheries Science (M.S., Ph.D.)

Graduate Areas of Concentration

Aquaculture
Fish Genetics
Fisheries
Ichthyology
Invertebrate Fisheries
Limnology
Parasites and Diseases
Physiology and Ecology of Marine and Freshwater Fishes
Steam Ecology
Toxicology
Water Pollution Biology

Wildlife Science (M.S., Ph.D.)

Graduate Areas of Concentration

Animal-Habitat Relationships
Behavior
Biology of Big Game and Small Mammals
Community Studies
Ecology of Avian and Mammalian Predators
Ecology of Waterfowl and Upland Gamebirds
Effects of Environmental Contaminants
Food Habits and Nutrition
Parasites and Diseases
Population Dynamics
Reproductive Biology
Toxicology of Pesticides
Wildlife Ecology
Wildlife-Forestry Interactions
Wildlife Science

This department prepares students for professional careers in fisheries and wildlife as biologists, managers, consultants, and administrators. Course work leading to the B.S., M.Agr., M.S., M.A.I.S., and Ph.D. degrees is offered.

The undergraduate curriculum is based upon the belief that students in fisheries and wildlife should be provided with a good education in biology and ecology as the basis for careers in resource science and management. But fisheries and wildlife are not simply biological disciplines. Educated professionals must be aware of the inherent social, as well as biological, considerations and must operate with a perspective that is integrative. Toward this end, biological, social, economic, and political knowledge is integrated within the curriculum to provide students with a broad framework for understanding and resolving resource problems.

The undergraduate curriculum is composed of a core and several educational options or areas of concentration. Students may elect either a fishery science or wildlife science major. The core is composed of course work required in both majors. The concentrations reflect the diversity of educational and career opportunities within fisheries and wildlife.

The fisheries science major is intended to provide students with perspectives and approaches for understanding and managing fisheries and aquatic systems. Options within the fisheries science major include fishery science, marine resources, fisheries/business, public education/extension, and individual studies. Education in the fisheries science major prepares students for graduate study or professional employment in research or management of fisheries and aquatic systems. One term of full-time enrollment at a marine field station (normally the Hatfield Marine Science Center in Newport) is required for the B.S. degree in fisheries science.

The wildlife science major is intended to provide students with the biological expertise and social perspectives to understand and manage wildlife resources and the terrestrial and aquatic systems they depend upon. Options within the wildlife science major include wildlife science, public education/extension and individual studies. Education in the wildlife science major prepares students for professional employment in management or research, and for graduate study.

Students planning to transfer to this department should focus on courses in general biology, general chemistry, physics, and mathematics during their freshman and sophomore years.

Strategically located for the study of fisheries and wildlife, Oregon State University has, within easy access, state fish hatcheries, a game farm, refuges, experimental streams and ponds, and the Hatfield Marine Science Center at Newport. Research by the Oregon Department of Fish and Wildlife and by Cooperative Wildlife and Fishery Research Units is of basic value to the instructional program.

Graduate programs leading to the M.Agr., M.S., M.A.I.S., or Ph.D. permit intensive study in special areas of interest under the guidance of nationally known scientists. Advanced study in fisheries science may be pursued in water pollution biology, stream ecology, aquaculture, ecology of marine and freshwater fishes, taxonomy and systematics, genetics, toxicology, and parasites and diseases of fish. Advanced study in wildlife science is oriented toward resource management and can involve almost any bird or mammal species or habitat. Research emphasis may be placed on population dynamics and utilization, life history and ecology, habitats, food habits and nutrition, behavior, and organization of animal communities. Opportunities exist for work in terrestrial and aquatic systems.

The core courses required of all students seeking the B.S. degree are listed below. The student must choose one area of concentration by the beginning of the junior year.

CURRICULUM

B.S. Degree Requirements (180)

Baccalaureate Core (48)

Fisheries and Wildlife Core (108-110)

FW 107. Orientation to Fisheries & Wildlife (1)
FW 251. Principles of Wildlife Conservation (3)
FW 255. Wildlife Techniques (2)
FW 313. Ichthyology (4)
FW 320. Introductory Population Dynamics (4)
FW 321. Fisheries & Wildlife Resource Ecol (3)
FW 407. Senior Seminar (2)

Science

BI 201, BI 202, BI 203. General Biology (12)
BI 370. General Ecology or BI 371. Ecological Mthods (3)
CH 221, CH 222, CH 223 or CH 121, CH 122, CH 123 General Chemistry (9-15)
MTH 241 or MTH 251. Calculus (4)
ST 351. Introduction to Statistical Methods (4)
PH 201. General Physics (5)
ST 351. Introduction to Statistical Methods (4)

Communications

COMM 111. Public Speaking (3)
WR 121. English Composition (3)
WR 222. English Composition (3)

Other Required Courses

EC 201. Microeconomics (3)
PS 474. Bureaucratic Politics and the Policy Process (4) or PS 476, Science and Politics
Select two of the following:
ANTH 481. Natural Resources & Community Values (3)
BA 432. Environmental Law (4)
FOR 321. Recreation Behavior & Mgt (4)
HSTS 415. Theory of Evolution & Foundation of Modern Biology (3)
PHL 440. Environmental Ethics (3)
PHL 443. Values & Human Ecology (3)
PS 475. Politics of Environmental Problems (4)

OPTIONS

FISHERY SCIENCE OPTION

Intended for students interested in a career in the science and management of fishery resources.

Fisheries and Wildlife Core courses plus:

CH 331. Organic Chemistry (4)
FW 454. Fishery Biology (5)
FW 456. Limnology (5)
BI 311. Genetics or ANS 378, Animal Gen (4)
ST 352. Introduction to Statistical Methods (4)
Select two of the following: (8)
FW 310. Wildlife Biology: Mammals
FW 311. Wildlife Biology: Birds
Z 473. Herpetology
Select one of the following: (4)
ANS 314. Animal Physiology
FW 476. Fish Physiology
Z 423. Environmental Physiology
Z 430. Principles of Physiology
Select one of the following: (4)
BOT 221. Systematic Botany
BOT 341. Plant Ecology
BOT 416. Aquatic Botany
Select one of the following: (4-5)
ENT 433. Aquatic Entomology
Z 361. Invertebrate Biology and Z 362. Invertebrate Biology Lab
Select one of the following: (3-4)
FOR 415. Forest Policy

FOR 365. Issues in Natural Resources Conservation
RNG 341. Rangeland Resources
Select one of the following: (3-4)
FE 430. Watershed Processes
GEO 482. Forest Geomorphology
RNG 355. Desert Watershed Management
RNG 455. Riparian Ecology & Management
Select one of the following: (4)
AREC 351. Natural Resources Management
AREC 352. Natural Resources and Environmental Economics
F 434. Forest Resource Economics I
FRR 462. Economics of Recreation Resources
Twelve credits of the following at the Hatfield Marine Science Center:
FW 407. Seminar (1)
FW 431. Dynamics of Marine Biological Resources (4)
FW 465. Marine Fisheries (4)
FW 470. Aquatic Toxicol & Pollution Biol (3)
FW 494. Parasites and Diseases of Marine Fishes and Invertebrates (5)
FW 495. Principles of Aquaculture (4)
FW 496. Culture of Aquatic Organisms (4)
FW 497. Aquaculture (3) (Writing Intensive Course)
FW 498. Aquaculture Lab (2)
Electives (3-8)

WILDLIFE SCIENCE OPTION

Intended for students interested in careers in wildlife science and management.

Fisheries and Wildlife Core courses plus:
BOT 221. Systematic Botany (4)
CH 331. Organic Chemistry (4)
FW 310. Wildlife Biology: Mammals (4)
FW 311. Wildlife Biology: Birds (4)
FW 481. Wildlife Ecology (3) (Writing Intensive Course)
FW 482. Senior Project (2) (Writing Intensive Course)
BI 311. Genetics or ANS 378. Animal Gen (4)
ST 352. Introduction to Statistical Methods (4)
Z 473. Herpetology (3)
Select one of the following: (3-5)
BOT 341. Plant Ecology
BOT 416. Aquatic Botany
RNG 347. Arid Land Biomes and RNG 348. Arid Land Plants
RNG 350. Grassland Ecosystems
Select one of the following: (4)
AREC 351. Natural Resources Management
AREC 352. Natural Resources and Environmental Economics
FOR 434. Forest Resource Economics I
FRR 462. Economics of Recreation Resources
Select one of the following: (3-5)
CSS 305. Principles of Soil Science
FE 430. Watershed Processes
RNG 355. Desert Watershed Management
RNG 455. Riparian Ecology & Management
Select one of the following: (4-5)
FW 451. Biology of Game Birds
FW 453. Managed Forest and Wildlife Interactions
FW 458. Management of Big Game Animals
FW 485. Wildlife Behavior
Select one of the following: (4-5)
FW 454. Fishery Biology
FW 456. Limnology
Electives (10-17)

MARINE RESOURCES OPTION

For students interested in a career in research and management of marine fisheries and marine systems.

Fisheries and Wildlife Core courses plus:
CH 331. Organic Chemistry (4)
FW 454. Fishery Biology (5)
FW 456. Limnology (5)
BI 311. Genetics or ANS 378. Animal Genetics (4)
MRM 414. Ocean Resources Management or MRM 415. Coastal Resources Mgmt (3)
OC 331. Introduction to Oceanography (3)
OC 332. Coastal Oceanography (3)
OC 440. Introduction to Biol Oceanography (3)
ST 352. Introduction to Statistical Methods (4)
Two of the following:
FW 310. Wildlife Biology: Mammals or FW 311. Wildlife Biology: Birds (4)
Z 473. Herpetology (3)
Select one of the following: (4)
ANS 314. Animal Physiology
FW 476. Fish Physiology
Z 423. Environmental Physiology
Z 430. Principles of Physiology
Select one of the following: (4)
AREC 351. Natural Resources Management
AREC 352. Natural Resources and Environmental Economics
FOR 434. Forest Resource Economics I
FRR 462. Economics of Recreation Resources
Twelve credits of the following at the Hatfield Marine Science Center:
FW 407. Seminar (1)
FW 431. Dynamics of Marine Biological Resources (4)
FW 465. Marine Fisheries (4)
FW 470. Aquatic Toxicol & Pollution Biol (3)
FW 494. Parasites and Diseases of Marine Fishes and Invertebrates (5)
FW 495. Principles of Aquaculture (4)
FW 496. Culture of Aquatic Organisms (4)
FW 497. Aquaculture (3) (Writing Intensive Course)
FW 498. Aquaculture Lab (2)
Electives (8-11)

FISHERIES/BUSINESS OPTION

Fisheries and Wildlife Core courses plus:
AREC 221. Marketing in Agriculture or BA 390. Marketing (3-4)
AREC 441. Agricultural Financial Management or BA 340. Finance (4)
AREC 452. Marine and Fishery Economics (4)
AREC or BA Upper Division Electives (8)
BA 215. Fundamentals of Accounting (4)
BA 350. Managing Organizations (4)
FW 454. Fishery Biology (5)
FW 456. Limnology (5)
Two of the following:
FW 310. Wildlife Biology: Mammals or FW 311. Wildlife Biology: Birds (4)
Z 473. Herpetology (3)
Twelve credits of the following at the Hatfield Marine Science Center:
FW 407. Seminar (1)
FW 431. Dynamics of Marine Biological Resources (4)
FW 465. Marine Fisheries (4)
FW 470. Aquatic Toxicol & Pollution Biol (3)
FW 494. Parasites and Diseases of Marine Fishes and Invertebrates (5)
FW 497. Aquaculture (3) (Writing Intensive Course)
FW 496. Culture of Aquatic Organisms (4)
FW 498. Aquaculture Lab (2)
Electives (13-16)

PUBLIC EDUCATION/EXTENSION OPTION

For students interested in careers involving communication of agency or institution policies, research findings, and management decisions to specific user groups and the general public. This would include careers in extension, in public relations, and as information and education specialist with federal and state agencies, private industry or public organizations.

Fisheries and Wildlife Core courses plus:
FW 405. Feading and Conference/Extension (9)
FW 454. Fishery Biology (fisheries majors) or FW 481. Wildlife Ecology (Writing Intensive Course) and FW 482. Senior Project (5) (Writing Intensive Course((wildlife majors)
Two (fisheries majors) or three (wildlife majors) of the following: (8-12)
FW 310. Wildlife Biology: Mammals (4)
FW 311. Wildlife Biology: Birds (4)
Z 473. Herpetology (3)
Select one of the following: (4)
AREC 351. Natural Resources Management
AREC 352. Natural Resources & Environmental Economics
F 434. Forest Resources Economics I
FRR 462. Economics of Recreation Resources
15 credits from: COMM, WR, or other appropriate courses. Selection to be made by student in consultation with adviser
Wildlife Majors Only
FW 454. Fisheries Biology or FW 456. Limnology (5)

Fisheries majors are required to spend one term at the Hatfield Marine Science Center. Twelve credits of the following courses are required:
FW 407. Seminar (1)
FW 465. Marine Fisheries (4)
FW 470. Aquatic Toxicol & Pollution Biol (3)
FW 494. Parasites and Diseases of Marine Fishes and Invertebrates (5)
FW 497. Aquaculture (3) (Writing Intensive Course)
FW 498. Aquaculture Lab (2)
Electives (fisheries major 7-12; wildlife major 10-13)

INDIVIDUAL STUDIES

Intended for students interested in preparing an individual study program with a specific emphasis or focus. Examples that would be considered appropriate: fisheries/forestry; wildlife/forestry; environmental toxicology; wildlife/geography/land use planning; environmental law.

The student prepares an individual study program with a specific emphasis or focus. The program will be developed based on discussion with faculty advisers and other professionals. The fisheries program must include: a) two courses from FW 310, FW 311, and Z 473; b) FW 454; c) 9 additional credits in fisheries and wildlife; d) a course on the economics of natural resources; and e) supporting courses to total about 55-70

credits. The wildlife program must include: a) FW 310 and FW 311, Z 473, FW 481 and FW 482; b) 5 additional credits in fisheries & wildlife; c) a course on the economics of natural resources; and d) supporting courses total abut 55-70 credits. The program will be reviewed by the Resident Instruction Committee and will become a contract upon approval by the committee and the department head.

Qualification

The individual study concentration could be proposed at any time to be effective after achieving junior standing.

MINOR (27)

A sequence in general zoology or general biology is prerequisite.

BI 370. General Ecology (3)
FW 251. Principles of Wildlife Conservation (3)
Select two of the following:
- FW 310. Wildlife Biology: Mammals (4)
- FW 311. Wildlife Biology: Birds (4)
- FW 313. Ichthyology (4)
- Z 473. Herpetology (3)
- Electives (must be approved by head adviser)

Select 13 credits from the following:
- FW 255. Wildlife Techniques (1)
- FW 320. Introductory Population Dynamics (4)
- FW 321. Fisheries & Wildlife Resource Ecol (3)
- FW 325. Global Crises in Resource Ecology (3)
- FW 431. Dynamics Marine Biol Resources (4)
- FW 451. Biology of Game Birds (5)
- FW 454. Fishery Biology (5)
- FW 456. Limnology (5)
- FW 458. Mgmt of Big Game Animals (4)
- FW 465. Marine Fisheries (4)
- FW 470. Aquatic Tox & Pollution Biology (3)
- FW 485. Wildlife Behavior (4)
- FW 494. Diseases & Parasites of Marine Fishes & Invertebrates (5)
- FW 496. Culture of Aquatic Organisms (4)
- FW 497. Aquaculture (3) (Writing Intensive Course)
- FW 498. Aquaculture Lab (2)

COURSES

Lower Division

FW 107. ORIENTATION TO FISHERIES & WILDLIFE (1). Information relevant to academic pathways and career planning in the fields of fisheries and wildlife. Graded P/N.

FW 199. SPECIAL STUDIES (1-16). Graded P/N.

FW 240. MULTICULTURAL PERSPECTIVES IN NATURAL RESOURCES (3). Explores multicultural influences on development of natural resources in the American west. Effects of diverse social values on changes in the physical landscape and biodiversity.

FW 251. PRINCIPLES OF WILDLIFE CONSERVATION (3). History of conservation and natural resource use; ecological principles, and social and economic limitations of conservation; principles and practices of wildlife and fisheries management; role of research in management.

FW 255. WILDLIFE TECHNIQUES (2). Techniques and equipment to obtain information related to wildlife and fisheries science and management; fundamentals of hypothesis formation, data acquisition and analysis, and reporting of results.

Upper Division

FW 310. WILDLIFE BIOLOGY: MAMMALS (4). Morphology, evolution, ecology, ethology, and classification of mammals with emphasis on economically important groups. Field trip required. PREREQ: FW 251, FW 255, junior standing.

FW 311. WILDLIFE BIOLOGY: BIRDS (4). Identification, classification, structure, ecology, behavior, management principles and techniques applicable to all major groups of birds. PREREQ: One year biological science.

FW 313. ICHTHYOLOGY (4). Identification, anatomy, life history of fishes of Oregon and the North Pacific; evolutionary relationship of these fishes to the world fish fauna. PREREQ: One year biological science.

FW 320. INTRODUCTORY POPULATION DYNAMICS (4). Principles and concepts of population dynamics related to fish and wildlife populations; methods of estimating abundance and mortality; models for population and yield analysis. PREREQ: BI 370 or BI 371.

FW 321. FISHERIES AND WILDLIFE RESOURCE ECOLOGY (3). Perspectives in community and ecosystem ecology, including ecosystem classification, and their use in management of fisheries and wildlife resource systems. PREREQ: FW 320.

FW 325. *GLOBAL CRISES IN RESOURCE ECOLOGY (3). Historical and contemporary implications of the impacts of burgeoning human populations on rates and patterns of global ecological change. Changes in ecosystem processes and crises of species extinction in the context of cultural and political institutions. (Bacc Core Course)

FW 401. RESEARCH (1-16).

FW 405. READING AND CONFERENCE (1-16).

FW 407. SEMINAR (1-16).

FW 408/FW 508. WORKSHOP (1-16).

FW 431/FW 531. DYNAMICS OF MARINE BIOLOGICAL RESOURCES (4). Strategies of marine fishery management. A synthesis of the principles of population dynamics for single- and multi-species systems from the viewpoint of a marine resource manager. PREREQ: BI 370 or BI 371. Offered alternate years.

FW 451/FW 551. BIOLOGY OF GAME BIRDS (5). Identification, classification, life history strategies, ecology and management of upland and migratory gamebirds. PREREQ: FW 311.

FW 453/FW 553. MANAGED FOREST WILDLIFE INTERACTIONS (4). Management and ecology of terrestrial vertebrates in forest ecosystems. Effect of silvicultural practices on habitat in managed forests. Management of habitat to promote diversity and abundance of forest wildlife. PREREQ: F 341 or equivalent course in ecology. CROSSLISTED WITH FS 453/FW 553.

FW 454/FW 554. FISHERY BIOLOGY (5). Principles and methods used in studying the biology of fishes; ecological requirements of freshwater and anadromous fishes; principles and practices in sport fishery management. PREREQ: FW 313, FW 320.

FW 456/FW 556. LIMNOLOGY (5). Physical, chemical, and biological concepts in limnology and techniques related to aquatic resources and their management. PREREQ: Senior standing.

FW 458/FW 558. MANAGEMENT OF BIG GAME ANIMALS (4). A thorough understanding of ecology of herbivorous big game mammals. Techniques used to determine their abundance, diets, reproduction, and the cultural and political variables that contribute to formulation of management programs. PREREQ: 9 credits of upper division biological sciences.

FW 465/FW 565. MARINE FISHERIES (4). A global perspective on commercial fish and shellfish harvesting with emphasis on fishing technology and policy issues. PREREQ: FW 313. Offered alternate years.

FW 470/FW 570. AQUATIC TOXICOLOGY AND POLLUTION BIOLOGY (3). Principles of toxicology applied to aquatic systems; application of biological principles to the solution of water pollution problems. PREREQ: Junior standing.

FW 471/FW 571. ENVIRONMENTAL PHYSIOLOGY OF FISHES (4). Principles of the functional biology of fishes with emphasis on environmental interactions and management implications. PREREQ: FW 313, BI 370 or BI 371.

FW 472/FW 572. ADVANCED ICHTHYOLOGY (3). Evolution of fishes with emphasis on the role of ontogeny; cladistic methodology and classification contrasted with traditional taxonomic approaches. PREREQ: Two years upper division fisheries or zoology.

FW 473/FW 573. FISH ECOLOGY (4). Behavior of fishes as a mode of accommodation to various ecological and evolutionary constraints. Importance of heritable and learned patterns to population and community dynamics. Application of behavioral studies to the solution of management problems. PREREQ: BI 370; FW 313.

FW 474/FW 574. EARLY LIFE HISTORY OF FISHES (3). Overview of diversity of development patterns in fishes; emphasis on morphology, life history, and evolution. PREREQ: FW 313 or equivalent. Offered alternate years.

FW 476/FW 576. FISH PHYSIOLOGY (4). Physiological specializations and adaptations of major groups of fishes. PREREQ: FW 313; CH 123, or CH 223.

FW 481/FW 581. WILDLIFE ECOLOGY (3). Interrelationships of wildlife, environment and humans. Evaluation of properties and habitats of wildlife populations. PREREQ: BI 370 or BI 371; FW 310, FW 311, FW 320; ST 351. (Writing Intesnvie Course)

FW 482/FW 582. SENIOR PROJECT (2). Independent research project designed and conducted by student. PREREQ: Senior standing, ST 351. (Writing Intensive Course)

FW 485/FW 585. WILDLIFE BEHAVIOR (4). Adaptive significance of egocentric and social behavior of wildlife species. Implications of behavior in sound management practice. PREREQ: 9 credits of upper division biology.

FW 494/FW 594. DISEASES AND PARASITES OF MARINE FISHES AND INVERTEBRATES (5). Emphasis on interactions between marine organisms and potential disease-causing agents and on ecological conditions under which disease agents may serve as limiting factors in the marine environment. PREREQ: 6 credits of upper division biology.

FW 497/FW 597. AQUACULTURE (3). Principles and practices for the aquaculture of fish, shellfish, and algae. PREREQ: 9 credits of upper division biology. (Writing Intensive Course.)

FW 498/FW 598. AQUACULTURE LABORATORY (2). Culture techniques for fish, shellfish, and algae. Experience in pond aquaculture, salmon and oyster hatchery techniques, and water chemistry.

Graduate

FW 501. RESEARCH (1-16).

FW 503. THESIS (1-16).

FW 505. READING AND CONFERENCE (1-16).

FW 507. SEMINAR (1-16). Section 1: Selected Topics. Graded P/N

FW 580. STREAM ECOLOGY (3). Structure and function of stream ecosystems, with emphasis on biological processes; physical and chemical relations; riparian influences and landscape perspectives. PREREQ: 9 credits of upper division science.

FW 601. RESEARCH (1-16).

FW 603. THESIS (1-16).

FW 605. READING AND CONFERENCE (1-16).

FW 606. PROJECTS (1-16).

FW 607. SEMINAR (1-16).

FW 661. WILDLIFE POPULATION ANALYSIS (4). Quantitative methods for estimating the important parameters (i.e. density, survival, population stability, home range size) of wildlife populations. PREREQ: ST 411,ST 412. Offered alternate years.

FW 667. RESEARCH PERSPECTIVES (4). Critical evaluation of philosophical perspectives in resource science and management. The aim of the course is to help students develop their own philosophical views through discussion of dominant perspectives and their problems and suggestion of potentially more adequate views. PREREQ: 9 credits of upper division science, philosophy or natural resources.

FW 699. SPECIAL TOPICS IN FISHERIES AND WILDLIFE (1-3). Various topics in fisheries science and wildlife science. May be repeated for up to 6 credits.

FOOD SCIENCE AND TECHNOLOGY

Daniel F. Farkas, Head
Wiegand Hall 100
Oregon State University
Corvallis, OR 97331-6602
(503) 737-3131

Faculty

Professors Arnold, Bailey, Bodyfelt, Dutson, Farkas, Hendricks, McDaniel, Scanlan, Selivonchick, Wrolstad; *Associate Professors* Daeschel, Kolbe, McGuire, Morrissey, Penner, Torres, Williams; *Assistant Professors* An, Bakalinsky, Park; *Senior Instructor* Watson

Undergraduate Major

Food Science and Technology (B.S.)

Minors

Food Science
Food Technology

Graduate Major

Food Science and Technology (M.S., Ph.D.)

Graduate Areas of Concentration
Enology and Beverage Technology
Food Chemistry/Biochemistry
Food Engineering Technology
Food Microbiology
Food Processing
Food Toxicology
Seafood Processing
Sensory Evaluation

Food science and technology is concerned with scientific and technological aspects of foods and related products. The academic program integrates principles and concepts acquired in the physical, biological, and engineering sciences, and applies them to the scientific and technological aspects of food processing. The role of the food scientist is to successfully integrate these disciplines to assure the nation of an abundant, high quality food supply that is nutritious, safe, and convenient.

The core curriculum is approved by the Education Committee of the Institute of Food Technologists, the professional society of international food scientists. This curriculum allows students to select elective credits to gain added expertise in special areas such as business, nutrition, industrial engineering, or a science-related field. Faculty advisers provide one-on-one guidance, undergraduate research projects, and assistance in career decisions, summer job selection, scholarship opportunities, and job placement.

Graduate programs leading to the M.S. or Ph.D. degree in food science permit intensified study in the subject areas of special interest. Research areas in the department include both basic and applied aspects of the chemistry/biochemistry, microbiology, and toxicology of foods; sensory analysis; and food engineering. Research in food processing operations covers a diversity of food commodities such as dairy products, fruits, vegetables, meats, and seafoods.

Departmental facilities include well-equipped laboratories and pilot plants for instruction and research, and the Food Toxicology and Nutrition Laboratory near Corvallis. Research facilities also are available at the Coastal Oregon Marine Experiment Station Seafood Laboratory at Astoria.

Work Experience and Internships

Because of the educational value of professional work experience, the department assists students in finding summer employment opportunities. A student may work six months (mid-June to mid-December) in the food industry and then return in January for two terms. This program is not a requirement, but some students have participated as many as three times. Students may earn internship credit with prior approval of the department and of the employer. OSU students may also participate in Alaska intern programs.

Cooperative Programs

A cooperative agreement exists with the University of Idaho for training Food Science and Technology students from Idaho at the undergraduate level at in-state tuition rates.

Alaska students can attend the University of Alaska-Fairbanks for two years and then transfer to OSU and earn a food science and technology degree in two additional years through the Western Undergraduate Exchange (WUE) Program. These students pay tuition at a rate of 1.5 times the in-state tuition, rather than full out-of-state tuition. See Student Exchanges in this catalog.

Scholarships

The College of Agricultural Sciences, the department, the food industry, and the Institute of Food Technologists offer both merit and financial need scholarships to encourage students preparing for careers in the food industry. Contact the department for more specific information. Also see the Scholarship section in the front of this catalog.

Career Opportunities

Career opportunities in the food industries include management, research and development, process and production supervision, quality assurance, distribution, sales, marketing, consulting, and trade associations. Food science graduates hold teaching, research and extension positions with colleges and universities. Governmental agencies employ food scientists for work in regulatory control, research, and the development of food standards. The department has graduated over 1,000 students in the past 74 years.

Curriculum

Baccalaureate Core (48)

Food Science and Technology Core

FST 101. Food Science Orientation (1)
FST 102. Maraschino Cherry (1)
FST 103. Food Quality Evaluation (1)
FST 210. Food Processing (3)[5]
FST 211. Food Processing Lab (1)[5]
FST 212. Dairy Processing (3)[5]
FST 213. Dairy Processing Lab (1)[5]
FST 310. Food Processing Calculations (3)[5]
FST 311. Food Processing Calculations Lab (1)[5]
FST 407. Seminar (1)
FST 411. Food Chemistry (4)
FST 412. Food Chemistry (4)
FST 414. Toxic Agents in Foods (2)
FST 420. Sensory Evaluation of Food or IE 451. Analysis and Design of Quality Assurance Systems (3) or FST 421. Food Law (3) or FST 479. Food Biotechnology (3) (must take 2 out of these 4 courses and one course must be either FST 420 or IE 451)
FST 423. Food Analysis (5)
FST 450. Advanced Food Processing (4)[1]
BRE 452. Food Engineering (4)
BRE 453. Food Engineering (4)

Biological Science

BI 103. General Biology (4)
NFM 225. Human Nutrition (4)
MB 302. General Microbiology (3)
MB 303. General Microbiology Lab (2)
MB 440. Food Microbiology (3)
MB 441. Food Microbiology Lab (2)

Physical Science

MTH 112. Elementary Functions (4)
MTH 251. Differential Calculus (4)
MTH 252. Integral Calculus (4)
ST 351. Intro to Stat Methods (4)
ST 352. Intro to Stat Methods (4)
PH 201. General Physics (5)
PH 202. General Physics (5)
CH 221. General Chemistry (5)
CH 222. General Chemistry (5)
CH 223. General Chemistry (5)
CH 324. Quantitative Analysis (4)
CH 331. Organic Chemistry (4)
CH 332. Organic Chemistry (4)
CH 337. Organic Chemistry Lab (2)
BB 350. Elementary Biochemistry (4)
AG 111. Computers in Agriculture (3)

Food Science and Technology majors must earn an overall GPA of 2.00 in the required food science and technology courses. With adviser approval, students may elect S/U grading in elective courses as provided for in the academic regulations.

The number of math credits required depends on placement. Food science and technology students are required to take math through MTH 252. The above curriculum with electives satisfies all the B.S. requirements of the University, the College of Agricultural Sciences, and the Department of Food Science and Technology.

MINORS

Food Science (28)
FST 411. Food Chemistry (4)
FST 412. Food Chemistry (4)
FST 414X. Toxic Agents in Foods (2)
MB 440. Food Microbiology (3)
MB 441. Food Microbiology Lab (2)

Electives
Select 13 credits from FST 210, FST 211, FST 212, FST 213, FST 310, FST 311, FST 450, BRE 452, BRE 453

Food Technology (34)
FST 102. Maraschino Cherry (1)
FST 103. Food Quality Evaluation (1)
FST 210. Food Processing (3)
FST 211. Food Processing Lab (1)
FST 212. Dairy Processing (3)
FST 213. Dairy Processing Lab (1)
NFM 225. Human Nutrition (4)
NFM 235. Science of Foods (4)
MB 302. General Microbiology (3)
NFM 310. Science and Mgmt of Foods (4)
IE 451. Analysis & Design of Quality Assurance Systems (3) OR FST 420. Sensory Evaluation of Food (3)
FST 421. Food Law (3)
MB 440. Food Microbiology (3)

COURSES

Lower Division

FST 101. FOOD SCIENCE ORIENTATION (1). For food science majors. Orientation and academic guidance toward career planning in food science and technology. Graded P/N.

FST 102. MARASCHINO CHERRY (1). The interdisciplinary nature of Food Science and Technology is demonstrated by examining historical, technological, and scientific aspects of maraschino cherry production.

FST 103. FOOD QUALITY EVALUATION (1). Standards and quality grading; detection, extraction, and identification of extraneous materials in foods.

FST 199. SPECIAL STUDIES (1-16). Graded P/N.

FST 210. FOOD PROCESSING (3). Methods of processing and preserving fruits and vegetables, cereal grains, seafoods, meats, and poultry. PREREQ: CH 123 or CH 223.

FST 211. FOOD PROCESSING LABORATORY (1). Laboratory and field work to accompany FST 210. Field trip required. COREQ: FST 210.

FST 212. DAIRY PROCESSING (3). Methods of processing and preserving milk and milk products and related unit operations. PREREQ: CH 123 or CH 223.

FST 213. DAIRY PROCESSING LABORATORY (1). Laboratory and field work to accompany FST 212. Field trip required. COREQ: FST 212.

Upper Division

FST 310. FOOD PROCESSING CALCULATIONS (3). Application of physics and chemistry to the quantification of food processing parameters; retort processing calculations. Schematic representation of food processing unit operations; material and energy balance calculations. PREREQ: PH 202, CH 123 or CH 223, MTH 251.

FST 311. FOOD PROCESSING LABORATORY (1). Laboratory to accompany FST 310. Material and energy balance calculations; moisture control technology including the determination of packaging requirements. COREQ: FST 310. PREREQ: MB 303.

FST 333. SCIENCE OF WINEMAKING (3). Introduction to wine production and wine types of the world. PREREQ: BI 201, BI 202, OR BI 203 with one year of college chemistry; MB 302 recommended.

FST 401. RESEARCH (1-16).

FST 403. THESIS (1-16).

FST 405. READING AND CONFERENCE (1-16).

FST 407. SEMINAR (1).

FST 410. INTERNSHIP (3-6). A work-internship to give students practical on-the-job training in the food processing or related industries. REQ: Department approval required. Submission of employer and employee evaluation forms, and written reports. PREREQ: Junior standing.

FST 411/FST 511. FOOD CHEMISTRY (4). Chemistry and biochemistry of foods. Water, colloids, enzymes, lipids, flavors. PREREQ: CH 332, BB 350.

FST 412/FST 512. FOOD CHEMISTRY (4). Chemistry and biochemistry of foods. Carbohydrates, colors and pigments, post-harvest changes in fruits and vegetables. PREREQ: CH 332, BB 350.

FST 414. TOXIC AGENTS IN FOODS (2). Occurrence and effects of toxic chemicals in foods. PREREQ: CH 337, BB 350.

FST 420/FST 520. SENSORY EVALUATION OF FOOD (3). For FST majors and for nonmajors. Procedures and test methods used to evaluate the sensory properties of foods. PREREQ: ST 352 or ST 412.

FST 421/FST 521. *FOOD LAW (3). Concepts, statutes, regulations, and agencies controlling the production, processing, and distribution of food. PREREQ: Senior standing. (Bacc Core Course)

FST 423/FST 523. ^FOOD ANALYSIS (5). Systematic chemical and physical analysis of foods. PREREQ: CH 324, CH 337; BB 350. (Writing Intensive Course)

FST 450/FST 550. ADVANCED FOOD PROCESSING (4). Applications of food engineering, food microbiology and food chemistry to practical food processing problems. Emphasis on computer supported calculations for heat transfer and chemical reactions. PREREQ: AG 111, BRE 453, FST 411, MB 440.

FST 451/FST 551. CURRENT TOPICS IN FOOD SCIENCE (3). Recent advances in food science and technology and their application to special fields of study. Consult department for topics, which vary from year to year. PREREQ: FST 412; MB 303; BB 350.

FST 479/FST 579. FOOD BIOTECHNOLOGY (3). Principles and applications of genetic engineering for food and beverage production. PREREQ: BB 450, MB 302, OR by consent of instructor. CROSSLISTED as MB 479/ MB 579.

Graduate

FST 501. RESEARCH (1-16).

FST 503. THESIS (1-16).

FST 505. READING AND CONFERENCE (1-16).

FST 507. SEMINAR (1).

FST 510. INTERNSHIP (3-6).

FST 531. CARBOHYDRATES IN FOODS (3). Chemical, physical, and functional properties of carbohydrates and their changes during processing and storage. PREREQ: CH 332; BB 451 or BB 491. Offered alternate years.

FST 533. LIPIDS IN FOODS (3). Function, composition, preservation, deterioration, and analysis. PREREQ: CH 332; BB 451 or BB 491. Offered alternate years.

FST 541. FOOD TOXICOLOGY (3). Principles, design and interpretation of toxicological studies; evaluation of techniques used to assess the safety of food and additions made to foods, epidemiological approaches to food toxicology. PREREQ: CH 332; BB 451 or BB 491. Offered alternate years.

FST 561. PIGMENTS AND COLOR EVALUATION (3). The chemical and physical properties of food pigments and the changes they undergo during processing and storage; color perception and evaluation. PREREQ: BB 451 or BB 491. Offered alternate years.

FST 562. PROTEINS IN FOOD (3). Characterization and biochemical significance of food protein systems; reactions of food proteins with other food components and how these interactions affect the physiochemical and nutritive properties of foods. PREREQ: BB 451 or BB 491. Offered alternate years.

FST 563. ENZYMES OF FOODS (3). Effect of processing methods on enzymes of foods; use of enzymes in food processing. PREREQ: BB 451 or BI 491.

FST 601. RESEARCH (1-16).

FST 603. THESIS (1-16).

FST 605. READING AND CONFERENCE (1-16).

FST 607. SEMINAR (1).

GENETICS

Warren Kronstad, Walt Ream, Co-Directors
Crop Science Building 231
Oregon State University
Corvallis, OR 97331-3002
(503) 737-3728

Faculty
Professors Kronstad and Ream; other faculty members are listed under the biological science departments.

Graduate Major

Genetics (M.A., M.S., Ph.D.)
Graduate Areas of Concentration
Animal Genetics and Improvement
Biochemical and Molecular Genetics
Cytology and Cytogenetics
Evolution and Speciation
Forest Genetics
Fungus Genetics
Genetics
Microbial Genetics
Plant Genetics and Improvement
Quantitative Genetics
Viral Genetics

Administered by the College of Agricultural Sciences, the University program in genetics provides an integrated course of study. Faculty for the program, drawn from throughout the University, are qualified geneticists workin in the major biological subdisciplines. Students in the program participate in

research designed to prepare them for careers in the forefront of the science of genetics. Requirements and procedures for admission may be obtained from the director of the program.

Genetics may also be used as an area of emphasis in the degree programs of various College of Science and professional school departments.

Although there is no undergraduate degree in genetics, prebaccalaureate students may select the genetics option in the biology degree program. The core courses in genetics (GEN 454/GEN 554, GEN 455/GEN 555, GEN 456/GEN 556, GEN 430/GEN 530) will prepare a student for graduate study.

To supplement the courses listed below, many departments offer courses in specialized or applied aspects of genetics.

COURSES

Upper Division

GEN 401. RESEARCH (1-16). Graded A,B,C,D,F,E.

GEN 405. READING AND CONFERENCE (1-16).

GEN 430/GEN 530. INTRODUCTION TO POPULATION AND QUANTITATIVE GENETICS (3). Nature and extent of genetic variation. Effects of selection and other evolutionary forces on the genetic composition of populations. Inbreeding and relationship coefficients. Inheritance and effects of selection and mating systems on quantitative characters.

GEN 454/GEN 554. MICROBIAL GENETICS (4). Principles of microbial genetics. Topics include prokaryotic genetics, replication, transcription, translation, plasmids and transposons, DNA repair, and gene regulation. PREREQ: Two terms of biochemistry and genetics or consent on instructor. CROSSLISTED as MB 454/MB 554.

GEN 455/GEN 555. EUKARYOTIC MOLECULAR GENETICS (4). Current concepts of eukaryotic molecular genetics with an emphasis on gene structure and regulation of gene expression. Topics will include recombinant DNA techniques, eukaryotic gene structure transcription and translation, posttranslational effects, genome evolution and genetic engineering. PREREQ: Two term of biochemistry and genetics, or consent of instructor. MB/MCB/GEN 454/554. MCB 553 recommended. CROSSLISTED as MCB 555.

GEN 456/GEN 556. MOLECULAR AND CELLULAR BIOLOGY (3). Current concepts of integrated cellular function in multicellular organisms, presented in an integrated manner. Topics such as development, differentiation, immunology, neurobiology and tumorigenesis in both animals and plants will be covered. PREREQ: Two terms of biochemistry and genetics, or consent of instructor. MCB 553, MB/MCB/GEN 454/554. MCB/GEN 455/55 recommended. CROSSLISTED as MCB 556.

Graduate

GEN 501. RESEARCH (1-16). Graded A,B,C,D,F,E.

GEN 503. THESIS (1-16).

GEN 505. READING AND CONFERENCE (1-16).

GEN 507. SEMINAR (1-16). One-credit sections.

GEN 536. MOLECULAR VIROLOGY (4). A survey of representative viruses with an emphasis on the molecular mechanisms involved in replication, transcription, and pathogenesis. CROSSLISTED as MB 536, MCB 536, BB 536.

GEN 573. CYTOGENETICS (4). Effects of variations in chromosome structure and number on heredity and development. PREREQ: GEN 431 or GEN 311 or consent of instructor. Offered alternate years. CROSSLISTED AS HORT 573, GEN 573.

GEN 591. SELECTED TOPICS IN GENETICS (3). Advanced treatment of topics of special interest in one or more areas of genetics. May be repeated for credit. Not offered every year.

GEN 601. RESEARCH (1-16).

GEN 603. THESIS (1-16).

GEN 605. READING AND CONFERENCE (1-16).

GEN 625. PLANT MOLECULAR GENETICS (3). Structure, expression, and interactions of the plant nuclear, chloroplast and mitochondrial genomes. Critical examination of the current literature on gene regulation, mobile genetic elements and biotechnology in higher plants. PREREQ: GEN 421 and BB 451 or consent of instructor. Offered alternate years.

GEN 664. HOST PARASITE INTERACTIONS; GENETICS AND PHYSIOLOGY (3). Mendelian and molecular analysis of host-pathogen genetics. Biochemical and physiological basis of plant disease. Topics include gene organization and function, chromosome mapping, parasexuality, and genetic models for plant disease resistance. Host-parasite recognition, pathogenicity, and host responses to infection. PREREQ: GEN 421, BOT 551, BOT 331, BB 451. Offered alternate years. CROSSLISTED as BOT 664, MCB 664.

HORTICULTURE

C. D. Boyer, Head
Ag and Life Sciences Building 4017
Oregon State University
Corvallis, OR 97331-7304
(503) 737-3695

Faculty

Professors Baggett, Boyer, Breen, P. Chen, T. Chen, Crabtree, Facteau, Fuchigami, J. Green, Hemphill, Mansour, Mielke, D. Mok, M. Mok, Proebsting, Richardson, Righetti, William; *Associate Professors* Azarenko, Braunworth, Clough, Cook, Daley, Mehlenbacher, Potter, Stang, Strik; *Assistant Professor* Candolfi; *Instructors* A. Green, Hay, Stewart

Courtesy Faculty

Banowetz, Doss, Freeman, Gabert, Hummer, McFarlane, Potter, Reed, Watson

Adjunct Faculty

Adams, Bondi, Bubl, Darnell, Fitch, R. Fletcher, Hellman, Jensen, Kaufman, Landgren, Long, Maul, McGrath, McNeilan, McReynolds, Morgan, Olsen, Poole, Rackham, Regan, Rogers, Tiger, Van Buskirk

Undergraduate Major

Horticulture (B.S.)

Options

Horticultural Science

Turf and Landscape Management

Minor

Horticulture

Graduate Major

Horticulture (M.S., Ph.D.)

Graduate Areas of Concentration

Culture and Management of Horticultural Crop Production

Genetics and Breeding of Horticultural Crop Production

Physiology and Biochemistry

Horticulture involves the production, genetic improvement, storage, and marketing of fruits, nuts, vegetables, flowers, and nursery crops; and the design, construction, and management of landscape plantings. It is a science, an art, an avocation, and a business. Horticultural and other high value specialty crops are the largest component of Oregon's agricultural industry. Landscape horticulture is a rapidly expanding service industry in the urban areas of the Pacific Northwest and throughout the nation. Excellent and varied career opportunities exist for college graduates in both crop and landscape horticulture.

The undergraduate program provides students with a solid background in the fundamental life and physical sciences, as well as an understanding of the technologies and management systems used in the horticultural industry. Problem-solving and decision-making skills are stressed, as is student involvement. Field trips are an important component of many of the courses.

The program has two options: horticultural science, and turf and landscape management. The horticultural science option prepares students for careers dealing directly or indirectly with the production, breeding, post-harvest handling, marketing, and scientific study of horticultural crops. The turf and landscape management option prepares students for careers involving the design, construction and maintenance of turf and landscape plantings. Both options allow the student considerable flexibility to pursue a minor or to tailor course work to meet individual goals. Qualified students interested in the business aspects of horticulture are encouraged to pursue a minor in business. All undergraduates are required to complete either an approved internship or an undergraduate thesis.

A high school student preparing for the program should follow a well-balanced college prep curriculum. Course work in biology, chemistry, and mathematics is strongly recommended. Course work in the social sciences, humanities, arts, and foreign languages is also encouraged, and the student should develop public speaking and writing abilities.

The program was designed to facilitate timely completion of degree requirements by transfer and postbaccalaureate students. Students intending to transfer into the program from a two- or four-year institution should complete as many of the lower division requirements as possible. Some vocational-technical courses from community colleges may be equivalent to lower division horticulture courses. Equivalent credit can be given for such courses. Contact a departmental adviser for further information.

For additional information about the program, contact one of the undergraduate advisers: Anita L. Green (Head Adviser,

Horticultural Science and Turf and Landscape Management; Jack Stang (Horticultural Science); Tom Cook (Turf and Landscape Management).

CURRICULA

Baccalaureate Core Requirements (48)

Horticulture Core

HORT 111. Intro to Horticultural Crops or HORT 112. Intro to Turf & Lndscpe Mgmt (2)
HORT 300. Introduction to Crop Production (4)
HORT 301. Principles of Horticultural Technology (4)
HORT 311. Plant Propagation (4)
HORT 407. Seminar (1)
HORT 410. Internship or HORT 403. Thesis (6-12)
Completion of requirements of either Horticultural Science or Turf and Landscape Management Option (55-64)

General Science

CH 121, CH 122, CH 123. Gen Chem (or equiv) (15)
BI 211, BI 212, BI 213. Gen Biol (or equiv) (12)

Agricultural Sciences

CSS 305. Principles of Soil Science (5)
ENT 311. Introduction to Integrated Pest Management (5)
BOT 350. Intro to Plant Pathology (4)
CSS 440. Weed Control (5)

Other Agriculture

AG 111. Computers in Agriculture (3)
AG 199B. Library Research (1)

HORTICULTURAL SCIENCE OPTION

MTH 245. Math for mgmt, life & social sci (4)
CH 331. Organic Chemistry (or equivalent) (4)
BOT 221. Systematic Botany (4)
ST 201. Statistics (or equivalent) (4)
Economics elective
AREC or BA. Business electives (3)
BOT 331. Plant Physiology (5)
CSS 430 (3) or BI 311. Genetics (4)
Select at least 20 credits from the following:
HORT 226, HORT 227. Plant Materials
HORT 315. Landscape Maintenance
HORT 316. Plant Nutrition
HORT 351. Greenhouse Environment
HORT 414. Geo. Information Systems in Hort
HORT 433. Vegetable Crops
HORT 441. Plant Tissue Culture
HORT 445. Post Harvest Physiology
HORT 450. Plant Breeding
HORT 451. Tree Fruits
HORT 452. Small Fruits and Viticulture
HORT 461. Nursery Management
HORT 475. Ag Mgmt of Oregon's Soil Res
HORT 477. Agroecology
HORT 480. Case Studies in Cropping Systems Management
At least 8 credits of upper division course work in agricultural sciences and science; or in business, agricultural and resource economics and economics

TURF AND LANDSCAPE MANAGEMENT OPTION

MTH 112. Elementary Functions (4)
CH 331. Organic Chem or BOT 221. Systematic Botany (4)
Economics elective
Business electives (9)
BOT 341, RNG 350 or BI 370. Ecology (3-4)
Select two of the following:
BOT 331. Plant Physiology or CSS 430 or BI 311. Genetics or BOT 414. Agrostology (4) or CSS 460. Seed Production or CSS 335. Water Resources
HORT 226, HORT 227 and HORT 228. Plant Materials (9)
HORT 280, HORT 281, and HORT 291. Landscape Design (9)
HORT 314. Turf Maintenance (4)
HORT 315. Landscape Maintenance (4)
HORT 358 and HORT 360. Landscape Construction (7)

GENERAL HORTICULTURE MINOR (27)

HORT 111. Intro to Horticultural Crops
HORT 300. Introduction to Crop Production (4)
HORT 301. Principles of Horticulture Technology (4)
HORT 407. Seminar (1)
At least 16 additional credits in horticulture including at least six upper division credits

TURF AND LANDSCAPE MANAGEMENT MINOR (27)

HORT 112. Intro to Turf and Landscape (2)
BI 103. General Biology or equivalent (4)
HORT 301. Principles of Horticultura Technology (4)
CSS 305. Soil Science (5)
HORT 314. Principles of Turf Maintenance (4)
HORT 315. Principles & Practices of Landscape Maintenance (4)
HORT 418. Golf Course Maintenance (4)

GRADUATE STUDIES

The Department of Horticulture offers Master of Agriculture, Master of Science, and Doctor of Philosophy degree programs. Students in the latter two programs select

thesis topics, in consultation with a graduate adviser, which are complementary to an ongoing research program. Thesis research topics are in the field of physiology, biochemistry, genetics, breeding, or culture and management of fruit, vegetable, or ornamental crops.

Since Oregon is a major horticultural area, departmental research and graduate programs are oriented to basic and applied mission-oriented investigations with clearly defined objectives.

Research and teaching assistantships are available as resources permit, as is graduate student office space. Graduate degree students are not required to show proficiency in a foreign language, but are required to participate in graduate seminar presentations. A 4-credit teaching experience is required of doctoral students. Most Department of Horticulture faculty members are graduate faculty members; some also serve as faculty in the Genetics Program/Plant Physiology Program.

For more information or application, contact any member of the graduate faculty or Dr. P. J. Breen, Department of Horticulture, OSU, Corvallis, Oregon 97331. Provision of Graduate Record Examination scores and letters of reference with application materials will expedite consideration of admission applications.

COURSES

Lower Division

HORT 111. INTRODUCTION TO HORTICULTURAL CROP PRODUCTION (2). Characteristics of commercial horticulture; survey of commercial horticultural systems with emphasis on the Pacific Northwest; career opportunities in horticulture. Required field trips.

HORT 112. INTRODUCTION TO TURF AND LANDSCAPE MANAGEMENT (2). Survey of turf and landscape management industry with emphasis on the Pacific Northwest; career opportunities. Required field trips.

HORT 226, HORT 227, HORT 228. LANDSCAPE PLANT MATERIALS (3,3,3). Identification of trees, shrubs, vines, and ground covers, used in landscape horticulture; their use in plant composition.

HORT 280. LANDSCAPE DESIGN THEORY (3). Functional and aesthetic aspects of landscape planning as a basis for design decisions affecting the built environment; the site planning process; history of landscape planning; case studies.

HORT 281. LANDSCAPE DESIGN STUDIO (3). Application of landscape design theory. Project work in studio. PREREQ: HORT 280.

HORT 291. LANDSCAPE DESIGN AND MANAGEMENT (3). Technical aspects of site development including use of architectural and plant materials; case studies. PREREQ: HORT 281.

Upper Division

HORT 300. INTRODUCTION TO CROP PRODUCTION (4). Principles, practices and issues relating to the production, marketing and improvement of horticultural and agronomic crops. Comparison of crop production systems; geography of crop production; cropping calendars. PREREQ: Year of General Biology or equivalent. CROSSLISTED as CSS 300.

HORT 301. PRINCIPLES OF HORTICULTURAL TECHNOLOGY (4). Principles and practices relating to control of plant growth and development; manipulation of growth rate, plant form, flowering, fruiting, and dormancy by means of environment, chemicals and pruning and training. PREREQ: General biology or botany sequence.

HORT 311. ^PLANT PROPAGATION (4). The regeneration of plants from vegetative and reproductive tissue and organs. Horticultural and physiological principles, methods, and techniques for laboratory, greenhouse nursery, field, and orchard. PREREQ: HORT 301. (Writing Intensive Course)

HORT 314. PRINCIPLES OF TURFGRASS MAINTENANCE (4). Identification and adaptation of common turfgrasses. Physiology of turfgrass growth and response to cultural and environmental stresses. Cultural practices including establishment, general maintenance, and pest control. Field trips required. PREREQ: HORT 301 or CSS 302; CSS 305.

HORT 315. PRINCIPLES AND PRACTICES OF LANDSCAPE MAINTENANCE (4). Maintenance practices related to non-turf landscape areas. Emphasis on pruning, planting, fertilization, and pest control. Plant responses to stress, particularly those encountered in the urban environment. Field trips required. PREREQ: HORT 301.

HORT 316. PLANT NUTRITION (4). Factors influencing nutrient absorption and composition; criteria of essentiality and roles of elements; nutritional status and nutrient balance with emphasis on interpreting soil and tissue analysis. Basic concepts of mineral nutrition and soil management for woody plants and turf emphasized. PREREQ: BOT 331, CSS 305.

HORT 351. ^GREENHOUSES AND CONTROLLED ENVIRONMENTS FOR CROPS (4). Integrated systems for management of aerial and root environments in greenhouses and other highly controlled crop production facilities. PREREQ: HORT 301, CSS 305 or equivalent courses. (Writing Intensive Course)

HORT 358. LANDSCAPE CONSTRUCTION: SITE MEASUREMENT AND PROJECT LAYOUT (3). Site survey; layout and dimensioning of site development projects; plan and profile layout of project work.

HORT 360. LANDSCAPE CONSTRUCTION: IRRIGATION AND DRAINAGE (4). Surface grading/drainage techniques and structures; principles and techniques of landscape and turf irrigation. Field trips required. PREREQ: HORT 358, CSS 305.

HORT 401. RESEARCH (1-16).

HORT 403. THESIS (1-16).

HORT 405. READING AND CONFERENCE (1-16).

HORT 407. SEMINAR (1). Graded P/N.

HORT 410. INTERNSHIP (6). Work-internship (10 weeks) to acquaint horticulture majors with the practices of the horticulture industry. Under direction of Departmental Internship Committee. Requires approved statement of intent, submission of employer and employee evaluation forms, and written report. PREREQ: Junior standing.

HORT 414. RES/GEOGRAPHIC INFORMATION SYSTEMS IN HORTICULTURE (3). Students will learn how to utilize aerial photographs in a wide variety of horticultural applications. Training students in the use of computer software that allows the manipulation of digitized photographs is a major goal. Applications deal with producing dosage maps for the application of agricultural chemicals evaluating turf in golf courses and using digitized photos in landscape design..

HORT 418. ^GOLF COURSE MAINTENANCE (4). Basic aspects of golf course maintenance under temperate zone conditions. Offered alternate years. PREREQ: HORT 314. (Writing Intensive Course)

HORT 433/HORT 533. SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS (4). Classification of vegetable crops based on phylogenetic and horticultural characteristics; environmental and cultural requirements.

HORT 441/HORT 541. PLANT TISSUE CULTURE (4). Principles, methods, and applications of plant organ, tissue, cell, and protoplast culture. Laboratory is important part of course. Topics include callus culture, regeneration, micropropagation, anther culture, mutant selection, somatic hybridization, and transformation. PREREQ: BOT 331, BI 311, or CSS 430.

HORT 445/HORT 545. POST-HARVEST PHYSIOLOGY (4). Storage physiology and biochemistry of fruits, vegetables, and ornamental crops. Influence of pre-harvest, grading, storage, packaging, transportation, and marketing. Effects of storage temperature, CO2, O2, ethylene on ripening. Involves lectures, recitation, and lab demonstrations. Offered alternate years. PREREQ: BOT 331.

HORT 450/HORT 550. PLANT BREEDING (4). An introduction to the genetic improvement of self-pollinated, cross-pollinated, and asexually propagated species and the genetic principles on which breeding methods are based. Examples are drawn from a wide range of crops, including cereal grains, grasses, fruits, nuts, and vegetables; guest lecturers discuss their breeding programs. Additional topics include crop evolution, germplasm preservation, disease resistance, and biotechnology. PREREQ: BI 311 or CSS 430/CSS 530. CROSSLISTED as CSS 450.

HORT 451. TREE FRUIT PHYSIOLOGY AND CULTURE (4). Plant growth and development in relation to tree fruit production; emphasis on canopy development and pruning theory, flowering and fruit-set and development and dormancy and cold acclimation. Field trips required. PREREQ: HORT 301, BOT 331 or concurrent enrollment. Offered alternate years.

HORT 452/HORT 552. BERRY AND GRAPE CROP PHYSIOLOGY AND CULTURE (4). Plant growth and development in relation to production of wine grapes, caneberries, strawberries, blueberries, and cranberries. Field trips required. PREREQ: HORT 301, BOT 331. Offered alternate years.

HORT 461. NURSERY MANAGEMENT (3). Nursery and ornamental crop production management; nature of the industry; presentations by nursery industry leaders, locating and planning organizations and layouts for efficient production, handling, and distribution; programming production; nursery practices; field and container growing of woody ornamentals; mechanization; quality control; record keeping; application of technology and management principles to solving production problems. Field trips required.

HORT 475/HORT 575. AGRICULTURAL MANAGEMENT OF OREGON SOIL RESOURCES (2). Field trips to study soil and crop management for agriculture and forestry through the experiences of Oregon farmers, ranchers, and foresters. Trips to both dryland and irrigated enterprises in eastern Oregon, irrigated and nonirrigated operations in western Oregon, and managed forests and rangelands throughout Oregon. A field trip fee may be charged. PREREQ: Senior standing. CROSSLISTED as CSS 475.

HORT 477/HORT 577. AGROECOLOGY (4). Selected topics in agroecology, exploring agroecological principles in the design of environmentally and economically sustainable agricultural systems. A holistic, interdisciplinary framework will be used to study the dynamic properties of agroecosystems, including nutrient cycling, energy flow, interactions of biotic components, diversity and stability, and required inputs of external resources. Impacts of farming practices on agroecosystems, society, and the global environment will be examined. Alternative farming practices will be examined which have potential to minimize detrimental environmental impacts and enhance the economic and social goals of rural communities. Field trips to nearby farms using innovative farming practices and Agricultural Experiment Station research sites will be an integral part of this course. Alternate years.

HORT 480/HORT 580. CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT (4). Decision cases involving the production of field and horticultural crops; individual and group activities; discussion of the decision-making process. Multiple field trips required. (WIC course) PREREQ: HORT 300 or CSS 300, Senior standing in Agriculture. CROSSLISTED as CSS 480/CSS 580.

Graduate

HORT 501. RESEARCH (1-16).

HORT 503. THESIS (1-16).

HORT 505. READING AND CONFERENCE (1-16).

HORT 507. SEMINAR (1-16).

HORT 511. RESEARCH AND EDUCATIONAL PERSPECTIVES IN HORTICULTURE (2). Introduces beginning graduate students to the faculty in Horticulture and provides an in-depth discussion of their research and education programs.

HORT 512. DISCUSSIONS IN PLANT SCIENCE (1). Student presentations dealing with selected topics in the plant sciences and examined in the context of contemporary research.

HORT 513. TECHNOLOGY OF PLANT TRANSFORMATIONS (3). Principles, methods and recent developments in the genetic engineering of higher plants. PREREQ: BOT 331, GEN 311 or CSS 430/530. Offered alternate years.

HORT 520. TOPICS IN HORTICULTURE RESEARCH (1-3).

HORT 521. RESEARCH TECHNIQUES (1-3). Separate sections dealing with the theory and practice of various laboratory and field techniques use in horticultural research.

HORT 573. CYTOGENETICS (4). Effects of variation in chromosome structure and number. Offered alternate years. CROSSLISTED AS GEN 573, MCB 573.

HORT 601. RESEARCH (1-16).

HORT 603. DISSERTATION (1-16).

HORT 605. READING AND CONFERENCE (1-16).

HORT 606. PROJECTS (1-16).

HORT 607. SEMINAR (1-16).

HORT 611. PLANT GENETICS (3). Specific topics in genetics of higher plants. PREREQ: BI 311. REC: HORT 573. Offered alternate years.

HORT 623. PHLOEM TRANSPORT (3). Structure, pathways and mechanisms involved in the translocation of substances in the phloem. Offered alternate years.

HORT 629. PLANT DORMANCY AND STRESS PHYSIOLOGY (3). Physiology of dormancy, cold hardiness and other stresses in plants; ecology and molecular biology of plant hardiness; viability tests and freezing processes and cryopreservation of plants. Offered alternate years.

HORT 691. PLANT GENETIC ENGINEERING (2). Discussion of current literature in gene identification, expression, and transfer of relevance to improving plants' agronomic, horticultural and silvicultural characteristics. Alternate years. PREREQ: BOT 625 or equivalent. CROSSLISTED as FS 691; MCB 691.

MICROBIOLOGY

See College of Science.

NATURAL RESOURCES

The College of Agricultural Sciences, in cooperation with the Colleges of Forestry, Liberal Arts, and Science, participates in offering a broad-based B.S. degree in Natural Resources. A student enrolls in the department most related to the specialty area he or she selects under the Natural Resources Program. See the Interdisciplinary Studies section of this catalog for curriculum details.

RANGELAND RESOURCES

William Krueger, Head
Strand Agriculture Hall 202
Oregon State University
Corvallis, OR 97331-6704
(503) 737-3341

Faculty

Professors Buckhouse, Eddleman, Krueger, R. Miller, Sharrow, Vavra; *Associate Professors* Borman, Doescher, Johnson, Kauffman, Larson, McInnis

Courtesy Faculty

Associate Professor Pyke; *Assistant Professors* Angell, Barker, Ganskopp, P. Miller, Riegel, Svejcar

Adjunct Faculty

Professor Obermiller; *Associate Professor* Mobley; *Assistant Professors* Sheehy

Undergraduate Major

Rangeland Resources (B.S.)

Options

General Rangeland Resources
Range/Forestry/Fire Management
Range Management
Range Science
Range/Soils
Range/Wildlife
Wildland Ecology

Minor

Rangeland Resources

Graduate Major

Rangeland Resources (M.S., Ph.D.)

Graduate Areas of Concentration

Agroforestry
Fire Ecology of Rangeland Resources
Ecology Rangelands
Physiological Ecology
Range Improvement
Range Nutrition
Riparian Zone Management
Watershed Management

Rangeland resource management is one of the family of natural re sources professions important to the social, economic, and political development of Oregon, the nation, and the world. It is based upon ecological principles and is concerned with the restoration, improvement, conservation, and use of rangelands. Since range management is practiced on lands producing domestic and wild animals, timber, water, and recreation, concepts of integrated land use are included in the curriculum. A good balance among soil, domestic animal, wildlife, ecology, and other biological sciences is realized in the educational program.

The curriculum below includes University and Departmental requirements for the B.S. degree and provides emphasis either in science, management, ecology, or allied disciplines. The B.S. degree is also offered on the campus of Eastern Oregon State College at La Grande through an extension of the OSU Rangeland Resources Department. Facilities for study include classroom and field-oriented educational environments both on-campus and at locations through Oregon. Field trips are taken in conjunction with specific courses.

Graduate work leading to M.Agr., M.A.I.S., M.S., or Ph.D. degrees may involve research on domestic or wild animals, range nutrition, community ecology, physiology of range plants, range improvement, range watershed and riparian zone management, rangeland restoration, utilization and management, agroforestry, fire ecology, and range economics. Research locations occur in both western and eastern Oregon.

Summer employment with private industry, government agencies, and on range research projects makes possible learning experiences while earning a salary. Employment opportunities include resource management, research, Extension, ranch management, college and university teaching, business and industrial activities related to rangeland resources, and foreign agricultural and resource development assistance.

The Department of Rangeland Resources is accredited by the Society for Range Management. It is recognized throughout the country as one of the leading institutions of rangeland management.

CURRICULUM

Each student must take core courses plus additional courses in one of the seven options.

Baccalaureate Core (48)[6]

Rangeland Resources Core (110)[6]
MTH 241. Calculus for Mgmt and Soc Sci (4)[7]
CH 121. Gen Chem (5)
CH 122. Gen Chem (5)
CH 203. Organic Chem (3)
CH 331. Organic Chemistry or BB 331. Intro to Molecular Biology (4)
BI 211, BI 212. General Biology (8)[7]
CSS 305. Principles of Soil Sci (5)
CSS 465. Soil Morphology & Survey (4)
EC 201, EC 202. Principles of Econ (6)[7]
AREC 351. Nat Res Management (4)[7]
AG 111. Computers in Agriculture (3)
ST 351. Intro to Stat Methods (4)
ANS 211. Nutrition (3)
ANS 436 or ANS 443. Beef (Sheep) Productn (3)
BOT 221. Systematics (4)
BOT 331. Physiology (5)
BOT 414. Agrostology (4)
BI 370. Gen Ecol or BOT 341. Plant Ecol (3)
GEO 202. Geology of the surface of the Earth (4)
WR 327. Tech Rept Writing (3)[7]

Natural Resources (11)
FOR 111. Intro to For (4)
FRR 251. Rec Res Mgt (4)
FW 251. Principles of Wldlf (3)
CSS 310. Forage Prod and Mgt (4)

Rangeland Resources (30)
RNG 341. Rangeland Res (3)
RNG 301. Career Orientation (1)
RNG 347. Arid Land Biomes (3)
RNG 348. Arid Land Plants (2)
RNG 350. Grassland Ecosystems (3)
RNG 355. Desert Watershed Mgt (3)
RNG 403. Senior Thesis (3) (Writing Intensive Course)
RNG 421. Rnglnd Impr & Restoration Eco (4)
RNG 441. Rnglnd Analysis (4)
RNG 442. Rnglnd-Animal Rel (4)
RNG 490. Rnglnd Mgt Planning (4)

Free electives (3-13)

OPTIONS

Option course work must include a minimum of 15 upper division credits. Students must choose one option.

RANGE SCIENCE OPTION (27)
ANS 378. Animal Breeding (4)
Physics (8)
Biology and range (13)
Electives (2)

RANGE/FORESTRY/FIRE MANAGEMENT OPTION (27)
Select 27 credits from:
FOR 220. Aerial Photos Interpretation and Forest Measurements (3)
FOR 241. Dendrology (5)
FOR 341. For Ecol (5)[8]
ENT 415. Forest Insects & Disease Mgmt (5)
FOR 321. Mensuration (5)
FOR 441. Silviculture Principles (3)
FOR 420. Advanced Aerial Photos and Remote Sensing
RNG 436. Fire Science (3)
F 407 or RNG 407. Seminar (1)

RANGE/SOILS OPTION (27)
CSS 315. Nutrient Mgt & Cycling (4)
CSS 435. Soil Ecosystem Properties (4)
CSS 445. Soil Ecosystem Processes (4)
CSS 485. Env App (4)
CSS 425. Sustaining Soil Productivity (3)
Other soils and range classes (8)

RANGE MANAGEMENT OPTION (27)
FOR 220. Aerial Photo Interpretation and Forest Measurements (3) or GEO 415. Photo Intepretation (3)
ANS 378. Animal Breeding (5)
Additional Agribusiness Mgt (8)
Additional Plant Science (8)
Additional ANS and RNG (4)

RANGE/WILDLIFE OPTION (27)
Zoology (6)
GEN 311. Principles of Genetics (4)
FW Credits: 17 credits from FW 310 (or Z 472), FW 311 (or Z 451), FW 320, FW 321, FW 458, FW 481, FW 485 (or Z 348), Z 473, ENT 350

WILDLAND ECOLOGY OPTION (27)
Select two courses from:
FW 311. Birds or FW 310. Mammals (4)
FW 321. FW Ecol (3)
FW 458. Big Game (4)
RNG 455. Riparian Mgt (3)
RNG 436. Fire (3)
CSS 435. Soil Ecosystems Properties (4)
Select three courses from:
BOT 441. Autecology (3)
BOT 442. Pl Ecol (3)
FOR 341. For Ecol (4)
BI 371. Ecol Meth (3)
GEO 422. Biotic Resource Geography (3)
Electives (6)

GENERAL RANGELAND RESOURCES
27 credits of electives chosen in consultation with adviser and department head

MINOR PROGRAM (27)

Note: Completion of the Rangeland Resources Minor alone does not qualify students for Rangeland Conservationist positions with the U.S. Office of Personnel Management (OPM).

Requirements
RNG 341. Rangeland Resources (3)
RNG 347. Arid Land Biomes or RNG 350. Grasslnd Ecosystems (3)
RNG 421. Rnglnd Imp & Restoration Ecol. (4)
RNG 442. Rnglnd-Animal Rel (4)
RNG 490. Rnglnd Mgmt & Plan (4)
Select 9 additional credits from:
Any other RNG course
BOT 341. Plant Ecology (4)
ANS 436. Sheep Production (3)
ANS 443. Beef Production (3)

COURSES

Upper Division

RNG 301. CAREER ORIENTATION (1). Opportunity to explore rangeland careers in an informal, seminar-like setting.

RNG 341. RANGELAND RESOURCES (3). Nature and management of rangelands. Integrated land use with emphasis on plant-animal-soil interactions.

RNG 347. ARID LAND BIOMES (3). Designed to acquaint students with the physical, climatic, and vegetational characteristics of arid rangelands in the U.S. and their world counterparts. An emphasis will be placed upon community level descriptions of arid biomes.

RNG 348. ARID LAND PLANTS (2). Emphasis is placed on identification of important plant species occurring in arid land biomes of the U.S. Students are required to learn both scientific and common names, ecological requirements and tolerances, reaction to grazing and their value as forage and cover.

RNG 350. GRASSLAND ECOSYSTEMS (3). Designed to acquaint students with grassland systems with emphasis on North American grasslands and comparison with grasslands of other continents. Emphasis of the course is on system structure, process and function. Major consideration will be placed on phytoedaphic and zootic relationships.

RNG 355. DESERT WATERSHED MANAGEMENT (3). Principles and methods in managing rangeland for optimum production and regulation of water yields, as well as maintaining soil stability and on-site productivity. Effects of grazing herbivores and their potential as land use, manipulative tools. Concepts of arid land hydrology, with emphasis on the resultant effects on runoff quantity and quality.

RNG 403. ^SENIOR THESIS (1-16). Writing Intensive Course.

RNG 405/RNG 505. READINGS AND CONFERENCE (1-16).

RNG 406/RNG 506. PROJECTS (1-16). Graded P.

RNG 411. ADVANCED PLANT ID (2). Advanced rangeland plant taxonomy. Consent of instructor. Department approval required.

RNG 415/RNG 515. RANGELAND FIELD TRIP (2). Trip will occur during quarter break. Students will be required to register winter term and attend organizational meetings. Students are expected to cover individual and transportation costs incurred during the trip. It is advised that students take RNG 347 (Arid Land Biomes) and RNG 348 (Arid Land Plants) before the field trip. Departmental approval required.

RNG 421/RNG 521. RANGELAND IMPROVEMENTS AND RESTORATION ECOLOGY (4). Practices for rehabilitating degraded rangelands are studied. This involves knowledge of manipulating plants, animals, and microenvironments of rangelands for optimal sustained yield of rangeland resources, for maintenance and improvement of basic natural resources, and for improved ecosystem functions.

RNG 436/RNG 536. WILDLAND FIRE SCIENCE (3). Principles and applications of prescribed fire as a natural resource management tool. Documentation of fire behavior and fire effects, influence of climate, vegetation composition, and land use on fire severity, behavior and management. Ecological role of fire on natural and managed ecosystems. Offered alternate years. Offered 1996-97.

RNG 441/RNG 541. RANGELAND ANALYSIS (4). Techniques used to describe vegetation in shrublands, grasslands, and forests. Use of measurements in resource management. Course is field-oriented, emphasizing both theory and practice of wildland inventory methods. REC: Introductory statistics course is helpful.

RNG 442/RNG 542. RANGELAND-ANIMAL RELATIONS (4). Domestic and wild animal use of rangelands as related to environmental factors, palatability, food habits, nutrition, physiography, and their effects on management of rangeland-animal resources.

RNG 450/RNG 550. LANDSCAPE ECOLOGY AND ANALYSIS (3). Course will introduce students to the principles and terminology of landscape ecology in a rangeland context. We will examine the pattern and distribution of elements across the landscape and seek relationships between element location and environmental parameters. Landscape dynamics through time will be quantified, analyzed, and mapped. PREREQ: RNG 341 or equivalent.

RNG 455/RNG 555. RIPARIAN ECOLOGY AND MANAGEMENT (3). Study of the ecology of riparian vegetation, including successional processes in riparian zones, productivity, structure and diversity of riparian ecosystems. The class is focused on the terrestrial vegetation, soils and animals of riparian ecosystems. Emphasis is placed on the past abuse associated with riparian ecosystems, methods of rehabilitation, and theories of the proper use of riparian ecosystems under a multiple use philosophy (i.e. fish, wildlife, livestock, aesthetics, recreation, and silviculture). Alternate years. Offered 1996-1997.

RNG 468/RNG 568. INTERNATIONAL RANGELAND RESOURCE MANAGEMENT (3). Discussion of the problems and potentials of range management techniques as they are applied in developing countries. This is accomplished by examining traditional development actions in light of social, economic, ecological, and technical constraints. Qualifies as Baccalaureate Core synthesis (Contemporary Global Issues) course.

RNG 477/RNG 577. AGROFORESTRY (3). Theory and worldwide practice of multiple-crop low input sustainable systems involving concurrent production of tree and agricultural products. Biological, economic, social, and political factors which underlie the application of agroforestry technology. PREREQ: Course in basic ecology. Qualifies as Baccalaureate Core synthesis (Science, Technology and Society) course.

RNG 490/RNG 590. RANGELAND MANAGEMENT PLANNING (4). Administration and management of rangelands; planning processes involving goal setting, inventories, personnel management, environment, conflict resolution, and other constraints necessary for decision-making. Use of data collected from field problems to support the execution of class plans. Field trip required.

Graduate

RNG 501. RESEARCH (1-16).

RNG 503. MASTERS THESIS (1-16).

RNG 603. DOCTORAL THESIS (1-16).

RNG 607. SEMINAR (1-2).

RNG 643. ARID LAND PLANT PHYSIOLOGY (4). Basic physiological characteristics and growth strategies of arid land plants are studied. Alternate years. Offered 1996-1997.

RNG 661. AGRICULTURAL RESEARCH PERSPECTIVES (3). Planning and managing agricultural research projects, publishing research results, professional ethics, interactions of science, scientists, and society. Alternate years. Offered 1995-96.

RNG 662. RANGELAND ECOLOGY (3). Studies ecological theory in rangeland and related resource management. Population ecology, succession and classification are discussed and evaluated. Alternate years. Offered 1995-96.

RNG 667. FIRE ECOLOGY (3). Examination of ecosystem response to fire. Mechanisms by which the physical, climatic and biotic components affect fire behavior are studied. Study focuses on the variable effects of fire on nutrient cycles, vegetation, animals, and management of natural resources. Alternate years. Offered 1996-97.

STATISTICS

See College of Science.

FOOTNOTES

*Baccalaureate Core Course

^Writing Intensive Course (WIC)

[1]Required courses are not to be taken S/U.

[2]Fisheries Science majors take two of these three courses. Wildlife Science majors take all of these.

[3]Requirement may also be met, with approval of the head adviser, by attending another marine field station.

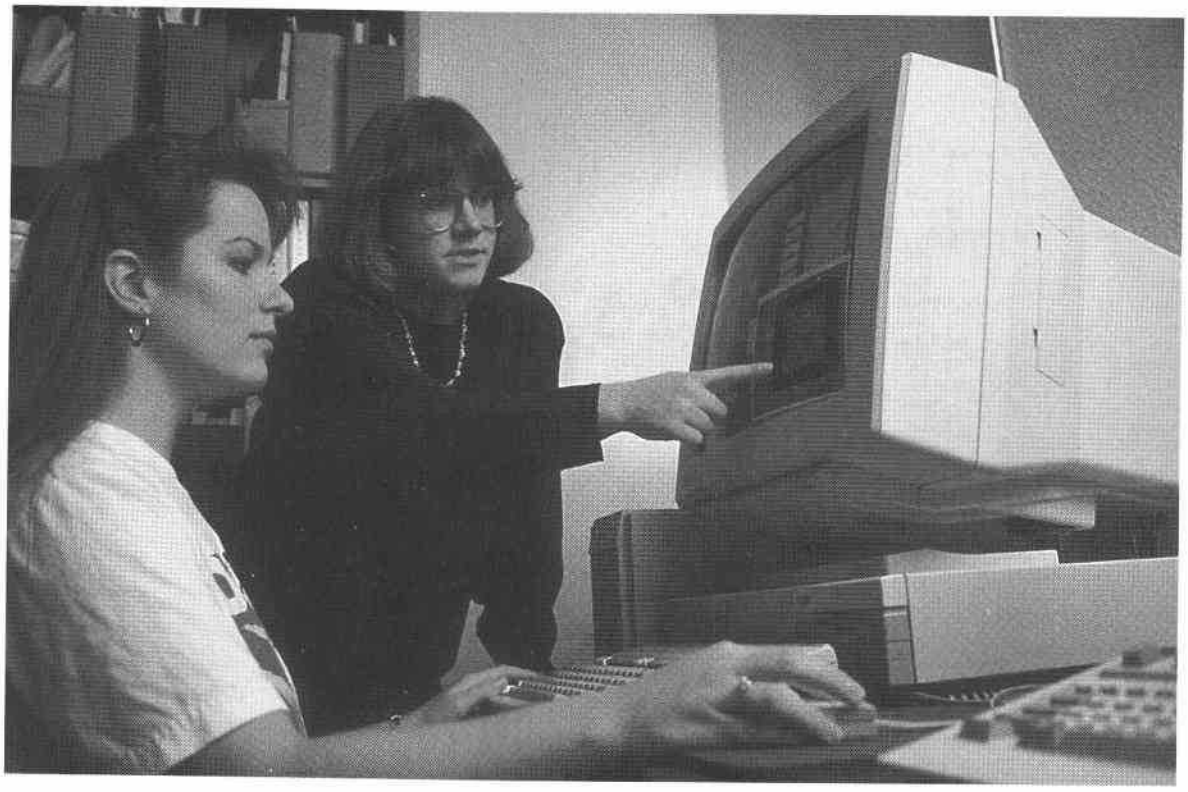
[4]Offered at Hatfield Marine Science Center.

[5]A minimum of 12 credits must be taken from the following food processing courses: FST 210, FST 211, FST 212, FST 213, FST 310, FST 311, FST 450.

[6]Certain classes may be used to satisfy both the Baccalaureate Core and the Rangeland Resources core.

[7]Satisfies requirements of the Baccalaureate Core.

[8]Offered during Forestry's Spring Intensive Term.



The College of Business provides students with the professional preparation necessary for successful careers in modern business and management. Emphasis is placed not only upon the concepts and analytical techniques of business decision-making, but also upon the obligations and opportunities of business people for effective service to society. The undergraduate and graduate programs in business and the undergraduate program in accounting are all accredited by the American Assembly of Collegiate Schools of Business.

The College of Business offers two undergraduate degree programs and one graduate degree program. Curricula lead to Bachelor of Arts (B.A.), Bachelor of Science (B.S.), and Master of Business Administration (M.B.A.) degrees. The college participates in the M.A.I.S. program but college faculty will not serve as the major professor for M.A.I.S. degrees. For advanced degrees see Graduate School.

Business Administration offers options in accounting, international business, financial services, management, management information systems, marketing management, and general business. A minor in a nonbusiness area is required of all business students.

College of Business undergraduate students have the opportunity to participate in the student exchange programs around the world.

Undergraduate Majors

Business Administration (B.A., B.S.)
Options
Accounting
Financial Services
General Business
Management Information Systems
International Business
Management
Marketing Management

Minor

Business Administration

Certificate Program

Post-Baccalaureate Certificate in Accounting

Graduate Major

Business Administration (M.B.A.)

International Degree

Undergraduates with majors in the College of Business can earn a second degree in International Studies. See the Interdisciplinary Studies section of this catalog for more information.

Post-Baccalaureate Certificate in Accounting

A postbaccalaureate certificate in accounting is intended for those who wish to prepare for careers in professional accounting. The certificate is available to those holding a baccalaureate degree that did not involve specialized accounting education. The required accounting course work is identical to that required for the B.S. in Business Administration with an option in accounting. In addition, certain business and related elective courses are recommended.

Minor Program

The College of Business offers a transcript-visible minor for students majoring in other disciplines. The minor allows students to tailor a program of study to enhance their skills in areas such as marketing, management, and finance. More information may be obtained in the Office of Student Services 214 Bexell Hall (503-737-3716).

Graduate Program

Master of Business Administration

The M.B.A. degree program is designed primarily for students whose undergraduate degrees are in disciplines other than business administration (although business graduates are also accepted). The program stresses breadth of knowledge in all areas of business and administration. It provides a working knowledge of those skills necessary for the graduate to develop into a competent and responsible executive in both private and public organizations.

Graduate International Exchange Program

The College of Business has a student exchange program for M.B.A. students with the Copenhagen School of Economics and Business Administration, Copenhagen, Denmark.

High School Preparation

The following high school courses are recommended for students planning to enroll in the College of Business: English, four years; mathematics, four years; history and social studies, three years; keyboarding, one year; natural science, two years. In addition, competence in microcomputer word processing, spreadsheet and data base software is recommended.

Transfer Students

Students planning to transfer into the College of Business should do so as early as possible. Those planning to transfer from a community college should consult the business adviser at the community college to determine the most appropriate courses to complete prior to transfer. The head adviser of the College of Business may also be contacted for advice.

Advising and Placement

The College of Business has experienced advisers available to advise students in all academic matters as well as in the areas of career choice and job placement. The services of the Career Planning and Placement Center are available to all students seeking information concerning placement opportunities and interviews with visiting firms.

Academic Requirements

The standards set forth below apply to all students enrolled in the College of Business and are in addition to those standards applicable to all students in the University. Students are responsible for satisfying these requirements and should seek clarification in the Office of Student Services, Bexell 214.

Students are expected to make satisfactory progress toward a degree. Satisfactory

Footnotes for this section on page 191.

Bexell Hall 200
Oregon State University
Corvallis, OR
97331-2603
(503) 737-3716

ADMINISTRATION

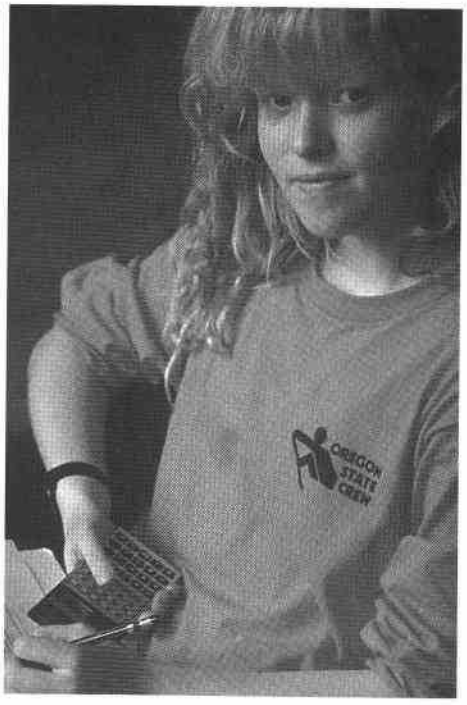
DONALD F. PARKER
Sara Hart Kimball Dean

CLARA HORNE
Head Adviser

progress includes (but is not limited to) the completion of all review group courses listed below by the time the designated number of credits has been completed within a specified number of terms. At a minimum, the record of every student in the college will be reviewed at the completion of 45, 90, and 135 credits. Students will be required to transfer from the College of Business if:

(a) a minimum of 2.50 grade-point average (OSU grades only) is not achieved in each set of review group courses listed below, OR

(b) two or more review group courses have not been completed in the designated year. (Exception: Transfer students who are following a schedule approved during their first term at OSU by the head adviser of the college.)



Review Group Courses

Only grades earned in courses completed at OSU are used in the 2.50 grade-point average computation.

(a) At the end of the freshman year (45 credits or three terms): WR 121, MTH 111, MTH 241, MTH 245, COMM 111, or COMM 114;

(b) At the end of the sophomore year (90 credits or six terms): BA 211, BA 213, BA 230, BA 271, BA 275, BA 278, EC 201, EC 202;

(c) At the end of the junior year (135 credits or nine terms): BA 347, BA 340, BA 350, BA 352, BA 357, and BA 390;

(d) During the senior year (135-180 credits or 12 terms): BA 469, BA 471, and all specified 400-level course work.

To graduate, a student must also have a 2.50 grade-point average in all course work taken in the College of Business and in all 400-level course work taken in the college.

Review group courses for which a W or grades A-F are received may be repeated no more than once.

Concurrent Degrees

Students who wish to earn an undergraduate degree in business administration combined with a degree in other areas in which degrees are offered at OSU may enroll in the concurrent degree program. The requirements to qualify for two degrees are listed under Requirements for Baccalaureate Degrees. Students who intend to obtain one of their degrees in business administration should see the head adviser of the College of Business as soon as possible.

Business Administration

Curricula

The undergraduate curriculum in business administration reflects the increasingly complex economic, social, and technological aspects of modern business decision-making. Course work emphasizes the development of effective decision-making, an understanding of personal values and motivation, and an awareness of the interrelationship between business and society. In the junior or senior year, students select one of several options that include specialized course work in their area of major interest. (See Options.)

The study of business administration is combined with a minor in a nonbusiness area. Minors are designed to augment the education of the business executive by providing tools or understanding related to the increasingly complex demands business professionals must deal with during a business career.

Program Requirements (180)

Business Administration Core Curriculum (53)

The business administration core curriculum provides students with basic skills in accounting, data processing and quantitative methods; an understanding of the legal and social environment of business; a background in management and organizational behavior, marketing, finance, and operations management; and the opportunity to integrate course work and further develop decision-making skills through the analysis of business cases.

Option (24-36)

The options are designed to allow students to extend their professional preparation beyond the introductory level in one or more areas. Most options (except accounting and management information systems) may be completed within one academic year and are designed for the senior year. Students electing accounting or management information systems begin their option course work in the junior year.

Minor (27 or more)

Each business administration student is required to complete a minor area of study or an approved alternative in course work outside the College of Business. Students typically begin course work for their minors in the sophomore year.

Mathematics (12)

The basic mathematics requirements are MTH 111, College Algebra; MTH 241, Calculus for Management and Social Science; and MTH 245, Mathematics for the Management, Life and Social Sciences, preceded, if needed, by prerequisite mathematics courses. Entering transfer students who have completed a mathematics sequence through one term of calculus may substitute this mathematics background for part or all of the mathematics requirement.

Economics (6)

Micro- and macroeconomics are covered in EC 201 and EC 202, Principles of Economics. Students transferring from another institution who have completed a year course in principles of economics have completed this requirement.

Written and Oral Communication (6)

Business students also must take WR 121, English Composition; and COMM 111, Public Speaking; or COMM 114, Argument and Critical Discourse.

University General Requirements

MTH 111, WR 121, and COMM 111 or COMM 114 meet the University's baccalaureate core requirements for Mathematics, Writing I, and Writing III/Speech, respectively. All students must meet the other baccalaureate core requirements (42 credits) and the other requirements for baccalaureate degrees. (See Requirements for Baccalaureate Degrees.)

Core Curriculum

Freshman Year

MTH 111, MTH 241, MTH 245. Math (12)
COMM 114 or COMM 111. Speech (3)
WR 121. English Composition (3)
Baccalaureate core, unrestricted electives (27)

Sophomore Year

BA 211, BA 213. Acc Principles (6)
BA 230. Business Law (4)
BA 271. Information Technology in Business (3)
BA 275. Quantitative Business Methods (4)
BA 278. Intro to Management Science (4)
EC 201, EC 202. Principles of Economics (6)
Baccalaureate core, minor courses, or unrestricted electives (18)

Junior Year

BA 340. Finance (4)
BA 347. International Business (4)
BA 350. Organizational Systems (4)
BA 352. Organizational Behavior (4)
BA 357. Operations Management (4)
BA 390. Marketing (4)
Baccalaureate core, minor courses, or unrestricted electives (21)

Senior Year
BA 469. Strategic Management & Bus Policy (4)
BA 471. Management Information Systems (3)
Business Administration Option (Students majoring in business administration must choose an option no later than the beginning of their senior year) (24-36)
Baccalaureate core, minor courses, or unrestricted electives (5-17)
Students in accounting begin their option in the junior year, reducing their elective credit as needed.

OPTIONS

Students who complete all requirements will receive the B.A. or B.S. degree in Business Administration. All students in business administration must complete 24-36 credits of business administration or related courses in one of the options listed below.

ACCOUNTING, FINANCE, AND INFORMATION MANAGEMENT

Charles Neyhart, Chair
Bexell Hall 206
Oregon State University
Corvallis, OR 97331-2603
(503) 737-4276

Faculty
Professors Bailes, Bloomfield, Frishkoff, Harrison, Neyhart, Nielsen, Nielson; *Associate Professors* Abrassart, C. Brown, Kleinsorge, Paschke, Seville, Sullivan; *Assistant Professors* Coakley, Gammill, Graham

ACCOUNTING OPTION (36)

The primary goal of the accounting option at Oregon State University is to provide a professionally oriented program to prepare students for successful careers in the major fields of accounting. Accounting students take the courses shown below (beyond the introductory accounting courses that are taken by all business students).

Junior Year
BA 317, BA 318, BA 319. Intermediate Acc (12)
BA 321, BA 322. Cost Accounting (8)
BA 325. Tax Accounting I (4)

Senior Year
BA 417. Advanced Accounting I (4)
BA 420. Accounting Information Systems I (4)
BA 427. Auditing (4)
TOTAL: 36

Students in accounting will begin their 36-credit option in the junior year, reducing their elective credits as needed. All accounting option course work must be taken on a graded (A-F) basis. Courses that are beyond introductory accounting and that are completed at another institution or through correspondence study are not transferable. Admission to BA 317 and BA 321 requires junior standing and completion of BA 211 and BA 213 with a minimum required GPA. Admission to all senior accounting courses requires senior standing, completion of BA 317, BA 318, and BA 319 with a minimum required GPA; completion of BA 321 and BA 322 with a minimum required GPA; and departmental approval. Students should consult the departmental office for enrollment requirements.

MANAGEMENT INFORMATION SYSTEMS OPTION (24)

The mission of the Information Management Option is to prepare students for entry level positions and successful careers within the field of information management. The program builds on the business and computer skills classes required of all business students, and prepares students specifically to apply the information technologies to business tasks.

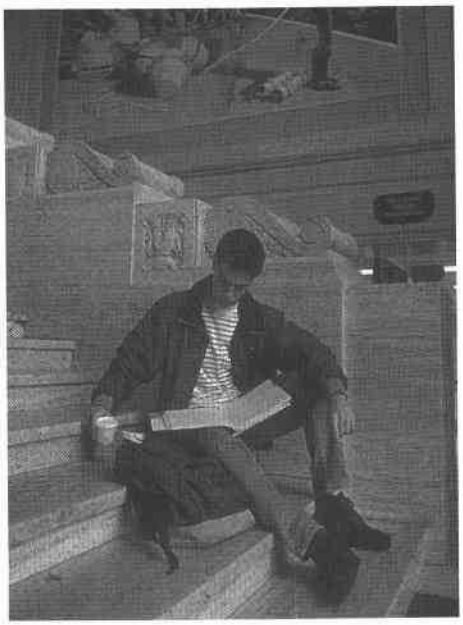
Students are asked to complete a programming course (CS 151) and three information management courses during the Junior Year:
BA 370. Business Data Processing (4)
BA 371. Business Systems Analysis & Design (4)
BA 372. Business Software Development (4)

Satisfactory completion of these courses puts the student in a good position to work as an intern during the summer between the Junior and Senior years. Courses in the Senior year are:
BA 479. Current Topics in Info. Mgmt. (4)
BA 483. Management of Information Technologies (4)
Plus either:
BA 462. Project Management (4) or
BA 477. Simulation in Business (4)

Students should consult the departmental office for current information relative to the above requirements.

FINANCIAL SERVICES OPTION (28)

Financial managers engage in many activities designed to ensure the efficient utilization of an organization's or an individual's capital resources. Oregon State University's emphasis is on institutional finance, which includes careers in banking, brokerage, insurance, and other financial fields.



Individuals entering a career with a financial institution have many opportunities open to them. A large number of persons going into banking select career paths in either operations or lending. Within the lending area, persons can specialize in installment credit lending to consumers of durable goods, mortgage lending to home builders and buyers, or commercial lending to help finance the growth of business firms. Young men and women entering the securities industry find careers as stock and bond brokers, security analysts, or portfolio managers. Individuals choosing the area of insurance typically enter company operations through either claims or underwriting positions. Those with sales positions can choose to work either with corporations or individuals as a client base. In addition, many persons decide to work for the government as finance personnel in charge of revenue and expenditure programs.

Senior Year
BA 435. Insurance Planning for Individuals (4)
BA 440. Financial Management (4)
BA 441. Mgmt of Depository Financial Services Institutions (4)
BA 442. Investments (4)
Select three from the following:
BA 325. Tax Accounting I (4)
BA 436. Insurance Planning & Alts for Bus (4)
BA 437. Employee Benefits & Estate Planning (4)
BA 443. Security Analysis & Portfolio Mgmt (4)
BA 445. International Financial Mgmt (4)

MANAGEMENT, MARKETING, AND INTERNATIONAL BUSINESS

Ronald L. Miller, Chair
Bexell Hall 208
Oregon State University
Corvallis, OR 97331-2603
(503) 737-3520

Faculty
Professors Becker, W. Browne, Gobeli, Miller, Parker; *Associate Professors* D. Brown, Drexler, King, Larson, Lawton, McAlexander, MuKatis, Shane; *Assistant Professors* Camacho, Chandrashekar, Fiegener, Gonzalez, Koenig; *Acting Assistant Professor* B. Browne; *Instructors* Bach, Dowling, Kaldenberg, Milosevic, Schwallie; *Professors Emeritus* Amano, Dane, Gray

MANAGEMENT OPTION (24)

The management Option prepares students for careers as managers and supervisors in goods producing and service businesses. Students obtain a solid grounding in the management of systems, personnel, and quality. The integrative focus of the Management Option also provides excellent preparation for graduate-level studies in law, urban and regional planning, public services administration, and health care administration.

Senior Year
BA 451. Quality Management (4)
BA 453. Human Resources Mgmt (4)
BA 459. Competitive Analysis (4)
Select one of the following:
BA 460. Enterprise Management (4)
BA 406. Projects (4)
BA 410. Internship (4)
Select two of the following:
BA 452. Leadership and Team Building (4)
BA 458. Tech Systems Mgmt (4)
BA 462. Project Management (4)
BA 463. Family Business Mgmt (4)
BA 468. Intl Comparative Management (4)

MARKETING MANAGEMENT OPTION (24)

The Marketing Option prepares students with both technical marketing skills and leadership training. Students may enter marketing careers in business, not-for-profit organizations, and the public sector. International and domestic markets are studied.

Senior Year
BA 492. Consumer Behavior
Select one from the following:
BA 498. Services Marketing (4)
BA 499. Marketing Policy (4)
Select at least four from:
BA 493. Advertising Mgmt (4)
BA 494. Marketing Technology (4)
BA 495. Retail Management (4)
BA 496. Marketing Research (4)
BA 497. International Marketing (4)

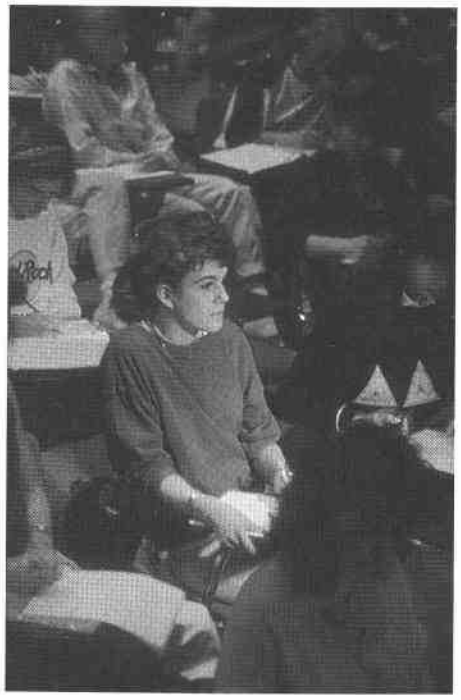
INTERNATIONAL BUSINESS OPTION (24)

The International Business Option prepares students for management positions in organizations engaged in international trade. Graduates of this program are typically employed with firms involved in exporting, importing, or service organizations that facilitate international trade. Students study the economic, political, geographical, and sociocultural factors which impact doing business across national boundaries.

Senior Year
BA 445. International Financial Mgmt (4)
BA 468. International Comparative Mgmt (4)
BA 497. International Marketing (4)
EC 440. International Trade (3)
Area Study Courses (9)
Students must also complete 9 credits of Area Study courses approved by the Office of Student Services, Bexell 214 and demonstrate second-year foreign language proficiency consistent with the area identified above.

GENERAL BUSINESS OPTION (21)

All students in the option must take 24 credits of 400-level College of Business courses in addition to the undergraduate business core curriculum. Approval of the program by College of Business Advising Office is required.



BUSINESS ADMINISTRATION MINOR (28)

The minor assumes familiarity with computerized word processing, spreadsheets, and database management. Students without such preparation should take BA 131 or a similar course.
BA 215. Fundamentals of Accounting (4)
Select at least one of the following:
BA 230. Business Law (4)
BA 347. International Business (4)
Select at least three of the following:
BA 340. Finance (4)
BA 350. Organizational Systems (4)
BA 352. Organizational Behavior (4)
BA 357. Operations Management (4)
BA 390. Marketing (4)
Select a minimum of two 400-level business courses (8 credits), or additional business courses from the list above (prerequisites must be satisfied).
TOTAL: 28 credits minimum

NONBUSINESS MINORS (27)

A nonbusiness University-approved minor or an approved alternative is required of all business undergraduate majors. Minors and alternatives must consist of a minimum of 27 credits, with at least 12 credits at the upper division level. Students are responsible for determining whether the minor has been approved for transcript visibility and to request the notation on their transcript. Approved alternatives will not be noted on transcripts.

A list of approved alternatives is available from the head adviser of the College of Business. In addition to the approved alternatives, students may also propose a coherent set of nonbusiness courses to fulfill this requirement. Students must demonstrate how the proposal supports their career goals. Proposals must be submitted to the head adviser no later than the beginning of the junior year. The head adviser will not approve proposals that represent a deviation from a University-approved minor or an approved alternative.

Candidates for the B.A. degree must complete a minor offered by the Department of Foreign Languages and Literatures or complete 27 pre-approved credits of foreign language and culture studies, 12 of which must be at the upper division level. Students who choose the latter must also demonstrate a foreign language proficiency equivalent to that attained at the end of a second year language sequence.

COURSES

Lower Division

BA 101. INTRODUCTION TO BUSINESS (3). Explores the relationships between competitive markets and business organizations; examines the roles played by business in society; introduces the functions and operations that must exist if businesses are to create goods and services; highlights major problems faced by managers in planning, organizing, directing, and controlling enterprises; identifies career opportunities in private and public enterprises.

BA 131. BUSINESS PRODUCTIVITY SOFTWARE (2). Use of application programs as communication tools; primarily e-mail, word processing, and spreadsheet modeling.

BA 199. SPECIAL STUDIES (1-16). Graded P.

BA 211. FINANCIAL ACCOUNTING (3). Accounting information from the perspective of external users, principally investors and creditors. Emphasis on the preparation and interpretation of financial statements; income recognition and determination; and asset valuation. PREREQ: MTH 111 and sophomore standing.

BA 213. MANAGERIAL ACCOUNTING (3). Accounting information from the perspective of management users with an emphasis on date accumulation for product costing, planning, and performance evaluation and control. PREREQ: BA 211.

BA 215. FUNDAMENTALS OF ACCOUNTING (4). A survey of basic accounting principles and procedures that is designed for nonbusiness students. Encompasses both financial and managerial accounting from a user perspective. Not open to business students.

BA 230. BUSINESS LAW I (4). Nature and function of the law in our business society; obligations arising out of agency contract formation, discharge and breach tort; warranty; regulation of competition; and international aspects thereof.

BA 271. INFORMATION TECHNOLOGY IN BUSINESS (3). Application of information technology as a personal productivity tool within a business environment. Integrative use of application programs such as word processors, database management systems, spreadsheets, presentation graphics, and hypertext systems. PREREQ: BA 131 or equivalent demonstrated proficiency.

BA 275. QUANTITATIVE BUSINESS METHODS (4). Management decision processes utilizing statistical methods, use and application of probability concepts, sampling procedures, statistical estimation, and regression to the analysis and solution of such business problems as income and cost estimation, sales forecasting, performance evaluation, inventory analysis, and quality control. PREREQ: MTH 245.

BA 278. INTRODUCTION TO MANAGEMENT SCIENCE (4). Management decision processes utilizing mathematical models, use and application of modeling techniques, mathematical programming, decision theory, and other methods to the analysis and solution of business problems. PREREQ: BA 275, MTH 241, sophomore standing.

Upper Division

BA 315. ACCOUNTING FOR DECISION MAKING (4). Cost accounting concepts in product costing, standard costing, profit planning and budgeting, taught with a management emphasis. Topics to be covered from the perspective of understanding the content and how to use cost accounting information in decision making. PREREQ: BA 215. Not open to business students.

BA 317. INTERMEDIATE ACCOUNTING (4). Financial accounting theory and practice; financial statement overview; income determination; and, valuation, measurement, and recognition of current assets. PREREQ: BA 213, junior standing, and departmental approval.

BA 318. INTERMEDIATE ACCOUNTING (4). Continuation of philosophy established in BA 317. Application to non-current assets and liabilities, including pensions, leases, and income tax allocation. PREREQ: BA 317.

BA 319. INTERMEDIATE ACCOUNTING (4). Concepts and valuation of owners equity; contributed and earned capital, earnings per share; disclosure requirements; alternatives to conventional financial reporting; analysis of financial statements; and cash flow analysis. PREREQ: BA 318.

BA 321. COST ACCOUNTING (4). Cost behavior, profit planning and budgeting, motivation and control, cost accounting systems, standard costing. PREREQ: BA 213.

BA 322. COST ACCOUNTING (4). Relevant costs. Cost accumulation and allocation for specific decisions, segment performance measurement and control, quantitative techniques in cost and managerial accounting. PREREQ: BA 321.

BA 325. TAX ACCOUNTING I (4). Principles and philosophy of the federal tax system as it applies to individuals and business entities accounting and reporting under federal tax law with an emphasis on the individual taxpayer. PREREQ: BA 213 and junior standing.

BA 340. FINANCE (4). Role and functions of financial manager in modern business firm; environment in which manager operates; formulation of financial objectives and policies; financial analysis, forecasting, planning, and control; asset management; capital budgeting; acquisition of funds through borrowing, stock issue, and by internal means; dividend policy; international aspects of finance. PREREQ: BA 213 or BA 215; junior standing.

BA 347. INTERNATIONAL BUSINESS (4). Current patterns of international business, socioeconomic and geo-political systems with countries as they affect the conduct of business; major theories explaining international cusiness transactions; financial forms and institutions that facilitate international transactions; interface between nation-states and the firms conducting foreign business activities. PREREQ: Junior standing and EC 202.

BA 350. ORGANIZATIONAL SYSTEMS (4). A system perspective for managing organizations is applied to processes and structures. Emphasis is placed on total quality management. topics include changing environments, systems analysis, planning, organizing, directing, evaluating. PREREQ: Junior standing.

BA 352. ORGANIZATIONAL BEHAVIOR (4). Diagnose behavior at the individual and small group level and develop skills in improving individual and small group performance. An emphasis is placed on the practical application of theory and research. concepts of total quality and diversity are integrated into course topics. PREREQ: Junior standing.

BA 357. OPERATIONS MANAGEMENT (4). Decision making in managing the production of goods and services: product planning, process planning, facility planning, control of quantity, cost and quality. Special emphasis on exponential forecasting, inventory management, work methods, project management, productivity improvement, international comparisons. PREREQ: BA 275, BA 278; and junior standing.

BA 370. BUSINESS DATA PROCESSING (4). Introduce students to the Information Management career field. Emphasis placed on understanding how information technology can be applied to enhance decision making and further competitive strategies within a business environment, and on the characteristics and roles of business information systems. Each student will be required to use state-of-the-art computer application programs to solve business problems. PREREQ: BA 213, BA 271, BA 275, BA 278.

BA 371. BUSINESS SYSTEMS ANALYSIS AND DESIGN (4). Systems analysis, design, control, documentation, and implementation techniques for business information system applications. Covers documentation methods used in all phases of the development life cycle. PREREQ: BA 370.

BA 372. BUSINESS SOFTWARE DEVELOPMENT (4). Software development environment and tools used for creating business computer applications. Emphasis on program development with COBOL covers data base management systems, report generators, and documentation requirements. PREREQ: BA 371 and CS 151.

BA 390. MARKETING (4). Consumer and industrial markets; activities and enterprises involved in distributing products to those markets. Objective is to develop an understanding of distribution processes, marketing problems, and marketing principles. PREREQ: EC 201 and junior standing.

BA 405. READING AND CONFERENCE (1-16). Supervised individual work in some field of special application and interest. Subjects chosen must be approved by professor in charge. PREREQ: Senior or graduate standing. Departmental approval required.

BA 406. PROJECTS (1-16). Departmental approval required.

BA 407. SEMINAR (1-16).

BA 410. BUSINESS INTERNSHIP (1-6). Graded P. Planned and supervised work experience at selected cooperating business firms. Supplementary training, conference, reports, and appraisals. PREREQ: Upper-division standing. Sections A and B, the former subtitled Accounting. Graded P/N.

BA 417. ADVANCED ACCOUNTING (4). An advanced course in financial accounting theory; corporate combination, consultated financial statements, foreign operations, and subsidiaries, partnerships, financial statements; contemporary issues in financial accounting. PREREQ: BA 319, BA 322, senior standing and departmental approval.

BA 420. ACCOUNTING INFORMATION SYSTEMS (4). Accounting information systems and organizations, basic business processes, information technology, and developing business solutions with an emphasis on problem analysis and critical thinking skills. PREREQ: BA 171, BA 340, BA 350, BA 357, BA 390, BA 319, AND BA 322. Senior standing and departmental approval.

BA 421. ACCOUNTING INFORMATION SYSTEMS II (3). Advanced systems and EDP audit topics. Small business AIS design, DBMS considerations, decision support systems, special data integrity problems relating to dispersed data processing. Efficient and effective EDP audit procedures. PREREQ: BA 420 and departmental approval.

BA 423. NONBUSINESS ACCOUNTING (3). An advanced course in accounting for and financial management of nonbusiness entities. Topics in accounting for, financial reporting by, and auditing of nonbusiness entities will be covered. The relationships between accounting and management that are unique to nonbusiness organizations will be examined as well as the financial management issues that are unique to these organizations. This is a project/case study course. PREREQ: BA 319, BA 322, senior standing and departmental approval.

BA 424. FINANCIAL ACCOUNTING TOPICS (3). Conceptual and applied examination of contemporary issues and advances in financial accounting and reporting. PREREQ: BA 319, BA 322, senior standing and departmental approval.

BA 425. TAX ACCOUNTING II (3). Principles and procedures of the federal tax system with an emphasis on partnerships, corporations, and estates and trusts. Some complex topics apply to individuals. PREREQ: BA 325, senior standing, and departmental approval.

BA 427. AUDITING (4). Types of audits and auditors. Theory, practice, environment, and ethics of auditing. Types of audit reports. The nature of a professional audit: planning, evidence gathering and evaluation, and reporting of results. PREREQ: BA 319, BA 322, senior standing, and departmental approval.

BA 430. TOPICS IN BUSINESS LAW (4). Legal aspects of property rights, including intellectual property, forms of business, labor and employee considerations, antitrust, insurance, debtor-creditor law including bankruptcy and alternatives to litigation. PREREQ: BA 230.

BA 432/BA 532. ENVIRONMENTAL LAW (4). Legal relationships arising out of rights to air, water, and land. The impact of federal and state regulation on pollution control and on the production, use, and disposal of hazardous materials. PREQ: Junior standing.

BA 435/BA 535. INSURANCE PLANNING FOR INDIVIDUALS (4). Understanding the operation of the insurance industry with emphasis on insurance applications in financial planning for individuals. Risk nature; insurance principles; insurance company operations; regulation; life, health, annuity, auto, fire, and liability insurance; family business continuation; retirement planning; Social Security; estate planning. PREREQ: BA 340 or BA 530.

BA 436/BA 536. INSURANCE PLANNING AND ALTERNATIVES FOR BUSINESS (4). Handling of insurable business risks, including both insurance and non-insurance financing alternatives. Risk management function; loss forecasting; loss reduction; workers compensation; liability, and multi-line insurance. PREREQ: BA 340 or BA 530.

BA 437/BA 537. EMPLOYEE BENEFITS AND ESTATE PLANNING (4). Employer and employee objectives for benefit plans. Employee life, medical, disability, and retirement plans. Gift and estate taxes. Estate planning problems and tools, including property ownership, wills, trusts, and strategies for closely held business insterests. PREREQ: BA 340 or BA 530.

BA 440/BA 540. FINANCIAL MANAGEMENT (4). Capital market theory and the valuation of risky assets, capital budgeting, valuing the firms securities, capital structure theory, long-term financing alternatives, cost of capital, dividend policy, working capital management, financial analysis and planning, mergers and takeovers. PREREQ: BA 340 or BA 530.

BA 441/BA 541. MANAGEMENT OF DEPOSITORY FINANCIAL SERVICES INSTITUTIONS (4). Operation of commercial banks and other kinds of depository institutions; management of financial services; analysis of loan and investment policies, operating and pricing policies, and current developments in financial services. PREREQ: BA 340 or BA 530.

BA 442/ BA 542. INVESTMENTS (4). Risk and reward characteristics of investments; sources of investment information; domestic and international security markets; investment characteristics of common stocks, debt securities, convertible securities, option contracts, and investment companies; real property investment; economic market analysis; technical market analysis; tax aspects of investments; investment management. PREREQ: BA 340 or BA 530.

BA 445/BA 545. INTERNATIONAL FINANCIAL MANAGEMENT (4). International monetary environment; foreign exchange risk management; source and availability of funds to finance trade and multinational operations; taxation planning and control; international portfolio diversification; international banking; capital budgeting; political risk; evaluation of performance. PREREQ: BA 347; BA 340 or BA 530.

BA 446/BA 546. MANAGEMENT OF THE MULTINATIONAL ENTERPRISE (4). Advanced integrative course in international business with an emphasis on the multinational enterprise. Focus on the unique problems, characteristics, and demands that face firms engaged in international business. Reviews the evolving patterns, management practices, and the strategic and operational decisions of multinational enterprises. PREREQ: BA 347, BA 340, BA 350, BA 352 and BA 390; or BA 530, BA 550, and BA 590.

BA 451. QUALITY MANAGEMENT (4). Theory, principles, procedures, and tools of quality management, including application exercises and integrative process improvement project. PREREQ: BA 350, BA 352, BA 357.

BA 452. LEADERSHIP AND TEAM BUILDING (4). In-depth practice and development of three skills: leadership, team building, and negotiations. Provides opportunities for learning to increase one's own effectiveness as a group member or leader. PREREQ: BA 350, BA 352.

BA 453. HUMAN RESOURCES MANAGEMENT (4). Applied knowledge of personnel administration for line supervisors and managers. Integrates systems approach to understanding government regulation of employment, resolution of workplace personnel problems, and performance based personnel management. PREREQ: BA 350, BA 352, or BA 550.

BA 455. MANAGEMENT AND UNION RELATIONS (4). Union organizing and recognition, contract negotiations, strikes, and grievance administration including collective bargaining policies and practices, unions as organizations, labor movement history, and labor law. PREREQ: BA 350, BA 352.

BA 457. ADVANCED OPERATIONS MANAGEMENT (4). Planning and scheduling a variety of different types of flow processes such as batch, assembly, project, transportation, jobshop, warehouse. Case studies are used to stress the importance of developing a long range strategic operations plan. PREREQ: BA 357.

BA 458. TECHNOLOGY SYSTEMS MANAGEMENT (4). Theory, principles, procedures and tools of technology management, with focus on the innovation process from a systems perspective. Application experience through integrative technology development project that involves project management skills. PREREQ: BA 350, BA 352, BA 357.

BA 459. COMPETITIVE ANALYSIS (4). Strategic planning, macro and industry drive variables, and scenario construction. Project involves analysis of industry competition and examination of behaviors in segmented competitive groupings. Examination of competitive strategies in different industries. PREREQ: BA 213, BA 350, BA 352.

BA 460. ENTERPRISE MANAGEMENT (4). Entrepreneurial and innovation processes applied to new business start-ups, existing small businesses, and new ventures within larger organizations; new venture planning, project management and productivity improvement. Cases and projects are used to apply concepts and to develop communication skills. PREREQ: BA 340, BA 350, BA 352, BA 390.

BA 461/BA 561. VENTURE CONSULTING (4). Student consultants apply business concepts and problem solving skills to assist new ventures and on-going businesses in one-term consulting projects. Techniques developed for problem diagnosis, project scheduling and analysis, data gathering, formulation of recommendations, and preparing and presenting recommendations and reports. PREREQ: BA 460 or BA 560.

BA 462/BA 562. PROJECT MANAGEMENT (4). Covers the tools available to project managers, the human and organizational dimensions in different project environments, some computer applications, cases, and a student project. PREREQ: BA 350, BA 352 and BA 357; or BA 550.

BA 463/BA 563. FAMILY BUSINESS MANAGEMENT (4). Focuses on the opportunities and the problems characteristic of family businesses: entrepreneurship, management succession, transfer of ownership, mixing family and business roles, family conflicts, personnel issues, non-family employees, and outside advisers. PREREQ: Senior standing/ graduate standing.

BA 465/BA 565. GOVERNMENT RELATIONS IN BUSINESS (4). Government regulation of business through budgetary, legal and administrative controls, and the influences of businesses on government through political and economic methods. PREREQ: Senior standing/graduate standing.

BA 466. BUSINESS ETHICS (4). Analysis and critique of conventional conceptions of business ethics. Evaluation of ethical issues involving businesses at firm, national, and international levels. PREREQ: Senior standing.

BA 468/BA 568. INTERNATIONAL COMPARATIVE MANAGEMENT (4). Managerial practice throughout the world, market versus centrally directed economies. Political regimes and business organizations. Careers and values of managers in different countries. Forms of worker participation and management-union relations. Variety of national systems of management as a challenge to American managers. PREREQ: BA 300, BA 350, BA 352, or BA 550.

BA 469. ^STRATEGIC MANAGEMENT AND BUSINESS POLICY (4). Role of top management; focus on the tasks of the general manager, including analysis of external environment setting corporate goals and objectives, and implementing plans through policy making. Uses a business simulation game and case studies of companies. PREREQ: BA 340, BA 350, BA 352, BA 357, BA 390; senior standing. (Writing Intensive Course)

BA 471. MANAGEMENT INFORMATION SYSTEMS (3). Application of computers to solve business problems, with an emphasis on the development and use of business information systems. The course assumes each student is already a competent user of various computer-based application programs such as word processors, database management systems, spreadsheets, and presentation graphics. PREREQ: BA 213, BA 271, BA 275, BA 340, BA 350, BA 357, BA 390.

BA 477/BA 577. SIMULATION IN BUSINESS (4). Application of simulation techniques to the solution of business problems. Concepts and technical aspects of design, construction, validation, and use of business simulation models. Investigation of specialized computer languages for constructing simulation models. Student projects to analyze a business situation using simulation concepts and models. PREREQ: BA 278, BA 372.

BA 478. TOPICS IN MANAGEMENT SCIENCE (4). The techniques of management science are applied to the analysis of various managerial problems. The case method is utilized, with each case drawn from an existing organization. The emphasis is on problem formulation, solution procedures, and the steps necessary to gain management acceptance for implementation of the recommended solution. PREREQ: BA 275, BA 278.

BA 479. CURRENT TOPICS IN INFORMATION MANAGEMENT (4). Study of current research and state-of-the-art issues in the use of computers to assist in the management process, including such topics as end-user computing, new generation computer languages, telecommunications, networking, application development and other current topics. PREREQ: BA 372.

BA 483. MANAGEMENT OF INFORMATION TECHNOLOGIES (4). Integration and management of the various information resources in a business organization, including management information systems, decision support systems, telecommunications, data management, and office automation. Analysis of the user/managers role in information system design and the management of information system departments. PREREQ: BA 372.

BA 492/BA 592. CONSUMER BEHAVIOR (4). Understanding the processes that lead to purchase, so as to improve decisions on segmentation and the appropriate marketing mix for each segment. How consumers and households make decisions, and why different individuals/groups make different decisions. Application of behavioral science concepts, at individual, subcultural and cultural levels. Effects of consumerism and regulation also are considered. PREREQ: BA 390 and senior standing; or BA 590.

BA 493/BA 593. ADVERTISING MANAGEMENT (4). Analysis of the influence of advertising and other forms of promotion on attitudes and behavior of consumer and industrial buyers. Identification and examination of major decisions of marketing/ advertising managers implementing the promotional mix.

BA 494/BA 594. MARKETING AND TECHNOLOGY (4). The management of marketing in a technological environment. New product development, sales force management, and business-to-business marketing, with special reference to high technology markets. PREREQ: BA 390 and senior standing or BA 590.

BA 495/BA 595. RETAIL MANAGEMENT (4). Management of retail business, with emphasis on strategic planning, analysis and control, focused on middle- and upper-management decision. PREREQ: BA 390 and senior standing; or BA 590.

BA 496/BA 596. MARKETING RESEARCH (4). Problem identification, problem definition, alternative identification; research design, methodology, questionnaire design; data collection and analysis related to the marketing research process. PREREQ: BA 390 and senior standing; or BA 590.

BA 497/BA 597. INTERNATIONAL MARKETING (4). Influences on the design of the international marketing plan, including product policy, pricing, channels of distribution, delivery, servicing and promotion. Consideration of political, regulatory and trade barriers. PREREQ: BA 300, BA 390 and senior standing; or BA 590.

BA 498/BA 598. SERVICES MARKETING (4). Formulation of strategic and tactical marketing plans for organizations, both business and not-for-profit, in the service sector of the economy. Projects or cases are used to provide a comprehensive experience. PREREQ: BA 390 and senior marketing option students or BA 590.

BA 499. MARKETING POLICY (4). Market and competitive analysis for developing overall strategies and tactics to achieve the marketing objectives of the business enterprise. Projects or cases are used to provide a comprehensive experience. PREREQ: BA 390 and last term senior marketing option students only.

Graduate

BA 501. RESEARCH (1-16).

BA 505. READING AND CONFERENCE (1-16). Departmental approval required.

BA 506. PROJECTS (1-16). Departmental approval required.

BA 507. SEMINAR (1-16).

BA 510. BUSINESS INTERNSHIP (1-6). Planned and supervised work experience at selected cooperating business firms. Supplementary training, conferences, reports, and appraisals. PREREQ: Graduate standing. Departmental approval required.

BA 511. BUSINESS FUNDAMENTALS (4). A two-week intensive study and skill development course involving team work, managing diversity, financial reporting, and business simulation. PREREQ: Graduate standing. Graded P/N.

BA 513. NEGOTIATION SKILLS (1). Theory and practice of principled negotiations in business situations. Requires intensive work with experiential exercises, feedback, and simulations. PREREQ: Graduate standing.

BA 521. MANAGERIAL ACCOUNTING (4). Uses of accounting information for managerial planning, decision-making, and control. Emphasis is placed on understanding accounting information contained in internal (managerial) reports. Concepts of costs, assets, expenses, revenues, profitability, income, and value are interrelated. Problems and cases stress the type of data relevant to managerial decisions and the methods of using such data. PREREQ: BA 511; graduate standing.

BA 524. SELECTED TOPICS IN ACCOUNTING (3). Examination of the impact of recent advances in accounting on the management of contemporary business. Topic will vary from term to term. PREREQ: BA 521; graduate standing.

BA 530. FINANCIAL MANAGEMENT (4). Overview of the theory of financial management of a business enterprise. Stresses objective of maximizing the firms value and the application of analytical techniques to financial decision making. PREREQ: BA 521; graduate standing.

BA 531. LEGAL ENVIRONMENT OF BUSINESS (4). Nature and function of law in our business society; obligations arising out of contract formation; and liabilities associated with the commission of torts, crimes, civil violations, breach of contract and breach of warranty. Ethical considerations are highlighted. PREREQ: BA 511; graduate standing.

BA 544. INVESTMENTS (3). Economic, technical, and tax aspects of alternative investments including equity securities, bonds, real property, investment companies, options and forward contracts. Special emphasis on option valuation models and portfolio management. PREREQ: BA 340 or BA 530; graduate standing.

BA 547. INTERNATIONAL BUSINESS (4). Integrative course on the international business environment. Focus on the unique problems, characteristics, and demands that face firms engaged in international business. Reviews current patterns and trends, managment practices, and the strategic and operational decisions with international business. PREREQ: Graduate standing.

BA 548. INTERNATIONAL FINANCIAL MANAGEMENT (3). Foreign exchange risk management, the foreign investment decision, political risk management, international financial markets, cost of capital, international banking, import/export financing, working capital management, planning and control, and taxation. PREREQ: BA 530; graduate standing.

BA 549. SELECTED TOPICS IN FINANCE (3). Recent advances in selected finance fields. Topics will vary from term to term. PREREQ: BA 530; graduate standing.

BA 550. ORGANIZATIONAL THEORY AND BEHAVIOR (3). Intensive study of management theory, including organization structure and organizational behavior with special emphasis on how managers respond to a rapidly changing environment. PREREQ: graduate standing.

BA 552. MANAGING PEOPLE IN ORGANIZATIONS (4). An intensive examination of organizational behavior and personnel literature for effectively managing people in organizations. Selection and training, asserting authority, managing groups, performance review and compensation, initiating change, managing upward and lateral relations. PREREQ: BA 350 and BA 352; or BA 550; graduate standing.

BA 553. PERSONNEL ADMINISTRATION AND INDUSTRIAL RELATIONS (4). Employment practices and policies, affirmative action, compensation and benefits administration, performance evaluation, personnel administration law, and union-management relations. PREREQ: BA 350 and BA 352; or BA 550; graduate standing.

BA 555. DATA ANALYSIS FOR MANAGEMENT (4). Application of statistical methods to assist in the planning and control of business operations. First course in a three-course quality management sequence. PREREQ: BA 511; graduate standing.

BA 556. MANAGING OPERATIONS (4). Conceptual framework for studying the managerial decisions involved in converting inputs into goods and services. Second course in a three-course quality. management sequence. PREREQ: BA 555; graduate standing.

BA 557. QUALITY MANAGEMENT (4). Contemporary development of total quality management theory, procedures and techniques including Hoshin planning, process improvement and innovation through quality function development. Third course in a three-course quality management sequence. PREREQ: BA 556; graduate standing.

BA 558. BUSINESS CONDITIONS ANALYSIS (4). Methods of economics and mathematics applied to analysis and forecasting of general business conditions accounting systems (national income, international payments, flow of funds) models in aggregate income analysis, business fluctuations and growth, and such forecasting techniques as input-output analysis, the statistical and econometric methods. PREREQ: Graduate standing.

BA 559. STRATEGIC PLANNING (3). The planning process; missions, goals and objectives; product and market identification; industry and competitor analysis; developing strategies and determining financial and resource implications; implementation and control of the business plan. Project focus and emphasis. PREREQ: BA 340 or BA 530; BA 350 or 550; BA 390 or BA 590; graduate standing.

BA 560. ENTREPRENEURSHIP AND INNOVATION (3). Entrepreneurial and innovation processes applied to new business start-ups, existing small businesses, and new ventures within larger organizations; new venture planning, technology transfer, project management and productivity improvement. Cases and projects are used to apply concepts and to develop communication skills. PREREQ: BA 340 or BA 530; BA 350 or BA 550; BA 390 or BA 590; graduate standing.

BA 569. BUSINESS POLICY FORMULATION AND IMPLEMENTATION (4). Examination of the general managers functions, including establishing corporate direction, and formulating and implementing policies. Related concepts such as the values of the general manager, social responsibility, innovation, and competition are reviewed in terms of their impact on the general managers integrative function. Case studies provide the basis for analyzing concepts and the opportunity to deal simultaneously with the many interrelated aspects of company operations. PREREQ: BA 521, BA 530; BA 556, BA 590; graduate standing.

BA 571. INFORMATION MANAGEMENT (4). Role of information, computers, and computer information systems in an organization, including management information systems, decision support systems, databases, and information centers. Systems design, security and privacy of data, disaster planning, hardware and software selection; are discussed from the viewpoint of the user and manager. Computer projects are assigned to illustrate topics. PREREQ: Graduate standing.

BA 572. INFORMATION MANAGEMENT APPLICATION (3). Application of the concentp and theories of information management to projects in functional business areas. with approval of the supervising faculty member, students will identify a project, determine its scope and feasibility, and complete it. PREREQ: BA 571, graduate standing.

BA 578. DECISION MODELS (4). Systematic analysis of complex business decisions. Business application of prescriptive models of choice, including deterministic models and models of decision making under conditions of uncertainty. Applications to problems of: resource allocation, determining the value of information and making choices given multiple and conflicting objectives. PREREQ: BA555; graduate standing.

BA 581. TOPICS IN COMPUTER INFORMATION MANAGEMENT (3). Recent advances in the use of computers to assist in the management process. Study of the relationship between information needs and the organizations structure, objectives and decision centers. PREREQ: BA 571; graduate standing.

BA 584. TOPICS IN DECISION SCIENCES (3). Application of management science techniques to selected problem areas within business. Topics will vary from term to term. PREREQ: BA 555; graduate standing.

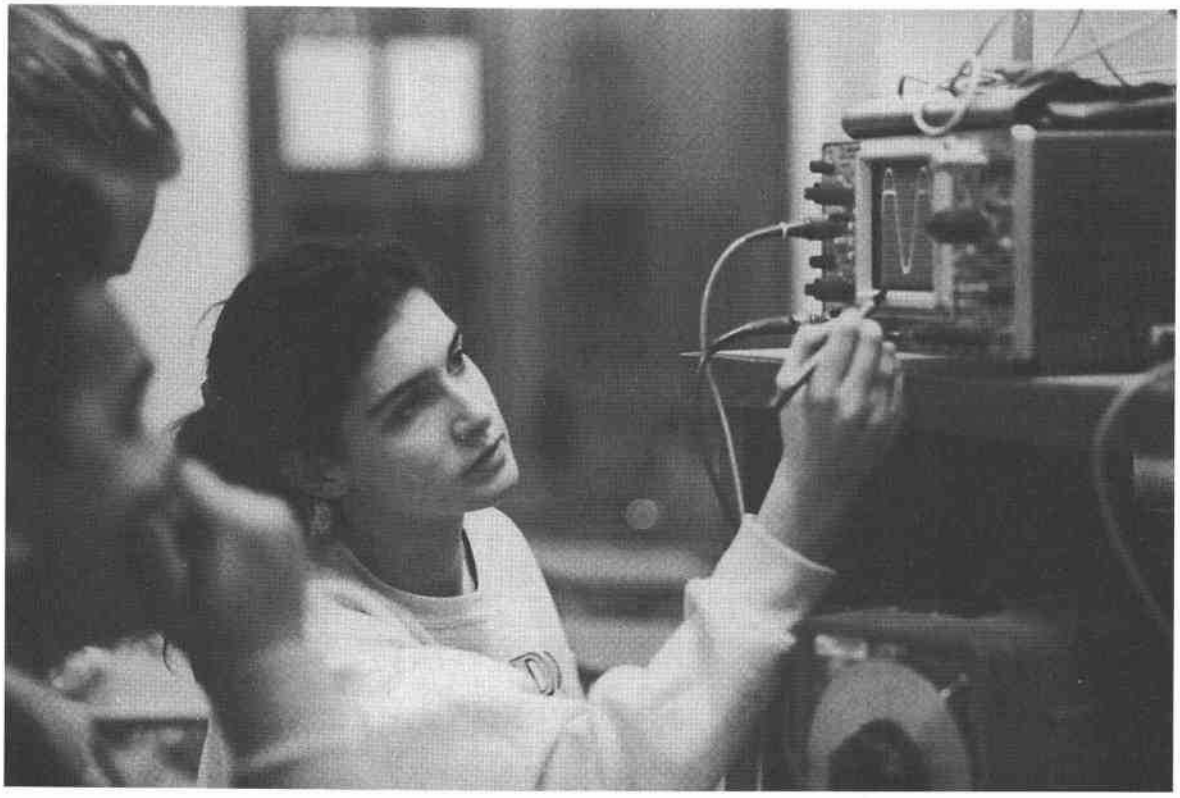
BA 590. MARKETING MANAGEMENT (4). Intensive analysis of consumer and industrial markets, the institutions involved in marketing and distributing products, and major managerial decisions. Emphasis on identifying structure of decisions, understanding buyer behavior, and application of marketing concepts. PREREQ: Graduate standing.

BA 591. STRATEGIC MARKETING (3). Evaluation of internal and external environments in the development of strategic marketing plans. Projects or cases provide a comprehensive and realistic planning experience. PREREQ: BA 590; graduate standing.

BA 599. SELECTED TOPICS IN MARKETING (4). Concepts and methods in advanced marketing management practice. Latest theoretical developments and quantitative methods in marketing, with particular relevance to managerial applications. PREREQ: BA 590; graduate standing.

FOOTNOTES

*Baccalaureate Core Course
^Writing Intensive course (WIC)



The College of Engineering at Oregon State University grew out of a department established in 1889. Its purpose is to provide a quality education for students entering the engineering profession. It has awarded more than 16,000 degrees. The reputation that its graduates have established in industry, business, and government through their imaginative work and leadership attests to the accomplishments of the college in providing a sound education.

The college offers degrees in engineering, computer science, construction engineering management, engineering physics and radiation health physics. Students may choose engineering majors from chemical, civil, computer, electrical and electronics, industrial and manufacturing, mechanical, and nuclear engineering. Educational preparation for land surveying, a licensed profession in all states, is offered through civil engineering.

The Engineering Profession

Engineering is the profession in which a knowledge of the mathematical and natural sciences gained through education, experience, and practice is applied with judgment to develop ways to economically utilize the materials and forces of nature for the benefit of humankind. It is a licensed profession in all of the states of the U.S.A., and educational programs must meet high professional standards. Engineers are not only responsible for planning, design, construction, and management, but also for the safety and welfare of the public which relies on their work.

Preparing for an Engineering Career

To prepare for the professional practice of engineering, students must complete an accredited program of study leading to a Bachelor of Science degree in an established engineering field. Each engineering curriculum requires 204 credits and includes a balance of courses in mathematics, science, liberal arts, engineering science, and engineering design.

Upon graduation, students who complete an engineering degree are eligible to take the Fundamentals of Engineering Examination of the State Board of Engineering Examiners in any state. After passing the examination and completing four years of progressively responsible engineering work, graduates are eligible to take the professional engineering license examination of the state in which they intend to practice.

Although some fields of industrial and government employment do not require formal professional licensure, the educational preparation for the bachelor's degree is a necessity for virtually all such employment.

Preparation for the professional practice of land surveying follows a pattern of education, experience, examination, and professional licensure similar to that required for professional engineering practice.

Students completing the radiation health physics degree will be eligible to take Part I of the Certified Health Physics (CHP) Examination of the American Board of Health Physics after one year of applied health physics practice. After six years of responsible professional experience in health physics, graduates will be eligible to take Part II of the CHP examination.

Pre-Professional Program

Courses included in the freshman and sophomore years comprise a pre-professional program of study that produces a solid foundation for professional program studies at the junior, senior, and advanced degree levels. (See the pre-professional curricula which follow.) The pre-professional program may be taken at Oregon State University or at any accredited college or university that offers equivalent courses transferable to OSU.

The required pre-professional courses in the program listings are designated with a (✥). These courses must be completed before the student is eligible to apply for admission to the professional program. The other courses listed are important and may all require prerequisites for junior-level courses.

All engineering programs have the same required pre-professional courses. This allows the flexibility of selecting a major after one or two years of study. Other majors offered by the college have different required pre-professional courses appropriate to that major.

Professional Program

The professional program consists of various curricula offered at the junior and senior levels which are designed to prepare students for a professional career.

Each curriculum provides an opportunity for specialization through judicious selection of elective courses. However, to become fully versed in a specialty requires additional study at the graduate level.

Admissions Requirements

Pre-Professional Program

Admission to the pre-professional program requires that students meet general University admission requirements, as published in the OSU *General Catalog*. Students admitted to the pre-professional program are assigned to the department of their choice for advising and program planning.

Professional Program

Enrollment in professional program courses is restricted to those students who have clearly demonstrated an ability to achieve the high standards required for professional studies. It is limited in each curriculum by the number of students who can be served by the faculty and the facilities of that curriculum.

Students must apply to the College of Engineering for admission to the professional program. To be eligible to apply, students must complete 80 credits, including all required courses, by the end of summer term for fall admission and by the end of fall term for winter admission. Grades of C or better and a minimum of 2.25 cumulative GPA must be earned in required courses.

Students who have completed their pre-professional studies at a college or university

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Oregon State University
Corvallis, OR
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(503) 737-3101

ADMINISTRATION

S. John T. Owen
Dean
Director of Engineering Experiment Station

Thomas M. West
Acting Associate Dean, Administration

R. Gary Hicks
Associate Dean, Research and Graduate Studies

Roy C. Rathja
Assistant Dean, Undergraduate Programs and Head Adviser

Footnotes for this section on page 217.

other than Oregon State University must apply both to the OSU Office of Admissions for admission to OSU and to the College of Engineering for admission to the professional program. Application forms and information on policies and programs are available from the College of Engineering.

Choosing a Major

The selection of a major is often difficult for students who have not had close association with engineering activities. Students should not be overly concerned with this problem since the pre-professional curricula of all engineering programs during the freshman year are essentially equivalent. This flexibility allows students to change majors during the freshman year without loss of progress. Engineering students who are unsure about their choice for a major are advised to register in pre-general engineering until they make a decision.

The final selection of a major is a significant milestone in a student's life, since this choice has a lifetime effect on his or her professional career. Student's are advised to study the options carefully and to take full advantage of the counseling available.

Accreditation

Professional standards are assured by periodic inspection of the college by off-campus teams operating under the Accreditation Board for Engineering and Technology, Inc. (A.B.E.T.). The engineering curricula at Oregon State University are accredited by the Engineering Accreditation Commission of A.B.E.T. Civil, electrical, and mechanical engineering were first accredited in 1936; chemical engineering in 1942; industrial engineering in 1950; nuclear engineering in 1973; and computer engineering and industrial engineering (manufacturing) in 1985. The construction engineering management program was accredited in 1980 by the American Council for Construction Education (A.C.C.E.).

Minors

The College of Engineering offers minors in: Environmental Engineering, Computer Science, Nuclear Engineering, Radiation Health Physics, and Earth Information Science and Technology. See the listings in the departmental areas in this section of the catalog.

Cooperative Programs

The College of Engineering has cooperative programs of two types. In each case, agreements exist to make available to students degree opportunities not normally available through Oregon State University alone.

University of Idaho Degrees

The University of Idaho has a cooperative agreement with Oregon State University which allows Oregon resident engineering students to earn geological, metallurgical, or mining engineering degrees at the University of Idaho. Students must attend the University of Idaho for at least the last year of the degree program.

Three-Two Program Degrees

By cooperative arrangement, students may pursue dual degree programs in engineering and science, usually physics. Other degree-granting institutions provide the first three years of a science program and required pre-professional courses. Oregon State University provides the last two years in professional studies plus the remaining part of the science degree requirements. Students graduate with two baccalaureate degrees, one in engineering from Oregon State University and one in a science area from the cooperating institution.

International Degree

Undergraduates with majors in the College of Engineering can earn a second degree in international studies. See the Interdisciplinary Studies section of this catalog for more information.

Graduate Study

Because of the growing complexity of modern engineering practice, graduate study is important for those students who wish to specialize. Students who have established satisfactory undergraduate records and who are looking for the greatest opportunity in their professional field should consider continuation of their education beyond the baccalaureate degree. Study for the Master of Science (M.S.) degree normally requires one or two years. The Doctor of Philosophy (Ph.D.) degree requires three to four additional years.

BIORESOURCE ENGINEERING

Andrew Hashimoto, Head
Gilmore Hall 116
Oregon State University
Corvallis, OR 97331-3906
(503) 737-2041

Faculty

Professors Cuenca☆, English☆, Hashimoto, Kolbe☆, Miner☆, Moore☆; *Associate Professors* Hellickson☆; McGuire☆; *Assistant Professors* Bolte, Selker, Tice☆

Undergraduate Minors

Irrigation Engineering

Graduate Major

Bioresource Engineering (M.S., Ph.D.)

Graduate Areas of Concentration

Bioprocess Engineering
Bioresource Systems
Food Engineering
Postharvest Preservation and Processing
Soil and Water Resources
Water Quality

The bioresource engineering curriculum prepares students to advance the scientific knowledge and application of engineering principles and problem-solving techniques to activities and technologies associated with and integral to the production, processing, handling, storage and distribution of biological resources to include food, feed, fiber and other products of renewable resources; and to responsibly manage these resources.

The curriculum is flexible and diversified and helps students prepare for employment in positions of responsibility in agriculture, agriculture-related industries, food processing, environmental and natural resource management, educational institutions, utilities and in government. In addition to providing a strong foundation in engineering and physical and biological sciences, it allows students to expand their interests in emerging technologies, biological and agricultural sciences and liberal arts.

The graduate program leading to a Master of Science and Doctor of Philosophy degrees emphasizes courses in food and bioprocess engineering, and water resources engineering. Supplemental courses include bioresource systems analysis, expert systems, processing machinery, water quality, and agricultural waste management.

Curriculum

Irrigation Engineering Minor (30)

A minor in Irrigation Engineering is available to any undergraduate student accepted into the professional engineering program. This minor enables engineering students to be exposed to the agricultural, biological, and engineering sciences needed to specialize in agricultural and food related industries.

ENGINEERING (17)

Required

CE 311, CE 312. Fluid Mechanics (6)
CE 313. Hydraulic Engineering (3)
BRE 434. Irrigation Water Quality and Drain (4)
BRE 433. Irrigation System Design (4)

Elective

BRE 471. Biosystems Modeling Techniques (3)
CE 412. Hydrology (3)
CE 417. Hydraulic Engineering (3)
CE 413. Water Resources Design (3)
STAT 314. Intro to Stat for Engineers (13)

SCIENCE (13)

Required

CSS 200. Principles of Crop Science (4)
CSS 305. Principles of Soil Science (5)

Elective

MB 230. Introductory Microbiology (4)
BI 212. Biology (5)
BOT 331. Plant Physiology (5)

Courses

Upper Division Courses

Courses numbered 500 and above may be taken for graduate credit.

Upper Division

BRE 433/BRE 533. IRRIGATION SYSTEM DESIGN (4). Principles of soil physics and plant water use applied to irrigation system design. Design of gravity, pressurized, and trickle irrigation systems, improving on-farm water water management, performance characteristics of pumps and other irrigation equipment. PREREQ: ENGR 332. Lec/lab. Offered alternate years.

BRE 434/BRE 534. DRAINAGE SYSTEM DESIGN (4). Design of on-farm water supply and distribution systems including wells, pipelines and open channel flow. Hydraulics of soil profiles and design of agricultural drainage systems. Salinity management in agricultural production systems. PREREQ: ENGR 332. Lec/lab. Offered alternate years.

BRE 452/BRE 552. FOOD ENGINEERING I (4). Service course for non-engineering majors. Conservation of mass and energy and fundamentals of fluid dynamics with application to food processing. PREREQ: MTH 251, PH 201.

BRE 453/BRE 553. FOOD ENGINEERING II (4). Service course for non-engineering majors. Thermodynamics and heat transfer applied to the processing of food. Field trips may be required. PREREQ: BRE 452.

BRE 471/BRE 571. BIOSYSTEMS MODELING TECHNIQUES (3). Development of functional relationships using interpolation, regression, and cubic splines; development of models from first principles, simulation of random processes; optimization techniques. PREREQ: A course in programming, senior standing in engineering.

Graduate

BRE 501. RESEARCH (1-16). Section 1: Graduate Student Orientation Seminar to acquaint new graduate students about Graduate school and department requirements, policies and expectations, and departmental research programs; **Section 2:** Graduate Research Publication Seminar to expose students to requirements for successful proposals and publication of research results.

BRE 503. THESIS (1-16).

BRE 505. READING AND CONFERENCE (1-16). Graded P/N.

BRE 506. PROJECTS (1-16).

BRE 507. SEMINAR (1). Section 1: Graduate Student Orientation. Seminar to acquaint new graduate students about Graduate school and department requirements, policies and expectations, and departmental research programs; **Section 2:** Graduate Research Publication Seminar to expose students to requirements for successful proposals and publication of research results.

Graduate

BRE 514. GROUNDWATER HYDRAULICS (3). Analytical and numerical modeling of groundwater flow systems. Steady and unsteady flow in confined and unconfined aquifers. Finite difference modeling of aquifers and well fields. Analysis of well tests for hydraulic properties of aquifers. PREREQ: CE 313. Offered alternate years. CROSSLISTED AS CE 514.

BRE 525. STOCHASTIC HYDROLOGY (3). Study the elements of randomness embedded in the hydrological processes with emphasis on time series analysis, stationarity, periodic/trend component, stochastic component, time series synthesis, ARMA model, spatial sampling and scale variability. CROSSLISTED as CE 525.

BRE 536. OPTIMUM IRRIGATION MANAGEMENT (3). Management of irrigation systems for economic optimization. Management to control salinity, alkalinity, and toxic residuals. Algorithms for optimum irrigation management. Offered alternate years.

BRE 540. FIELD AND LABORITORY TECHNIQUES IN SUBSURFACE HYDROLOGY (1-3). Tools and methods employed to characterize hydrologic properties of subsurface systems. Use of GPR, TDR, resistivity, and methods of determining hydraulic conductivity, sorptivity, bulk density, and other fundamental hydrologic properties. Must be taken in conjunction with BRE 542.

BRE 542. VADOSE ZONE TRANSPORT (3). Introduction to the physical and hydraulic properties involved in flow from the soil sufrace to goundwater. Classical infiltration equations will be derived and presented with exact and approximate solutions. Attention is focused on application to pollutant transport and recent advances in non-ideal flow. PREREQ: MTH 254.

BRE 544. HYDRAULICS OF OPEN CHANNELS (4). Steady, uniform, and nonuniform flow in natural and artificial open channels; unsteadyflow; interaction of flow with river structures; computational methods. PREREQ: CE 313. CROSSLISTED as CE 544. Offered alternate years.

BRE 548. NONPOINT SOURCE POLLUTION ASSESSMENT AND CONTROL (3). Quantitative description of the processes whereby pollutants of natural and manmade origin enter and adversely impact the quality of surface and groundwater resources. Integrates hydrologic understandings with those of water quality dynamics. Utilizes alternate analytical techniques to design abatement and evaluation strategies as well as tools for interaction with the regulatory process.

BRE 549. REGIONAL HYDROLOGIC MODELING (3). Challenges in regional scale water resource analysis and management with empasis on application to production agriculture. Application of geostatistical techniques to spatially variable systems and remote sensing to large-scale water resource systems. Development of soil-water-atmosphere-plant models. Analysis of evapotranspiration estimating methods. PREREQ: MTH 256. Offered alternate years.

BRE 550. ENGINEERING PROPERTIES OF BIOLOGICAL MATERIALS (4). Rheological, thermal, and electromagnetic properties of non-wood biological materials; measurement methods and equipment, influence of composition and structure, and use of properties in engineering calculations. Lec/lab. PREREQ:ENGR 213, ENGR 332.

BRE 561. BIOCONVERSION PROCESSES (4). Biologically mediated processes to convert biomass into food, feed, fuel, and other useful products. Discuss properties of biomass that make them amendable to bioconversion, the major microbial and enzymatic processes that occur during bioconversion and the design and economic considerations that influence the feasibility of bioconversion systems. PREREQ: Basic principles of microbiology and biochemistry. Lec/lab.

BRE 580. BIOSYSTEMS INSTRUMENTATION (3). Introduction to sensors and techniques important to bioresources production, including temperature, radiation, strain, psychrometry, displacement, flow rate, and pressure. Projects emphasize signalconditioning, data acquisition and storage using microcomputers to analyze and control agricultural and food processes.

BRE 582. FINITE ELEMENT METHOD (3). Application of the finite element method to the solution of problems of heat flow, fluid flow, and elasticity. Computer solution of finite elementequations. Writing finite element programs for micro and mainframe computers. PREREQ: MTH 256. Offered alternate years.

BRE 583. ADVANCED DIGITAL IMAGE ANALYSIS (3). Advanced digital image/signal analysis for image enhancement, restoration, and preprocessing, statistical pattern recognition, syntactic pattern recognition. Provide fundamental understanding of advanced image processing techniques with case studies in natural resource management, environmental monitoring, land surface processes, and machine vision using remotely sensed satellite image, scanned image, and video/still frame image.

BRE 601. RESEARCH (1-16).

BRE 603. THESIS (1-16).

BRE 605. READING AND CONFERENCE (1-16).

BRE 606. PROJECTS (1-16).

BRE 607. SEMINAR (1-16).

BRE 662. INTERFACIAL PROCESSES (3). Fundamentals of colloid and surface chemistry with emphasis on biomolecular behavior at interfaces, and application to biofilm development and biomolecular separation processes. Offered alternate years.

BRE 672. BIOSYSTEMS MODELING APPLICATIONS (3). Development and analysis of mathematical descriptions of various ecological processes, including productive and consumptive system components. Mass and energy flow characterization in ecological systems. Analysis of autocatylic, self-organizing, adaptive, and chaotic systems. PREREQ: BRE 573 or equivalent.

CHEMICAL ENGINEERING

E.A.C./A.B.E.T. Accredited

Wm. James Frederick, Head
Gleeson Hall 103
Oregon State University
Corvallis, OR 97331-2702
(503) 737-4791

Faculty

Professor Frederick☆; *Professor* Kimura; *Associate Professors* Jovanovic, Levien☆, Rochefort; *Assistant Professors* Rorrer, Koretsky, Iisa

Undergraduate Major

Chemical Engineering (B.S.)

Graduate Major

Chemical Engineering (M.S., Ph.D.)

Graduate Areas of Concentration
Applied Thermodynamics
Biochemical Reactors
Biotechnology
Ceramics Materials Processing
Chemical Engineering
Chemical Recovery Technology (Pulp and Paper)
Combustion
Fluidization Engineering
Process Control/Optimization
Reactor Design
Supercritical Fluid Technology

Chemical engineers design and develop safe and economical processes and industrial facilities for converting basic raw materials into products that are useful to people. Typical processes include those used for waste treatment, petroleum refining, and the production of pharmaceuticals, solid-state electronic devices, composite materials, paper, synthetic fibers and plastics, and traditional commodities such as industrial chemicals and detergents.

The chemical engineering curriculum provides students with a background of fundamental knowledge which prepares them for responsible positions in research and development, design, technical service, plant operation, technical sales, and management in a wide variety of industries. It places major emphasis on mathematics, chemistry, and engineering sciences in addition to courses in design and analysis.

Chemical engineering students who plan to work in industrial research laboratories or to pursue an academic career should continue with graduate work toward the M.S. or Ph.D. degree.

CURRICULUM

PRE-PROFESSIONAL

Freshman Year

CH 221✥, CH 222, CH 223. General Chem (15)
MTH 251, MTH 252. Diff and Integral Calc (8)✥
MTH 253. Infinite Series and Sequences (4)✥
WR 121. English Composition (3)✥
CHE 101. Chemical Engr Orientation (3)
CHE 102. Intro Chem Engr Comp (3)✥
PH 211. General Physics (4)✥
HHP 231. Lifetime Fitness for Health (3)[1]
Perspectives (3)[1]
Free Electives (5)

Sophomore Year

CH 334, CH 335, CH 336. Organic Chem (9)
MTH 254. Vector Calculus I (4)✥
MTH 256. Applied Diff. Equations (4)✥
ENGR 211. Statics (3)✥
ENGR 212. Dynamics (3)✥
CHE 211. Material Balances (3)
CHE 212. Energy Balances (3)
PH 212. General Physics (4)✥
ENGR 201. Electrical Fundamentals (3)✥
COMM 111. Inform and Persuasive Communication (3) or COMM 114✥
WR 327. Technical Report Writing (3)
Perspectives (9)[1]

PROFESSIONAL CHEMICAL ENGINEERING

Junior Year

CH 440, CH 441, CH 442. Physical Chemistry (9)
ENGR 311. Thermodynamics (3)
ENGR 331, ENGR 332, ENGR 333. Momentum, Energy and Mass Transfer (11)
CHE 312. Chemical Engineering Thermodynamics (3)
CHE 323. Applied Momentum and Energy Transfer (3)
CHE 361. Data Acquisition and Process Cntrl (3)
CHE 461. Process Control (3)
Engineering Science Elective (5)[2]
Perspectives (6)[1]
Synthesis (3)[1]
Free electives (3)

Senior Year

CHE 411, CHE 412. Mass Transfer Operations (6)
CHE 414, CHE 415. Chem Engr Laboratory (6)
CHE 431, CHE 432. Chem Engr Plant Design (6)
CHE 443. Chemical Reactor Engineering (3)
ENGR 390. Engineering Economy (3)
BB 351. Biochemistry (5)
Engineering Science Elective (6)[2]
Synthesis (3)[1]
Free Electives (12)
Chemistry Elective (1)

COURSES

Lower Division

CHE 101. CHEMICAL ENGINEERING ORIENTATION (3). Department engineering orientation. Lec/rec.

CHE 102. INTRODUCTORY CHEMICAL ENGINEERING COMPUTATION (3). Application of FORTRAN programming to various topics in chemical engineering. Lec/rec.

CHE 211. CHEMICAL PROCESS CALCULATIONS (3). Material balances, energy balances, and thermophysical and thermochemical calculations. PREREQ: General chemistry; sophomore standing in engineering. COREQ: MTH 252. Must be taken in order. Lec/rec.

CHE 212. CHEMICAL PROCESS CALCULATIONS (3). Material balances, energy balances, and thermophysical and thermochemical calculations. PREREQ: CHE 211 General chemistry; sophomore standing in engineering. Must be taken in order.

Upper Division

CHE 312. CHEMICAL ENGINEERING THERMODYNAMICS (3). Thermodynamic property relationships, phase equilibrium, thermodynamic cycles, and availablity. PREREQ: ENGR 311, CHE 212, CHE 203 or CH 223, MTH 256.

CHE 323. APPLIED MOMENTUM AND ENERGY TRANSFER (3). Application of momentum and energy transfer phenomena to designing industrial equipment. PREREQ: ENGR 332, CHE 212.

CHE 361. DATA ACQUISITION AND PROCESS DYNAMICS (3). Fundamental principles of process dynamics and instrumentation used in the control of process variables such as pressure, temperature and flow rate. PREREQ: MTH 256; ENGR 201; ENGR 332.

CHE 401. RESEARCH (1-16).

CHE 405. READING AND CONFERENCE (1-16).

CHE 406. PROJECTS (1-16).

CHE 410. INTERNSHIP (1-16).

CHE 411/CHE 511. MASS TRANSFER OPERATIONS (3). Mass transfer operations; design of separation processes. Must be taken in order. PREREQ: CHE 212, CHE 312, ENGR 333, CH 442.

CHE 412/CHE 512. MASS TRANSFER OPERATIONS (3). Mass Transfer operations; design of separation processes. PREREQ: CHE 212; ENGR 312, ENGR 333; CH 442. Must be taken in order. Lec/rec.

CHE 414. CHEMICAL ENGINEERING LABORATORY (3). Unit operations and unit processes; preparation of technical reports. Must be taken in order. PREREQ: CHE 411, CH 443.

CHE 415. CHEMICAL ENGINEERING LABORATORY (3). Unit operations and unit processes; preparation of technical reports. Must be taken in order. PREREQ: CH 411, CH 443.

CHE 431/CHE 531. CHEMICAL PLANT DESIGN (3). Design of chemical plants and chemical engineering equipment. PREREQ: CHE 212, CHE 411, CHE 443, ENR 390.

CHE 432/CHE 532. CHEMICAL PLANT DESIGN (3). Design of chemical plants and chemical engineering equipment. PREREQ: CHE 212, CHE 411, CHE 443, ENGR 390.

CHE 443/CHE 543. CHEMICAL REACTION ENGINEERING (3). The design of chemical reactors, comparison of performance and economic evaluation of reactor types. Emphasis on single phase reacting systems. PREREQ: MTH 256, CH 442, CHE 312, ENGR 333, CHE 212.

CHE 461/CHE 561. PROCESS CONTROL (3). Analog and digital control methods and control strategies in the chemical process industries. PREREQ: MTH 256, CHE 361.

Graduate

CHE 501. RESEARCH (1-16).

CHE 503. THESIS (1-16).

CHE 505. READING AND CONFERENCE (1-16).

CHE 506. PROJECTS (1-16).

CHE 507. SEMINAR (1-16). One credit seminar graded P/N.

CHE 514. FLUID FLOW (3). Fundamentals of fluid dynamics for Newtonian and non-Newtonian fluids; flow through porous media; two phase flow. Lec/rec.

CHE 520. MASS TRANSFER (3). Diffusion in gases, liquids, solids, membranes, and between phases. Effects of reactions on mass transfer. Mass transfer rates by convection and dispersion. Rates of combined heat and mass transfer. Must be taken in order.

CHE 521. MASS TRANSFER (3). Diffusion in gases, liquids, solids, membranes, and between phases. Effects of reactions on mass transfer. Mass transfer rates by convection and dispersion. Rates of combined heat and mass transfer. Must be taken in order. CHE 521 not offered every year.

CHE 522. CONVECTIVE HEAT TRANSFER (3). Fundamentals of convective heat transfer; boiling heat transfer and condensation; heat transfer in gas solid systems; application to design of heat transfer equipment. Lec/rec. Not offered every year.

CHE 525. CHEMICAL ENGINEERING ANALYSIS (3). Modeling of physical and chemical processes; mathematical analysis of models with appropriate advanced techniques. PREREQ: CHE 525 is prerequisite to CHE 526.

CHE 526. CHEMICAL ENGINEERING ANALYSIS (3). Modeling of physical and chemical processes; mathematical analysis of models with appropriate advanced techniques. PREREQ: CHE 525 is prerequisite to either CHE 526 or CHE 527.

CHE 537. CHEMICAL ENGINEERING THERMODYNAMICS I (3). I: Applications of the fundamental laws of thermodynamics to complex systems. Properties of solutions of non-electrolytes. Phase and chemical equilibrium. II: Various topics in advanced thermodynamics such as chemical reaction equilibrium analysis and modeling for aqueous electrolyte solutions, methods of estimating properties, availability analysis. Thermodynamics II not offered every year.

CHE 538. CHEMICAL ENGINEERING THERMODYNAMICS II (3). Applications of the fundamental laws of thermodynamics to complex systems. Properties of solutions of non-electrolytes. Phase and chemical equilibrium. II: Various topics in advanced thermodynamics such as chemical reaction equilibrium analysis and modeling for aqueous electrolyte solutions, methods of estimating properties, availability analysis. Thermodynamics II not offered every year.

CHE 540. CHEMICAL REACTORS I (3). Design, performance and scale up. Reactors involving solids: packed, fluidized, trickle and slurry reactors.

CHE 541. CHEMICAL REACTORS II (3). Design, performance and scale up. Reactors without solids: gas/liquid absorbers, biochemical systems, non-ideal flow, polymerization systems.

CHE 542. BIOCHEMICAL REACTION ENGINEERING (3). Enzyme kinetics, metabolic stoichiometry, cell-culture kinetics, and the design analysis and economics of batch, fed-batch and continuous biochemical reactors. PREREQ: Physical Chemistry.

CHE 550. ADVANCED PROCESS CONTROL (3). Modern control theory applied to chemical systems. Identification, analysis, and control of processes using state-space and input-output methods in continuous and discrete time. PREREQ: CHE 461.

CHE 551. STRATEGY OF PROCESS DESIGN AND OPTIMIZATION (3). Optimal design and operation of chemical processing systems, including large-scale and large number of variable type problems; mathematical methods; process modeling; flow sheet synthesis; constrained optimization; planning and scheduling problems.

CHE 552. ANALYSIS OF CHEMICAL ENGINEERING MODELS (3). Critical evaluation of models and solutions for problems in process flow sheeting, transport phenomena, reaction engineering, separations, and process dynamics. Reading and critique of pertinent research literature. PREREQ: CHE 527 or equivalent.

CHE 581. SELECTED TOPICS (3). Non-sequence course designed to acquaint students with recent advances in chemical engineering. Topics vary from term to term and from year to year. May be repeated for credit.

CHE 603. THESIS (1-16).

CHE 605. READING AND CONFERENCE (1-16).

CHE 606. PROJECTS (1-16).

CIVIL ENGINEERING

E.A.C./A.B.E.T. Accredited

Wayne C. Huber, Head
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Oregon State University
Corvallis, OR 97331-2302
(503) 737-4934

Faculty

Professors C. Bell☆, Bella☆, Garrison☆, Hicks☆, Huber☆, Hudspeth☆, Klingeman☆, Layton☆, McDougal☆, Pritchett☆, Schroeder☆, Schultz☆, Vinson☆, Williamson☆; *Associate Professors* Eldin, Hernried, Istok, Nelson, Peterson☆, Rogge☆, Semprini☆, Sollitt☆, Woods, Yim; *Assistant Professors* Dickenson, Hunter-Zaworski☆, Lundy, Miller☆

Undergraduate Majors

Civil Engineering (B.S.)
Civil Engineering-Forest Engineering (B.S.)
Options
Environmental Engineering
Earth Information Science and Technology (EIST)-See Interdisciplinary Studies

Minor

Environmental Engineering
Earth Information Science and Technology (EIST)-See Interdisciplinary Studies

Graduate Majors

Civil Engineering (M.S., Ph.D.)
Graduate Areas of Concentration
Civil Engineering
Construction Engineering Management
Environmental Engineering
Geotechnical Engineering
Ocean Engineering
Structural Engineering
Transportation Engineering
Water Resources Engineering
Ocean Engineering (M.Oc.E.)
Graduate Area of Concentration
Ocean Engineering

The civil engineering curriculum is designed to prepare students for professional and responsible engineering positions with business, industry, consulting firms, or government. The curriculum includes basic sciences, social sciences, humanities, communication skills, engineering sciences, and engineering design.

Civil engineering is a diverse professional field with discipline specialties in structures, transportation, water supply and water pollution control, environmental engineering, geotechnical engineering, hydrology, hydraulics and water resources, surveying, ocean engineering, and engineering planning and economics.

All students receive basic instruction in all disciplines. Additional elective courses in structures, water resources, transportation, surveying, environmental, geotechnical, ocean engineering, and construction engineering management are available.

The Department of Civil Engineering offers an undergraduate minor and option in Environmental Engineering. The Environmental Engineering option and minor provides education in water pollution, air pollution, solid wastes and hazardous wastes.

Surveying and Mapping course work is offered as a part of the Earth Information Science and Technology (EIST) option and minor in Interdisciplinary Studies.

The growing complexity of modern engineering practice has required further specialization in one or more engineering disciplines. This is generally attained through postgraduate study. The Civil Engineering Department offers Master of Science degree programs in construction engineering management, environmental engineering, geotechnical engineering, ocean engineering, structural engineering, transportation engineering, and water resources engineering. A unique Master of Ocean Engineering program is also available. Doctoral programs leading to the Ph.D. degree are available in environmental engineering, geotechnical engineering, ocean engineering, structural engineering, transportation engineering, and water resources engineering. Areas of concentration can be combined to form an integrated civil engineering M.S. program or M.S. and Ph.D. minors.

EARTH INFORMATION SCIENCE AND TECHNOLOGY

Fore more information about the Earth Information Science and Technology option and minor, see the Interdisciplinary Studies section of this catalog.

CURRICULUM

PRE-CIVIL ENGINEERING

Freshman Year

CE 101,[5] CE 102 (or FE 215)✥. Civil and Construction Engineering Orientation (6)
MTH 251, MTH 252, MTH 253. Calculus (12)✥
CH 201✥, CH 202.[5] Chemistry for Engineering Majors (6)
PH 211. General Physics with Calculus (4)✥
Approved biological science (4)[1, 5]
WR 121. Writing (3)[1]✥
COMM 111 or COMM 114. Speech (3)[1]✥
HHP 231. Fitness (3)[1]
Perspectives (6)[1]
Free elective (4)

Sophomore Year

MTH 254. Vector Calculus (4)✥
MTH 256. Differential Equations (4)✥
ENGR 211✥, ENGR 212✥, ENGR 213.[5] Mech (Statics, Dynamics), Strength of Materials (9)

ENGR 201. Electrical Fundamentals (3)✥
ST 314. Intro to Statistics for Engineers (3) 5
ENGR 245 Engr Graphics and Design (3)5
PH 212, PH 213. General Physics with Calc (8)✥
WR 327. Tech Writing (3)1
Science elective (3)
Free electives (2)
Perspectives (9)1
TOTAL (102)

PROFESSIONAL CIVIL ENGINEERING

Junior Year

ENGR 311. Thermodynamics (3)
ENGR 390. Engineering Economy (3)
CE 311, CE 312. Fluid Mechanics (6)
CE 313. Hydraulic Engineering (3)
CE 321, CE 322 Civil Engineering Materials (7)
CE 353. Environmental Engr Fund I (3)
CE 361. Surveying Theory (3)
CE 372. Soils Engineering (4)
CE 373. Applied Soil Mechanics (3)
CE 381, CE 382. Structural Theory I, II (6)
CE 383. Design of Steel Structures (3)
CE 392. Intro to Transportation Engr (3)
Free electives (4)

Senior Year

CE 412. Hydrology (3)
CE 451. Environmental Engr Fund II (3)
CE 481. Reinforced Concrete I (3)
CE 491. Highway Engineering (3)
Technical electives (26)
Free elective (4)
Perspectives (3)1
Synthesis (6)1
TOTAL (102)

ENVIRONMENTAL ENGINEERING OPTION AND MINOR

Civil engineering students may elect a transcript-visible option in Environmental Engineering. A minimum of 21 credits is required. Students from other departments electing the minor are required to complete the 21 credits required for the option plus six credits from additional core courses.

Option and Minor Core Courses (21)

CE 453/CE 553. Environmental Engineering Design (3)
CE 460/CE 560. Management of Hazardous Substances (3)
CE 467/CE 567. Chemistry for Environmental Engineers (3)
CE 454/CE 554. Air Pollution Control (3) or approved course credits in atmospheric sciences
Approved electives (9). Contact the Civil Engineering Department for a list of approved elective courses.

Additional Core Courses for Minor (6)

CE 353. Environmental Engineering Fundamentals I(3)
CE 451/CE 551. Environmental Engineering Fundamentals II (3)

SURVEYING AND MAPPING

See Earth Information Science and Technology (EIST) under the Interdisciplinary Studies section of this catalog.

Graduates of Civil Engineering are eligible to take the Fundamentals of Land Surveying Examination in pursuit of the Professional Land Surveying license by selecting courses as follows.

Civil Engineering students require CE 361 (Surveying Theory) and three courses from the following list.

Construction Engineering Management students require CEM 263 (Plane Surveying), CE 365 (Highway Location and Design) and three courses from the following list.

CE 365. Highway Location and Design (3)
CE 461/CE 561. Photogrammetry (3)
CE 463/CE563. Control Surveying (4)
CE 465/CE 565. Oregon Land Survey Law (3)
CE 469/CE 569. Property Surveys (3)

COURSES

Lower Division

CE 101. CIVIL AND CONSTRUCTION ENGINEERING ORIENTATION (3). Description of civil engineering and construction management professions; problem solving; communication skills. PREREQ: Enrollment in pre-engineering.

CE 102. COMPUTERS IN CIVIL AND CONSTRUCTION ENGINEERING (3). Use of microcomputers in engineering problem solving. PREREQ: CE 101 or equivalent.

Upper Division

Courses numbered 500 & above may be taken for graduate credit.

CE 311, CE 312. FLUID MECHANICS (3,3). Conservation of mass, momentum and energy in incompressible fluids with civil engineering applications. Must be taken in sequence.

CE 313. HYDRAULIC ENGINEERING (3). Analysis of large civil engineering fluid systems including conduit flow, multiple reservoirs, pipe networks, pumps, turbines, open channels and hydraulic structures. PREREQ: CE 312.

CE 321. ^CIVIL ENGINEERING MATERIALS (4). Highway materials; aggregate, concrete and asphalt. Standard test methods. PREREQ: ENGR 213. (Writing Intensive Course)

CE 322. CIVIL ENGINEERING MATERIALS (3). Engineering properties of metals, plastics, composites, and wood. ASTM Standards for these materials and standards for testing. PREREQ: ENGR 213.

CE 353. ENVIRONMENTAL ENGINEERING FUNDAMENTALS I (3). Application of engineering principles to the analysis of environmental problems. Topics include water and ari pollution, disposals of hazardous wastes, and global change. PREREQ: CH 202, MTH 256, biological science elective.

CE 356. TECHNOLOGY AND ENVIRONMENTAL SYSTEMS (3). Use and limitations of technological approaches to the solution of environmental problems. Description of mathematical models and risk analysis as applied to global environmental systems. (Bacc Core Course)

CE 361. SURVEYING THEORY (3). Use of surveying equipment, Gaussian error theory applied to measurements, calculations of position on spherical and plane surfaces, state plane coordinate systems, introduction to global positioning systems. PREREQ: ST 314.

CE 365. HIGHWAY LOCATION AND DESIGN (3). Curve problems in highway design, including circular, vertical, compound curves and spirals; earth distribution analysis; preliminary office studies; paper location procedures and field layout problems. PREREQ: CE 361 or CEM 263.

CE 372. SOILS ENGINEERING (4). Uses of soils in engineering and construction. Identification and classification. Compaction principles and methods. Basic soil mechanics and introductions to foundations and excavations. PREREQ: ENGR 213; or CE 311 or CEM 311.

CE 373. SOIL MECHANICS (3). Soil strength and soil mechanics theories applied to analyses of slope stability, retaining structures, and foundations. PREREQ: CE 372.

CE 381, CE 382. STRUCTURAL THEORY I,II (3,3). Beam deflection, redundant structures, combined stress, columns, structural members and frames. Must be taken in order. PREREQ: ENGR 213.

CE 383. DESIGN OF STEEL STRUCTURES (3). Elastic and plastic methods of structural steel analysis, design of steel structures. PREREQ: CE 382.

CE 392. INTRODUCTION TO TRANSPORTATION ENGINEERING (3). Transportation systems characteristics, traffic estimation, comprehensive transportation planning, highway economics, driver and vehicle characteristics, highway operations and capacity, signalization and control.

CE 401. RESEARCH (1-16).

CE 405. READING AND CONFERENCE (1-16).

CE 406. PROJECTS (1-16).

CE 407. SEMINAR (1-3).

CE 411/CE 511. OCEAN ENGINEERING (3). An introductory course applying civil engineering methods in the marine environment. Topics include wind waves and tides; nearshore currents and sediment transport; wave forces on seawalls and piles; and rubble structures. PREREQ: CE 313 or CEM 311.

CE 412/CE 512. HYDROLOGY (3). Fundamentals of hydrology, the hydrologic cycle, precipitation, streamflow, hydrograph analysis and hydrologic measurements. PREREQ: ST 314.

CE 413/CE 513. WATER RESOURCES DESIGN (3). Application of hydrologic and hydraulic engineering principles together with economic and environmental planning and analysis to the design of water resources projects. PREREQ: CE 412 and CE 417.

CE 415/CE 515. PORTS AND HARBORS (3). Planning and design criteria of near-shore and harbor facilities, including piers, platforms, jetties, sea walls, groins, moorings, docks, submerged pipelines, harbor design and use of hydraulic models. PREREQ: CE 411.

CE 417/CE 517. HYDRAULIC ENGINEERING (3). Theory and design of hydraulic structures. Application of the principles of fluid mechanics and hydraulics to the analysis, synthesis, and elementary design of hydraulic systems involving hydraulic structures and machinery. PREREQ: CE 313.

CE 419/CE 519. MUNICIPAL PLANNING AND ENGINEERING (3). Urban structure; urban goals and objectives; concepts of planning; analysis and demand estimation for planning and implementing civil services; regulation and control of land use and development; financing and funding municipal engineering projects; administration and management of municipal engineering. PREREQ: Senior standing.

CE 420/CE 520. ENGINEERING PLANNING (3). The application of systems analysis to structuring, analyzing, and planning for civil engineering projects. Concept of the system and its environment; setting goals, objectives, and standards; evaluation criteria; solution generation and analysis; evaluation and optimization; decision-making implementation.

CE 422. MODERN CONSTRUCTION METHODS (3). An in-depth study of the construction process and its many phases. Equipment and method alternatives; management styles. Several field trips to construction sites.

CE 424/CE 524. CONTRACTS AND SPECIFICATIONS (3). Quantity surveying; unit prices, subcontracts, overhead costs, profits; principles and laws of contracts applied to engineering.

CE 451/CE 551. ENVIRONMENTAL ENGINEERING FUNDAMENTALS II (3). Characterization of natural and polluted waters. Principles of mass transfer applied to pollutant fate and transport in natural and polluted environments. Reaction kinetics and stoichiometry for treatment of pollutants. Control methods for pollutants. PREREQ: CE 353.

CE 453/CE 553. ENVIRONMENTAL ENGINEERING DESIGN (3). Design of water and wastewater treatment facilities including physical, chemical and biological processes. PREREQ: CE 451.

CE 454/CE 554. AIR POLLUTION CONTROL (3). Characterization of air pollutants. Engineering, chemical, and meteorological aspects of atmospheric pollutants and their control. PREREQ: CE 353.

CE 456/CE 556. ENVIRONMENTAL ASSESSMENT (3). Introduction to environmental modeling; risk analysis, principles of applied ecology, and environmental strategies.

CE 460/CE 560. MANAGEMENT OF HAZARDOUS SUBSTANCES (3). Hazardous waste legislation, partitioning of chemicals in soil and water, risk assessment, and management of hazardous substances by industry. Emphasis on management and remediation of underground storage tanks. PREREQ: CE 353 or CH 203.

CE 461/CE 561. PHOTOGRAMMETRY (3). Geometry of terrestrial and vertical photographs, flightline planning, stereoscopy and parallax, stereoscopic plotting instruments, analytical photogrammetry, orthophotography, introduction to photo interpretation, and aerial cameras. PREREQ: CE 361 or CEM 263.

CE 463/CE 563. CONTROL SURVEYING (4). Control specifications, methods, and problems in obtaining large area angular measurement; precise leveling; triangulation and trilateration figure adjustments with introduction of least square techniques. Global positioning systems. PREREQ: CE 361 or CEM 263.

CE 465/CE 565. OREGON LAND SURVEY LAW (3). Oregon U.S. public land survey; state statutes, common law decisions, and administrative rules dealing with boundary law; case studies; unwritten land transfers; original and resurvey platting laws; guarantees of title; deed descriptions. PREREQ: CE 361 or CEM 263, ro FE 210.

CE 466/CE 566. PHOTO INTERPRETATION (3). Air photo interpretation and application to engineering problems; factors responsible for the formation and developments of artificial features and geological land forms. PREREQ: CE 361 or CEM 263.

CE 467/CE 567. CHEMISTRY FOR ENVIRONMENTAL ENGINEERS (3). Fundamentals of inorganic and organic chemistry as applied to water, air, and solid and hazardous waste treatment. Basic laboratory methods for water and wastewater characterization. PREREQ: CE 353 or CH 203, ENGR 311 or CH 440.

CE 469/CE 569. PROPERTY SURVEYS (3). U.S. public land survey, restoration of corners, subdivision of sections; maps, subdivision plats, and resurvey plats; subdivision design; introduction to LIS/GIS; field astronomy. PREREQ: CE 361.

CE 471/CE 571. FOUNDATIONS FOR STRUCTURES (3). Criteria, theory, and practice of design and construction for foundations for structures. Use of in situ tests in geotechnical engineering. PREREQ: CE 373.

CE 472/CE 572. SOIL TESTING FOR ENGINEERS (4). Soil sampling; organization of soils laboratory; identification; permeability, consolidation and strength tests. PREREQ: CE 373.

CE 473/CE 573. EARTH STRUCTURES (3). Analysis of seepage and stability for earth dams. Design and construction considerations for embankments, earth dams and their foundations. PREREQ: CE 373.

CE 476/CE 576. DESIGNING WITH GEOTEXTILES (3). Classification of geotextiles and their applications, functions and mechanisms, and properties and tests. Design methods for drains, roads, embankments, walls and erosion control. PREREQ: CE 373 and CE 491; or FE 316.

CE 480/CE 580. SELECTED TOPICS IN STRUCTURAL DESIGN (3). A critical examination in depth of topics selected by the instructor from among topics not covered in other structural design courses. PREREQ: CE 383 and CE 481 or equivalent.

CE 481/CE 581. REINFORCED CONCRETE I (3). Basic principles of reinforced concrete design; safety and economy; strength, stability and serviceability criteria; design of simple reinforced concrete members to resist compressive, bending, and shearing loads. PREREQ: CE 383.

CE 482/CE 582. WOOD DESIGN (3). Properties and behavior of lumber and panel products; structural design of columns, beams and diaphragms; design of connections: bolts, nails, timber connectors, and adhesives. PREREQ: CE 383.

CE 483/CE 583. BRIDGE DESIGN (3). AASHTO specifications for bridge design; design for moving loads; design of concrete slab, T-beam, and composite steel-concrete bridges; simple and continuous spans. PREREQ: CE 481.

CE 485/CE 585. APPLIED STRUCTURAL ANALYSIS (3). Development of matrix stiffness method. Use of computer programs to analyze structures. Introduction to finite element method. PREREQ: CE 382.

CE 486/CE 586. PRESTRESSED CONCRETE (3). Prestressed concrete analysis and design; systems of prestressing; materials; economics. PREREQ: CE 481.

CE 488/CE 588. PROBABILISTIC STRUCTURAL ENGINEERING (3). Applications of probability theory and statistics in the analysis and design of civil engineering systems. Development of probabilistic models for loading and resistance. Introduction to probability-based design criteria including load and resistance factor design. PREREQ: ST 314.

CE 489/CE 589. DESIGN FOR NATURAL HAZARDS (3). Design of structures to resist the effects of earthquakes and wind loads. Seismic design philosophy, code requirements, and detailing for steel and reinforced concrete. PREREQ: CE 383, CE 481 or equivalent.

CE 491. HIGHWAY ENGINEERING (3). Highway standards, geometric design, cross section and roadside design, traffic control devices, channelization, highway surfaces, pavement design, highways and the environment, highway construction and maintenance. PREREQ: CE 392.

CE 492/CE 592. PAVEMENT STRUCTURES (3). Repeated load characteristics of pavement materials; design of pavement structures for streets, highways and airports; pavement management systems. PREREQ: CE 491.

CE 495/CE 595. TRAFFIC OPERATIONS AND DESIGN (3). Traffic operations and engineering; human and vehicular characteristics; traffic stream characteristics; highway capacity analysis; location and design of highway facilities; intersection operation, control and design. PREREQ: CE 491.

Graduate

CE 501. RESEARCH (1-16).

CE 503. THESIS (1-16).

CE 505. READING AND CONFERENCE (1-16).

CE 506. PROJECTS (1-16).

CE 507. SEMINAR (1-3).

CE 510. INTERNSHIP (1-16).

CE 514. GROUNDWATER HYDRAULICS (3). Principles of groundwater flow and chemical transport in confined and unconfined aquifers, aquifer testing and well construction. Design of dewatering and contaminant recovery systems. PREREQ: CE 313. CROSSLISTED as BRE 514.

CE 516. GROUNDWATER REMEDIATION (3). Theory and practice of groundwater monitoring and sampling. Environmental site assessments. Physical, chemical, and biological methods for in situ treatment of contaminated aquifers. PREREQ: CE 514 or equivalent.

CE 518. GROUNDWATER MODELING (3). Application of numerical methods to the solution of water flow and solute transport through saturated and unsataurated porous media. Analysis of confined and unconfined aquifers. Computer solution of large-scale field problems including groundwater contamination and aquifer yield. PREREQ: BRE 356 or equivalent, CE 514 or equivalent. CROSSLISTED as BRE 518.

CE 521. CONSTRUCTION ENGINEERING MANAGEMENT (3). Principles of engineering and construction management for efficient delivery of constructed facilities; fundamentals of project management and project administration with emphasis on quality, time, cost, and project safety.

CE 522. CONSTRUCTION ENGINEERING MANAGEMENT METHODS (3). Capital budgeting and equipment policy, estimating and estimating systems, cost and reporting systems, employee motivation and construction market seasonality. PREREQ: ENGR 390.

CE 523. ENGINEERING ECONOMIC PLANNING (3). Planning of engineering facilities and economical land use. L.C.D.C. and zoning. Selection of alternatives and economic analysis and evaluation. Benefit cost analysis plus retirement and replacement analysis. PREREQ: ENGR 390.

CE 525. STOCHASTIC HYROLOGY (3). Study the elements of randomness embedded in the hydrological processes with emphasis on time series analysis, stationarity, periodic/trend component, stochastic component, time series synthesis, ARMA model, spatial sampling and scale variability. CROSSLISTED as BRE 525.

CE 526. ADVANCED CONCRETE TECHNOLOGY (3). Cement and concrete characteristics and behavior; testing and quality control; mixture design; construction techniques; maintenance and rehabilitation techniques. PREREQ: CE 321.

CE 527. ASPHALT TECHNOLOGY (3). Advanced topics in bituminous materials, asphalt aggregate combinations, bituminous mixtures, materials characterization, and construction techniques. PREREQ: CE 321 or equivalent.

CE 528. SOIL IMPROVEMENT (3). Techniques to improve the performance of soils in engineering applications; compaction, blending, admixtures and geotextiles; properties, functions, applications, tests and design of geotextiles for embankments and roads. PREREQ: CE 372 and CE 321.

CE 529. LOW VOLUME ROADS DESIGN (3). Aggregate surfaces, drainage, side slopes, and retaining walls; geotextiles, low cost stream crossings, dust control; traffic studies, geometric design, safety issues, construction, maintenance operations and management. Offered alternate years.

CE 530. SELECTED TOPICS IN STRUCTURAL ANALYSIS AND MECHANICS (3). A critical examination in depth of topics selected by the instructor from among topics not covered in other structural analysis and mechanics courses. May be repeated for a maximum of 9 credits on different topics. PREREQ: Graduate standing.

CE 531. STRUCTURAL MECHANICS (3). Theories of failure, multi-axial stress conditions, torsion, shear distortions, energy methods of analysis. Nonlinear and inelastic behavior. PREREQ: Graduate standing.

CE 532. FINITE ELEMENT ANALYSIS (3). Applications of the finite element method to structural analysis, fluid flow and elasticity problems. Use and development of large finite element computer programs. PREREQ: CE 539.

CE 533. STRUCTURAL STABILITY (3). Mathematical models of elastic and inelastic stability in structural frames, numerical methods of solution. PREREQ: CE 539.

CE 534. STRUCTURAL DYNAMICS (3). Analytical and numerical solutions for single, multi-degree of freedom and continuous vibrating systems. Behavior of structures, dynamic forces and support motions. Seismic response spectrum analysis. PREREQ: Graduate standing.

CE 535. INTRODUCTION TO RANDOM VIBRATIONS (3). Introduction to probability theory and stochastic processes. Correlations and power spectral density functions. Response of linear systems to random excitations. First excursion and fatigue failures. Applications in structural and mechanical system analysis and design. PREREQ: CE 534 or ME 537.

CE 536. NONLINEAR DYNAMICS (3). Oscillations in nonlinear systems having few degrees of freedom. Qualitative and quantitative methods; phase plane analysis, averaging, perturbation, stability. Forced and self-excited oscillations, limit cycles, and domain of attraction. PREREQ: CE 534 or ME 537.

CE 537. ADVANCED TOPICS IN DYNAMICS (3). Advanced topics in linear and nonlinear dynamics, and random vibrations. Markov random processes and Fokker-Planck equation. Stationary and nonstationary excitations and responses. Approximate nonlinear analysis methods including perturbation, equivalent linearization, and closure techniques. Applications in structural and mechanical system analysis and design. PREREQ: CE 534.

CE 538. PLATE AND SHELL STRUCTURES (3). Development of basic plate equations; classical and numerical solutions; shell structures. PREREQ: graduate standing.

CE 540. FIELD AND LABORATORY TECHNIQUES IN SUBSURFACE HYDROLOGY (1-3). Introduction to the tools and methods employed to characterize hydrologic properties of subsurface systems. Hands-on use of GPR, TDR, resistivity, and methods of determining hydraulic conductivity, sorptivity, bulk density, and other fundamental hydrologic properties. Must be taken in conjunction with BRE 542. CROSSLISTED as BRE 540.

CE 543. APPLIED HYDROLOGY (4). Advanced treatment of hydrology covering major components of the hydrological cycle with special emphasis on surface water; hydrologic analysis and design of water resource systems; runoff prediction; and simulation of surface water systems. PREREQ: CE 412 or equivalent. Offered alternate years.

CE 544. OPEN CHANNEL HYDRAULICS (4). Steady uniform and nonuniform flow in natural and artificial open channels; unsteady flow; interaction of flow with river structures; and computational methods. PREREQ: CE 313. Offered alternate years.

CE 545. SEDIMENT TRANSPORT (4). Principles of sediment erosion, transportation and deposition in rivers, reservoirs, and estuaries; measurement, analysis, and computational techniques. PREREQ: CE 313. Rec. Offered alternate years.

CE 546. RIVER ENGINEERING (4). Multi-purpose river use; natural physical processes in alluvial rivers; channel modification practices; river structures; design practices; impact of river modification; problem analysis; and impact minimization. PREREQ: CE 313. Offered alternate years.

CE 547. ENVIRONMENTAL RESOURCE SYSTEMS (3). Organization of complex systems; system behavior and response; natural resource assessments; environmental impacts; cumulative effects; conflicts and conflict resolution; environmental strategies, and tactics. Offered alternate years.

CE 548. WATER QUALITY DYNAMICS (3). Mass balance, advection and diffusion in streams, lakes and estuaries; thermal pollution, heat balance, oxygen balance, and eutrophication; mathematical models; and numerical solutions. PREREQ: CE 311 or equivalent.

CE 549. CONTEMPORARY TECHNOLOGY (3). Philosophy and sociology of contemporary technology; technological methods, strengths, and limitations; examination of contemporary issues and conflicts.

CE 550. AQUEOUS ENVIRONMENTAL CHEMISTRY (3). Applied chemical concepts for environmental scientists and engineers, emphasizing mathematical solutions to problems of ionic equilibria in natural waters and treatment processes. PREREQ: CE 567 or equivalent.

CE 552. PHYSICAL AND CHEMICAL PROCESSES LABORATORY (3). Investigation of physical and chemical processes for treatment of water supplies and municipal, industrial, and hazardous wastes. COREQ: CE 558.

CE 555. MICROBIAL PROCESSES IN ENVIRONMENTAL SYSTEMS (3). Energetics, kinetics and stoichiometry of microbial transformations of organic and inorganic compounds. Mathematical models of biodegradation. PREREQ: CE 567.

CE 557. HAZARDOUS WASTE REMEDIATION (3). Physical, chemical, and thermal processes for treatment of hazardous wastes and contaminated soils. Selection of treatment technologies for hazardous waste remediation. COREQ: CE 550.

CE 558. PHYSICAL AND CHEMICAL PROCESSES FOR WATER AND (3). WASTEWATER TREATMENT. Principles and design of processes including adsorption, precipitation, filtration, coagulation, sedimentation, and chemical oxidation. PREREQ: CE 550.

CE 559. MICROBIOLOGICAL PROCESSES FOR MUNICIPAL AND HAZARDOUS WASTE (3). Principles and design of microbial processes for treatment of municipal and hazardous wastes. PREREQ: CE 550, CE 555. Lec/rec.

CE 562. ENVIRONMENTAL CHEMISTRY LABORATORY (3). Measurement of pollutants common to environmental engineering applications. COREQ: CE 550.

CE 564. MICROBIAL PROCESSES LABORATORY (3). Investigation of microbiological processes for treatment of municipal, industrial, and hazardous wastes. COREQ: CE 559.

CE 568. BIOREMEDIATION OF XENOBIOTIC COMPOUNDS (3). Investigation of microbial degradation pathways and kinetics for xenobiotic compounds applied to environmental systems and wastewater treatment processes. PREREQ: CE 555.

CE 570. GEOTECHNICAL ENGINEERING PRACTICE (3). Development and management of actual projects through the examination of case histories; evaluation of geotechnical data; development of design recommendations and preparation of project reports. PREREQ: CE 471/CE 571.

CE 574. ENGINEERING PROPERTIES OF SOILS (4). Geochemistry of soil formation, clay mineralogy, physical chemistry of clay water systems, permeability, consolidation, and shear strength. PREREQ: CE 373.

CE 575. EARTH RETENTION AND SUPPORT (4). Earth pressure theories. Earth supporting structures including walls, bulkheads, culverts, and shafts. PREREQ: CE 373.

CE 577. GEOTECHNICAL ENGINEERING IN COLD REGIONS (3). Characteristics of seasonally and permanently frozen ground; physical, thermal, and mechanical properties of frozen soils; frost heave phenomena; prediction of the ground thermal regime; thaw consolidation and stability of thawing slopes; foundation design for cold regions. PREREQ: CE 471. Offered alternate years.

CE 578. GEOTECHNICAL EARTHQUAKE ENGINEERING (3). Characteristics of ground motions during earthquakes; dynamic soil properties and site response analysis; soil liquefaction and settlement under cyclic leading; seismic earth pressures; seismic slop stability. PREREQ: CE 373. Offered alternate years.

CE 579. DEEP FOUNDATIONS (4). Installation of piles; construction and design of drilled piers; analyses of axially and laterally loaded piers, piles and pile groups; wave equation and dynamic monitoring for pile behavior. PREREQ: CE 471/CE 571. Offered alternate years.

CE 590. SELECTED TOPICS IN TRANSPORTATION ENGINEERING (1-3). Selected topics on contemporary problems in transportation engineering; application of ongoing research from resident and visiting faculty.

CE 591. TRANSPORTATION SYSTEMS ANALYSIS AND PLANNING (4). Transportation system analysis, planning, and characteristics; technological characteristics of highway, rail, air, and other transportation modes; transport analysis techniques; transportation network analysis and evaluation; planning studies, demand analysis and forecasting; evaluation of alternative plans. PREREQ: CE 392. Offered alternate years.

CE 593. TRAFFIC FLOW ANALYSIS AND CONTROL (4). Traffic operations and control systems; traffic flow theory and stream characteristics; street network capacity analysis; computerized traffic models; regulation; accident and safety improvement. PREREQ: CE 495. Offered alternate years.

CE 594. TRANSPORTATION FACILITY DESIGN (4). Location and design of highways, airports, and other surface transportation terminals; design for safety, energy efficiency, and environmental quality. PREREQ: CE 491. Offered alternate years.

CE 596. PAVEMENT EVALUATION AND MANAGEMENT (3). Advanced topics in pavement evaluation techniques and pavement management procedures. PREREQ: CE 492.

CE 597. PUBLIC TRANSPORTATION (3). Characteristics and nature of public transportation systems, including bus, light and heavy rail; financing policy considerations; planning transit service; managing and operating transit systems for small and large urban areas. PREREQ: CE 392. Offered on demand.

CE 598. AIRPORT PLANNING AND DESIGN (3). Characteristics and nature of the air transport system. Airport financing, air traffic control. Analysis and design of airports and the airport planning processes. Airport appurtenances. Airport pavement design and drainage. PREREQ: CE 392. Offered alternate years.

CE 599. TRANSPORTATION PLANNING APPLICATIONS (3). Techniques of transportation planning applied in urban areas and for resource transportation; calibration, testing and application of traffic estimation models; evaluation of alternate plans. PREREQ: CE 591. Offered alternate years.

CE 601. RESEARCH (1-16).

CE 603. THESIS (1-16).

CE 605. READING AND CONFERENCE (1-16).

CE 606. PROJECTS (1-16).

CE 607. OCEAN ENGINEERING SEMINAR (1). Presentations from on-campus and off-campus speakers discussing state of technology topics in ocean engineering research, development, and construction. Graded P/N.

CE 639. DYNAMICS OF OCEAN STRUCTURES (3). Dynamic response of fixed and compliant structures to wind, wave and current loading; Morison equation and diffraction theory for wave and current load modeling, time and frequency domain solution methods; application of spectral and time series analyses; system parameter identification; and stochastic analysis of fatigue and response to extreme loads. Offered alternate years.

CE 640. SELECTED TOPICS IN OCEAN AND COASTAL ENGINEERING (1-3). Selected topics on contemporary problems in ocean and coastal engineering; application of ongoing research from resident and visiting faculty. May be repeated for a maximum of 9 credits on different topics. PREREQ: CE 641. Offered alternate years.

CE 641. OCEAN ENGINEERING WAVE MECHANICS (3). Linear wave theory; shoaling, refraction, diffraction, superposition; wave forces; wind wave hindcasting; practical applications in ocean science and engineering. PREREQ: CE 313.

CE 642. RANDOM WAVE MECHANICS (3). Random wave theories, probability and statistics of random waves and wave forces, time series analyses of stochastic processes, ocean wave spectra. PREREQ: CE 641. Offered alternate years.

CE 643. COASTAL ENGINEERING (3). Coastal sediment transport including nearshore currents, longshore onshore-offshore transport, and shoreline configuration; functional planning of coastal facilities for shoreline stabilization, backshore protection, inlet stabilization, and harbor protection; coastal structure design including design criteria, design conditions, and structural stability. PREREQ: CE 641. Offered alternate years.

CE 644. OCEAN INSTRUMENTATION AND CONTROL THEORY (3). Electrical systems components; analog and digital filters/amplifiers; passive network analyses; instrument behavior for displacement, velocity, acceleration, force and flow measurements; simple feedback and control theory for linear electrical/mechanical/hydraulic systems; digital data acquisition. PREREQ: ENGR 201, MTH 256. Offered alternate years.

CE 645. WAVE FORCES ON STRUCTURES (3). Wave forces on small and large members, dimensional analyses and scaling of equations, identification and selection of force coefficients for Morison equation; compatibility of wave kinematics and force coefficients in Morison equation, diffraction and radiation of surface gravity waves by large floating bodies, wavemaker problem, and reciprocity relations. PREREQ: CE 641.

CE 646. COASTAL AND ESTUARINE HYDRODYNAMICS (3). Circulation and dynamics of coastal and estuarine waters, long wave theories for shallow water waves; hydraulics of inlets; transport theories; diffusion and dispersion; and numerical modeling of circulation and transport in estuaries. Offered alternate years. PREREQ: CE 641.

CE 647. OCEAN AND COASTAL ENGINEERING MEASUREMENTS (3). Hands-on experience in the conduct of sea, shore, and laboratory experiments, including sampling and measurements of waves, currents, wind, tides, sediments, bathymetry, shore profiles, wave forces on structures, and structural response. PREREQ: CE 641. Offered alternate years.

CE 648. FINITE AMPLITUDE WAVE MECHANICS (3). Nonlinear wave theories, perturbation expansion of nonlinear boundary value problems, numerical solutions of integral equation methods for nonlinear waves. PREREQ: CE 641. Offered alternate years.

CE 649. MARINE GEOTECHNICAL ENGINEERING (3). Overview of marine geology, sedimentation processes; marine sediment properties, sampling, testing, anchorages,; Biot consolidation theory; and wave-structure-foundation interaction for piles, pipelines, sea walls, and caissons. PREREQ: CE 373, CE 641. Offered alternate years.

CIVIL ENGINEERING-FOREST ENGINEERING

A five-year dual-degree program in civil engineering and forest engineering is offered jointly by the Departments of Civil Engineering (in the College of Engineering) and Forest Engineering (in the College of Forestry). Advising is done through either department. See College of Forestry.

CONSTRUCTION ENGINEERING MANAGEMENT

A.C.C.E. Accredited

H.D. Pritchett, Program Coordinator
Department of Civil Engineering
Apperson Hall 202
Oregon State University
Corvallis, OR 97331-2302
(503) 737-2006

Undergraduate Major

Construction Engineering Management (B.S.)

The Department of Civil Engineering offers a unique academic degree program in Construction Engineering Management (CEM). The program blends principles of basic science, engineering, and technology with a strong component of business subjects to prepare graduates for a productive career in the construction industry.

The CEM program is built on a rigorous four-year curriculum that leads to the Bachelor of Science degree. The program emphasizes practical applications as well as basic principles. Students are given many hands-on experiences in the laboratory and are involved in numerous field trips as a supplement to their classroom activities.

Graduate study in Construction Engineering Management is listed under Civil Engineering.

CURRICULUM

PRE-CONSTRUCTION ENGINEERING MANAGEMENT

Freshman Year

CE 101, CE 102 (or FE 215). Civil & Const Engr Orien (6)✣
PH 201, PH 202, PH 203. Physics (15)✣
MTH 251, MTH 252. Calculus (8)✣
WR 121. English Composition (3)1e
HHP 231. Lifetime Fitness (3)[1]
Perspectives (9)[1]
COMM 111 or COMM 114. Speech (3)[1]✣
Free elective (4)

Sophomore Year

BA 215. Fundamentals of Accounting (4)✣
BA 230. Business Law I (4)
BA 275. Quantitative Business Methods (4)✣
BA 278. Intro to Management Science (4)✣
CEM 251, CEM 252. Statics and Dynamics for Construction (6)✣
CEM 263. Plane Surveying (3)✣
CEM 291. Fundamentals of Estimating (3)✣
CH 201. Chemistry for Engineering Majors (3)✣
EC 201, EC 202. Prin of Economics (6)[1]
ENGR 213. Strength of Materials (3)✣
ENGR 245. Engr Graphics & Design (3)[1]✣
WR 327. Technical Writing II (3)[1]
Approved biological science (4)[1]✣
Free elective (1)
TOTAL (102)

PROFESSIONAL CONSTRUCTION ENGINEERING MANAGEMENT

Junior Year

CEM 311. Fluid Mechanics and Hydraulics (4)
CEM 341, CEM 342. Construct Estimating (6)
CEM 343. Construct Project Management (3)
CE 321, CE 322. Civil Engineering Materials (7)
CE 372. Soils Engineering (4)
CEM 381, CEM 383 Structural Theory, Probs (8)
ENGR 390. Engineering Economy (3)
CE 365. Highway Location and Design (3)
BA 340. Finance (4)
BA 315. Accounting for Decision Making (4)
Perspectives (3)[1]
Free electives (2)

Senior Year

CEM 441, CEM 442, CEM 443. Const Mgmt (9)
CEM 471, CEM 472. Elec & Mech Facilities (7)

CEM 407. Const Engr. Management Sem (3)
CE 424. Contracts and Specifications (3)
BA 352. Organizational Behavior (4)
BA 453. Human Resources Management (4)
Technical electives (8)
Synthesis (6)[1]
Free electives (7)
TOTAL (102)

COURSES

Lower Division

CEM 251. STATICS FOR CONSTRUCTION (3). Fundamental concepts of statics applied to elementary civil engineering problems. PREREQ/COREQ: MTH 251.

CEM 252. DYNAMICS FOR CONSTRUCTION (3). Kinematics, Newtons laws of motion, work energy and impulse-momentum relationships for particles and rigid bodies. PREREQ: ENGR 211 or CEM 251, MTH 252.

CEM 263. PLANE SURVEYING (3). Use and adjustment of surveying equipment; surveying methods applied to construction; geometry of highway location including circular and vertical curves; terrain analysis using aerial photographs; and earthwork quantities and distribution. PREREQ: sophomore standing in Engineering.

CEM 291. FUNDAMENTALS OF ESTIMATING (3). Interpretation of drawings and specifications for use in estimating, planning, and communication. Plan reading, visualization, sketching, and quantity take-off techniques. PREREQ: CE 101, sophomore standing in Engineering.

Upper Division

Courses numbered 500 and above may be taken for graduate credit.

CEM 311. FLUID MECHANICS AND HYDRAULICS (4). Pressure and energy concepts of fluids, fluid measurements, flow in pipes and open channels. PREREQ: CEM 252 or ENGR 212.

CEM 341, CEM 342. CONSTRUCTION ESTIMATING (3,3). Fundamentals of estimating and bidding construction projects; types of estimates; estimating and methods of construction for sitework, concrete, and carpentry; estimating subcontracts, estimating job overhead and home office overhead; and estimating profit. Must be taken in order. PREREQ: CEM 291.

CEM 343. CONSTRUCTION PROJECT MANAGEMENT (3). Principles of project control and productivity management; planning and scheduling, cost control systems, quality management, project safety, procedures for analysis of construction activities for improvement. PREREQ: CEM 342.

CEM 381. STRUCTURAL FUNDAMENTALS (4). Introduction to statistically determinant analysis and design of steel structures. PREREQ: ENGR 213. Lec/rec.

CEM 383. STRUCTURAL PROBLEMS (4). Analysis and design of building elements of concrete and timber; detailing and fabrication. PREREQ: CEM 381.

CEM 405. READING AND CONFERENCE (1-6).

CEM 406. PROJECTS (1-6).

CEM 407. SEMINAR (1-3). Professional practice of construction engineering management.

CEM 441/CEM 541, CEM 442/CEM 542, CEM 443/CEM 543. CONSTRUCTION MANAGEMENT (3,3,3). CEM 441: Heavy Construction Management Methods; CEM 442: Building Construction Management and Methods, including form design. CEM 443: Engineering Management of Construction. Study of construction projects and their improvement through the implementation of management techniques and operational procedures. PREREQ: ENGR 390, CE 321.

CEM 471. ELECTRICAL FACILITIES (4). Principles and applications of electrical components of constructed facilities; basic electrical circuit theory, power, motors, controls, codes, and building distribution systems. Lec/lab.

CEM 472. MECHANICAL FACILITIES (3). Principles and applications of mechanical components of constructed facilities; heating, ventilating, air conditioning, plumbing, fire protection, and other mechanical construction. Lec/lab.

COMPUTER SCIENCE

Walter Rudd, Head
Dearborn Hall 303
Oregon State University
Corvallis, OR 97331-3202
(503) 737-3273

Faculty

Professors Bose, Cook, Cull, Rudd; *Associate Professors* Budd, D'Ambrosio, Dietterich, Minoura, Pancake, Quinn; *Assistant Professors* Burnett, Crowl, Saletore, Tadepalli; *Senior Instructors* Beekman, Johnson

Undergraduate Major

Computer Science (B.S.)

Minor

Computer Science

Graduate Major

Computer Science (M.A., M.S., Ph.D.)

Graduate Areas of Concentration
Analysis of Algorithms
Artificial Intelligence
Computer Architecture
Computer Science
Information-Based Systems
Parallel Computing
Programming Languages
Software Engineering
Theory of Computation

Computer Science is the study of programs, data, computing machinery, and people, and how they interact. The Department of Computer Science offers programs leading to the B.S., M.A., M.A.I.S., M.S., and Ph.D. The undergraduate program courses and requirements are designed to provide a strong background in the fundamental areas in computer science including operating systems, compilers, and computer architecture plus additional work in artificial intelligence, database management systems, or software engineering. The undergraduate program prepares students for advanced study, for careers in the computing industry, or for applications in areas such as science, engineering, and business. Students enter the undergraduate computer science program by declaring computer science as their major. The recommended high school preparation is four years of mathematics, science, and English. High school programming or computer applications courses should not be taken in place of other college preparatory courses.

The graduate programs in computer science emphasize programming and computer languages, the theory of computation, analysis of algorithms, computer design, software systems, parallel processing, artificial intelligence, and information-based systems. The Master's program provides advanced instruction beyond the undergraduate degree to prepare students for careers in which a higher level of education and experience is required. The Ph.D. program prepares students for careers at universities or for work in research laboratories in government and industry.

CURRICULUM

PRE-COMPUTER SCIENCE

Freshman Year
WR 121. Writing I (3)[1]
WR 222. Writing II (3)[1]
HHP 231. Fitness (3)[1]
MTH 231. Elements of Discrete Math I (4)✥
MTH 232. Elements of Discrete Math II (4)✥
MTH 251. Calculus I (4)✥
CS 101. Computers and People (4)✥
CS 161. Intro to Computer Sci I (4)✥
CS 162. Intro to Computer Sci II (4)✥
Biological Science (4)✥
Perspectives (6)[1]
Electives (5)

Sophomore Year
MTH 252, MTH 253. Calculus (8)✥
CS 261. Data Structures (4)✥
PH 211, PH 212, PH 213. General Physics with Calculus (12)✥
PH 211R, PH 212R, PH 213R. Gen Physics Laboratory (3)
WR 327. Technical Writing (3)[4]
Perspectives (9)[1]
Electives (5)

Junior Year
CS 311, CS 361, CS 381. Computer Science (12)
CS 321, CS 325. Computer Science (7)
MTH 351. Intro to Num Analysis (3)
Perspectives (6)[1]
Contemporary global issues (3)[1]
Science, technology, and society (3)[1]
Electives (14)

Senior Year
CS 411, CS 470, CS 480. Computer Science (12)

Upper division computer science electives (12)
Electives (24)

NOTE: It is strongly recommended that all students include a substantial amount of course work in a computer-related area such as one of the physical or mathematical sciences, engineering, or business.

COMPUTER SCIENCE MINOR (36)

The department offers an undergraduate minor in computer science for students enrolled in other departments. In addition to a broad introduction to computer science, the minor provides the flexibility to specialize in a computer science area related to the student's major.

Required
CS 101. Computers: Appl & Impl (4)
MTH 231. Elements of Discrete Math I (4)
CS 161. Programming Methodology (4)

CS 162. Introduction to Data Structures (4)
MTH 232. Elements of Discrete Math II (4)
CS 261. Adv Data Structures (4)

Electives
(12 credits from upper division computer science courses other than CS 391, CS 401, CS 405, CS 406, CS 407, or CS 410)

COURSES

Lower Division

CS 101. COMPUTERS: APPLICATIONS AND IMPLICATIONS (4). Computers—their applications and implications in the age of information. The varieties of computer hardware and software. The effects, positive and negative, of computers on human lives. Hands-on experience with several diverse microcomputer applications, including graphics, word processing, spreadsheets, and databases.

CS 131. INTRODUCTION TO FORTRAN PROGRAMMING (4). Thorough treatment of FORTRAN language elements and control and data structures. PREREQ: CS 161 or previous programming experience.

CS 151. INTRODUCTION TO C PROGRAMMING (4). Thorough treatment of the basic elements of C, bitwise operations, flow of control, Input/Output, functions, arrays, strings, and structures. PREREQ: Previous programming experience.

CS 161. INTRODUCTION TO PROGRAMMING METHODOLOGY (4). Problem solving methods and algorithm development. Fundamental principles of program design and programming practices. Pascal programming language. PREREQ: CS 101 or equivalent.

CS 162. INTRODUCTION TO DATA STRUCTURES (4). Linear data structures and trees. Files and file structures. Algorithm design methods. PREREQ: CS 161.

CS 199. SELECTED TOPICS (3).

CS 261. ADVANCED DATA STRUCTURES (4). Trees and graphs. Search trees. Searching, sorting, and hashing. PREREQ: CS 162 and MTH 231.

Upper Division

CS 311. OPERATING SYSTEMS I (4). Introduction to operating systems using UNIX as the case study. System calls and utilities, fundamentals of processes and interprocess communication. PREREQ: CS 261, ECE 271.

CS 321. INTRODUCTION TO THEORY OF COMPUTATION (3). Survey of models of computation including finite automata, formal grammars, and Turing machines. PREREQ: CS 251.

CS 325. ANALYSIS OF ALGORITHMS (4). Recurrence relations, combinatorics, recursive algorithms, proofs of correctness. PREREQ: CS 261.

CS 361. FUNDAMENTALS OF SOFTWARE ENGINEERING (4). Introduction to software engineering and the software engineering lifecycle: requirements specification; design techniques; implementation; verification and validation; debugging techniques; project management. PREREQ: CS 261.

CS 381. PROGRAMMING LANGUAGE FUNDAMENTALS (4). An introduction to the concepts found in a variety of programming languages. Programming languages as tools for problem solving. A brief introduction to languages from a number of different paradigms. PREREQ: CS 261.

CS 391. SOCIAL AND ETHICAL ISSUES IN COMPUTER SCIENCE (3). In-depth exploration of the social, psychological, political, and ethical issues surrounding the computer industry and the evolving information society. PREREQ: CS 101.

CS 401. RESEARCH (1-16).

CS 405. READING AND CONFERENCE (1-16).

CS 406. PROJECTS (1-16).

CS 407. SEMINAR (1-16).

CS 410. OCCUPATIONAL INTERNSHIP (1-15).

CS 411. OPERATING SYSTEMS II (4). Principles of computer operating systems: concurrent processes, mutual exclusion, memory management, file systems. I/O systems, performance evaluation, multiprocessor systems, and distributed systems.

CS 419. SELECTED TOPICS IN COMPUTER SCIENCE (3-4). Topics of special and current interest not covered in other courses. Can be repeated for credit. PREREQ: Senior standing in computer science.

CS 420/CS 520. GRAPH THEORY WITH APPLICATIONS TO COMPUTER SCIENCE (3). Directed and undirected graphs; paths, circuits, trees, coloring, planar graphs, partitioning; computer representation of graphs and graph algorithms. Applications in software complexity metrics, program testing, and compiling. PREREQ: CS 325.

CS 430/CS 530. ARTIFICIAL INTELLIGENCE PROGRAMMING TECHNIQUES (4). Symbols and symbolic programming. Lisp basics: eval, recursion, variable binding and scoping, macros. Representation and problem solving in Lisp, Advanced topics: alternative data representations, generators, data-driven control, agendas. AI programming paradigms. PREREQ: CS 325, CS 381.

CS 440/CS 540. DATABASE MANAGEMENT SYSTEMS (4). Purpose of database systems, levels of data representation. Entity-relationship model. Relational systems: data definition, data manipulation, query language (SQL), relational calculus and algebra, data dependencies and normal forms. DBTG network model. Query optimization, recovery, concurrency control. PREREQ: CS 261 or graduate standing in computer science.

CS 450/CS 550. INTRODUCTION TO COMPUTER GRAPHICS (4). Display devices, graphics software, interactive graphics, three-dimensional graphics. PREREQ: CS 312, CS 325.

CS 451/CS 551. PROGRAMMING GRAPHICAL USER INTERFACES (4). Introduction to the design and implementation of GUIs, focusing on the X-Window system platform. Event-driven systems, X-Library and X-Toolkit support, widget sets, influence of OSF/Motif policy guidelines.

CS 460. APPLIED SOFTWARE ENGINEERING (4). Application of software engineering methodology to real-world applications of computers. Course emphasizes implementation of a working software system in a team environment. PREREQ: CS 361.

CS 470. COMPUTER ARCHITECTURE (4). Computer architecture using processors, memories, and I/O devices as building blocks. issues involved in the design of instruction set architecture, processor, pipelining and memory organization. Design philosophies and tradeoffs involved in Reduced Instruction Set Computer (RISC) architectures. PREREQ: ECE 375. CROSSLISTED as ECE 472.

CS 475. INTRODUCTION TO PARALLEL COMPUTING (4). Theoretical and pactical survey of parallel processing, including a dicussion of parallel architectures, parallel programming language, and parallel algorithms. Programming one or more parallel computers in a higher-level parallel language. PREREQ: CS 325, CS 470 or ECE 472.

CS 480. TRANSLATORS (4). An introduction to compilers; attribute grammars, syntax- directed translation, lex, yacc, LR(1) parsers, symbol tables, semantic analysis, and peep-hole optimization. PREREQ: CS 311, CS 321, CS 325.

Graduate

CS 501. RESEARCH (1-16).

CS 503. THESIS (1-16).

CS 505. READING AND CONFERENCE (1-16).

CS 506. PROJECTS (1-16).

CS 507. SEMINAR (1-16). Introduction to the features available on the Computer Science Department computing facilities. Presentation of graduate student research. PREREQ: Graduate standing in computer science.

CS 511. OPERATING SYSTEMS II (4). Design strategies for operating systems, including problems in multiprogramming, multiprocessing, memory management, interprocess synchronization and communications, network file systems, and management of interdependent system resources. PREREQ: CS 311.

CS 515. ALGORITHMS AND DATA STRUCTURES (4). Introduction to computational complexity. Survey of data structures: linear lists, strings, trees, graphs. Representation and algorithms; analysis of searching and sorting algorithms; storage management. PREREQ: Graduate standing in computer science.

CS 516. THEORY OF COMPUTATION AND FORMAL LANGUAGES (4). Models of computation. Universal Machines. Unsolvable problems. Nondeterministic computation. Chomsky hierarchy: regular, context-free, context-sensitive and unrestrictive grammars; characterization, closure properties, algorithms, and limitations. PREREQ: Graduate standing in computer science.

CS 519. TOPICS IN COMPUTER SCIENCE (1-5). Graded P. Topics of special and current interest not covered in other courses. May be repeated for credit. May not be offered every year. PREREQ: CS 511, CS 515.

CS 521. COMPUTABILITY (4). Recursive functions. Turing Machines. Undecidability. Relativized computation. Complexity classes. PREREQ: CS 516.

CS 523. ANALYSIS OF ALGORITHMS (4). Design and analysis techniques. Divide and conquer algorithms. Difference equations. Graph problems, matrix problems, fast transforms, and arithmetic algorithms. PREREQ: CS 515.

CS 524. NP-COMPLETE AND HARDER PROBLEMS (4). Complexity classes and reducibilities. NP-Complete problems, proof techniques, and heuristics, approximation algorithms. Provably hard problems. Hierarchies. PREREQ: CS 523

CS 527. ERROR-CORRECTING CODES (4). Hamming codes, linear codes, cyclic codes, BCH and Reed-Solomon codes. Introduction to Galois fields. Encoding and decoding algorithms. Burst error correcting codes, asymmetric and unidirectional codes. Applications of codes for computer systems. PREREQ: CS 515, MTH 341.

CS 529. SELECTED TOPICS IN THEORETICAL COMPUTER SCIENCE (1-5). Topics of interest in theory of computation, formal languages, or analysis of algorithms. Topics include: theory of parsing, finite state machines, complexity of computing, combinatorial optimization, bilinear algorithms. May be repeated for credit. PREREQ: CS 521 or CS 523.

CS 531. ARTIFICIAL INTELLIGENCE (4). Goals and methods of AI. Knowledge representation: propositional logic, predicate logic, other notations, direct representations. Reasoning and problem solving; search methods, deduction as search, non-deductive methods. PREREQ: CS 530, CS 515.

CS 532. ADVANCED ARTIFICIAL INTELLIGENCE (4). Advanced topics in representation and reasoning. Model and proof theory, representation design. Problem domains in AI: planning, learning, natural language (parsing, understanding, generation), vision, diagnosis, design. PREREQ: CS 531.

CS 533. EXPERT SYSTEMS (4). Design and implementation of expert systems. Nature of expertise. Models of expert problem solving including heuristic classification, fault trees, model-based reasoning, and case-based reasoning. Techniques for knowledge acquisition, reasoning under uncertainty, truth maintenance systems. Approaches to providing explanation and performing evaluation of expert systems. PREREQ: CS 531.

CS 534. MACHINE LEARNING (4). Survey of practical techniques for constructing learning programs. Probably-approximately correct learning. Techniques for learning decision trees, neural networks, probability distributions, Boolean formulas. Incorporating knowledge into the learning process; explanation-based learning. Skill acquisition and speed-up learning. PREREQ: CS 515, basic probability theory.

CS 535. CYBERNETICS (4). Control and communication organisms and machines; neural nets, cellular autonata, L-systems, genetic algorithms. PREREQ: graduate standing.

CS 539. SELECTED TOPICS IN ARTIFICIAL INTELLIGENCE (1-5). Advanced topics of current interest. Typical topics include qualitative reasoning, reasoning under uncertainty, truth maintenance systems, automated deduction, neural networks, automatic programming, and research methods. May be repeated for credit. PREREQ: CS 531.

CS 541. INFORMATION-BASED SYSTEMS (4). Data modeling: object-oriented and logic-based data models, data management for complex applications, database translation and integration. Implementation techniques: recursive-query evaluation, access methods for spatial data, storage management. Case studies. PREREQ: CS 540, CS 515.

CS 549. SELECTED TOPICS IN INFORMATION-BASED SYSTEMS (1-5). Current topics in information-based systems, e.g. information management for CAD, geographical information systems, distributed information systems, data models for complex applications. May be repeated for credit. PREREQ: CS 541.

CS 552. USER INTERFACE DESIGN (4). Principles and practices governing the quality and acceptability of usr interfaces. Includes color theory, conceptual models, screen layout assessment, and testing techniques. PREREQ: CS 551 or CS 561.

CS 561. SOFTWARE ENGINEERING (4). Survey of models of software lifecycle, user interface design, programming style, control of complexity, testing methods, and ease of maintenance. PREREQ: CS 361 and graduate standing or equivalent work experience.

CS 562. APPLIED SOFTWARE ENGINEERING (4). Application of software engineering methodology to the development of a complete software system. PREREQ: CS 561.

CS 569. SELECTED TOPICS IN SOFTWARE ENGINEERING (1-5). Topics include new programming methodologies, productivity, software development, software complexity metrics. May be repeated for credit. PREREQ: CS 561.

CS 570. COMPUTER ARCHITECTURE (4). Advanced concepts in computer architecture. Performance improvement employing advanced piplining and multiple instruction scheduling techneiques. Issues in memory hierarchy and management.PREREQ: Graduate standing in Computer Science. CROSSLISTED as ECE 570.

CS 575. INTRODUCTION TO PARALLEL COMPUTING (4). Theoretical and practical survey of parallel processing, including a discussion of parallel architecture, parallel programming language, and parallel algorithms. Programming one or more parallel computers in a higher-level parallel language. PREREQ: CS 570 or ECE 570.

CS 576. PARALLEL ARCHITECTURES (4). In-depth study of advanced concepts in parallel and distributed architectures; analysis and modeling of vector supercomputers. SIMD and MIMD multiprocessor systems. Issues in interconnection networks, memory systems and software support for parallelism. PREREQ: CS 570 or ECE 570.

CS 577. PARALLEL PROGRAMMING LANGUAGES (4). In-depth study of languages used to program parallel computers, including low-level machine-dependent languages, high-level languages, and trade-offs between portability, programmability, and performance. PREREQ: CS 575.

CS 578. PARALLEL ALGORITHMS AND THEORY (4). Design and analysis of parallel algorithms. PRAM and its variants. Parallel computation thesis. Parallel complexity classes. Analysis of interconnection networks. PREREQ: CS 575.

CS 579. TOPICS IN COMPUTER ARCHITECTURE AND PARALLEL PROCESSING (1-5). Current topics in advanced computer architecture and parallel processing. May be repeated for credit. PREREQ: CS 575, CS 570 or ECE 572

CS 580. TRANSLATORS (4). An introduction to compilers; attribute grammars, syntax- directed translation, lex, yacc, LR(1) parsers, symbol tables, semantic analysis, and peep-hole optimization. PREREQ: CS 311, CS 321, CS 325.

CS 581. PROGRAMMING LANGUAGES (4). A study of the concepts of modern programming and paradigms. PREREQ: CS 381, CS 511.

CS 582. OBJECT-ORIENTED ANALYSIS AND PROGRAMMING (4). Introduction to the elements of object-oriented analysis, design and programming techniques. Topics are introduced in a programming language-independent fashion. Topics covered include object-oriented design, classes, methods, inheritance, software reuse.

CS 589. SELECTED TOPICS IN PROGRAMMING LANGUAGES (1-5). An in-depth examination of a specific topic of interest in programming language design and implementation. Example topics include object-oriented programming, parallel programming, compiler optimization, programming language semantics. May be repeated for credit. PREREQ: CS 581.

CS 601. RESEARCH (1-16).

CS 603. DISSERTATION (1-16).

CS 605. READING AND CONFERENCE (1-16).

CS 607. SEMINAR (1-16).

ELECTRICAL AND COMPUTER ENGINEERING

Vija K. Tripathi, Head
Electrical Engineering 220A
Oregon State University
Corvallis, OR 97331-3211
(503) 737-2541

Faculty

Professors Arthur, Forbes, Goodnick, Mohler, Temes, Tripathi, Van Vechten, Wager, Wallace; *Associate Professors* Alexander☆, Amort☆, Engelbrecht, Herzog, Kiaei, Kolodziej, Plant, Rathja, Spee; *Assistant Professors* Kenney, Koc, Lee, Lu, Magana, Schreier, Shor, Wiesshaar; *Instructor* Gygax

Undergraduate Majors

Computer Engineering (B.S.)
Electrical and Electronics Engineering (B.S.)

Graduate Major

Electrical and Computer Engineering (M.S., Ph.D.)

Graduate Areas of Concentration

Computer Engineering (Architecture, Microprocessors, Parallel Systems)
Electrical Engineering
Electromagnetics (Microwave Circuits, Optics, Propagation)
Electronics (Materials, Devices, Circuits)
Power Engineering (Systems, Machines, Power Electronics)
Systems and Control

Two baccalaureate degree programs are offered through the college: electrical and electronics engineering and computer engineering.

The curriculum for electrical and electronics engineering meets requirements for the professional engineering degree and is accredited by A.B.E.T. Students completing course work in this curriculum are awarded the B.S. degree in electrical and electronics engineering.

The computer engineering curriculum meets requirements for the professional engineering degree and is accredited by A.B.E.T. It requires most of the lower division courses and some of the upper division courses required in electrical and electronics engineering, but provides additional opportunities for computer engineering-related course work during the junior and senior years. The undergraduate program in computer engineering emphasizes the design of computers or information systems and the use of computers in design, system analysis, and simulation. Students completing course work in this curriculum are awarded the B.S. degree in computer engineering.

Both curricula require students to take course work in the sciences and the liberal arts. Undergraduates may elect courses in science or engineering during the sophomore, junior, and senior years to prepare for graduate work or to form a broad undergraduate program. Many courses allow students to work in the departments well-equipped laboratories, providing direct experience with analog, digital, and hybrid computers, design and manufacture of integrated circuits, and a variety of electronic and electrical engineering equipment.

ELECTRICAL AND ELECTRONICS ENGINEERING

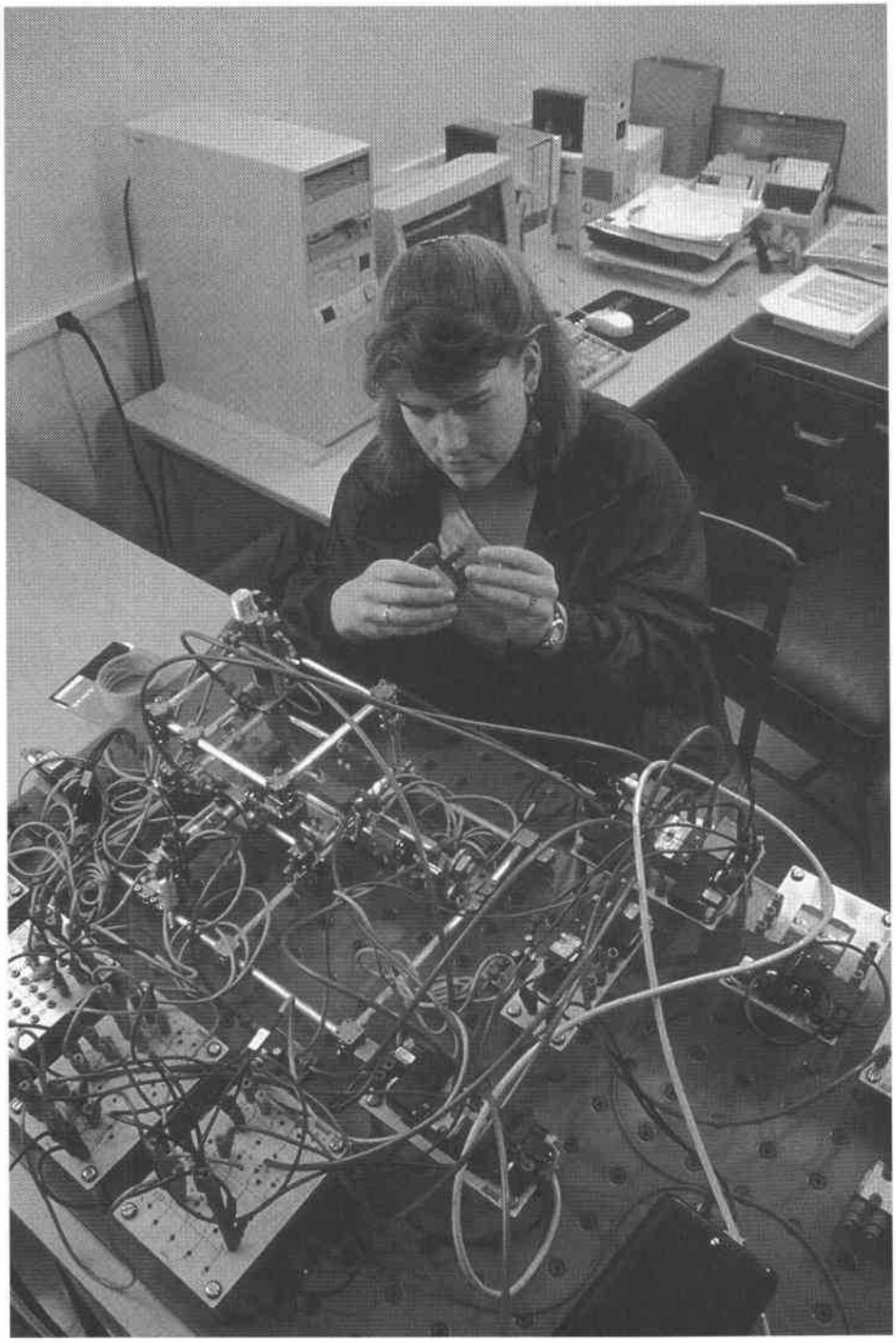
E.A.C./A.B.E.T. Accredited

The curriculum in electrical, electronics and computer engineering provides a wide range of opportunities in undergraduate and graduate study in the areas of communications, computers, control and systems science, power electronics, machines, generation and transmission systems, electronics, and electronic materials, devices, and integrated circuits.

PRE-ELECTRICAL AND ELECTRONICS ENGINEERING CURRICULUM

Freshman Year

ECE 111, ECE 112. Orientation (4)✥
MTH 251, MTH 252, MTH 253. Calculus (12)✥
CH 201✥, CH 202. General Chemistry (6)
Biological Sciences (4)[1]
Writing I (3)[1]✥
PH 211. General Physics (4)✥
Lifetime Fitness (3)[1]
CS 151 or CS 161. Programming Meth or restricted elec (4)
Perspectives (6)[1]
Electives (4)



Sophomore Year
MTH 254✥, MTH 255, MTH 256✥. Vector Calc & Diff Equations (12)
PH 212, PH 213. General Physics (8)✥
ECE 271, ECE 272. Digital Logic Design (4)
ENGR 201✥, ENGR 202, ENGR 203. Electrical Fundamentals (9)
ENGR 211, ENGR 212. Stat & Dynam (6)✥
CS 131. FORTRAN or CS 162. Intro to Data Structures (4)✥
Perspectives (3)[1]
COMM 111 or COM 114 (3)[1]
Electives (3)

PROFESSIONAL ELECTRICAL AND ELECTRONICS ENGINEERING CURRICULUM

Junior Year
ECE 317. Electronic Materials & Devices (3)
ECE 322. Electronic Circuits (4)
ECE 323. Digital Electronics (4)
ECE 331. Electromech Energy Convers (4)
ECE 351, ECE 352. Signals & Syst I & II (6)
ECE 375. Computer Struct & Assemb Lang (4)
ECE 390. Electric & Magnet Fields (4)
ECE 391. Electromagnet Fields & Trans Lnns (4)
ST 421. Intro to Mathematical Statistics (3)
PH 314. Modern Physics (4)
ENGR 311. Thermodynamics (3)
ENGR 390. Engineering Economy (3)
Electives (2)
Synthesis (3)[1]

Senior Year
Senior departmental electives (20)
ECE 441, ECE 442, ECE 443 (6)
Restricted electives (4)
Synthesis (9)[1]
Electives (6)
Writing II (3)[1]
Perspectives (3)[1]

COMPUTER ENGINEERING

E.A.C./A.B.E.T. Accredited

Offered through the Department of Electrical and Computer Engineering. See information listed above under Electrical and Electronics Engineering.

PRE-COMPUTER ENGINEERING CURRICULUM

Freshman Year
ECE 111, ECE 112. Orientation (4)
CS 161✥, CS 162. Intro to CS I & II (8)
MTH 231. Discrete MTH I (4)
MTH 251, MTH 252, MTH 253. Calculus (12)✥
CH 201✥, CH 202. General Chemistry (6)
Biological Sciences (4)[1]
Writing 121 (3)[1]✥
HHP 231. Lifetime Fitness (3)[1]
PH 211. General Physics (4)
Electives (3)

Sophomore Year
ECE 271. Digital Logic Design (4)
MTH 254✥, MTH 255, Mth 256✥. Vector Calc & Diff Equations (12)
ENGR 201✥, ENGR 202, ENGR 203. Electrical Fundamentals (9)
ENGR 211, ENGR 212. Statics & Dynamics (6)
PH 212, PH 213. General Physics (8)✥
COMM 111 or COMM 114. Speech (3)[1]✥
CS 261. Data Structures (4)
Electives (2)
Western Culture (3)[1]✥

PROFESSIONAL COMPUTER ENGINEERING CURRICULUM

Junior Year
ECE 317. Electronic Materials & Devices (3)
ECE 322, ECE 323. Electronic & Digital Circuits (8)
ECE 351, ECE 352. Sign & Syst I and II (6)
ECE 375. Comp Structures & Assem Lang Prog (4)
CS 311. Operating Systems (4)
ECE/CS 300-level jr restrictive electives (3)
Science and Society (3)[1]
Contemporary Golbal Issues (3)[1]
Literature and the Arts (3)[1]
Social Processes and Institutions (3)[1]
ENGR 390. Engineering Economics (3)
Writing II (3)1
Restrictive electives (jr ECE/CS 3xx) (3)
Elective (2)

Senior Year
ECE 441, ECE 442, ECE 443. Senior Design Project (6)
CE 471. Design of MicroprocessSystems s (4)
ECE 472. Computer System Architecture (4)
ECE 474. VLSI System Design (4)
ECE 478. Digital Communication &Computer Networks (4)
CS 411. Operating Systems (4)
ECE/CS 400-level restrictive electives (4)
ST 421. Intro to Math Statistics (3)
Synthesis (3)

Restrictive electives (4)
Electives (8)
Perspectives (3)

COURSES

Lower Division Courses

ECE 111. ORIENTATION TO COMPUTER APPLICATIONS (2). Usage of personal computers and software for word processing, graphics, spreadsheets, and data bases in an engineering environment.

ECE 112. ORIENTATION TO UNIX SYSTEMS (2). Introaduction to UNIX basics and the use of MATLAB for engineering computations.

ECE 199. SPECIAL STUDIES (TBA). One-credit section graded P/N.

ECE 271. DIGITAL LOGIC DESIGN (3). A first course in digital logic design using small and medium scale integrated circuits. PREREQ: ENGR 203. Lec/rec.

Upper Division Courses

Courses numbered 500 and above may be taken for graduate credit.

ECE 317. ELECTRONIC MATERIALS AND DEVICES (3). Semiconductor fundamentals, mathematical models, PN junction operation and device characteristics. PREREQ: ENGR 202 or ENGR 203.

ECE 322. ELECTRONIC CIRCUITS (4). Transient and steady state behavior of linear electronic circuits. PREREQ: ECE 321. Lec/lab.

ECE 323. DIGITAL ELECTRONICS (4). Switching in electronic devices and circuits. Design and analysis of circuits in digital systems. Interconnections and noise problems. PREREQ: ECE 322. Lec/lab.

ECE 331. ELECTROMECHANICAL ENERGY CONVERSION (4). Non-linear magnetic circuits. Saturable reactors and transformers. Voltage generation and energy conversion principles for electromechanical devices. Characteristics of electromechanical machines. PREREQ: ECE 311. Lec/lab.

ECE 351. SIGNALS & SYSTEMS I (3). Analytical techniques for signal, system, and circuit analysis. PREREQ: ENGR 203.

ECE 352. SIGNALS & SYSTEMS II (3). Analytical techniques for signal, system, and circuit analysis. PREREQ: ECE 351.

ECE 375. COMPUTER STRUCTURES & ASSEMBLY LANGUAGE PROGRAMMING (4). An introduction to the Von Neuman computer architecture and assembly language programming. PREREQ: ECE 271. Lec/lab.

ECE 390. ELECTRIC AND MAGNETIC FIELDS (4). Static and quasi-static electric and magnetic fields. PREREQ: MTH 255, ENGR 203.

ECE 391. ELECTROMAGNETIC FIELDS AND TRANSMISSION LINES (4). Time varying fields with application to engineering problems and transmission lines theory. PREREQ: ECE 390. Lec/lab.

ECE 401. RESEARCH (TBA).

ECE 405. READING AND CONFERENCE (TBA).

ECE 406. PROJECTS (TBA).

ECE 417/ECE 517. BASIC SEMICONDUCTOR DEVICES (3). Theory of pn and Schottky junctions; MOSFET, MESFET, JFET, and bipolar transistors. PREREQ: ECE 317.

ECE 418/ECE 518. SEMICONDUCTOR PROCESSING (2). Theory and practice of basic semiconductor processing techniques. Introduction to process simulation. PREREQ: ECE 317 or equivalent. Lec/lab.

ECE 422/ECE 522. ANALOG INTEGRATED CIRCUITS (4). Theory and design of CMOS and bipolar analog integrated circuits such as operational amplifiers. PREREQ: ECE 322, ECE 323 recommended.

ECE 423/ECE 523. DIGITAL INTEGRATED CIRCUITS (4). Theory and design of digital integrated circuits including CMOS and bipolar logic. PREREQ: ECE 323. Lec/lab.

ECE 428/ECE 528. DATA ACQUISITION I (4). Fundamentals of data acquisition systems. PREREQ: ECE 323, ECE 352. Lec/lab.

^ECE 429/ECE 529. DATA ACQUISITION II (4). Transducers for use in data acquisition systems. PREREQ: ECE 323. Lec/lab. (Writing Intensive Course)

ECE 431/ECE 531. ELECTROMECHANICAL ENERGY CONVERSION (4). Generalized machine theory. Steady state and dynamic characteristics and analysis of electromechanical machines: direct current, synchronous, and induction machines. PREREQ: ECE 331. Lec/lab.

ECE 432/ECE 532. POWER SYSTEM ANALYSIS I (4). Energy flow systems, parameters, characteristics, and control under steady state conditions. PREREQ: ECE 331, ECE 312, ECE 352. Lec/lab.

ECE 433/ECE 533. POWER SYSTEM ANALYSIS II (4). Energy flow systems, characteristics, and modeling under transient flow conditions. PREREQ: ECE 432. Lec/lab.

ECE 434/ECE 534. POWER ELECTRONICS I (4). Fundamentals and applications of electronic circuits and devices used in energy-related systems. PREREQ: ECE 322, ECE 331, ECE 352. Lec/lab.

ECE 435/ECE 535. POWER ELECTRONICS II (4). Introduction to drive systems consisting of power electronics controllers and motors: ac motors and controlled rectifiers or chopper; induction motors and voltage regulators or inverters; variable reluctance and stepper drives; permanent magnet motor systems. PREREQ: ECE 331 and ECE 434. Lec/lab.

ECE 452/ECE 552. CONTROL ENGINEERING I (5). Modeling of continuous and discrete processes suitable for use in control system design. Stability evaluation for linear stationary systems. PREREQ: ECE 352. Lec/lab.

^ECE 453/ECE 553. CONTROL ENGINEERING II (5). Design and compensation of continuous discrete, and mixed linear control systems. Design and use of analog and digital PID compensators. PREREQ: ECE 451 and ECE 452. Lec/lab. (Writing Intensive Course)

ECE 454/ECE 554. CONTROL ENGINEERING III (5). Design and compensation of control systems. Introduction to nonlinear systems and systems involving time delay. Prediction of limit cycles. PREREQ: ECE 453. Lec/lab.

ECE 461/ECE 561. PROBABILISTIC METHODS IN ELECTRICAL ENGINEERING (4). Design of circuits and systems with random internal or external parameters. Introduction to random processes and spectral analysis. PREREQ: ECE 351, ST 421.

ECE 462/ECE 562. COMMUNICATIONS I (4). Modulation and demodulation of information signals; properties of noise and its effect in communication systems. Analog and digital systems. PREREQ: ECE 352 and ST 421.

ECE 463/ECE 563. COMMUNICATION II (4). Digital data communication systems, introductory information theory, and coding. PREREQ: ECE 461 and ECE 462.

ECE 464/ECE 564. DIGITAL SIGNAL PROCESSING (4). Discrete-time signals, the discrete Fourier transform; design and implementation of digital filters. PREREQ: ECE 352.

ECE 471/ECE 571. COMPUTER ENGINEERING: MICROCOMPUTER APPLICATIONS (4). Introduction to the internal organization and application of microprocessors and microcomputers. Design process for microprocessor systems. PREREQ: ECE 375. Lec/lab.

ECE 472/ECE 572. COMPUTER SYSTEM ARCHITECTURE (4). Introduction to the processor structure, memory organization, control unit, and input/output features of a modern digital computers. PREREQ: ECE 375. CROSSLISTED AS CS 472/CS 572.

ECE 474/ECE 574. VLSI SYSTEM DESIGN (4). Introduction to custom and semi-custom digital integrated circuit design as used in VLSI systems. The use of CAD/CAE tools, design management, and design methodology are introduced. PREREQ: ECE 323 and ECE 475.

^ECE 475. SENIOR DESIGN PROJECT (4). This is a capstone design course which also incorporates requirements for a university writing intensive course (WIC). PREREQ: ECE 471 and ECE 472. (Writing Intensive Course)

ECE 478/ECE 578. DIGITAL COMMUNICATION AND COMPUTER NETWORKS (4). Principles of communication as applied to the interchange of information in networks of digital systems. PREREQ: ECE 375.

^ECE 482/ECE 582. OPTICAL ELECTRONICS (4). Laser theory, laser systems, photodetectors, coherent optical detection, electro-optic and acousto-optic modulation, optical networks. PREREQ: ECE 391 or equivalent. Lec/lab. CROSSLISTED as PH 202, PH 582. (Writing Intensive Course)

ECE 483/ECE 583. GUIDED WAVE OPTICS (4). Optical fibers, fiber mode structure and polarization effects, fiber interferometry, fiber sensors, conventional and coherent fiber communications, coherent OTDR, integrated optoelectronic devices. PREREQ: ECE 391 or equivalent. Lec/lab. CROSSLISTED as PH 202, PH 583.

ECE 484/ECE 584. ANTENNAS AND PROPAGATION (4). Electromagnetic wave propagation and radiation. PREREQ: ECE 312 and ECE 352. Offered alternate years.

ECE 485/ECE 585. MICROWAVE TECHNIQUES (4). Introduction to basic techniques required for the design of high frequency circuits and systems. PREREQ: Senior standing in ECE. Lec/lab. Offered alternate years.

Graduate Courses

ECE 501. RESEARCH (TBA).

ECE 503. THESIS (TBA).

ECE 505. READING AND CONFERENCE (TBA).

ECE 506. PROJECTS (TBA).

ECE 507. SEMINAR (TBA). .

ECE 511. ELECTRONIC MATERIALS AND CHARACTERIZATION (3). Physics and chemistry of electronic materials and methods of materials characterization. PREREQ: Graduate standing in ECE.Offered alternate years.

ECE 512. ELECTRONIC MATERIALS PROCESSING (3). Technology, theory, and analysis of processing methods used in integrated circuit fabrication. PREREQ: Graduate standing in ECE. Offered alternate years.

ECE 513. SEMICONDUCTOR DEVICES I (3). Advanced treatment of two-terminal semiconductor electronic devices. PREREQ: ECE 520 recommended. Offered alternate years.

ECE 514. SEMICONDUCTOR DEVICES II (3). Advanced treatment of three-terminal semiconductor electronic devices. PREREQ: ECE 513.

ECE 515. SEMICONDUCTOR DEVICES III (3). Physics and analysis of semiconductor microwave and optical devices. PREREQ: ECE 520 and ECE 513.

ECE 516. ANALOG CMOS INTEGRATED CIRCUITS (3). Analysis and design of analog integrated circuits. PREREQ: ECE 427/ECE 527.

ECE 520. ANALOG CMOS INTEGRATED CIRCUITS (3). Presents principles and techniques of design of electronic circuits. Focuses on design methodology for analog integrated circuits. Practical aspects of CAD tools in analyzing and laying out circuits .

ECE 526. DIGITAL INTEGRATED CIRCUITS (3). Analysis and design of digital integrated circuits. PREREQ: ECE 423/ECE 523.

ECE 527. VLSI SYSTEM DESIGN (3). Design, layout, and simulation of a complete VLSI chip using CAD tools. PREREQ: ECE 526.

ECE 536. POWER SYSTEM OPERATION I (3). Calculation algorithms and procedures used for large power systems networks in the determination of fault currents and voltages. PREREQ: ECE 431/ECE 531 and ECE 432/ECE 532.

ECE 537. POWER SYSTEM OPERATION II (3). The influence of power electronic devices on the development of the power system—harmonics, filters, ac-dc-ac conversion HVDC. PREREQ: ECE 432/ECE 532, ECE 433/ECE 533, and ECE 434/ECE 534.

ECE 538. ELECTRICAL ENERGY DEVICES I (3). Development of dynamic models for all classes of electrical machine; synchronous, induction, permanent magnet and reluctance motors. Computer simulations. PREREQ: ECE 431/ECE 531.

ECE 539. POWER ELECTRONIC SYSTEMS (3). DC-AC, AC-DC, DC-DC high power converters; devices, topologies and control strategies. PREREQ. ECE 434/ECE 534.

ECE 550. LINEAR SYSTEMS (4). Linear dynamic systems theory and modeling. PREREQ: ECE 453/ECE 553.

ECE 555. CONTROL OF LINEAR SYSTEMS (3). Observers and controllers. Linear state feedback. Optimal control problem formulation. Solution methods from the calculus of variations; Pontryagin maximum principle and Hamilton-Jacobi theory applied to a number of standard optimal control problems; computational solution methods. PREREQ: ECE 550.

ECE 560. STOCHASTIC SIGNALS AND SYSTEMS (4). Stochastic processes, correlation functions, spectral analysis applicable to communication and control systems. PREREQ: ECE 461/ECE 561.

ECE 567. DIGITAL SIGNAL PROCESSING (3). Advanced methods in signal processing, optimum filter design, decimation and interpolation methods, quantization error effects, spectral estimation. PREREQ: ECE 464/ECE 564 and ECE 560.

ECE 568. DIGITAL IMAGE PROCESSING (3). Image processing, enhancement and restoration, encoding and segmentation methods. PREREQ: ECE 461/ECE 561 and ECE 464/ECE 564.

ECE 570. HIGH PERFORMANCE COMPUTER ARCHITECTURE (4). Advanced concepts in computer architecture. Performance improvement employing advanced pipelining and multiple instruction scheduling techniques. Issues in memory hierarchy and management. PREREQ: Graduate standing in ECE. CROSSLISTED as CS 570.

ECE 576. PARALLEL AND DISTRIBUTED ARCHITECTURES (4). In-depth study of advanced concepts in parallel and distributed architectures; analysis and modeling of vector supercomputers, SIMD and MIMD multiprocessor systems. Issues in interconnection networks, memory systems, and software support for parallelism. PREREQ: ECE 472/ECE 572 and ECE 570.

ECE 577. COMPUTER ARITHMETIC (3). Number systems; basic arithmetic operations; high-speed and area-efficient arithmetic algorithms and architectures; advanced topics in floating-point and residue arithmetic. PREREQ: Graduate standing. CROSSLISTED as CS 577.

ECE 580. NETWORK THEORY (4). Linear graphs, multiport networks, and other topics in advanced network theory. PREREQ: Graduate standing in ECE.

ECE 590. ANALYTICAL TECHNIQUES IN ELECTROMAGNETIC FIELDS (4). Basic analytical techniques required to solve meaningful field problems in engineering. PREREQ: Graduate standing in ECE.

ECE 591. ADVANCED ELECTROMAGNETICS (3). Advanced techniques for analyzing problems in electromagnetics, primarily numerical. PREREQ: ECE 590. Offered alternate years.

ECE 592. ADVANCED OPTOELECTRONICS (3). Principles of quantum exchange devices, field-material interaction and theory, and applications of optical circuits and devices. PREREQ: ECE 482/ECE 582 and ECE 590. Offered alternate years.

ECE 593. MICROWAVE CIRCUITS AND MEASUREMENTS (3). Theory and design of microwave circuits based on circuit models of active elements. PREREQ: ECE 590. Offered alternate years.

ECE 594. MICROWAVE DEVICES (3). Operating characteristics, limitations, and related theory of circuit elements and modeling techniques. PREREQ: ECE 590.

ECE 601. RESEARCH (TBA).

ECE 603. THESIS (TBA).

ECE 605. READING AND CONFERENCE (TBA).

ECE 606. PROJECTS (TBA).

ECE 607. SEMINAR (TBA).

ECE 619. SELECTED TOPICS IN SOLID STATE (3). Special courses taught on various topics in solid state as interests and demands vary.

ECE 647. ELECTRICAL ENERGY DEVICES II (3). Adjustable speed drives, associated power electronic converters, dynamic modeling control strategies. PREREQ: ECE 545, ECE 546.

ECE 649. SELECTED TOPICS IN ELECTROSYSTEMS (3). Course work to meet students' needs in advanced or specialized areas; design of high voltage transmission systems, power system analysis, machine analysis, instrumentation, and process control. PREREQ: Graduate standing in ECE.

ECE 650. NONLINEAR SYSTEM THEORY (3). Nonlinear dynamics and control, stability theory, limit cycles, Liapunov methods, Popov criterion and describing functions. PREREQ: ECE 550.

ECE 651. SYSTEM IDENTIFICATION (3). Statistical and deterministic methods for system identification for both parametric and nonparametric problems; solution methods derived as algorithms for computational use; practical applications. PREREQ: ECE 550 and ECE 560.

ECE 652. ADAPTIVE AND LEARNING SYSTEMS (3). Models for deterministic and stochastic systems. Parameter estimation, adaptive prediction and control of deterministic systems. Adaptive filtering, prediction, and control of stochastic systems. PREREQ: ECE 651.

ECE 653. STOCHASTIC FILTERING AND CONTROL (3). Discrete and continuous optimal filters developed for state estimation and prediction; introduction to stochastic control theory. Practical applications of separation principle. PREREQ: ECE 550 and ECE 560.

ECE 659. SELECTED TOPICS IN SYSTEMS AND CONTROL (3). Course work to meet students needs in advanced or specialized areas and to introduce the newest important results in systems and control. PREREQ: Graduate standing in ECE.

ECE 661. COMMUNICATION SYSTEMS—WAVE FORM COMMUNICATIONS (3). Modern "Shannon" communication theory. Basic receiver and transmitter models for discrete and continuous information; some implementations. PREREQ: ECE 560.

ECE 662. COMMUNICATION SYSTEMS—CODING AND INFORMATION THEORY (3). Various aspects of information theory, with particular emphasis on the coding process; data compression problems, and the development of rate distortion theory. PREREQ: ECE 462/ECE 562 and ECE 560.

ECE 669. SELECTED TOPICS IN COMMUNICATIONS AND SIGNAL PROCESSING (3). Course work to meet students needs in advanced or specialized areas and to introduce the newest important results in signal processing. PREREQ: Graduate standing in ECE.

ECE 678. PARALLEL COMPUTER ARCHITECTURES (3). Parallel computer architectures and algorithms, hypercubes, and other advanced methods. PREREQ: ECE 576.

ECE 679. SELECTED TOPICS IN COMPUTER ENGINEERING (3). Topics to be presented at various times include: information storage and retrieval, computer architecture, fault-tolerant computing, asynchronous sequential circuits, automata, data transmission, coding theory. PREREQ: Graduate standing in ECE.

ECE 681. NETWORK SYNTHESIS (3). Synthesis of specified driving point and transfer functions by using both passive and active networks. PREREQ: ECE 580.

ECE 699. ADVANCED TOPICS IN ELECTROMAGNETICS (3). Advanced studies in field and wave theories and special devices. Topic examples are microwave and acoustic devices, advanced lasers and masers, electron beam interactions with traveling waves, MHD device dynamics. PREREQ: Graduate standing in ECE.

ENGINEERING PHYSICS

Kenneth Krane, Director
Weniger Hall 301
Oregon State University
Corvallis, OR 97331-6507
(503) 737-4631

Undergraduate Major

Engineering Physics (B.S.)

The curriculum in engineering physics provides basic and advanced instruction in physics and mathematics and the techniques for applying this knowledge to engineering problems. It prepares students for engineering opportunities that have roots in fundamental results obtained from research in physics.

UNDERGRADUATE DEGREE PROGRAM

Students in engineering physics must complete a core curriculum of engineering science courses in addition to a rigorous curriculum of advanced courses in physics and mathematics. Flexible options permit a variety of advanced engineering analysis and design courses to be selected in the engineering discipline that most closely matches the students career objectives. Many engineering physics students take their advanced work in electrical or mechanical engineering, for example. This flexibility is one of the principal advantages of the engineering physics degree program.

A joint degree program permits students to earn two simultaneous B.S. degrees—an engineering physics degree through the College of Engineering and a physics degree through the College of Science.

CAREERS

Students with degrees in engineering physics find employment in a wide variety of technological fields—solid state devices and their applications, materials science, electronics, aerospace research and develop-

ment, lasers and optical sciences, computers, plasma physics, and fusion engineering. Students with engineering physics degrees can qualify to enter graduate programs at major U.S. universities in basic and applied physics, computer science, and a variety of engineering disciplines.

PREPARATION

Recommended high school preparation for students who plan to major in engineering physics includes one year each of chemistry and physics and four years of mathematics through analytic geometry. Mathematics preparation is especially important; students who are not ready to start calculus (MTH 251) upon entering may be delayed in their progress toward a degree. Transfer students are encouraged to contact the Department of Physics at the earliest possible time to discuss their placement in the course curricula.

ADVISING

Students in engineering physics enroll in the College of Engineering through the Department of Physics. Each undergraduate is assigned an adviser, who helps select the curriculum that will best prepare the student for his or her career goals. Minor variations in the degree requirements are often possible, but must be discussed with and approved by the adviser at the earliest possible stage of curriculum planning.

CURRICULUM

PRE-ENGINEERING PHYSICS

Freshman Year

MTH 251, MTH 252, MTH 253. Calculus (12)✥
CH 221, CH 222, CH 223. General Chem (15)✥
PH 101. Physics Orientation (1)✥
PH 211. General Physics with Calculus (4)✥
PH 211. Physics Recitation (1)✥
Biological science (4)[1]
Computer programming (4)✥
Fitness (3)[1]
Writing I (3)[1] ✥
Perspectives (3)[1]

Sophomore Year

MTH 254, MTH 255, MTH 256. Calculus and Differential Equations (12)✥
PH 212, PH 213. General Physics with Calc (8)✥
PH 212, PH 213. Physics Recitation (2)✥
PH 314. Introductory Modern Physics (4)✥
ENGR 201. Electrical Fundamentals (3)✥
ENGR 211. Statics (3)✥
ENGR 213. Strength of Materials (3)✥
Computer programming (4)✥
Perspectives (9)[1]
Writing II and III (6)[1]
TOTAL (104)

PROFESSIONAL ENGINEERING PHYSICS

Junior Year

PH 421, PH 422. Intermediate Mechanics (6)
PH 431, PH 432. Electromagnetic Theory (6)
PH 461, PH 462. Mathematical Physics (6)
Engineering science electives (7)
Engineering electives (10)
Physics elective (3)
Unrestricted electives (3)
Perspectives (6)[1]
Synthesis (3)[1]

Senior Year

PH 451. Quantum Physics (3)
PH 401. Research (1)
PH 403. Senior Thesis (2)
Synthesis (3)[1]
Engineering science electives (6)
Engineering electives (14)
Physics electives (6)
Unrestricted electives (15)
TOTAL (100)

ENGINEERING SCIENCE

Roy Rathja, Assistant Dean
Batcheller Hall 151
Oregon State University
Corvallis, OR 97331-2411
(503) 737-5236

Each engineering curriculum includes a number of courses that are appropriate for all engineering students. Because of their commonality, these are called engineering science courses.

Engineering sciences have their roots in mathematics and basic science and serve as a bridge between science and engineering. They involve the application of scientific methods to practical engineering situations and lead to solutions of problems that are fundamental in analysis, design, and synthesis.

COURSES

"Sophomore standing in engineering" refers to a student registered in an accepted program, who has completed 45 credits (with minimum grades of C), including MTH 251, MTH 252, plus three additional science or mathematics courses listed in an engineering curriculum. Many engineering courses require sophomore standing in engineering as a prerequisite.

Lower Division

ENGR 111. ENGINEERING ORIENTATION I (3). Engineering as a profession, historical development, ethics, curricula and engineering careers. Introduction to problem analysis and solution, data collection, accuracy and variability. PREREQ: College algebra and trigonometry. Lec/lab.

ENGR 112. ENGINEERING ORIENTATION II (3). Systematic approaches to engineering problem solving using computers. Logical analysis, flow charting, input/output design, introductory computer programming and use of engineering software. PREREQ: ENGR 111. Lec/lab.

ENGR 201. ELECTRICAL FUNDAMENTALS (3). Electric theory laws. Circuit analysis of dc circuits. Natural, step, and sinusoidal responses of circuits. Operational amplifier characteristics and applications. PREREQ: Sophomore standing in Engineering. Lec/lab.

ENGR 202. ELECTRICAL FUNDAMENTALS (3). Steady-state ac circuits—single and three-phase. Resonance, mutual inductance, operational amplifier applications. PREREQ: ENGR 201. Lec/lab.

ENGR 203. ELECTRICAL FUNDAMENTALS (3). Two-port networks, transfer functions, transient analysis. PREREQ: ENGR 201. Lec/lab.

ENGR 211. STATICS (3). Analysis of forces induced in structures and machines by various types of loading. PREREQ: Sophomore standing in engineering. Lec/lab

ENGR 212. DYNAMICS (3). Kinematics, Newtons laws of motion, and work-energy and impulse-momentum relationships applied to engineering systems. PREREQ: ENGR 211; PH 211; sophomore standing in engineering. Lec/lab.

ENGR 213. STRENGTH OF MATERIALS (3). Properties of structural materials; analysis of stress and deformation in axially loaded members, circular shafts, and beams, and in statically indeterminate systems containing these components. PREREQ: ENGR 211; sophomore standing in engineering. Lec/lab.

ENGR 245. ENGINEERING GRAPHICS AND DESIGN (3). Graphic communication, multiview and pictorial representation, conceptual design, spatial analysis, engineering designs; graphical analysis and solutions; industrial procedures; introduction to design theory, and computer-aided drafting. PREREQ: Sophomore standing in engineering. Lec/lab.

Upper Division

ENGR 311. THERMODYNAMICS (3). Laws of thermodynamics, closed and open (control volume) systems; thermodynamic properties cycles. Lec.

ENGR 312. THERMODYNAMICS (4). Applications: Machine and cycle processes, thermodynamic relations, non-reactive gas mixtures, reactive mixtures, thermodynamics of compressible fluid flow. Must be taken in order. PREREQ: MTH 256; CH 203 for ENGR 311. Lec/rec.

ENGR 321. MATERIALS SCIENCE (3). Structure and properties of metals, ceramics and organic materials; control of structure during processing and structural modification by service environment. PREREQ: CH 203. Lec.

ENGR 322. MECHANICAL PROPERTIES OF MATERIALS (4). Mechanical behavior of materials, relating laboratory test results to material structure, and elements of mechanical analysis. PREREQ: ENGR 213, ENGR 321. Lec/lab.

ENGR 331. MOMENTUM, ENERGY, AND MASS TRANSFER (4). A unified treatment using control volume and differential analysis of: fluid flow, momentum transfer, conductive, convective and radiative energy transfer, binary mass transfer and prediction of transport properties. PREREQ: MTH 256; ENGR 212. COREQ: ENGR 311. Must be taken in order. Credit for both ENGR 331 and CE 311 not permitted. Lec/rec.

ENGR 332. MOMENTUM, ENERGY, AND MASS TRANSFER (4). A unified treatment using control volume and differential analysis of: fluid flow, momentum transfer, conductive, convective and radiative energy transfer, binary mass transfer and prediction of transport properties. PREREQ: MTH 256; ENGR 212. COREQ: ENGR 311. Must be taken in order. Lec/rec.

ENGR 333. MOMENTUM, ENERGY, AND MASS TRANSFER (3). A unified treatment using control volume and differential analysis of: fluid flow, momentum transfer, conductive, convective and radiative energy transfer, binary mass transfer and prediction of transport properties. PREREQ: MTH 256; ENGR 212. COREQ: ENGR 311. Must be taken in order. Lec/rec.

ENGR 390. ENGINEERING ECONOMY (3). Time value of money; economic study techniques, depreciation, taxes, retirement, and replacement of engineering facilities. PREREQ: Sophomore standing in Engineering.

ENGR 407. SEMINAR (1-16). Graded P.

ENGR 485/ENGR 585. COMPREHENSIVE LITERATURE SEARCHING IN ENGINEERING AND SCIENCE (1). An introduction to the use of engineering and science indexes and abstracts, including on-line database searching. database searching.

ENGR 490/ENGR 590. ENGINEERING ECONOMIC ANALYSIS (3). Advanced techniques in engineering economy featuring capital budgeting, cost estimating, tax considerations, evaluation of public activities, cost effectiveness, risk and uncertainty model and project comparison methods. PREREQ: ENGR 390 and introductory statistics.

FOREST ENGINEERING

See College of Forestry. Also see College of Forestry for information on the Civil Engineering-Forest Engineering program.

GENERAL ENGINEERING

The freshman year of the general engineering curriculum meets the requirements of all other engineering curricula except chemical engineering and engineering physics, which require a different chemistry sequence. Students who have not decided upon a major are encouraged to register in general engineering during their pre-professional studies. Advising will be through the Department of Industrial and Manufacturing Engineering.

CURRICULUM

The pre-general engineering curriculum below will prepare students to enter many of the engineering departmental programs. Students may transfer into another program any time during the first year; they must transfer by the end of the year.

PRE-GENERAL ENGINEERING
(one-year program)
Freshman Year

ENGR 111, ENGR 112✥. Engr Orientation I,II (6)
MTH 251, MTH 252. Diff and Integral Calc (8)✥
MTH 253. Infinite Series and Sequences (4)✥
CH 201✥, CH 202, CH 203. General Chem (9)
WR 121. English Composition (3)✥
COMM 111 or COMM 114. Speech (3)✥
PH 211. General Physics (4)✥
Perspectives (9)[1]
HHP 231. Lifetime Fitness (3)[1]
Elective (2)

GEOLOGICAL ENGINEERING

A cooperative program with the University of Idaho. See head adviser, College of Engineering, for information.

INDUSTRIAL AND MANUFACTURING ENGINEERING

E.A.C./A.B.E.T. Accredited

Sabah U. Randhawa, Acting Head
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Oregon State University
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Faculty
Associate Professors Fichter☆, Logendran, McDowell, Olsen☆, Randhawa, West☆; *Assistant Professors* K. Beaumariage, T. Beaumariage, Burhanuddin, Funk; *Instructors* Beck, Brings, Shea

Undergraduate Major

Industrial Engineering (B.S.)
Option
Manufacturing Engineering (B.S.)

Graduate Major

Industrial Engineering (M.S., Ph.D.)
Graduate Areas of Concentration
Computer-Integrated Manufacturing
Engineering Economics
Human Factors
Manufacturing Systems
Operations Research and Management Science
Production Planning and Control
Quality Assurance and Reliability
Systems Engineering
Systems Simulation

The industrial and manufacturing engineering curricula is designed to develop engineering ability and management skills which prepare students for challenging and responsible careers. This people-oriented and cost-conscious preparation is widely applicable in industrial, service, commercial, and government activities.

The department offers two professional industrial engineering programs. The four-year, standard program provides courses in all of the traditional areas of industrial and manufacturing engineering: operations research, information systems, work design, human engineering, systems analysis, quality control, facilities planning, production control, computer-integrated manufacturing, robotics, and engineering management. In addition, students may utilize restricted electives to gain added expertise in special areas such as statistics, computer science, or business.

The five-year manufacturing engineering co-op program is directed toward careers in manufacturing. It includes two internships with cooperating industries in the Northwest and allows students to gain practical experience. The internships are coordinated with University classes and are a requirement for graduation. The co-op program is similar to the standard industrial engineering curriculum, but includes several manufacturing-oriented courses.

CURRICULUM

PRE-INDUSTRIAL ENGINEERING
Freshman Year

ENGR 111. Engineering Orientation I (3)
ENGR 112. Engineering Orientation II (3)✥
MTH 251, MTH 252. Differential Calculus (8)✥
MTH 253. Infinite Series (4)✥
CH 201✥, 202. General Chemistry (6)
PH 211. General Physics (4)✥
Writing 121, English composition (3)[1]✥
COMM 111. Public Speaking (3)[1]✥ or COMM 115. Argument and Critical Discourse (3)[1]✥
Perspectives (9)[1]
HHP 231. (3)[1]
Free elective (4)

Sophomore Year

IE 251. Industrial Statistical Modeling (3)
IE 341. Work Design, Measurement and Human Factors (4)
ENGR 201. Electrical Fundamentals (3)✥
ENGR 211✥, ENGR 212✥, ENGR 213. Mechanics of Materials (9)
ENGR 245. Engr Graphics and Design (3)
PH 212✥, PH 213✥. General Physics (8)
MTH 254. Vector Calculus I (4)✥
MTH 256. Applied Differential Equations (4)✥
BA 215. Fundamentals of Accounting (4)
WR 327. Technical Report Writing (3)
Biological science elective (4)[1]
Perspectives (3)[1]
TOTAL (102)

PROFESSIONAL INDUSTRIAL ENGINEERING
Junior Year

IE 335. Materials and Processes in Mfg (3)
IE 336. Industrial Mfg Ops and Systems (3)
IE 351. Quality and Reliability Control (4)
IE 352. Industrial Process Analysis (3)
IE 362, IE 363. Production Plng & Control I, II (6)
IE 365. Materials Handling & Facility Design (3)
ENGR 311. Thermodynamics (3)
ENGR 321. Materials Science (3)
ENGR 331. Momtm, Energy & Mass Trans (4)
ENGR 390. Engineering Economy (3)
Engineering science electives (7)
Restricted IME electives (3)
MTH 341. Linear Algebra (3)
Perspectives (3)[1]

Senior Year

IE 413. Computer Simulation for Indstrl Apps (3)
IE 414. Industrial Data Systems (3)
IE 481, IE 482, IE 483. Industrial Systems Optimization I, II, III (9)
IE 497, IE 498. Indus Engr Analysis & Design (6)

Restricted electives (15)
Engineering science elective (3)
Perspectives (3)[1]
Synthesis (6)[1]
Free Elective (3)
TOTAL (102)

PROFESSIONAL INDUSTRIAL ENGINEERING (MANUFACTURING ENGINEERING)

Junior Year

IE 335. Materials and Processes in Mfg (3)
IE 336. Industrial Mfg Opers and Systems (3)
IE 351. Quality and Reliability Control (4)
IE 352. Industrial Process Analysis (3)
IE 362, IE 363. Product Plng & Control I, II (6)
IE 365. Materials Handling & Fac Design (3)
IE 407A. Manufacturing Engineering Sem (1)
ENGR 331. Momtm, Energy and Mass Trans (4)
ENGR 390. Engineering Economy (3)
MTH 341. Linear Algebra (3)
Internship (0)

First Senior Year

IE 413. Comp Simulation for Indust Apps (3)
IE 414. Industrial Data Systems (3)
IE 431, IE 432 Comp Aided Mfg I, II (6)
IE 434. Mfg Tooling and Product Design (3)
IE 407B. Manufacturing Engineering Sem (1)
ENGR 311. Thermodynamics (3)
ENGR 321. Materials Science (3)
Engineering science elective (4)
Restricted elective (6)
Perspectives (3)[1]
Internship (0)

Second Senior Year

IE 481, IE 482. Indust Sys Optimiz I, II (6)
IE 496. Mfg Engr Analysis and Design (3)
Restricted electives (10)
Engineering science elective (3)
Perspectives (3)[1]
Synthesis (6)[1]
Free elective (3)
TOTAL (102)

COURSES

Lower Division

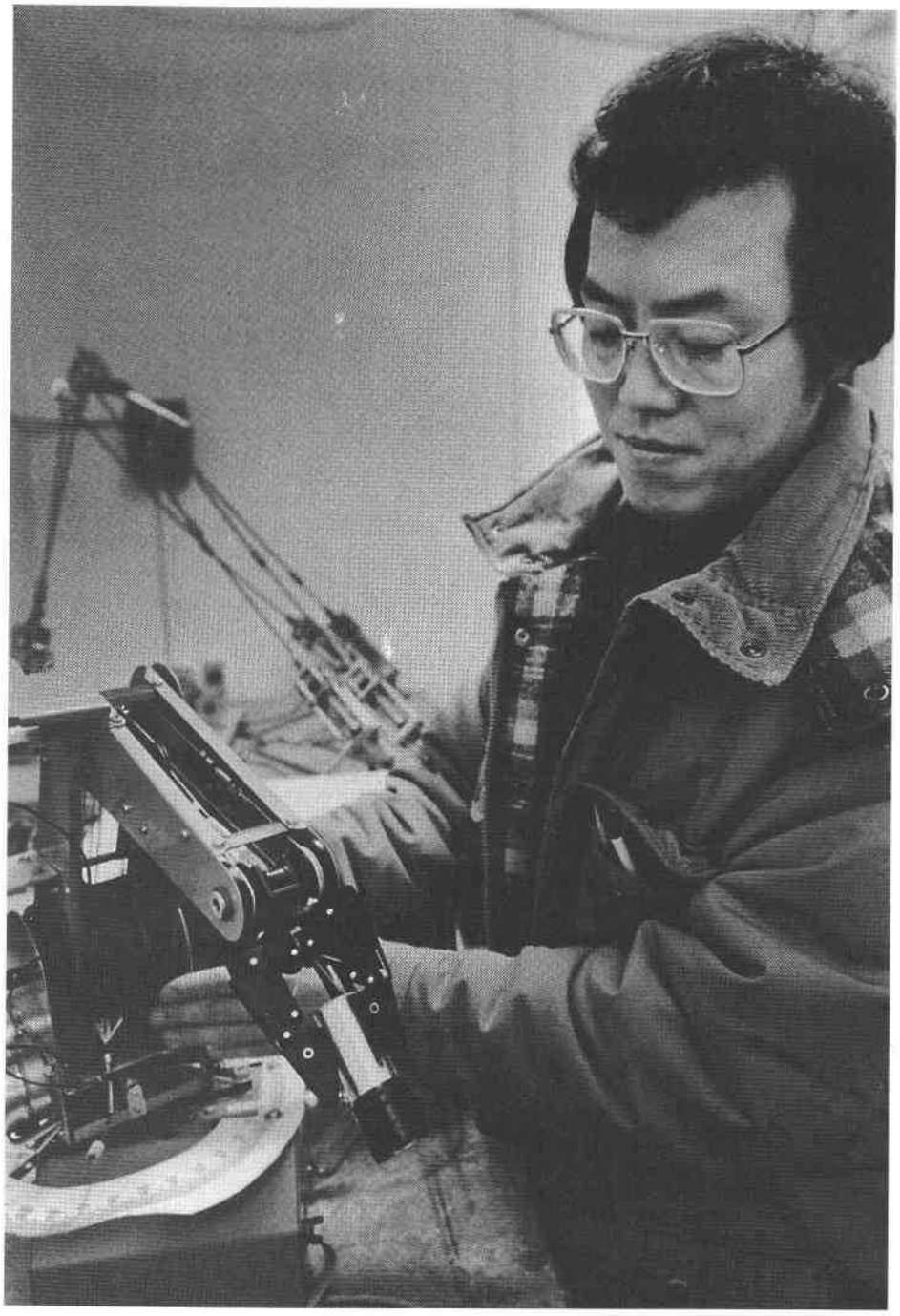
IE 251. INDUSTRIAL STATISTICAL MODELING (3). Probability and statistical models for engineering with applications to quality control, reliability, project management, and random processes. PREREQ: MTH 251.

Upper Division

IE 335. MATERIALS AND PROCESSES IN MANUFACTURING (3). Methods of processing various raw materials into finished products. Materials include metals, plastics, ceramics and composites. Processes include machining, casting, forming, joining and nontraditional methods. Emphasis is placed on the relationship of materials and process on the design and manufacture of finished products. PREREQ: ENGR 245.

IE 336. INDUSTRIAL MANUFACTURING OPERATIONS AND SYSTEMS (3). Analysis of industrial manufacturing operations and manufacturing systems. Design of multistage manufacturing systems, equipment selection, integration of manufacturing cells, automation and control. PREREQ: IE 335.

IE 341. WORK DESIGN, MEASUREMENT AND HUMAN FACTORS (4). Theory and application, work design and measurement, principles of motion economy, time standards. Human factors consideration in workplace design. PREREQ: IE 251.



IE 351. QUALITY AND RELIABILITY CONTROL (4). Control of quality through the use of statistical analysis; typical control techniques and underlying theory. Development of reliability models and procedures for product assurance. PREREQ: IE 251.

IE 352. INDUSTRIAL PROCESS ANALYSIS (3). Systematic analysis of industrial manufacturing processes through the use of statistical analysis, methods, procedures, and application of statistical techniques including use of classic process analysis techniques, evolutionary operation and response surface methodologies. PREREQ: IE 351.

IE 362. PRODUCTION PLANNING AND CONTROL I (3). Forecasting techniques; network and other scheduling methods; routing, dispatching, and inspecting; machine assignment and maintenance; material and process control. PREREQ: IE 251.

IE 363. PRODUCTION PLANNING AND CONTROL II (3). Line balancing, inventory analysis, production systems analysis, master production scheduling, materials requirement planning. PREREQ: IE 362.

IE 365. MATERIAL HANDLING AND FACILITY DESIGN (3). Selection of material handling equipment, its application, coordination, and effect on plant layout in industrial situations; location and arrangement of facilities; design of warehouse facilities. PREREQ: IE 245, IE 362, ENGR 390.Lec/lab.

IE 405. READING AND CONFERENCE (1-16).

IE 406. PROJECTS (1-16).

IE 407. SEMINAR (1-16).

IE 413/IE 513. COMPUTER SIMULATION MODELS FOR INDUSTRIAL APPLICATIONS (3). Principles of Monte Carlo simulation using digital computer models; discrete-event models, with applications to management and engineering. PREREQ: IE 251 or knowledge of descriptive statistics; ENGR 112 or computer experience.

IE 414/IE 514. INDUSTRIAL DATA SYSTEMS (3). Principles of microprocessors and data processing systems; microcomputer hardware, software, and application to management and engineering. PREREQ: ENGR 112 or programming experience.

IE 416/IE 516. ARTIFICIAL INTELLIGENCE SYSTEMS FOR ENGINEERING (3). Concepts of symbolic problem solving, knowledge representation, and inference applied to problems in engineering analysis and design. Artificial Intelligence programming. PREREQ: IE 414 and senior or graduate standing in engineering.

IE 417/IE 517. KNOWLEDGE-BASED SYSTEM DESIGN (3). Knowledge-based systems and their application to engineering analysis and design. Knowledge engineering. Knowledge engineering tools. Development of knowledge-based engineering systems. PREREQ: IE 416.

IE 418/IE 518. ENGINEERING SYSTEMS INTEGRATION (3). Conceptualization and design of complex human-machine systems. Systems thinking. Rapid prototyping and structured design tools. Project and team management. PREREQ: IE 417, 441, 483.

IE 419/IE 519. SIMULATION IN CIM PLANNING AND DESIGN (3). Analysis and design of integrated manufacturing systems through the application of discrete and continuous modeling techniques. Development of CIM decision support systems utilizing animated simulation. PREREQ: IE 413.

IE 431/IE 531. COMPUTER-AIDED MANUFACTURING I (3). Computers as control devices in manufacturing. Topics include programming languages, interfaces, sensors, actuators, and control theory. Emphasis on applications to design of manufacturing control systems. PREREQ: ENGR 112.

IE 432/IE 532. COMPUTER-AIDED MANUFACTURING II (3). Computer controlled manufacturing machines. Topics include industrial vision systems, numerical control programming, robot programming, and factory floor communication. Emphasis on applications to design of manufacturing systems. PREREQ: IE 431.

IE 434/IE 534. MANUFACTURING TOOLING AND PRODUCT DESIGN (3). Analysis and design fundamentals of tooling for economical production. Forces and material properties in relation to the locational, positional, and securing requirements of cutting, forming, and fabrication operations. PREREQ: IE 335.

IE 435/IE 535. DESIGN OF INDUSTRIAL ROBOTIC SYSTEMS (3). Industrial robots in manufacturing systems. Topics include mechanics, control, programming, end-of-arm tooling, selection, safety, and system integration. Emphasis on industrial robot design and its impact on manufacturing system design. PREREQ: IE 431.

IE 438/IE 538. INDUSTRIAL PROCESS CONTROL (3). The optimal control of industrial feedback processes, including modeling feedback process, transformations, stability and optimization in the presence of noise. PREREQ: IE 251 or equivalent statistical material, MTH 256.

IE 441/IE 541. HUMAN FACTORS ENGINEERING I (3). Human sensory, motor, and information processing capabilities and their relationship to the design of workplaces and human-machine systems. Human errors and reliability. Experimental methods in human factors engineering. PREREQ: IE 341, IE 251 or equivalent statistical material.

IE 442/IE 542. HUMAN FACTORS ENGINEERING II (3). Mathematical models of human-machine systems. Principles of human-computer interaction. Design of advanced human-machine systems. PREREQ: IE 441.

IE 444/IE 544. INDUSTRIAL SAFETY (3). History, legislation, and organization of safety management; accident costs, causes, and prevention; role of environmental hazards and workplace design in industrial safety. PREREQ: IE 251 or ST 314.

IE 450/IE 550. TOTAL QUALITY MANAGEMENT (3). Principles of TQM. Vision/value statements and the management feedback process in TQM. Super and subordinate goals and the 10 step TQM problem solving process. Juran's trilogy and Deming's 14 principles. Team formation, team building, and motivation. The Malcom Baldridge award. ISO 9000. PREREQ: Senior standing.

IE 451/IE 551. ANALYSIS AND DESIGN OF QUALITY ASSURANCE SYSTEMS (3). Systematic analysis of industrial processes through the application of statistical techniques. Analysis of product quality and design of quality improvement programs; development of reliability models. PREREQ: STAT 314. Not available for students with baccalaureate degrees in industrial engineering.

IE 452/IE 552. INDUSTRIAL SYSTEMS ANALYSIS I (3). Techniques for the statistical analysis and design of industrial control systems. Emphasis on the use of advanced mathematical models and techniques for the control and enhancement of industrial productivity. Applications include, but are not limited to, the estimation and control of process fallout and rework. PREREQ: IE 351 or IE 451.

IE 453/IE 553. INDUSTRIAL SYSTEMS ANALYSIS II (3). Techniques for the analysis of relationships between factors in industrial and human-machine systems. Emphasis on the interpretation of computer simulation results, human-machine interactions and industrial process yields. PREREQ: IE 452.

IE 456/IE 556. RELIABILITY (3). Reliability measures, hazard functions, probabilistic design, static reliability models, dynamic reliability models, reliability testing and sequential life testing. PREREQ: IE 351 or IE 451.

IE 465/IE 565. FACILITY LAYOUT AND LOCATION ANALYSIS (3). Analytic modeling of facility layout and location problems, including single- and multiple-facility location problems with Manhattan and Euclidian distance norms, warehouse layout, quadratic location problems, and allocation location problems. PREREQ: IE 481.

IE 481/IE 581. INDUSTRIAL SYSTEMS OPTIMIZATION I (3). Techniques of analysis and solution of problems in industrial and management systems. Emphasis on application of linear and integer programming and extensions. PREREQ: IE 251, MTH 341.

IE 482/IE 582. INDUSTRIAL SYSTEMS OPTIMIZATION II (3). Techniques of analysis and solution of problems in industrial and management systems. Emphasis on application of dynamic programming, Markovian processes, queueing, and general optimization as applied to industrial problems. PREREQ: IE 481. Lec/rec.

IE 483/IE 583. INDUSTRIAL SYSTEMS OPTIMIZATION III (3). Techniques for analysis and solution of problems in industrial and management systems. Emphasis on general nonlinear optimization and solution of complex systems using multiple objective techniques. PREREQ: IE 482/IE 582. Lec/rec.

IE 491/IE 591, IE 492/IE 592, IE 493/IE 593. SELECTED TOPICS IN SYSTEMS STUDIES (3). Recent advances in industrial engineering pertaining to the theory and application of system studies. analysis and design of natural resource systems; evaluation; detection extraction; processing and marketing systems; advanced design of production systems with reference to social, economic, and regional planning; human engineering studies of man-machine systems; applications of operations research techniques. Nonsequence course. Not offered each term.

IE 494/IE 595. ENGINEERING MANAGEMENT (3). Functions and techniques of management as they apply to the engineering environment. Special emphasis on the engineers transition to management and productivity improvement. PREREQ: Senior standing.

IE 495/IE 595. INDUSTRIAL DECISION MAKING (3). Multicriteria-multiobjective decision making; evaluation of existing and proposed industrial systems, cost and value of information, utility measurement, multiobjective programming and multidimensional risk analysis. PREREQ: ENGR 390, and basic statistical knowledge.

IE 496. MANUFACTURING ENGINEERING ANALYSIS AND DESIGN (3). Product function analysis, design of products and manufacturing processes, selection of equipment, control of process quality and manufacturing systems design. PREREQ: Senior standing in Industrial (Manufacturing) Engineering; IE 352, IE 362, IE 432, ENGR 390. Lec/rec.

IE 497. INDUSTRIAL ENGINEERING ANALYSIS AND DESIGN (3). Product design; selection and replacement of major tools, processes, and equipment; paperwork controls; subsystem revision; system or plant revision; selection and training of personnel; long-run policies and strategy. PREREQ: Senior standing in Industrial Engineering; IE 352, 363, 365, ENGR 390.

IE 498. INDUSTRIAL ENGINEERING ANALYSIS AND DESIGN (3). Product design; selection and replacement of major tools, processes, and equipment; paperwork controls; subsystem revision; system or plant revision; selection and training of personnel; long-run policies and strategy. PREREQ: Senior standing in Industrial Engineering; IE 352, 363, 365, ENGR 390.

Graduate

IE 503. THESIS (1-16).

IE 505. READING AND CONFERENCE (1-16).

IE 506. PROJECTS (1-16).

IE 507. SEMINAR (1-16).

IE 561. MANUFACTURING SYSTEMS DESIGN I (3). New product life (NPI) cycle, management of the NPI cycle, design for manufacturing, concurrent engineering, manufacturing strategies, degree of automation, flexible automation, economics of automation, implementation, and global competition. PREREQ: ST 314 or equivalent, computer programming experience.

IE 562. MANUFACTURING SYSTEMS DESIGN II (3). Manufacturing systems analysis, aggregate production planning, master scheduling, MRP/CRP/JIT, scheduling, line balancing, information and decision support systems for manufacturing. PREREQ: ST 314 or equivalent, computer programming experience.

IE 563. MANUFACTURING SYSTEMS DESIGN III (3). Implementing change in manufacturing systems, management of manufacturing projects and products; resource-constrained project scheduling. PREREQ: ST 314 or equivalent, computer programming experience.

IE 603. THESIS (1-16).

IE 605. READING AND CONFERENCE (1-16).

IE 606. PROJECTS (1-16).

IE 607. SEMINAR (1-16).

MECHANICAL ENGINEERING

E.A.C./A.B.E.T Accredited

Gordon M. Reistad, Head
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Corvallis, OR 97331-6001
(503) 737-3441

Faculty

Professors Bushnell☆, Calder☆, Davis☆, Kanury, Kassner, Kennedy☆, Reistad☆, Reiter, Smith, Ullman☆, Welty☆, Wilson☆; *Associate Professors* Peterson, Philbrick, Warnes☆, Wheeler, Wolff; *Assistant Professors* Baker, Bergstrom☆, Paasch, Pattee, Spiewak, Walker, Zaworski☆

Undergraduate Major

Mechanical Engineering (B.S.)

Graduate Majors

Mechanical Engineering (M.S., Ph.D.)
Graduate Areas of Concentration
Applied Mechanics
Applied Thermodynamics
Combustion
Design
Dynamics
Energy
Fluid Mechanics
Heat Transfer
Materials Science
Mechanical Engineering
Physical and Mechanical Metallurgy
Solid Mechanics
Stress Analysis
Systems and Control

Materials Science (M.S.)
Graduate Area of Concentration
Materials Science

Mechanical engineers use the principles of science, together with mathematics, to design and develop equipment and processes for society. Mechanical engineers play major roles in the design, testing and operation of machines, including processes for energy conversion and equipment used in transportation and manufacturing. The mechanical engineering curriculum is broad in scope with course work and project activities in several areas. By proper choice of electives, students may achieve a degree of specialization and depth. The areas include applied stress analysis; design and analysis of mechanical and thermal/fluid systems; concurrent engineering, dynamics of physical systems; heating, ventilating, and air conditioning; heat transfer; fluid dynamics; metallurgy and materials; and power plant design. Digital computers are used extensively in departmental courses.

Mechanical engineers often begin their professional careers with machinery industries, petroleum industries, government agencies, and firms producing transportation and energy conversion equipment. Because of increasing complexity of mechanical systems, graduate study for the M.S. and Ph.D. degrees is advisable for students who wish to specialize in depth in any of the above areas. The undergraduate curriculum provides an excellent foundation for graduate study.

CURRICULUM

PRE-MECHANICAL ENGINEERING

Freshman Year
ME 101. Intro to Mechanical Engr (3)
Advanced Level Programming, Fortran, Pascal, or C; ME 102 or similar. (3)✥
CH 201✥, CH 202. General Chem (6)
MTH 251, MTH 252, MTH 253. Calculus (12)✥
PH 211. General Physics with Calculus (4)✥
WR 121. English Composition (3)✥
HHP 231. Fitness (3)[1]
Perspectives (9)[1]
Free Elective (3)
COMM 111. Public Speaking (3)[1]✥

Sophomore Year
MTH 254. Vector Calculus I (4)✥
MTH 256. Applied Differential Equations (4)✥
PH 212, PH 213. Gen Phys with Calculus (8)✥
ENGR 211✥, ENGR 212✥, ENGR 213. Statics, Dynam, and Mechanics of Materials (9)
ENGR 201✥, ENGR 202. Elec Fundamentals (6)
ST 314. Principles of Statistics/Phy Sci (3)[5]
Biological science (4)[1]
IE 335. Materials & Processes in Mfg (3)[5]
ENGR 245. Engr Graphics and Design (3)
WR 327. Tech Writing (3)
Perspectives (3)[1]
TOTAL (99)

PROFESSIONAL MECHANICAL ENGINEERING

Junior Year
ME 316. Mechanics of Materials (3)
ME 317. Dynamics (3)
ENGR 311. Thermodynamics (3)
ENGR 312. Thermodynamic Application (4)
ENGR 331, ENGR 332. Momentum, Energy and Mass Transfer (8)
ENGR 321. Materials Science (3)
ENGR 322. Mech Properties of Materials (4)
ME 382. Introduction to Design (4)
ME 383. Mechanical Component Design (4)
ME 350. Instrument Laboratory (1)
ENGR 390. Engineering Economy (3)
Free electives (5)
ME 373. Numerical Methods in Mech Engr (3)

Senior Year
Perspectives (6)[1]
Synthesis (6)[1]
ME 351. Mechanical Laboratory (4)
ME 441. Thermal/Fluid System Design (3)
ME 430. System Dynam & Control (3)
ME 418, ME 419. Senior Design Project (4)
Approved laboratory course (3)
ME 407. Seminar (1)
ME 417. Project Seminar (1)
Restricted ME design electives (6)
Restricted ME analysis electives (9)
Free electives (7)
TOTAL (105)

COURSES

Lower Division

ME 101, ME 102. INTRODUCTION TO MECHANICAL ENGINEERING (3,3). Orientation to mechanical engineering: methods used in solving engineering problems; computer programming; experience with typical mechanical engineering projects and problems. Must be taken in order. PREREQ: Trigonometry.

ME 206. PROJECTS (1-16). (Sophomore).

Upper Division

ME 306. PROJECTS (1-16). (Junior).

ME 316. MECHANICS OF MATERIALS (3). Determination of stresses, deflections, and stability of deformable bodies, including matrix structural analysis. PREREQ: ENGR 213, MTH 256.

ME 317. DYNAMICS (3). Continuation of the study of kinematics and kinetics of particles and rigid bodies, with applications to mechanical systems of current interest to engineers. PREREQ: ENGR 212, MTH 256.

ME 350. INSTRUMENT LABORATORY (1). Graded P. Function, operation, and application of common mechanical engineering instruments, measurement principles, statistical analysis. PREREQ: ENGR 202.

ME 351. ^MECHANICAL LABORATORY (4). Selection, calibration, and application of instruments. Hands-on testing of machines and processes. Analysis of tests and preparation of engineering reports. PREREQ: ENGR 312, ENGR 332, ME 316, ME 350. (Writing Intensive Course)

ME 373. NUMERICAL METHODS IN MECHANICAL ENGINEERING (3). Solutions to mechanical engineering problems using digital computers. Numerical modeling and formulation of representative engineering problems suitable for computer solutions. PREREQ: MTH 256, ME 102.

ME 382. INTRODUCTION TO DESIGN (4). Organization, planning, economics, and the use of creativity and optimization in solving mechanical design problems. Case studies and/or industrial design problems. PREREQ: ENGR 245, IE 335. COREQ: ME 316.

ME 383. MECHANICAL COMPONENT DESIGN (4). Design of machine elements and power transmission components. PREREQ: ME 382.

ME 401. RESEARCH (1-16). Repeat 3 times 9 credits.

ME 405. READING AND CONFERENCE (1-16). Repeat 3 times 9 credits.

ME 406. PROJECTS (1-16). Repeat 5 times 15 credits

ME 407. SEMINAR (1-16). Senior Seminar; Repeat 2 times 2 credits.

ME 412/ME 512. KINEMATIC DESIGN OF LINKAGES (3). Freedom and constraint in mechanical systems. Methods of planar linkage analysis and synthesis. Introduction to spatial linkage analysis and synthesis. PREREQ: ME 317, ME 383.

ME 413/ME 513. COMPUTER-AIDED DESIGN (3). Study of Computer-Aided Design (CAD) tools (hardware/software) and their applications to mechanical systems design. Design projects involving the application of CAD constitutes a major portion of the course. PREREQ: ME 373, ME 383.

ME 414/ME 514. SMART PRODUCTS DESIGN (3). Microprocessor applications for mechanical engineers. Design of electromechanical products which incorporate microprocessor technology. PREREQ: ME 373, ME 430.

ME 415/ME 515. DESIGN OF ROBOT MANIPULATORS (3). Kinematics, dynamics, and trajectory planning, and the design of serial connected and parallel connected robot manipulators. PREREQ: ME 317, ME 383.

ME 417. SENIOR PROJECT SEMINAR (1). Oral presentations of senior projects. PREREQ: ME 419.

ME 418. SENIOR PROJECT (1). Planning for Senior Project. COREQ: ME 351, ME 382.

ME 419. SENIOR PROJECT (3). An investigation carried out under the supervision of a faculty member. Project may contain experimental, analytical, or computer work but must be design. A formal written report is required. PREREQ: ME 418, ME 351, ME 373, ME 383.

ME 420/ME 520. APPLIED STRESS ANALYSIS (3). Elasticity theory, failure theories, plasticity, energy methods, finite element analysis, plate and shell structures. PREREQ: ME 316.

ME 421/ME 521. APPLIED STRESS ANALYSIS (3). Elasticity theory, failure theories, plasticity, energy methods, finite element analysis, plate and shell structures. PREREQ: ME 316.

ME 422/ME 522. MECHANICAL VIBRATIONS (3). Dynamic response of single and multiple degree-of-freedom systems to periodic and nonperiodic loading. PREREQ: ME 317.

ME 430. SYSTEMS DYNAMICS AND CONTROL (3). Modelling, analysis and control of linear continuous systems; stability, design, compensation. Fundamentals of nonlinear and digital systems. PREREQ: ME 317, ME 373, ME 383.

ME 431/ME 531. CONTROL SYSTEMS (3). State-space methods for linear systems. Analysis; transition matrix, controllability, observability, stability. Control; pole placement, optimal control. Elements of digital control. PREREQ: ME 430. Lec/lab.

ME 440/ME 540. TURBOMACHINERY DESIGN (3). Design processes in turbomachinery, vector diagrams, blade forms, and heat exchanger configurations. Thermofluid design of pumps, gas, steam and hydraulic turbines. PREREQ: ENGR 332, ENGR 312, ME 373.

ME 441. THERMAL/FLUID SYSTEM DESIGN (3). Fluid system components, including pumps, fans, turbines, compressors, heat exchangers, piping, and ducting systems. Students design systems integrating these components. Project work with written and oral reports. PREREQ: ENGR 332, ME 373. Lec/lab.

ME 442. THERMAL MANAGEMENT IN ELECTRONIC SYSTEMS (3). Intermediate heat transfer course focusing on the problem of cooling electronic components, microprocessors, printed circuit boards, and large electronic structures such as computers where a more integrated thermal management approach must be taken. A finite element heat transfer package is introduced as an analysis tool for the course. PREREQ: ENGR 332. Lec.

ME 443/ME 543. HEATING AND AIR-CONDITIONING (3). Heating, ventilating and air-conditioning of buildings for human comfort or industrial processes; design, selection, construction, and operation of air-conditioning equipment, including warm air, steam, hot water, and refrigeration systems. PREREQ: ME 441. Lec/lab.

ME 444/ME 544. POWER PLANT ENGINEERING (3). Fuels and combustion equipment, steam generators and auxiliaries, and power generation equipment including combustion engines, gas turbines, hydroelectric and nuclear power plants. Economics of design and operation. PREREQ: ME 441. Lec/rec.

ME 445/ME 545. INTRODUCTION TO COMBUSTION (3). Study of combustion science based on the background of chemistry, thermodynamics, fluid mechanics and heat transfer. Stoichiometry, energetics of chemical reactions, flame temperature, equilibrium product analyses, chemical kinetics, and chain reactions. PREREQ: ENGR 313, ENGR 332.

ME 452/ME 552. INSTRUMENTATION (3). The emphasis of the course is on dynamic measurements. Major elements of measurement systems are covered. These include transducers, and devices for signal conditioning, recording, storing and displaying (including digital data acquisition systems). PREREQ: ME 351, ME 430. Lec/lab.

ME 453/ME 553. EXPERIMENTAL MECHANICS (3). Stress analysis by strain measurement. Mechanical, optical, and electrical strain gages; brittle coating techniques; strain gage instrumentation; piezoelectric, capacitive, and inductive transducers; stress analysis by X-ray diffraction. PREREQ: ME 316, ME 317, ME 351. Lec/lab.

ME 460/ME 560. INTERMEDIATE FLUID MECHANICS (3). Ideal fluid flow including potential flow theory. Computer solutions in ideal fluid flow. Viscous flow and boundary layer theory. Introduction to turbulence. PREREQ: ENGR 331, ME 373.

ME 461/ME 561. GAS DYNAMICS (3). Dynamics and thermodynamics of compressible fluid flow. One-dimensional isentropic flow, nozzles, diffusers, normal and oblique shocks. Flow with friction and heating. Two-dimensional Prandtl-Meyer flow and method of characteristics. Computer solutions to general gas dynamic flow. PREREQ: ME 312, ME 373, ENGR 331.

ME 462/ME 562. AERODYNAMICS (3). Theories of flow of perfect, compressible, and viscous fluids; application of these theories to aerodynamic designs. PREREQ: ENGR 331, ME 373. Must be taken in order.

ME 470/ME 570, ME 471/ME 571, ME 472/ME 572. MECHANICAL ENGINEERING ANALYSIS (3). Problems solved by use of advanced mathematical methods. PREREQ: MTH 256, ME 373. Must be taken in order.

ME 480/ME 580. MATERIALS SELECTION (3). Selecting materials for engineering applications. The major families of materials, their properties, and how their properties are controlled; case studies and design projects emphasizing materials selection. PREREQ: ENGR 322.

ME 481/ME 581. PHYSICAL METALLURGY (3). Internal structure, constitution, physical and mechanical properties of metals, alloys, and other materials; dislocation theory; microstructural evaluation laboratory practice, photomicrography, quantitative micrography. PREREQ: ENGR 322. Lec/lab.

ME 482/ME 582. ADVANCED PHYSICAL METALLURGY (3). Thermodynamics of solids, phase transformations, strengthening mechanisms; diffusion, corrosion processes; microstructural evaluation lab practice; quantitative metallography. PREREQ: ME 481.

ME 483/ME 583. COMPOSITE MATERIALS (3). Fibers and matrices, mechanics of composites, reinforcement and failure mechanisms, properties and applications. PREREQ: ENGR 322. Lec/lab.

ME 484/ME 584. FRACTURE/FATIGUE (3). Fracture mechanics and fatigue mechanisms: Considerations in design of engineering materials and structures. PREREQ: ENGR 322, ME 383.

Graduate

ME 501. RESEARCH (1-16). May be repeated many times.

ME 503. THESIS (1-16). May be repeated many times.

ME 505. READING AND CONFERENCE (1-16). May be repeated many times.

ME 506. PROJECTS (1-16). May be repeated many times.

ME 507. SEMINAR (1-16). May be repeated many times.

ME 511. CAD/CAM III (3). Tolerance analysis and application in design/manufacturing practice. Tolerance specification, analysis, ANSI and ISQ standards, computer based metrology for qualification of parts, management of imperfect geometry through geometric dimensioning and tolerance. PREREQ: ME 413 or equivalent, engineering advanced undergraduate or graduate standing.

ME 516. EXPERT SYSTEMS IN DESIGN (3). Expert systems, applied artificial intelligence and knowledge representation in mechanical engineering design. Applications to expert systems in design, diagnosis, manufacturing, and planning. PREREQ: ME 413.

ME 517. OPTIMIZATION IN DESIGN (3). The study of mechanical design with emphasis on optimization. Mechanical designs and their unique aspects regarding optimization are treated. This will include strategies for functions of one variable and functions of N variables. Approximation techniques and application to other mechanical engineering design problems will also be considered. PREREQ: ME 383, ME 413. Not offered every year.

ME 518. THE CONCURRENT DESIGN OF PRODUCTS (3). Concurrent design requires the systematic communication of information across the entire product development and manufacturing enterprise. This course focuses on the structure and methods to enable concurrent design. these methods include the management of design information, quality function deployment (QFD), functional modeling, design for assembly (DFA), parametric design and others.

ME 519. SELECTED TOPICS IN DESIGN (3). Topics in mechanical design selected from the following: design processes, quality engineering, design for assembly, statistical machine design, the Taguchi method, and parametric design. May be repeated several times.

ME 525. CONTINUUM MECHANICS (3). Kinematics and governing field laws for continua. Predictions of behavior of fluids and elastic and inelastic solids. PREREQ: ME 316, ME 317.

ME 526. ELASTICITY (3). Applications of the field equations of linear elasticity to two and three dimensional engineering problems using exact, approximate, and numerical solution techniques. PREREQ: ME 525. Not offered every year.

ME 527. FRACTURE MECHANICS (3). Calculation of stress fields around cracks by analytical and numerical techniques; consideration of fatigue, plasticity, and dynamic effects. PREREQ: ME 525. Not offered every year.

ME 528. MECHANICS OF COMPOSITE STRUCTURES (3). Anisotropic elasticity theory, failure theories, classical lamination theories, delamination failure, mechanics of laminated beams, plates and shells. PREREQ: ME 525. Not offered every year.

ME 529. SELECTED TOPICS IN SOLID MECHANICS (3). Advanced topics in solid mechanics emphasizing research applications of current interest.

ME 531. CONTROL SYSTEMS (3). State-space methods for linear systems. Analysis; transition matrix, controllability, observability, stability. Control; pole placement, optimal control. Elements of digital control. PREREQ: ME 430. Lec/lab.

ME 535, ME 536. ADVANCED DYNAMICS (3). Analysis of the motions of mechanical systems. Kinematics, constraints, generalized coordinates and speeds. Kane's dynamical equations, with applications to systems of current interest. PREREQ: ME 317. Offered alternate years.

ME 537. VIBRATION ANALYSIS (3). Analytical mechanics and the fundamental equations of vibrating mechanical systems; inertia, stiffness, and flexibility matrices and their relationships with kinetic and potential energies. Prediction of response of multi-degree-of-freedom and distributed-parameter systems using normal coordinates. PREREQ: ME 422/ME 522. Offered alternate years.

ME 539. SELECTED TOPICS IN DYNAMICS (3). Advanced topics in dynamics emphasizing research applications of current interest. Maybe repeated.

ME 546. CONVECTION HEAT TRANSFER (3). An advanced treatment of forced and natural convection heat transfer processes emphasizing underlying physical phenomena. Current topical literature will be considered; analytical and numerical problem solving is included. PREREQ: ENGR 332, ME 373.

ME 547. CONDUCTIVE HEAT TRANSFER (3). Analytical and numerical solutions to steady state and transient conduction problems. PREREQ: ENGR 332, ME 373, ME 471/ME 571.

ME 548. RADIATION HEAT TRANSFER (3). Analytical and numerical methods of solution of thermal radiation problems. PREREQ: ENGR 332, ME 373.

ME 549. SELECTED TOPICS IN HEAT TRANSFER (3). Topics in heat transfer including advanced problems in conduction, radiation, and convection. Additional examination of heat transfer in multiphase systems, inverse problems, combined modes, equipment design, solution techniques and other topics of current interest considered, including extensive use of current literature. Not all topics covered each year. May be repeated

ME 565. INCOMPRESSIBLE FLUID MECHANICS (3). Generalized fluid mechanics; kinematics; methods of description, geometry of the vector field, dynamics of nonviscous fluids, potential motion, two-dimensional potential flow with vorticity. PREREQ: ME 470/570.

ME 566. VISCOUS FLOW (3). Boundary layer, stability, transition prediction methods, computational methods in fluid mechanics, recent developments. PREREQ: ME 565.

ME 567. COMPUTATIONAL FLUID DYNAMICS (3). Application of modern computational techniques to solve a wide variety of fluid dynamics problems including both potential and viscous flow. Emphasis on computer code development. PREREQ: ME 565, ME 566, ME 575.

ME 569. SELECTED TOPICS IN FLUID MECHANICS (3). Topics in fluid mechanics emphasizing research applications of current interest. May be repeated.

ME 575. NUMERICAL METHODS FOR ENGINEERING ANALYSIS (3). Numerical solutions of linear equations, difference equations, ordinary and partial differential equations. Emphasis on partial differential equation solution techniques relevant to mechanical engineering. PREREQ: ME 373.

ME 586. CREEP (3). Time-dependent plasticity of solids at lower and especially elevated temperatures. Dislocation and diffusion theory as particularly relevant to the dependent flow. PREREQ: ENGR 322, ME 481.

ME 588. STRUCTURE OF MATERIALS (3). The space lattice; diffraction of x-rays by crystals; experimental techniques in x-ray and electron diffraction; electron microscopy; alloy phase transformations; microstructural examination techniques; other selected topics. PREREQ: Graduate standing. Not offered every year.

ME 589. SELECTED TOPICS IN MATERIALS (3). Topics in materials science to correspond to areas of graduate research. Topics will be chosen from following list; Optical materials, dielectrics, oxidation and corrosion, ceramics, thermophysical properties, polymers and viscoelasticity, coatings and thin films.

ME 596. SELECTED TOPICS IN THERMODYNAMICS (3). Topics in thermodynamics including advanced problems in classical thermodynamics and statistical thermodynamics of current interest. Topics will likely be considered, including extensive use of literature. Not all topics covered each year. May be repeated.

ME 599. SELECTED TOPICS IN COMBUSTION (3). Advanced topics in combustion emphasizing research topics of current interest. May be repeated.

ME 601. (1-16). May be repeated many times.

ME 603. THESIS (1-16). May be repeated many times.

ME 605. READING AND CONFERENCE (1-16). May be repeated many times.

ME 606. (1-16). May be repeated many times.

ME 607. SEMINAR (1-16). May be repeated many times.

METALLURGICAL ENGINEERING

A cooperative program with the University of Idaho. See head adviser, College of Engineering, for information.

MINING ENGINEERING

A cooperative program with the University of Idaho. See head adviser, College of Engineering, for information.

NUCLEAR ENGINEERING

E.A.C./A.B.E.T. Accredited

Alan H. Robinson, Head
Radiation Center C116
Oregon State University
Corvallis, OR 97331-5902
(503) 737-2343

Faculty

Professors Binney☆, Dodd, Ringle☆, Robinson☆; *Associate Professors* Higginbotham☆, Klein☆, Reyes☆; *Assistant Professors* Higley, Palmer

Undergraduate Major

Nuclear Engineering (B.S.)

Minor

Nuclear Engineering

Graduate Major

Nuclear Engineering (M.S., Ph.D.)

Graduate Areas of Concentration
Application of Nuclear Techniques
Artificial Intelligence
Fusion Engineering
In-Core Fuel Management
Nuclear Reactor Engineering
Nuclear Instrumentation and Applications
Nuclear Medicine
Nuclear Power Generation
Nuclear Systems Design and Modeling
Nuclear Waste Management
Numerical Methods For Reactor Analysis
Radiation Shielding
Radioisotope Production
Space Nuclear Power
Thermal Hydraulics

The nuclear engineering curriculum is designed to prepare personnel for nuclear power plant operation, design of nuclear facilities, and research and development programs dealing with nuclear energy. Particular attention is directed toward application of scientific principles to both design and operation of nuclear installations. In addition, emphasis is provided in nuclear instrumentation, nuclear systems and materials, radiation protection, reactor analysis and nuclear power economics and, particularly safety and regulation in nuclear operations.

Excellent facilities are available for the instructional and research programs at the Radiation Center, including a TRIGA Mark II nuclear reactor and the AP-600 1/4 scale facility. Instruction is integrated with an extensive research program, with opportunities to participate at both the undergraduate and graduate levels.

CURRICULUM

PRE-NUCLEAR ENGINEERING

Freshman Year

NE 111, NE 112, NE 113. Intro to Nuc Eng (9)✥
MTH 251, MTH 252, MTH 253. Calculus (12)✥
CH 201, CH 202, CH 203. Chem for Engr Majors (9)✥
PH 211. General Physics with Calc (4)✥
WR 121. English Composition (3)✥
COMM 111. Public Speaking (3)[1]✥
Perspectives (6)[1]
HHP 231. Lifetime Fitness (3)[1]
Free electives (2)

Sophomore Year

NE 231, NE 232. Nuc and Radiation Physics (6)✥
NE 233. Nuc Radiation Detection and Instr (3)
MTH 254. Vector Calculus I (4)✥
MTH 256. Applied Differential Equations (4)✥
PH 212, PH 213. Gen Physics with Calculus (8)✥
BI 101 or BI 102 or BI 103. Gen Biology (4)[1]
ENGR 201. Electrical Fundamentals (3)
ENGR 211, ENGR 212, ENGR 213. Statics, Dynamics, Strength of Materials (9)✥
CS 131. Intro FORTRAN Programming (4)
Perspectives (6)[1]
TOTAL (102)

PROFESSIONAL NUCLEAR ENGINEERING

Junior Year

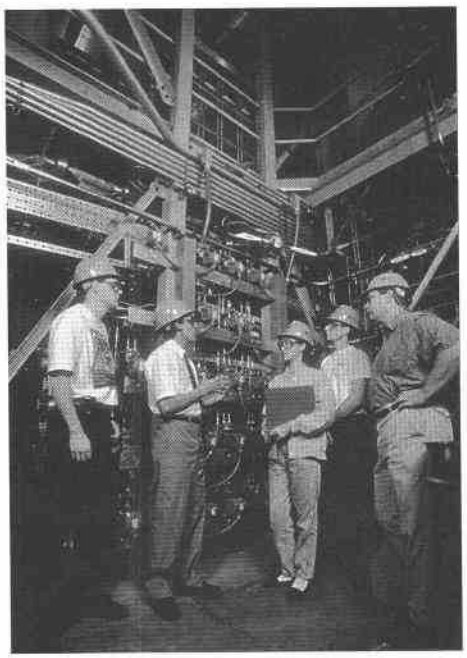
NE 361. Nuclear Reactor Systems (3)
NE 381. Principles of Radiation Safety (3)
ENGR 311, ENGR 312. Thermodynamics (7)
ENGR 321. Materials Science (3)
ENGR 331, ENGR 332. Momentum, Energy and Mass Transfer (8)
ENGR 390. Engineering Economy (3)
ME 373. Numer Methods in Mech Engr (3)
MTH 482. Math Meth for Engr and Sci (3)
WR 327. Technical Writing (3)[1]
Perspectives (6)[1]
Electives (restricted) (3)
Free Electives (5)

Senior Year

NE 407. Nuclear Engineering Sem (3 terms) (3)
NE 414. Nuclear Rules and Regulations (3)[6]
NE 444. Nuclear Fuel Cycle (3)[6]
NE 454, NE 455, NE 456. Nuc Reac Anlys (9)
NE 457. Nuclear Reactor Laboratory (3)
NE 467. Nuc Reactor Thermal Hydraulics (4)
NE 471, NE 472, NE 473. Nuc Power Sys Dsg (9)[7]
NE 484. Applied Radiation Safety (3)[7]
NE 486. Radiation Dosimetry (3)
Synthesis (6)[1]
Electives (restricted) (6)
TOTAL (102)

NUCLEAR ENGINEERING MINOR

Students not majoring in nuclear engineering or radiation health physics may take a



minor in nuclear engineering. A minor in nuclear engineering consists of the following courses:

NE 231, NE 232. Nuc and Radiation Physics (6)
NE 361. Nuclear Reactor Systems (3)
NE 381. Principles of Radiation Safety (3)
NE 454. Nuclear Reactor Analysis (3)
Other NE courses (200 level or higher) (12)
TOTAL (27)

COURSES

Lower Division

NE 111, NE 112, NE 113. INTRODUCTION TO NUCLEAR ENGINEERING (3). Introduction to all engineering fields, especially nuclear engineering; problem-solving techniques; careers in the nuclear industry; engineering ethics; nuclear history; elementary nuclear and reactor physics; basic nuclear fission and fusion theory; reactor types; nuclear safety; nuclear fuel cycle; and radiation protection.

NE 231, NE 232. NUCLEAR AND RADIATION PHYSICS (3,3). Nuclear structure; basic nuclear physics; basic quantum mechanics; radioactivity; radioactive decay modes; nuclear reactions; fission and fusion basics; interaction of ionizing radiation with matter; cross sections; effects of radiation on solids. PREREQ: MTH 252. CROSSLISTED as RNP 231, RHP 232. Must be taken in order.

NE 233. NUCLEAR RADIATION DETECTION AND INSTRUMENTATION (3). Principles and mechanisms underlying nuclear radiation detection and measurements; operation of nuclear electronic laboratory instrumentation; application of gas-filled, scintillation and semiconductor laboratory detectors for measurement of alpha, beta, gamma, and neutron radiation; experimental investigation of interactions of radiation with matter. PREREQ: NE 232. Lec/lab. CROSSLISTED as RHP 233.

Upper Division

Courses numbered 500 and above may be taken for graduate credit.

NE 319. SOCIETAL ASPECTS OF NUCLEAR TECHNOLOGY (3). Description and discussion of nuclear-realted issues as they impact society.

NE 341. NUCLEAR MATERIALS (3). Material properties of nuclear reactor systems; radiation damage to fuel and structural materials in fission and fusion reactors; radiation embrittlement and swelling; corrosion. PREREQ: ENGR 321. Offered alternate years.

NE 361. NUCLEAR REACTOR SYSTEMS (3). Design features of existing and proposed nuclear power generation systems. Examination of light water reactor nuclear fuel, core, cooling systems, main steam systems, power generation equipment, process instrumentation, containment, and active and passive engineered safety features. Advanced reactor design concepts.

NE 381. PRINCIPLES OF RADIATION SAFETY (3). Principles and theory of radiation protection. Regulatory agencies; dose units; sources of radiation; biological effects and risk; dose limits; introduction to external and internal dosimetry; shielding; reactor safety; atmospheric dispersion and reactor accidents. PREREQ: NE 232. CROSSLISTED as RHP 381.

NE 401/NE 501. RESEARCH (1-16). Graded P/N.

NE 405/NE 505. READING AND CONFERENCE (1-16).

NE 406/NE 506. PROJECTS (1-16). Graded P/N.

NE 407/NE 507. NUCLEAR ENGINEERING SEMINAR (1). Graded P/N. Lectures on current nuclear engineering topics.

NE 410/NE 510. INTERNSHIP (1-12). Graded P/N. Supervised technical work experience at approved organizations. PREREQ: Upper division standing.

NE 414/NE 414. NUCLEAR RULES AND REGULATIONS (3). A history of the key nuclear regulatory agencies; early and current radiation protection standards and organizations responsible for their formulation; major nuclear legislation; pertinent nuclear rules and regulations and their application. PREREQ: NE 381. Offered alternate years. CROSSLISTED as RHP 414/RHP 514.

NE 429. SELECTED TOPICS IN NUCLEAR ENGINEERING (1-3). Topics associated with nuclear engineering not covered in other undergraduate courses; topics may vary from year to year. Course may be repeated for credit. PREREQ: Consent of instructor.

NE 444/NE 544. NUCLEAR FUEL CYCLE (3). Technical and environmental aspects of the nuclear fuel cycle: mining, milling, conversion, and fuel fabrication; enrichment; fuel reprocessing; radioactive waste management; transport of radioactive material; interim fuel storage techniques. PREREQ: CH 203. Offered alternate years. CROSSLISTED as RHP 444/RHP 544.

NE 454, NE 554, NE 455/NE 555, NE 456/NE 556. NUCLEAR REACTOR ANALYSIS (3,3,3). Theory of nuclear reactors based upon physical models; nuclear physics; steady state and transient reactor behavior; one speed diffusion theory; numerical methods; fast and thermal spectrum calculations; multigroup methods; fuel burnup; fuel management; reactivity control; perturbation theory. PREREQ: CS 131, MTH 256, NE 232. COREQ: ME 373. Must be taken in order.

NE 457/NE 556, NE 458/NE 558. NUCLEAR REACTOR LABORATORY (3,3,3). Experiments using the TRIGA reactor to measure reactor properties and verify nuclear reactor theory; steady state and transient behavior of nuclear reactors, including reactivity effects of control rods and fuel; approach to critical; measurement of neutron flux distributions; nuclear physics experiments; nuclear reactor, and process instrumentation; experiments of students own design. COREQ: NE 456/556. Lec./lab.

NE 467/NE 567. NUCLEAR REACTOR THERMAL HYDRAULICS (4). Hydrodynamics and conductive, convective and radiative heat transfer in nuclear reactor systems. Core heat removal design; critical heat flux, hot spot factors, single and two-phase flow behavior. Advanced thermal hydraulic computer codes. PREREQ: ENGR 332.

NE 471/NE 571, NE 472/NE 572, NE 473/NE 573. NUCLEAR POWER SYSTEMS DESIGN (3,3,3). Practical design of nuclear power systems using fundamental nuclear engineering skills. Design projects involve the integration of reactor neutronics, dynamics and control, thermal hydraulics, transient analysis, safety analysis, power production, nuclear materials, fuel management and economic optimization. Emphasis is placed on designing advanced reactor systems for power production purposes. State-of-the-art computer codes are used for design analysis and evaluation. COREQ: NE 454/NE 554, NE 467/NE 567, ENGR 332 for NE 471/NE 571m NE 455/NE 555 or NE 472/NE 572. Must be taken in order.

NE 479. INDIVIDUAL DESIGN PROJECT (1-4). Individual project arranged by the student under the supervision of a faculty member. The design project is mutually agreed upon by the student and instructor and may be proposed by either. Number of credits are determined by the faculty member. Specific approval of the instructor is required before enrolling.

NE 484/NE 584. APPLIED RADIATION SAFETY (3). Application of radiation protection as practiced in the fields of nuclear science and engineering; application of health physics principles to reduce the health hazard at each of the following stages: design, preventative, assessment, and post-incident. PREREQ: NE 233, NE 381. Lec/lab. CROSSLISTED as RHP 484/RHP 584. (Writing Intensive Course)

NE 486/NE 586. RADIATION DOSIMETRY (3). Further development and more in-depth treatment of radiation dosimetry concepts introduced in NE 381, including the theoretical basis of radiation dosimetry, microdosimetry, external, internal and environmental dosimetry. PREREQ: NE 381. CROSSLISTED as RHP 486/RHP 586.

Graduate

NE 503. THESIS (1-16).

NE 526/NE 527. COMPUTATIONAL METHODS FOR NUCLEAR REACTORS (3,3,3). Application of digital computers to problems in nuclear engineering. Topics include multigroup diffusion theory, kinetic equations, Monte Carlo methods, Sn, collision probability methods, criteria for selecting methods, and computer programming. Must be taken in order. PREREQ: ME 573. Not offered every year.

NE 530. FUSION TECHNOLOGY (3). Fusion fuel cycles; plasma physics fundamentals; engineering of fusion reactors; first wall and blanket design; materials issues; magnetic and inertial confinement concepts. Offered alternate years.

NE 535. NUCLEAR RADIATION SHIELDING (3). Theoretical principles of shielding for neutron and gamma radiation; applications to problems of practical interest; analytical and computer solutions emphasized. PREREQ: NE 381 or consent of instructor. Offered alternate years. CROSSLISTED as RHP 535.

NE 537. APPLICATIONS OF NUCLEAR TECHNIQUES (3). Description of nuclear-related techniques used for analytical and process measurements; discussion of associated nuclear instrumentation and facilities. PREREQ: NE 233 or equivalent. Offered alternate years. CROSSLISTED as RHP 537.

NE 539. SELECTED TOPICS IN INTERACTION OF NUCLEAR RADIATION (1-3). Topics associated with interactions of nuclear radiation not covered in other graduate courses; topics may vary from year to year. Course may be repeated for credit. PREREQ: Consent of instructor. CROSSLISTED as RHP 539.

NE 543. RADIOACTIVE WASTE MANAGEMENT (3). Nuclear Waste Policy Act and Amendments; DOE, NRC, and EPA regulations related to high level radioactive waste; waste characteristics, forms, amounts, packages; geologic repositories and alternate disposal techniques; waste transportation; monitored retrievable storage; defense waste characteristics, amounts, disposal options; disposal plans in other countries. Offered alternate years. CROSSLISTED as RHP 543.

NE 549. SELECTED TOPICS IN NUCLEAR FUEL CYCLE ANALYSIS (1-3). Topics associated with the nuclear fuel cycle not covered in other graduate courses; topics may vary from year to year. Course may be repeated for credit. PREREQ: NE 444/NE 544. CROSSLISTED as RHP 549.

NE 559. SELECTED TOPICS IN NUCLEAR REACTOR ANALYSIS (1-3). Topics associated with nuclear reactor theory not covered in other graduate courses; topics may vary from year to year. Course may be repeated for credit. PREREQ: NE 456/NE 556.

NE 567. NUCLEAR REACTOR THERMAL HYDRAULICS (4). Hydrodynamics and conductive, convective and radiative heat transfer in nuclear reactor systems. Core heat removal design; critical heat flux, hot spot factors, single and two-phase flow behavior. Advanced thermal hydraulic computer codes. PREREQ: ENGR 332.

NE 568. NUCLEAR REACTOR SAFETY (3). Probabilistic risk assessment and system reliability analysis techniques applied to nuclear reactor safety. Examination of neutronic and thermal hydraulic transients, effectiveness of emergency systems, accident prevention and mitigation, assessment of radioactive releases to the environment. PREREQ: NE 454/NE 554, NE 467/NE 567. Offered alternate years.

NE 569. SELECTED TOPICS IN NUCLEAR REACTOR ENGINEERING (1-3). Advanced nuclear engineering design concepts, reactor systems analysis techniques and innovative nuclear engineering applications. Artificial intelligence and expert system applications to nuclear engineering problems. Topics may vary from year to year. Course may be repeated for credit.

NE 585. ENVIRONMENTAL ASPECTS OF NUCLEAR SYSTEMS (3). Federal and state regulations concerning environmental effects of nuclear power plants and other nuclear installations; development of analytical techniques for calculating quantities and effects of gaseous and liquid radioactive effluents released; effects of thermal discharge; atmospheric dilution and dispersion; cost-benefit studies. Not offered every year. CROSSLISTED as RHP 585.

NE 601. RESEARCH (1-16). Graded P/N.

NE 603. THESIS (1-16).

NE 605. READING AND CONFERENCE (1-16).

NE 606. PROJECTS (1-16). Graded P/N.

NE 607. NUCLEAR ENGINEERING SEMINAR (1). Graded P/N. Lectures on current nuclear engineering topics.

NE 651. NUCLEAR REACTOR DYNAMICS AND CONTROL (3). Dynamic behavior of nuclear reactors; point kinetics and space-time kinetics models; feedback effects, stability, transient analysis and control design methods for light water reactor power plant systems. PREREQ: NE 456/NE 556. Not offered every year.

NE 654. NEUTRON TRANSPORT THEORY (3). Properties of and methods for solution of the linear Boltzmann equation for nuclear reactors; spherical and double-spherical harmonics; integral equation methods; Monte Carlo methods. PREREQ: NE 456/NE 556. Offered alternate years.

NE 655, NE 656. ADVANCED PARTICLE PHYSICS FOR REACTOR ANALYSIS (3,3,3). Neutron slowing down and thermalization; fast spectrum calculations; cross section theory; scattering kernels; thermal spectra; and variational theory. PREREQ: NE 456/NE 556. May be taken in any order. Offered alternate years.

NE 667. ADVANCED THERMAL HYDRAULICS (3). Advanced topics in single and two-phase hydrodynamics and heat transfer for nuclear reactors. Two-phase flow patterns, flow instabilities, condensation induced transients, convective boiling heat transfer, and current topics in reactor safety thermal hydraulics. PREREQ: NE 467/NE 567. Offered alternate years.

NE 808. WORKSHOP (1-4).

RADIATION HEALTH PHYSICS

Dr. Jack F. Higginbotham
Department of Nuclear Engineering
Oregon State University
Radiation Center C116
Corvallis, OR 97331-5902
(503) 737-2343

Undergraduate Major

Radiation Health Physics (B.S.)

Minor

Radiation Health Physics

Graduate Major

Radiation Health Physics (M.S.)

Graduate Areas of Concentration

Application of Nuclear Techniques
Boron Neutron Capture Therapy
Emergency Response Planning
Environmental Monitoring
Environmental Pathways Assessment
Nuclear Medicine
Nuclear Rules and Regulations
Radiation Detection Methods
Radiation Dosimetry
Radiation Instrumentation
Radiation Shielding
Radioactive Material Transport
Radioactive Waste Management
Research Reactor Health Physics
Risk Assessment

This specialized program in the Department of Nuclear Engineering is designed for students with professional interest in the field of radiation protection, which is also known as health physics. It involves an integrated study of the physical aspects of ionizing and non-ionizing radiation, their biological effects, and the methods used to protect people and their environment from radiation hazards while still enabling the beneficial uses of radiation and radioactive material.

Excellent facilities are available for the instructional and research programs at the Radiation Center, including a TRIGA Mark II nuclear reactor. Instruction is integrated with an extensive research program, with opportunities to participate at both the undergraduate and graduate levels.

Certified Health Physicist

Students completing the radiation health physics degree will be eligible to take Part I of the Certified Health Physics (CHP) Examination of the American Board of Health Physics after one year of applied health physics practice. After six years of responsible professional experience in health physics, graduates will be eligible to take Part II of the CHP examination.

CURRICULUM

PRE-RADIATION HEALTH PHYSICS

Freshman Year

NE 111, NE 112, NE 113. Intro to Nuc Eng (9)✥
Mathematics through at least MTH 251 (12)[8]✥
One year General Chemistry (9-15)✥
One term Computer Science (4)
WR 121. English Composition (3)[1]✥
COMM 111. Public Speaking (3)[1]✥
Perspectives (3)[1]✥

Sophomore Year

RHP 231, RHP 232. Nuc and Rad Physics (6)✥
RHP 233. Nuc Radiation Detection and Instr (3)
BI 101✥, BI 102✥, BI 103. General Biology (12)
One year General Physics (12-15)✥
HHP 231. Lifetime Fitness (3)[1]
Perspectives (9)[1]
TOTAL (97)

PROFESSIONAL RADIATION HEALTH PHYSICS

Junior Year

RHP 381. Prin of Radiation Safety (3)
RHP 414. Nuclear Rules & Regulations (3)[6]
ST 201, ST 202. Principles of Statistics (6)
H 220. Intro to Epidemiology & Health Data Analysis (3)
Z 331, Z 332, Z 333. Human Anatomy & Phys (9)
WR 327. Technical Writing (3)
Perspectives (6)[1]
Electives (restricted) (9)
Electives (free) (6)

Senior Year

NE 407. Nuclear Engineering Sem (3 terms) (3)
RHP 444. Nuclear Fuel Cycle (3)[6]
RHP 480. Fld Prac in Rad Protection (3)
RHP 484. Applied Radiation Safety (3)
RHP 486. Radiation Dosimetry (3)
RHP 487. Radiation Biology (3)[6]
Synthesis (6)[1]
Electives (restricted in Health) (9)
Electives (restricted) (6)
Electives (free) (8)
TOTAL (95)

RADIATION HEALTH PHYSICS MINOR (30)

Students not majoring in radiation health physics or nuclear engineering may take a minor in radiation health physics. A minor in radiation health physics consists of the following courses:

RHP 231, RHP 232. Nuc and Radiation Physics (6)
RHP 233. Nuc Radiation Detection and Instrumentation (3)
H 220. Intro to Epidemiology and Health Data Analysis (3)
RHP 381. Principles of Radiation Safety (3)
RHP 414. Nuclear Rules and Regulations (3)
RHP 480. Field Practices in Radiation Protection (3)
RHP 484. Applied Radiation Safety (3)
RHP 486. Radiation Dosimetry (3)
RHP 487. Radiation Biology (3)
TOTAL (30)

COURSES

Lower Division

RHP 231, RHP 232. NUCLEAR AND RADIATION PHYSICS (3,3). Nuclear structure; basic nuclear physics; basic quantum mechanics; radioactivity; radioactive decay modes; nuclear reactions; fission and fusion basics; interaction of ionizing radiation with matter; cross sections; effect of radiation on solids. PREREQ: MTH 251. Must be taken in order. CROSSLISTED as NE 231, NE 232.

RHP 233. NUCLEAR RADIATION DETECTION AND INSTRUMENTATION (3). Principles and mechanisms underlying nuclear radiation detection and measurements; operation of nuclear electronic laboratory instrumentation; application of gas-filled, scintillation and semiconductor laboratory detectors for measurement of alpha, beta, gamma, and neutron radiation; experimental investigation of interactions of radiation with matter. PREREQ: RHP 232 or NE 232. Lec/lab. CROSSLISTED as NE 233.

Upper Division

RHP 381. PRINCIPLES OF RADIATION SAFETY (3). Principles and theory of radiation protection. Regulatory agencies; dose units; sources of radiation; biological effects and risk; dose limits; introduction to external and internal dosimetry; shielding; reactor safety; atmospheric dispersion and reactor accidents. PREREQ: RHP 232 or NE 232. CROSSLISTED as NE 381.

RHP 401/RHP 501. RESEARCH (1-16). Graded P/N.

RHP 405/RHP 505. READING AND CONFERENCE (1-16).

RHP 406/RHP 506. PROJECTS (1-16). NE 506 graded P/N.

RHP 410/RHP 510. INTERNSHIP (1-12). Graded P. Supervised technical work experience at approved organizations. PREREQ: Upper division standing.

RHP 414/RHP 514. NUCLEAR RULES AND REGULATIONS (3). A history of the key nuclear regulatory agencies; early and current radiation protection standards and organizations responsible for their formulation; major nuclear legislation; pertinent nuclear rules and regulations and their application. PREREQ: RHP 381 or NE 381. Offered alternate years. CROSSLISTED as NE 414/NE 514.

RHP 444/RHP 544. NUCLEAR FUEL CYCLE (3). Technical and environmental aspects of the nuclear fuel cycle: mining, milling, conversion, and fuel fabrication; enrichment; fuel reprocessing; radioactive waste management; transport of radioactive material; interim fuel storage techniques. PREREQ: CH 123 or CH 223. Offered alternate years. CROSSLISTED as NE 444/NE 544.

RHP 475/RHP 575, RHP 476/RHP 576, RHP 477/RHP 577. RADIATION PROTECTION ENGINEERING DESIGN (3,3,3). A comprehensive review of radiation protection theory and practice as applied to the design of radiation protection systems. Emphasis is placed on those systems related to nuclear power reactor operations. Must be taken in order. PREREQ: RHP 484/RHP 584, OR NE 484/NE 584, RHP 486/RHP 586 or NE 486/NE 586.

RHP 479. INDIVIDUAL DESIGN PROJECT (1-4). Individual project arranged by the student under the supervision of a faculty member. The design project is mutually agreed upon by the student and instructor and may be proposed by either. Number of credits are determined by the faculty memeber. Specific approval of the instructor is required before enrolling. CROSSLISTED as NE 479.

RHP 480/RHP 580. FIELD PRACTICES IN RADIATION PROTECTION (1-3). Individual participation in the operational functions of the radiation protection program at the OSU Radiation Center. Approval of the instructor is required before enrolling.

RHP 484/RHP 584. APPLIED RADIATION SAFETY (3). Application of radiation protection as practiced in the fields of nuclear science and engineering; application of health physics principles to reduce the health hazard at each of the following stages: design, preventative, assessment, and post-incident. PREREQ: RHP 233 or NE 233, RHP 381 or NE 381. Lec/lab. CROSSLISTED as NE 484/NE 584. (Writing Intensive Course).

RHP 486/RHP 586. RADIATION DOSIMETRY (3). Further developemnt and more in-depth treatment of radiation dosimetry concepts introduced in RHP 381, including the theoretical basis of radiation dosimetry, microdosimetry, external, internal and environmental dosimetry. PREREQ: RHP 381 or NE 381. CROSSLISTED as NE 486/NE 586.

RHP 487/RHP 587. RADIATION BIOLOGY (3). Biological effects of ionizing radiation at the molecular, cellular, and organismal levels with emphasis on vertebrates; both acute and chronic radiation effects are considered. PREREQ: RHP 381 or NE 381 or senior standing.

RHP 488/RHP 588. RADIOECOLOGY (3). Radionuclides in the environment: their measurement and identification, uptake and transfer through food chains. Effect of radiation on natural populations of plants and animals. PREREQ: RHP 381 or NE 381 or senior standing.

RHP 491/RHP 591. NON-IONIZING RADIATION PROTECTION (3). Sources, characteristics, applications, biological effects, exposure limits, detection, measurement and protection as related to lasers, ultraviolet light, ultrasound and magnetic fields. PREREQ: Senior standing. Not offered every year.

RHP 493/RHP 593. NON-REACTOR RADIATION PROTECTION (3). Radiation protection principles applied to technologically enhanced natural radiation sources, medical uses of radiation and radioactive materials, educational and research uses of radiation and radioactive materials, industrial applications and accelerators. PREREQ: senior standing. Not offered every year.

Graduate

RHP 503. THESIS (1-16).

RHP 535. NUCLEAR RADIATION SHIELDING (3). Theoretical principles of shielding for neutron and gamma radiation; applications to problems of practical interest; analytical and computer solutions emphasized. PREREQ: RHP 381 or NE 381, or consent of instructor. Offered alternate years. CROSSLISTED as NE 535.

RHP 537. APPLICATIONS OF NUCLEAR TECHNIQEUS (3). Description of nuclear-related techniques used for analytical and process measurements; discussion of associated nuclear instrumentation and facilities. PREREQ: RHP 233 or NE 233, or equivalent. Offered alternate years. CROSSLISTED as NE 537.

RHP 539. SELECTED TOPICS IN INTERATION OF NUCLEAR RADIATION (1-3). Topics associated with interactions of nuclear radiation not covered in other graduate courses; topics may vary from year to year. Course may be repeated for credit. PREREQ: Consent of instructor. CROSSLISTED as NE 539.

RHP 543. RADIOACTIVE WASTE MANAGEMENT (3). Nuclear Waste Policy Act and Amendments: DOE, NRC, and EPA regulations related to high level radioactive waste; waste characteristics, forms, amounts, packages; geologic repositories and alternate disposal techniques; waste transportation; monitored retrievable storage; defense waste characteristics, amounts, disposal options; disposal plans in other countries. Offered alternate years. CROSSLISTED as NE 543.

RHP 549. SELECTED TOPICS IN NUCLER FUEL CYCLE ANALYSIS (1-3). Topics associated with the nuclear fuel cycle not covered in other graduate courses; topics may vary from year to year. Course may be repeated for credit. PREREQ: RHP 444/RHP 544 or NE 444/NE 544. CROSSLISTED as NE 549.

RHP 585. ENVIRONMENTAL ASPECTS OF NUCLEAR SYSTEMS (3). Federal and state regulations concerning environmental effects of nuclear power plants and other nuclear installations; development of analytical techniques for calculating quantities and effects of gaseous and liquid radioactive effluents released; effects of thermal discharge; atmospheric dilution and dispersion; cost-benefit studies. Not offered every year. CROSSLISTED as NE 585.

RHP 589. SELECTED TOPICS IN RADIATION PROTECTION (1-3). Recent advances in radiation protection; greater in-depth study of current radiation protection issues. Topics may vary from year to year. Course may be repeated for credit.

FOOTNOTES

*Baccalaureate Core Course

^Writing Intensive Course (WIC)

✣Required for entry into the professional program.

☆Licensed professional engineer.

[1]Must be selected to satisfy the requirements of the Baccalaureate Core.

[2]Approved engineering science elective from department list.

[3]Approved technical electives from department list.

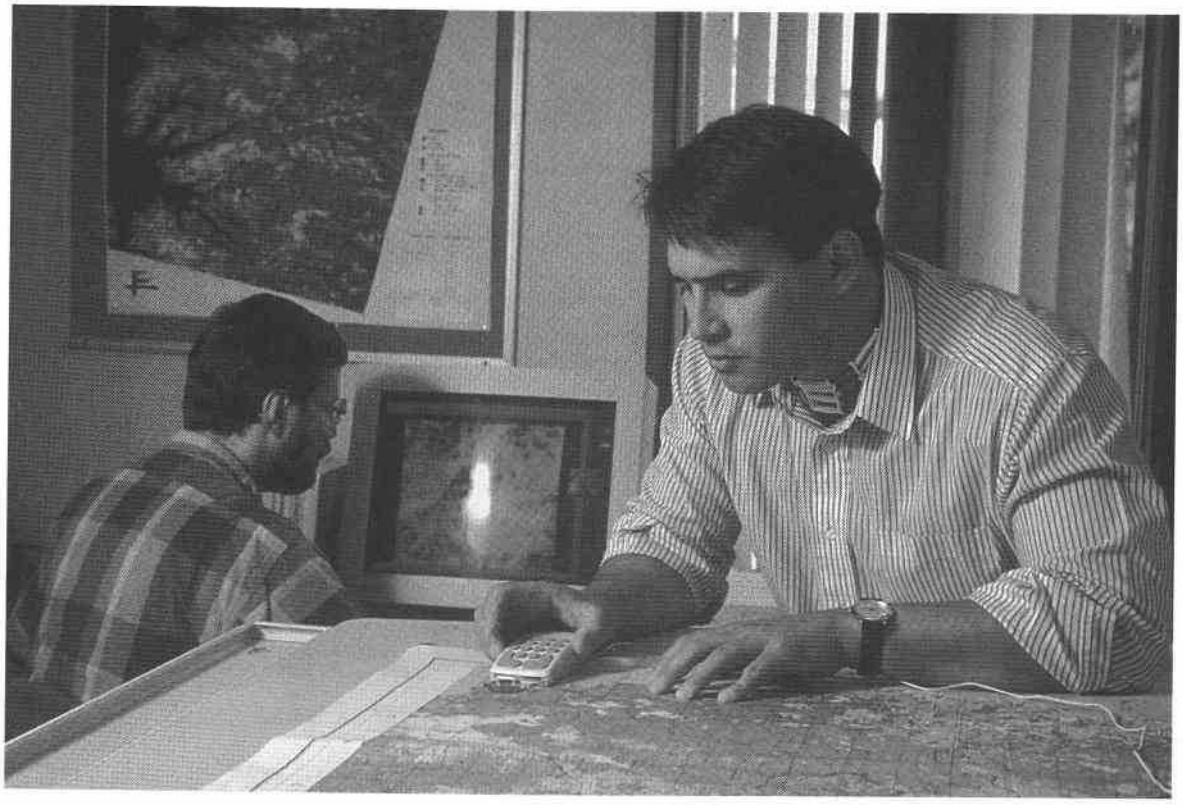
[4]Recommended to satisfy core requirement.

[5]Prerequisite for several upper division courses. Recommended for completion prior to entry into the Professional Program.

[6]Taught alternate years.

[7]Writing Intensive course.

[8]MTH 111, MTH 112, MTH 241, MTH 245, MTH 251, MTH 252, MTH 253, MTH 254, MTH 256 approved courses.



Forest ecosystems are important in the cultural base of societies worldwide, providing inspiration and a variety of goods and services. Nowhere are they more important than in Oregon, where forests and forest related activities dominate the economic and social life of the state.

The many-faceted programs of the college combine forest biology, social sciences, management sciences, and modern technology in computers, engineering, and environmental sciences. Graduates are employed managing forest resources for a diversity of needs; harvesting forest resources in the most up-to-date, environmentally-sensitive manner; maximizing use of wood through efficient processing methods; marketing wood products; and providing opportunities for sound recreational use of forests. Many are employed in teaching, extension, consulting, and research. A wide range of opportunities exists throughout the world for well-qualified graduates.

The college is dedicated to an educational program producing perceptive, socially-responsible graduates who are capable of wisely managing forests and other natural resources for production and conservation purposes, and of communicating effectively about these activities. It is committed to maintaining relevancy and recognized excellence in undergraduate and graduate education.

The college works with the OSU Career Planning and Placement Center to provide up-to-date information in both seasonal and permanent work and offers a full array of career services to prepare undergraduates and graduates for jobs.

All undergraduate forestry programs of the College of Forestry are accredited by either the Society of American Foresters or the Society of Wood Science and Technology. Selected M.F. programs in Forest Resources and Forest Biology also are accredited by the Society of American Foresters.

Departments and Degrees

Through three of its departments the college offers the Bachelor of Science (B.S.) degree in forest engineering, forest management, forest products, forest recreation resources, and natural resources. The Department of Forest Science offers graduate programs only (M.F., M.S., M.A.I.S., and Ph.D.). Graduate programs in other departments include the M.F., M.S., M.A.I.S., and Ph.D.

It is possible to complete requirements for more than one option within a department or to earn degrees in two departments if programs are planned carefully. Students may also change majors within the College, although this may involve additional time to complete curricular requirments

The College also offers an interdisciplinary degree with several specialization options under the Natural Resources program and forestry specializations within the Environmental Science and Bioresource Research B.S. degrees.

International Degree

Undergraduates with majors in the College of Forestry can earn a second degree in International Studies. See the Interdisciplinary Studies section of this catalog.

Minors

The college offers minors in Forest Management, Forest Products and Forest Recreation Resources for students in other majors on campus and participates in the Earth-Information Systems Technology interdisciplinary minor for students in any major.

High School Preparation

Students planning a major within the College of Forestry should include the following subjects in their high school programs: English, four years; mathematics, four years including trigonometry, and college algebra; chemistry, one year; physics, one year; graphics or mechanical drawing, one semester; computer science, one semester; social science, one year.

Entrance

To enroll in the College of Forestry, all new students must satisfy Oregon State University requirements for entrance.

Because of the technical and professional nature of the college's curricula, the college reserves the right to determine whether courses taken at another institution satisfy the college's curricular requirements. In general, equivalent college-level courses successfully completed at an accredited college or university are accepted. Those planning to transfer from an Oregon community college should consult the community college transfer programs booklet for a recommended transfer course list. The college does not generally grant credit for work done in vocational or technical training programs.

Advising

The College of Forestry is committed to creating an atmosphere conducive to the academic and personal development of its students through a strong faculty advising program.

Each student in the College of Forestry is assigned a faculty adviser and is expected to meet with that adviser on a regular basis. Advisers assist with appropriate course selection, explain program options in line with students' interests, and help monitor academic progress. Along with other advising personnel in the dean's office, they are also a valuable source of information and assistance for students concerning University regulations, summer and permanent jobs, exchange programs, professional opportunities, and personal problems that may be hampering academic achievement.

Peavy Hall 140
Oregon State University
Corvallis, OR
97331-5704
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ADMINISTRATION

George W. Brown
Dean

Bart A. Thielges
Associate Dean

A. Scott Reed
Assistant Dean for Extended Eduation

Pam Henderson
Coordinator Student Services

Footnotes for this section on page 231.

GRADUATION

Academic Requirements

192 quarter credits of university-level courses, (200 for Forest Engineering, and 255 for FE/CE joint degree program) including:

- Written/Oral communications, 13 credits including a senior writing intensive course
- OSU Core Curriculum, 39 credits
- Completion of an approved departmental curriculum.
- Approved work experience as noted below.

Professional and Personal Requirements

Those majoring in forest management, forest engineering, or forest products must complete six months of satisfactory employment in an area related to their major. Those majoring in forest recreation resources must satisfactorily complete a supervised internship.

Students are personally responsible for fulfilling all curricular requirements in proper sequence. Work performance and personal conduct are thoroughly appraised by the college. Since forestry is highly regarded for its ethical and its academic standards, students are responsible for observing the honor code of the college in its entirety. Departure from these ethical requirements may be reason for terminating a student.

EDUCATIONAL FACILITIES

Corvallis is one of the largest forestry research centers in America. Peavy Hall, the OSU forestry building, contains modern classroom, laboratory, and study facilities. An aggressive research program is conducted by the college through its Forest Research Laboratory and by the campus-based Forest Sciences Laboratory of the U.S. Forest Service. These facilities offer splendid educational and employment opportunities for superior students.

The college makes extensive use of various public and private forestry programs and facilities for student benefit. Numerous field trips to forest and wood processing plant operations, recreation facilities, and research areas enable students to observe contemporary problems and practices. Classes use the nearby college forests for daily field instruction. In addition to these 11,000 acres in the McDonald and Dunn Forests, the college manages other forests in Benton and Columbia counties for education and research. A Forest Products Collection contains approximately 2,500 species of wood, primarily from North and South America, Southeast Asia, and Africa.

STUDENT ACTIVITIES

Numerous opportunities exist for students to get involved in social and academic forestry activities. Clubs and student chapters of several professional societies are active in the college, as is Xi Sigma Pi, the national forestry honorary society.

SCHOLARSHIPS

The College of Forestry offers many scholarships for well-qualified students. Most are merit-based, and they range in value from $500 to $4,200. One application (forms available from the college) is used for all forestry scholarships, and applicants are selected each spring (deadline early March) for the following academic year.

EXCHANGES

Residents of Alaska, Colorado, Hawaii Idaho, Montana, Nevada, New Mexico, North Dakota, South Dakota, Utah, and Wyoming are eligible for consideration for a reduction in the normal out-of-state tuition rate for selected programs, one of which is forestry. Check a WVE Bulletin or contact the OSU Office of Adminissions at 503-737-4411.

BIORESOURCE RESEARCH

Bioresource Research students acquire research experience and broadly-based knowledge in interdisciplinary fields of agricultural, environmental, food, and forest sciences. Students determine their fields of study by choosing among ten different option areas. After two years of research in the program of a faculty mentor, each student writes a senior thesis. In addition to research expertise, students graduate with strong basic science backgrounds and problem-solving and communication skills. Many will become industrial or academic research professionals, in areas of science where there will be a shortage of qualified individuals for the foreseeable future. Others will enter graduate and professional schools in the life sciences, or become highly effective secondary school science teachers. There are over one hundred Bioresource Research faculty mentors, from fifteen departments in the colleges of Agricultural Science, Forestry, and Science: Agricultural Chemistry, Animal Science, Bioresource Engineering, Botany and Plant Pathology, Chemistry, Crop and Soil Science, Entomology, Fisheries and Wildlife, Food Science and Technology, Forest Resources, Forest Science, Horticulture, Microbiology, Rangeland Resources, and Zoology. The faculty are organized into ten interdepartmental option groups according to their research interests. See complete description under Interdisciplinary Studies.

FOREST ENGINEERING

William Atkinson, Head
Peavy Hall 213
Oregon State University
Corvallis, OR 97331-5706
(503) 737-4952

Faculty:
Professors Adams, Atkinson, Beschta, Garland, Sessions☆; *Associate Professors* Kellogg, Olsen☆, Pyles☆; *Assistant Professors* Skaugset; *Instructors* Jackson, Kramer☆

Undergraduate Majors

Forest Engineering (B.S.)
Forest Engineering-Civil Engineering (B.S.)

Graduate Major

Forest Engineering (M.F., M.S., Ph.D.)
Graduate Areas of Concentration
Forest Hydrology
Logging Engineering
Silviculture/Harvesting
Timber Harvesting Systems

The forest engineering curriculum prepares students to perform a wide range of engineering tasks associated with the management of forest lands. These include designing and constructing roads, bridges, and other structures; developing logging plans and adapting logging systems to achieve quality resource management.

Students are trained to analyze and evaluate engineering systems in order to integrate the mechanical and economic requirements of forest operations with the biological requirements of the forest and the need to protect soil and water resources. The curriculum includes courses in engineering, forest management, watershed management, and operations research. A five-year program is offered in cooperation with the Department of Civil Engineering. A graduate of this program receives a bachelor's degree in both forest engineering and civil engineering. Students must qualify for the College of Engineering's professional engineering program in order to be eligible for the dual degree. Students from both curricula are eligible to take the Fundamentals of Land Surveying and Fundamentals of Engineering examinations.

Forest engineering graduates are employed by private forestry firms, public forestry agencies, logging and construction companies, and surveying firms. Some establish their own consulting business after a few years of field experience.

ADVISING

Upon acceptance by the University, a student selecting the forest engineering major will be assigned a lower division adviser who will counsel the student during completion of the freshman and sophomore year programs. During the junior and senior years, students will be assigned to the junior and senior advisers respectively. Forest engineering-civil engineering majors will be advised initially by the lower division adviser, and then be transferred to the dual degree adviser for the duration of their academic work.

CURRICULUM

Forest Engineering Major (B.S.) is accredited by Society of American Foresters—In addition to the curricula listed below, all students are required to complete a total of six months of satisfactory employment in an area related to their major. This is usually

accomplished by two or more summers of work, but it may include work during the academic year. Work performance and personal conduct are thoroughly appraised by the College of Forestry.

Forest Engineering-Civil Engineering Program results in a B.S. in Forest Engineering that is accredited by the Society of America Foresters and a B.S. in Civil Engineering that is accredited by Accreditation Board for Engineering and Technology. In addition to the curricula listed below, and the six-month employment requirement, students must be admitted to the College of Engineering professional program following completion of the pre-engineering curriculum. (See courses footnoted in the FE-CE program shown below.) For additional information, refer to the College of Engineering section of this catalog.

FOREST ENGINEERING CURRICULUM

Freshman Year (48)
MTH 112. Elementary Functions (4)
MTH 251. Differential Calculus (4)
MTH 252. Integral Calculus (4)
CH 121. General Chemistry (5)
FE 210. Introduction to Forest Surveying (3)
FE 215. Forest Engineering Computations (3)
FE 407. Section 1/Current Issues in Forest Engr. (1)
FOR 111. Introduction to Forestry (4)
FOR 153. Tree Identification (3)
FOR 220. Forest Measurements (4)
FP 210. Wood Technology (4)
EC 201. Intro. to Microeconomics (3)
Baccalaureate core requirements (6)

Sophomore Year (50)
MTH 253. Infinite Series and Sequences (4)
PH 211, PH 212. Gen Physics with Calculus (8)
ST 351. Introduction to Statistical Methods (4)
ENGR 211. Statics (3)
ENGR 213. Strength of Materials (3)
FE 310. Forest Route Surveying (5)
FE 311. Advanced Forest Surveying (4)
FOR 240. Forest Biology (4)
FOR 321. Forest Mensuration (5)
BA 215. Accounting (4)
Approved program elective (3)
Baccalaureate core requirements (3)

Junior Year (51)
FE 370. Harvesting Processes (4)
FE 470. Logging Mechanics (4)
FE 471. Logging Management (4)
FE 315. Engr Properties of Forest Soils (3)
FE 316. Forest Soil Mechanics (3)
FE 440. Forest Operations Analysis (4)
FE 430. Watershed Processes (4)
FE 431. For Engr Fluid Mech & Hydrology (3)
F 431. Silviculture Principles (4)
ENGR 212. Dynamics (3)
GEO 221. Physical Geology for Engineers (3)
Approved program elective (3)
Baccalaureate core requirements (9)

Senior Year (51)
FE 407. Seminar (1)
FE 415. Logging Roads (4)
FE 416. Logging Road Structures (4)
FE 441. Production Planning (4)
FE 450. Resource Transportation Planning (3)
FE 451. Harv Area Plng & Implementation (4)
FOR 434. Forest Resource Economics I (4)
FOR 435. Forest Resource Economics II (4)
FRR 344. Amenity Resource Management (3)
FOR 415. Forest Policy (WIC) (4)
Approved program elective (4)
Baccalaureate core requirements (12)

FOREST ENGINEERING/CIVIL ENGINEERING DUAL DEGREE

Freshman Year (53)
MTH 251. Differential Calculus (4)✥
CH 201. Chemistry for Engr. Majors (3)✥
CE 101. CE Orientation (3)✥
FOR 111. Intro to Forestry (4)
Writing I (3)✥
MTH 252. Integral Calculus (4)✥
CH 202. Chemistry for Engr. Majors (3)✥
FE 215. FE Computations (3)✥
FE 407. Section 1/Current Issues in Forest Engr. (1)
FP 210. Wood Technology (4)
Western culture (3)
MTH 253. Infinite Series and Sequences (4)✥
PH 211. Physics (4)✥
FE 210. Intro to Forest Surveying (3)
FOR 220. Forest Measurements (4)
Electives (3)

Sophomore Year (55)
MTH 254. Vector Calculus I (4)✥
PH 212. Physics (4)✥
ENGR 211. Statics (3)✥
ENGR 245. Graphics/CAD (3)✥
Fitness (3)
PH 213. Physics (4)✥
ENGR 212. Dynamics (3)✥
ST 314. Statistics (3)✥
Writing II (3)
MTH 256. Differential Equations (4)✥
ENGR 201. Electrical Fundamentals (3)
ENGR 213. Strength of Materials (3)✥
FOR 321. Forest Mensuration (5)
EC 201. Principles of Microeconomics (3)
Baccalaureate core elective (3)
Electives (4)

Junior Year (52)
CE 381. Structural Theory I (3)
CE 311. Fluids Mechanics (3)
CE 321. Civil Engineering Materials (WIC) (4)
FE 310. Forest Route Surveying (5)
Baccalaureate core elective (3)
CE 382. Structural Theory II (3)
CE 312. Fluids Mechanics (3)
FE 315. Engr. Properties of Forest Soils (3)
CE 322. Civil Engineering Materials (3)
CE 392. Intro to Transportation Engr. (3)
Cultural diversity (3)
CE 383. Design of Steel Structures (3)
CE 313. Hydraulic Engineering Fund (3)
FE 316. Forest Soil Mechanics (3)
CE 353. Environmental Engineering (3)
FOR 240. Forest Biology (4)

Senior Year (52)
FE 370. Harvesting Processes (4)
ENGR 311. Thermodynamics (3)
CE 481. Reinforced Concrete I (3)
CE 491. Highway Engineering (3)
CE 451. Environmental Engineering Fund (3)
FE 470. Logging Mechanics (4)
FE 440 Forest Operations Analysis (4)
FOR 415. Forest Policy (WIC) (4)
Literature & arts (3)
Speech (3)
FE 471. Logging Management (4)
FOR 431. Silviculture Principles (4)
FRR 344. Amen & Res Mgt (3)
FE 311. Advanced Forest Surveying (4)
GEO 221. Geology (3)

Fifth Year (47)
FE 415. Logging Roads (4)
FE 441. Production Planning (4)
FOR 434. Forest Economics I (4)
FE 430. Watershed Processes (4)
FE 416. Logging Road Structures (4)
FE 450. Resource Transportation Planning (3)
FOR 435. Forest Economics II (4)
Baccalaureate core elective (3)
Restricted elective (CE) (3)
FE 451. Harvest Area Planning (4)
FE 407. Seminar (1)
Global issues (3)
Restricted electives (CE) (6)

COURSES

Lower Division Courses

FE 210. INTRODUCTION TO FOREST SURVEYING (3). Introductory forest surveying for beginning forestry students or students minoring in forestry. Basic concepts of plane surveying using forestry problems. Emphasis will be low-order surveying using the compass, abney, clinometer, and hand-level. Also includes introduction to the U.S. Public Land Survey System, topography, and mapping. PREREQ: Trigonometry.

FE 215. FOREST ENGINEERING COMPUTATIONS (3). Computer programming in BASIC for forestry and engineering majors. Introduction to algorithms for numerical searches, sorting, matrix manipulation, plane area and volume calculations (numeric integration). Introduction to forest engineering applications of stochastic simulation. PREREQ: Trigonometry, calculus (recommended).

Upper Division Courses

Courses numbered 500 and above may be taken for graduate credit.

FE 310. FOREST ROUTE SURVEYING (5). Route surveying and site surveying applied to forestry problems. Use of surveying equipment; traversing; computations; stadia; leveling; horizontal, vertical, compound, reverse and spiral curves; earthwork; construction staking; and "as-built" surveys. PREREQ: FE 210.

FE 311. ADVANCED FOREST SURVEYING (4). Advanced techniques for forest surveying. Directional instruments; electronic distance measurements; field astronomy; State Plane Coordinate Systems; horizontal control, specifications, triangulation and trilateration; U.S. Public Land Survey System; introductory survey law. PREREQ: FE 310. Taught alternate years.

FE 315. ENGINEERING PROPERTIES OF FOREST SOILS (3). Physical character of soils, mass-volume relationships, soil classification, capillarity, permeability, compressibility, soil strength theory and testing. Soil compaction, compaction testing, and field compaction control. PREREQ: ENGR 213.

FE 316. FOREST SOIL MECHANICS (3). Application of basic principles of engineering mechanics to soil problems; slope stability; lateral earth pressure theory; earth retaining structures. PREREQ: FE 315.

FE 370. HARVESTING PROCESSES (4). Timber harvesting methods from the forest to the mill. Technical feasibility and cost relationships in forestry operations. PREREQ: Junior standing in forestry.

FE 405. READING AND CONFERENCE (TBA).

FE 406. PROJECTS (TBA).

FE 407. SEMINAR (TBA).

FE 415/FE 515. FOREST ROADS (4). Location surveying, design, cost estimation, and construction practices for forest roads. Lecture on principles, and laboratory field practice in locating, surveying, designing, and cost estimating. PREREQ: FE 310.

FE 416/FE 516. FOREST ROAD STRUCTURES (4). Theory, design, construction, and cost estimating of stream crossing structures, timber bridges, and culverts. PREREQ: FE 415/FE 515.

FE 430/FE 530. WATERSHED PROCESSES (4). Effects of land use practices on the physical hydrology (interception, infiltration, evapotranspiration, subsurface flow and surface runoff, water yields, and peak flows) of forested watersheds. Surface erosion, mass soil movements, stream temperatures, nutrient levels and effects of management activities upon riparian systems; Forest Practice Rules. PREREQ: Junior standing.

FE 431/FE 531. FOREST ENGINEERING FLUID MECHANICS AND HYDROLOGY (3). Fluid properties, pressure, pressure measurement, control volumes, continuity, flow states, energy equation, flow in closed conduits, pipe systems, flow in open channels, culvert hydraulics. The hydrograph, methods for estimating peak flows; rainfall-runoff models, statistical analysis of stream gage records. PREREQ: Junior standing in forest engineering.

FE 440/FE 540 FOREST OPERATIONS ANALYSIS (4). Identification and measurement of production components in harvesting systems, heavy equipment operations, and crew type activities. Methods analysis, productivity improvement, and engineering economics. Report writing and oral presentation skills emphasized. PREREQ: ST 351, FE 370. Taught alternate years.

FE 441/FE 541. PRODUCTION PLANNING (4). Resource planning using critical path analysis, linear programming, and tactical approaches. Analysis of alternatives using benefit foregone, intangibles, and regulations. Business planning including bidding, budgeting, scheduling, inventory control, equipment replacement analysis, and fleet maintenance. PREREQ: Junior standing in engineering, business or forestry.

FE 450/FE 550. RESOURCE TRANSPORTATION PLANNING (3). The basic elements of transportation planning are developed and applied. Various resource transportation model scenarios are developed. Fixed and variable transportation costs are studied in detail. Computer analysis is rigorously applied. PREREQ: Junior standing.

FE 451/FE 551. TIMBER HARVEST AREA PLANNING AND ANALYSIS (4). Integrated timber harvest, logging, and transportation. Plan alternatives are developed and analyzed, computer analysis rigorously applied. Physical and economic feasibility is determined. Current Oregon State Forest Practice Rules are applied. PREREQ: FE 450/FE 550 and FE 471/FE 571.

FE 470/FE 570. LOGGING MECHANICS (4). Relationship of torque, power, and thrust to the operation of cable and ground harvesting systems. PREREQ: FE 370, ENGR 211.

FE 471/FE 571. LOGGING MANAGEMENT (4). Practical skills necessary for logging planning; harvest system operations. Advanced instruction on harvest unit layout, operations management, crew supervision, and safe-productive logging practices. PREREQ: FE 470.

Graduate Studies

Through the graduate school, the department offers the Master of Science (M.S.) and the Master of Forestry (M.F.) degrees with specializations in logging engineering, timber harvesting systems, forest operations, and forest hydrology. The department also offers Ph.D. specializations in logging engineering, timber harvesting systems, forest operations, and forest hydrology, and jointly with the Department of Forest Science offers a Ph.D. with a combined specialty in silviculture/harvesting.

Graduate Courses

FE 501. RESEARCH (TBA).

FE 503. THESIS (TBA).

FE 505. READING AND CONFERENCE (TBA).

FE 506. PROJECTS (TBA).

FE 507. SEMINAR (TBA). Subject matter as required by graduate programs.

FE 532. FOREST HYDROLOGY (3). Application of hydrologic principles to forest and rangelands, with special emphasis on the influence of land management on the hydrologic cycle in both rain and snow dominated regions. PREREQ: FE 430/FE 530.

FE 533. FOREST HYDROLOGY LABORATORY (1). Laboratory application of hydrologic principles to forest and rangelands, with special emphasis on the influence of land management on the hydrologic cycle in both rain and snow dominated regions. COREQ: FE 532.

FE 535. WATER QUALITY AND FOREST LAND USE (3). Influence of natural and land-use factors on water quality; monitoring strategies and analytical methods; municipal watershed management. PREREQ: FE 430/FE 530.

FE 536. INTEGRATED FOREST ENGINEERING AND HYDROLOGY (3). Decision making and evaluation of integrated problems involving forest engineering and forest hydrology; slope stability; riparian zone management; soil compaction; and road system stabilization, protection, and maintenance. PREREQ: FE 430/FE 530.

FE 542. FOREST ENGINEERING OPERATIONS MODELING (4). Harvest unit optimization; optimization of equipment replacement, scheduling and selection. Applied analysis using linear programming, integer programming, dynamic programming, network techniques, non-linear programming, iterative techniques, and simulation. PREREQ: FE 440/FE 540.

FE 552. FOREST TRANSPORTATION SYSTEMS (4). Analysis of interactions between harvesting and road systems. Advanced topics in road and landing spacing, determination of road standards, analysis of logging road networks, transfer and sort yard facility location. Simultaneous resource scheduling and transportation planning. PREREQ: FE 215, FE 440/FE 540. REC: FE 541.

FE 572. ADVANCED LOGGING MECHANICS I (4). Performance of on-road and off-road logging vehicles including trucks, wheeled and tracked skidders and forwarders. Fundamentals of cable logging system performance. Payload analysis. PREREQ: FE 215, ENGR 211, FE 470/FE 570.

FE 573. ADVANCED LOGGING MECHANICS II (3). Influence of design upon performance and interactions between ground vehicles and support surface. Simulation of ground vehicle performance. Properties of wire rope. Load-tension relationships, payload calculation and carriage design for cable logging. Helicopter logging. PREREQ: FE 572.

FE 575. FOREST OPERATIONS MANAGEMENT (3). The operational and business management aspects of accomplishing forest management objectives. Analysis of operational needs for site preparation, herbicide application, prescribed burning, reforestation, fertilization, precommercial thinning, contract preparation and administration, and the management of heavy equipment. Environmental consideration related to planning and conducting forest operations. PREREQ: F 431, F 432. Field trips required.

FE 601. RESEARCH (TBA).

FE 603. THESIS (TBA).

FE 605. READING AND CONFERENCE (TBA).

FE 607. SEMINAR (TBA). Subject matter is required by graduate programs.

FE 630. SPECIAL TOPICS IN FOREST HYDROLOGY (1-3). Recent advances in various aspects of forest hydrology and watershed behavior and management. Subjects will vary with faculty. May be retaken for credit.

FE 640. SPECIAL TOPICS IN FOREST ENGINEERING (1-3). Recent advances in logging engineering, forest engineering, and forest operations. Content will vary with instructor. May be retaken for credit.

FOREST PRODUCTS

Thomas McLain, Head
Forest Research Laboratory 105
Oregon State University
Corvallis, OR 97331-7402
(503) 737-4257

Faculty

Professors T. Brown, McLain, Wilson; *Associate Professors* Biermann, Brunner, Funck, Humphrey, Karchesy, Laver, Leichti,

Milota, Morrell; *Assistant Professors* Gartner, Gupta, Hansen, Reeb, Simonson

Undergraduate Major

Forest Products (B.S.)
Options
Wood Engineering and Science
Wood Industry Management
Minor
Forest Products

Graduate Major

Forest Products (M.S., M.F., Ph.D.)
Graduate Areas of Concentration
Pulp and Paper Technology
Computer-Aided Wood Processing
Wood Anatomy and Quality
Timber Engineering
Wood Chemistry
Biodeterioration and Wood Preservation
Wood Physics/Moisture Relations
Materials Science/Wood Composites
Forest Products Economics

The Department of Forest Products prepares students for a broad spectrum of employment and career opportunities in forest products and associated industries. Successful graduates provide the technical and managerial leadership needed to maximize the production and value of products from available forest resources as well as insure efficient and wise use of products. Because society's demand for products is increasing at a time when available domestic resources are tightening, OSU graduates are often at the forefront of innovation aimed at resolving this dilemma. Students in this curriculum receive a combination of science and business with specific education in wood science and technology.

In addition to the core curriculum, students select one of two options depending on their interests and abilities: Wood Industry Management or Wood Engineering and Science. Students may also earn concurrent bachelor's degrees in science, engineering, or business by taking additional time to complete requirements.

Students majoring in other programs at OSU may elect a minor in Forest Products, which will give them an insight into the use of wood and the forest products industry.

Forest Products major and minor students are employed by private industry or public agencies in management, technical services, sales, or marketing positions. Qualified students may pursue advanced degrees.

CURRICULUM

Freshman Year (44-52)
Mathematics (12) (See option requirements)
General chemistry (12-15) (See option requirements)
Writing I (3)
FOR 111. Introduction to Forestry (4)
FOR 153. Tree and Shrub Identification (3)
Fitness (3)
Computer Applications (2-3) (See option requirements)
COMM 111 Public Speaking (3) or COMM 114 Argument and Critical Discourse (3)
Electives (2-6)

Sophomore Year (46-50)
FOR 240. Forest Biology (4)
WR 214. Writing for Business (3) or WR 327 Technical Writing (3)
FP 210. Wood Technology & Utilization (4)
FP 211. Wood Properties and Measurements Lab (1)
General Physics (8-10) (See option requirements)
EC 201, EC 202. Economics (6)
Baccalaureate Core Perspectives Courses (6) [Cult. Div., West. Cult.]
Option courses/electives (14-16)

Junior Year (48)
FP 312. Wood and Fiber Anatomy (4)
FP 314. Wood and Fiber Physics (4)
FP 316. Wood and Fiber Chemistry (3)
FP 318. Mechanical Behavior of Wood (4)
FP 441. Primary Wood Processing (4)
Statistics (3) (See option requirements)
Baccalaureate Core Perspective Courses (6) [Lit/Arts, Diff. Power & Discrim.]
Baccalaureate Core Synthesis Courses (3) [Global Issues]
Option courses/electives (16)

Senior Year (48)
FP 407. Seminar (1)
FP 411, FP 412, FP 413. Forest Products Project (WIC) I,II,III (2,1,2)
FP 440. Drying and Preservation (3)
FP 442. Composites Manufacturing (4)
FP 445. Chemical Wood Processing and Pollution Control (3)
FP 446. Secondary Wood Products Manufacturing (3)
FP 460. Wood as a Resource for Housing (3)
Option courses/electives (26)

OPTIONS

Students are required to select one of the two options shown below to strengthen their preparation and focus on interest areas. The required courses are listed for each option. Students in the Science and Engineering option will select from a suite of courses to construct an overall program which complements the Forest Products major. Faculty advisers assist in planning programs to maximize student benefit and interests.

WOOD INDUSTRY MANAGEMENT OPTION (44)

Core Choise
MTH 112, 241, 245. Mathematics (12)
CH 121, 122, 123. General Chemistry (15)
PH 201, 202 General Physics (10)
BA 131. Business Productivity Software (2)

Required
BA 215. Fundamentals of Accounting (4)
BA 230. Business Law (4)
BA 275. Quantitative Business Methods (4)
BA 278. Intro to Mgmt Science (4)
BA 315. Accounting for Decision Making (4)
BA 340. Finance (4)
BA 350. Organization Systems (4)
BA 357. Operations Management (4)
FOR 435. Forest Resource Economics II (4)
FP 453. Forest Products Merchandizing (4)
FP 452. Process Control in Forest Products Industry (4)

WOOD ENGINEERING AND SCIENCE OPTION (44)

Core Choices
MTH 112, 251, 252. Mathematics (12)
CH 201, 202, 203. Chemistry for Engineering Majors (12) or CH 221, 222, 223 General Chemistry (15)
PH 211, 212. General Physics with Rec (10)
FOR 190. Intro. to Comp. App. in Forestry (or equivalent) (3)
ST 351. Intro to Statistical Methods I (4)

Required
CH 219. General Chemistry Lab (2)
PH 213. General Physics with Recitation (5)
ST 352. Intro. to Statistical Methods II (4)
Selection from suite of courses in science and/or engineering (28-31)

MINORS

FOREST PRODUCTS MINOR (27)

Core (4)
FP 210. Wood Technology and Utilization (4)
Choose 2 of following courses (8)
FP 312. Wood and Fiber Anatomy (4)
FP 314. Wood and Fiber Physics (4)
FP 316. Wood and Fiber Chemistry (4)
FP 318. Mechanical Behavior of Wood (4)
Choose 2 of following courses (6-7)
FP 441. Primary Wood Processing (3)
FP 442. Composites Manufacturing (4)
FP 445. Chemical Wood Processing and Pollution Control (3)
FP 446. Secondary Wood Products Manufact (3)
Choose from following or any not taken from those listed above (8-9)
FOR 111. Intro. to Forestry (4)
FOR 153. Tree and Shrub Identification (3)
FOR 435. Forest Resource Economics II (4)
FP 407. Seminar (1)
FP 440. Drying and Preservation (3)
FP 452. Process Control in For Prod Ind (4)
FP 460. Wood as a Resource for Housing (3)

COURSES

Lower Division Courses

FP 210. WOOD TECHNOLOGY AND UTILIZATION (4). Characteristics and uses of wood and fiber products; manufacturing processes; effect of tree growth and harvesting on forest products manufacturing and properties. Wood identification.

FP 211. WOOD PROPERTIES AND MEASUREMENTS LABORATORY (1). Measurement of basic wood properties; measurement and grades of wood raw materials and products.

Upper Division Courses
Courses numbered 500 and above may be taken for graduate credit.

FP 312. WOOD AND FIBER ANATOMY (4). Minute anatomy and variability of wood species; natural characteristics and deterioration; density, cell wall properties, and wood and fiber surfaces. PREREQ: FP 210.

FP 314. WOOD AND FIBER PHYSICS (4). Hygroscopic nature of the wood fiber and solid wood; wood-fluid relationships; steady-state flow processes; electrical, thermal, and sonic properties of wood and wood-based composite materials. PREREQ: PH 202; Calculus.

FP 316. WOOD AND FIBER CHEMISTRY (3). Lignin, polysaccharides, and extractives of wood and bark; distribution, isolation, structure, and relationships with anatomy, properties and uses;. PREREQ: 1 year general chemistry.

FP 318. MECHANICAL BEHAVIOR OF WOOD (4). Statics and strength of materials emphasizing wood and wood-based composites Introduction to elasticity; mechanical properties of wood; Introduction to wood design. PREREQ: PH 201.

FP 401. RESEARCH (1-16).

FP 405. READING AND CONFERENCE (1-16).

FP 407. SEMINAR (1).

FP 411, FP 412, FP 413. ^FOREST PRODUCTS PROJECT I,II,III (2,1,2). A capstone course in which students plan, execute, and report a research-type project of their own choice related to the field of forest products. **FP 411:** Project selection and planning, culminating in a written work plan. PREREQ: FP 312, FP 314, FP 316, FP 318. **FP 412:** Project is executed according to the work plan developed in FP 411. PREREQ: FP 411. **FP 413:** Findings are analyzed and presented in a written report and an oral presentation. PREREQ: FP 412. (Writing Intensive Course)

FP 440/FP 540. WOOD DRYING AND PRESERVATION (3). Drying wood, including lumber, veneer, and particles. Moisture-related problems of wood during processing and in-service. Wood-destroying organisms. Extending the life of wood using preservatives. PREREQ and COREQ: FP 314 or equivalent. Lec/lab.

FP 441/FP 541. PRIMARY WOOD PROCESSING (4). Mechanical breakdown of lumber, veneer and chips from a processing perspective; Mill/plant layout; quality and process control applications; Field trips. PREREQ: FP 210, FP 440.

FP 442/FP 542. COMPOSITES MANUFACTURING (4). Composites, wood adhesive and adhesion processes and plant layouts; laminated and panel products; coatings and overlays; quality control, recovery and grades. Field trips. PREREQ: FP 210.

FP 443/FP 543. PULP & PAPER MANUFACTURING I (4). Chemistry and technology of fundamental processes of the pulp and paper industry including pulping, bleaching, refining, sheet forming, filling, sizing, coloring, and coating. Paper testing and relationship of fiber properties. Field trips. PREREQ: FP 316 or equivalent.

FP 444/FP 544. PULP & PAPER MANUFACTURING II (4). Topics include unit process in pulp and paper; high polymer technology in pulp and paper; optical behavior of paper; colloidal properties of fibers and additives; paper machinery variables; paper specialties; air and water pollution problems. PREREQ: FP 443/FP 543.

FP 445/FP 545. CHEMICAL WOOD PROCESSING AND POLLUTION CONTROL (3). A survey of the chemical processing of wood with emphasis on its environmental impact. Topics include treating of wood to resist decay, pulping and papermaking, and adhesives used in wood composites. PREREQ: FP 316 or equivalent. Lec/lab.

FP 446/FP 546. SECONDARY WOOD-PRODUCTS MANUFACTURING (3). Application of machining, assembling, and finishing techniques to wood-based products to increase their value; the use of computers for design and process planning; environmental considerations in secondary processing. PREREQ: FP 210.

FP 452/FP 552. PROCESS CONTROL IN THE FOREST PRODUCTS INDUSTRY (4). Use of sensing devices, analysis methods, and hardware to control variables found in typical wood products processes. PREREQ: FP 314, FP 441, FP 442 or FP 443, ST 351 or BA 275.

FP 453/FP 553. FOREST PRODUCTS MERCHANDISING (3). Sale and distribution of forest products by manufacturers, wholesalers, and retailers. Roles of trade associations and price reporting services in relation to marketing activities of companies. International trade in forest products. Trade practices and customs, described by speakers from industry. PREREQ: FP 210.

FP 460. WOOD IAS A RESOURCE FOR HOUSING (3). The role of wood as a renewable resource in construction of residential and commercial buidings; covering all aspects of its selection and use in planning, construction, purchasing, and maintenance. With a focus on the consequence of material selection upon cost, performance, environment and society.

GRADUATE STUDIES

The department offers advanced studies through the Graduate School leading to the Master of Science, Master of Forestry, Master of Arts in Interdisciplinary Studies, Master of Science in Materials Science, and Doctor of Philosophy degrees with majors in Forest Products. Concentrations are offered in wood science for the doctorate and in wood science, forest products economics, forest products operations management, and wood technology at the master's level.

Graduate Courses

FP 501. RESEARCH (1-16).

FP 503. THESIS (1-16).

FP 505. READING AND CONFERENCE (1-16).

FP 506. PROJECTS (1-16).

FP 507. SEMINAR (1). Section 1: Beginning Seminar. **Section 2:** Seminar.

FP 512. WOOD AND FIBER ANATOMY (4). Development, structure, and function of cells and tissues in woody plants; cell types and distribution; cell wall ultrastructure and modifications; effect of anatomy on properties and uses; research techniques. PREREQ: FP 312.

FP 514. WOOD AND FIBER PHYSICS (4). Wood and fiber composites in terms of their physical behavior in heat, mass, and charge transport; dielectric theories, wood-fluid interactions; application to industrial processes; research techniques. PREREQ: FP 314, PH 202, MTH 252.

FP 516. WOOD AND FIBER CHEMISTRY (4). Chemistry of wood polysaccharides, lignin, polyphenolics, and other extractives; present and potential utilization; analytical procedures specific to chemical constituents of wood and bark. PREREQ: One year of organic chemistry.

FP 518. WOOD AND FIBER MECHANICS (4). Strength and orthotropic elasticity of solid-wood, paper, and reconstituted wood-based systems; nonlinear behavior; deformation and load-transfer mechanisms; mechanical and stochastic modeling; design considerations. PREREQ: FP 318, MTH 252.

FP 535. MARKET STRUCTURE AND PRICES IN FORESTRY (3). Applied forecasting and price analysis as they apply to the forest products industries. Industry structure, conduct, and performance; demand and supply factors and unique pricing strategies; lumber futures; and industry trends. CROSSLISTED AS FOR 535.

FP 561. FOREST POLICY ANALYSIS (3). Basic elements of forest policy problems, including resource allocation and efficiency, distribution and interpersonal equity, taxation, regulation and control, and planning and uncertainty; emphasis on policy and analysis and its uses in policy decision. CROSSLISTED AS FOR 561.

FP 601. RESEARCH (1-16).

FP 603. THESIS (1-16).

FP 605. READING AND CONFERENCE (1-16).

FP 606. PROJECTS (1-16).

FP 607. SEMINAR (1). Section 1: Beginning Seminar. **Section 2:** Seminar.

FP 611. SELECTED TOPICS IN WOOD AND FIBER SCIENCE (1-3). May be taken more than once.

FP 613. WOOD MICROTECHNIQUE (3). Preparation, sectioning, maceration, staining, and mounting of slides of wood and fibers for microscopic study; photomicrography. PREREQ: FP 312 or FP 512.

FOREST RESOURCES

John Walstad, Head
Peavy Hall 108
Oregon State University
Corvallis, OR 97331-5703
(503) 737-4951

Faculty

Professors Boyle, Brodie, Hann, N. Johnson, Shelby, Stankey, Tappeiner, Walstad; *Associate Professors* Carson, Daniels, Elwood, Jackson, R. Johnson, S. Reed, Ripple, Tesch; *Assistant Professors* Jensen, Marshall, Shindler; *Instructors* Hester, Middleton, M. Reed

Adjunct Faculty

Professors Kimerling, Lavender, Sessions; *Associate Professors* Duddles, Fletcher, Landgren, Reed, Rogers; *Assistant Professor* Kavanagh

Courtesy Faculty

Professors Achterman, Beuter, Haynes, Merriam, Starkey; *Associate Professors* Brooks, Greber, Larson, Peterson; *Assistant Professor* Alig

Undergraduate Majors

Forest Management (B.S.)
Options
Business Administration
Earth Information Science and Technology
Forest Biology
Forest Harvesting
Forest Products
Forest Recreation Resources
Forest Soils
Philosophy
Public Administration
Range Management
Statistics
Wildlife

Forest Recreation Resources (B.S.)
Options
Business Administration
Cultural Resource Management
Earth Information Science and Technology
Environmental Resource Interpretation
Forest Resources
Landscape Design
Law Enforcement
Philosophy
Public Administration
Range Resources
Resource Economics
Resource Planning
Tourism
Wildlife Resources

Natural Resources (B.S.)
Specialty Areas
Forest Ecosystems
Natural Resource Education
Recreatoin Ecosystem Planning

Undergraduate Minors

Forest Management
Forest Recreation Resources

Graduate Major

Forest Resources (M.F., M.S., Ph.D.)
Graduate Areas of Concentration
Community and Resource Development
Forest Biometrics
Forest Economics
Forest Management
Forest Management Science/Operations Research
Forest Modeling
Forest Planning Administration
Forest Policy
Forest Recreation
Forest Social Science
Forestry
Land Use Planning
Natural Resource Education and Extension
Remote Sensing and GIS
Silviculture
Soils

The Forest Resources Department provides broad-based education for those interested in natural resource systems and how to manage them. Two undergraduate degree options are offered: Forest Management, which emphasizes the understanding and management of forest resources for multiple uses, and Forest Recreation Resources, which prepares managers of recreational opportunities in forests and other natural resource areas.

Several forestry specialization areas are also offered under the Natural Resources Interdisciplinary Degree program.

FOREST MANAGEMENT CURRICULUM

The successful forest manager must understand the biological and physical processes of the forest and the social and economic forces that influence policies and actions affecting forests. The Forest Management core curriculum includes basic courses in the biological, physical, and social sciences, as well as professional courses designed to prepare students to manage forest resources. Strength in a related field can be obtained by selecting a listed option in a field such as business administration, forest biology, forest harvesting, forest products, soils, philosophy, public administration, range management, recreation management, statistics, or wildlife.

OPTIONS/MINORS (FM)

Curriculum options and minors are optional in the Forest Management curriculum and offer the student a way of adding strength and breadth in a discipline related to forestry. (See departmental listings for University-approved options and minors). The courses listed under an option are those required in addition to the FM core curriculum. Some options involve substitutes for or modifications of the core curriculum as noted. Certain courses may require prerequisites not included in the core curriculum.

MINOR IN FOREST MANAGEMENT (32-33)

Students majoring in other programs at OSU may elect a minor in Forest Management. This program provides basic knowledge about management of forest resources.

FOREST RECREATION RESOURCES CURRICULUM

Managers of wildland recreation resources must blend an understanding of social and biological sciences and management necessary to provide desired recreation opportunities. Thus, the Forest Recreation Resources curriculum includes the study of natural resources, recreational users of these resources, and recreational opportunities. Students must complete an approved option which will strengthen their ability to perform recreation planning and management with private and public organizations.

OPTIONS/MINORS (FRR)

Selection of a curriculum option or minor is required in the Forest Recreation Resources curriculum (see departmental listings for University-approved minors). An individualized option composed of cognate courses can be developed but must be approved by the Department. The courses listed under option/minor are those required in addition to the FRR core curriculum. Some options/minors involve substitutions for or modifications of the core curriculum as noted. Certain courses may require prerequisites not included in the core curriculum.

MINOR IN FOREST RECREATION RESOURCES (27)

Students majoring in other programs at OSU may elect a minor in Forest Recreation Resources. This program provides basic knowledge about recreation resource planning and management.

GRADUATES

Graduates in Forest Management and Forest Recreation Resources find employment with a variety of governmental and private organizations. They work as analysts, managers, forestry and recreation consultants, suppliers of forestry services, guides, outfitters, concessionaires, managers of resort properties and recreation managers for federal, state, and local government agencies.

The Forest Management and Forest Recreation Resources undergraduate curricula and the M.F. in Forest Resources are accredited by the Society of American Foresters.

FOREST MANAGEMENT CURRICULUM

Freshman Year (47)
BI 211, BI 212, BI 213. Biology (12)
CH 121, CH 122, CH 203. General Chem (13)
COMM 111 or COMM 114. Speech Communication (3)
FE 210. Intro to Forest Surveying (3)
FOR 111. Introduction to Forestry (4)
FOR 112. Forestry Computer Applications (3)
FOR 241. Dendrology (5)
MTH 245. Math for Mgmt Life & Social Sci (4)

Sophomore Year (47)
CSS 305. Principles of Soil Science (5)
EC 201, EC 202. Principles of Economics (6)
FOR 220. Aerial Photo Interp & Forest Msrmnts (4)
FOR 251. Recreation Resource Mgt (4)
FP 210. Wood Technology & Utilization (4)
GEO 199. SS: Exploring Arc/Info GIS (3)
HHP 231. Lifetime Fitness for Health (3)
MTH 241. Calculus for Mgmt & Social Sci (4)
ST 351, ST 352. Intro to Stat Methods (8)
Writing I (3)
Writing II (3)

Junior Year (50)
BOT 415/ENT 415. Forest Insect & Disease Mgmt (5)
FOR 321. Forest Mensuration (5)
FOR 322. Growth & Yield Models (3)
FOR 341. Forest Ecology (4)
FOR 355. Management for Multiple Resource Values (4)
FOR 365. Issues in Natural Resource Conserv (3)
FOR 406. Section 4: Integrated Project (1)
FOR 430. Forest Resource Economics I (4)
FOR 431. Forest Resource Economics II (4)
FOR 442. Silviculture: Reforestation (4)
FOR 443. Silvicultural Practices (4)
BCC Perspectives (9)

Senior Year (48)
FE 370. Harvesting Processes (4)
FE 430. Watershed Processes (4)
FOR 407, 406-2. Seminar (1)
FOR 457. Techniques for Forest Res Analysis (4)
FOR 459. Forest Res Planning & Decision Making (4)
FOR 460. Forest Policy (WIC) (4)
FS 453. Managed Forests & Wildlife Inter (4)
Organizations & Human Relations (3)
Electives (14)
Baccalaureate Core Curriculum (6)

OPTIONS

Options are not required. Students may choose any electives if basic departmental, college, and University requirements are met.

The courses listed under an option are those required in addition to the core curriculum. Some options involve substitutions for or modifications of the core curriculum as noted. Certain courses may require prerequisites not included in the core curriculum

BUSINESS ADMINISTRATION OPTION (27)
See listing under College of Business for minor and option requirements.

EARTH INFORMATION SCIENCE AND TECHNOLOGY (21)

Earth Information Science and Technology (EIST) Undergraduate Minor and Option

Undergraduate Minor

See Interdisciplinary Studies section in this catalog

Undergraduate Option

(21 credits, including 15 upper division)
Forest Management majors must take the five required core courses, plus two advaned courses from the list found in the Interdisciplinary Studies section of this catalog. The two advanced courses are selected in consultation with a departmental faculty adviser so as to best meet the student's professional interests.

FOREST BIOLOGY OPTION (22)

BOT 221. Systematic Botany (4)
CSS 435. Soil Ecosystem Properties (4)
FS 444. Forest Genetics (4)

Science Electives for Forest Biology Option:

Plus a minimum of 10 hours in two or more of the following scientific areas:

Biometry

ST 431. Sampling Methods (3)
ST 411, ST 412, ST 413. Methods of Data Analysis (12)

Botany

BOT 412. Morphology of Vascular Plants (4)
BOT 433. Hormonal Reg of Plant Growth (3)

Chemistry

CH 440, CH 441, CH 442. Physical Chem (9)

Entomology

ENT 442. Princ of Insect Pest Management (3)
ENT 486. Biological Control (3)
FS 450. Integrated Forest Protection (4)

General Biology

BB 350. Elementary Biochemistry (4)
FS 451. Managed Forests & Wildlife Interactions (4)
GEN 311. Genetics (4)

Soils

CSS 315. Nutrient Management and Cycles (4)
CSS 435. Soil Ecosystem Properties (4)
CSS 485. Environmental Appl of Soil Sci (4)

FOREST HARVESTING OPTION (23)

ENGR 211. Statics (3)
ENGR 213. Strengths of Materials (3)
FE 310. Forest Route Surveying (5)
FE 440. Operations Analysis (4)
FE 441. Production Planning (4)
FE 471. Logging Management (4)

FOREST PRODUCTS OPTION (25)

See listings under the Department of Forest Products for minors and options in Forest Products.

FOREST RECREATION RESOURCES OPTION (24-26)

FOR 251. Recreation Resource Management (4)
FOR 351. Rec Behav and Mgmt (4)
FOR 356. Recreation Resource Planning (5)
FOR 391. Natural Resource Comm (3)
FOR 432. Econ of Recreation Resources (4)
Select four credits from:
FOR 352. Wilderness Management (3)
FOR 453. Nature Based Tourism (3)
FOR 451. Hist & Cult Asp of Rec (4)
FOR 493. Environmental Interpretation (4)
FOR 495. Interpretive Project (2)

FOREST SOILS OPTION (23)

GEO 202. Geol of the Surface of the Earth (4)
MB 448. Microbial Ecology (3)
CSS 315. Nutrient Management and Cycling (4)
CSS 435. Soil Ecosystem Properties (4)
CSS 445. Soil Ecosystem Processes (4)
CSS 465. Soil Morphology and Survey (4)

PHILOSOPHY OPTION (26-28)

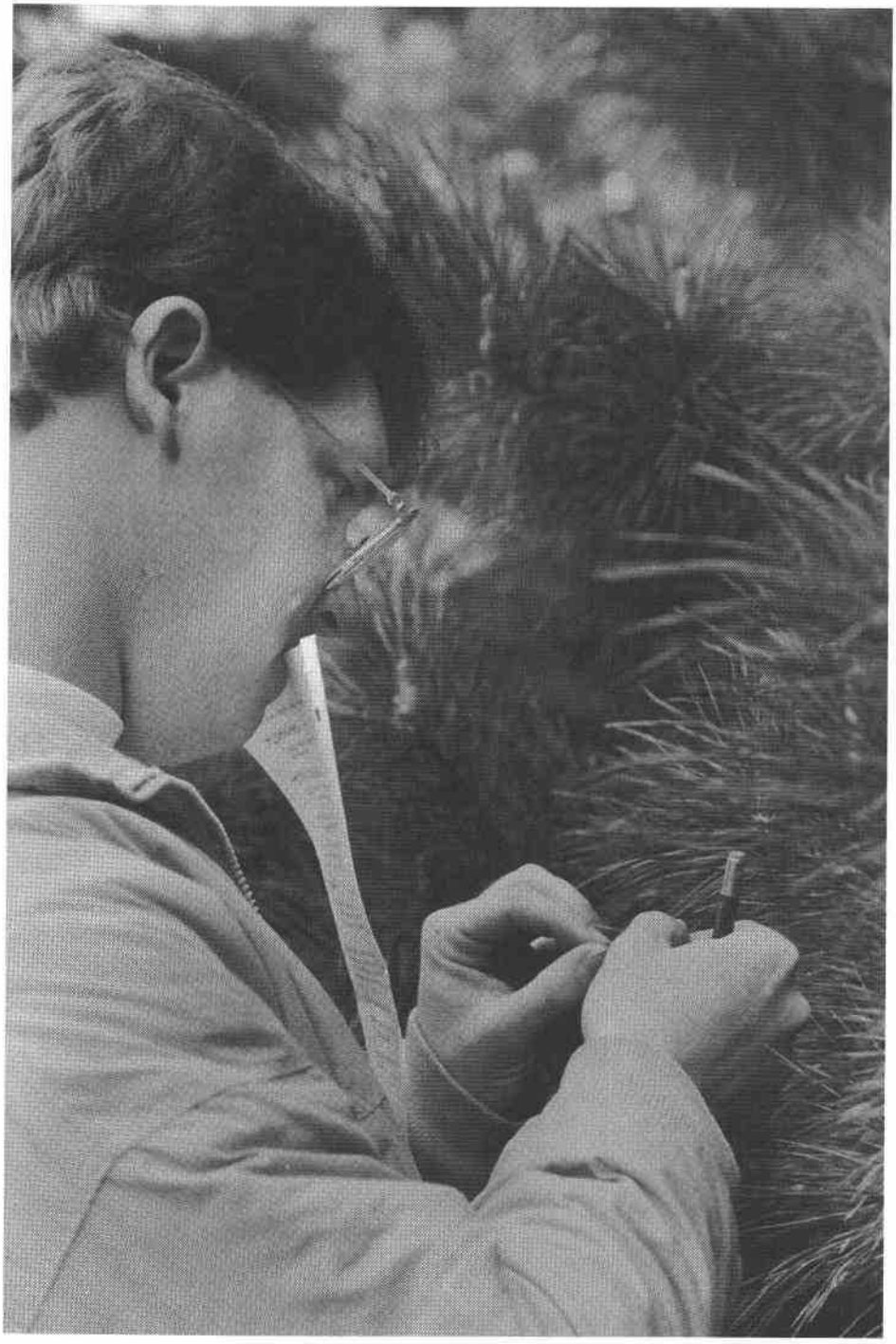
PHL 201. Introduction to Philosophy (4)
PHL 205. Ethics (4)
PHL 301, PHL 302, PHL 303. Hist of West Philosophy (12)
PHL 365. Law in Phil Perspective (4) or PHL 470. Philosophy of Science (3)
PHL 342. Contemporary Ethics (4) or PHL 440. Environmental Ethics (3)

PUBLIC ADMINISTRATION OPTION (26)

EC 435. The Public Economy (4)
PS 472, PS 473. Public Administration (8)
PS 474. Bureau Pol and the Policy Process (4)
PS 475. Pol of Env Problems (4)
Political Science electives (6)

RANGE MANAGEMENT OPTION (26)

ANS 121. Intro Animal Sci (4)
ANS 422. Sheep Production (4) or
ANS 424. Beef Production (4)



BOT 221. Systematic Botany (4)
FW 251. Princ of Wildlife Conserv (3)
RNG 347. Arid Land Biomes (3)
RNG 348. Arid Land Plants (2)
RNG 350. Grassland Ecosystems (3)
RNG 447. Agroforestry (3)

STATISTICS OPTION (31)
MTH 251. Differential Calculus (4)
MTH 252. Integral Calculus (4)
MTH 253. Infinite Series and Seq (4)
MTH 254. Vector Calculus I (4)
ST 421, ST 422, ST 423. Intro to Math Stat (9)
ST 431. Sampling Methods (3)
ST 437. Categorical Data Analysis (3) or
ST 448. Operations Research Methods (3)

WILDLIFE OPTION (29)
BOT 221. Systematic Botany (4)
FW 251. Prin of Wildlife Conserv (3)
FW 310. Wildlife Biology: Mammals (4)
FW 311. Wildlife Biology: Birds (4)
FW 321. Fish & Wildlife Resource Ecology (3)
FW 458. Management of Big Game Animals (4)
FW 481. Wildlife Ecology (3)
FS 453. Managed Forest and Wildlife Interactions (4)

MINOR IN FOREST MANAGEMENT (32-33)

(Not for Forest Resources students)
Core
FOR 111. Intro to Forestry (4)
FOR 141. Tree Identification (3)
FOR 220. Aerial Photos/Measurements (4)
FOR 240. Forest Biology (4) OR
FOR 341. Forest Ecology (5)
FOR 365. Issues in Natural Resource Conservation (3)
FOR 441. Silviculture Principles (4)
FOR 430. Forest Resource Economics I (4)

Select a minimum of 6 credits from:
FE 370, FE 430, FOR 321, FOR 460, FOR 439, FOR 431, FOR 457, FOR 251, FOR 351, FOR 352, FOR 354, FOR 391, FOR 444, FOR 462, FP 210, FS 444, FS 450, FS 453

COURSES

Lower Division Courses

FOR 111. INTRODUCTION TO FORESTRY (4). Forest resources in the world; forests and human well-being; where and how forests grow; environmental and human values; products, characteristics, and uses; basic elements of use, planning and management. Interpretation of forestry literature; professional origins in the U.S. REQ: Field trips.

FOR 112. INTRODUCTION TO COMPUTER APPLICATIONS IN FORESTRY (3). Introduction to word processing, DOS on IBM compatible computers and spreadsheet graphics software for forestry applications.

FOR 119. SPECIAL STUDIES (1-16).

FOR 141. TREE AND SHRUB IDENTIFICATION (3). Learn to identify the principal forest trees of North America, and the principal trees and shrubs of the Pacific Northwest. Also learn about forested regions of the world, and the structure and function of forest plants. REQ: Field trips.

FOR 220. AERIAL PHOTO INTERPRETATION AND FOREST MEASUREMENTS (4). An introduction to the field collection of forest measurements and the aerial photos used to assess the forest resource. The spatial relationship of field and photo-based data are emphasized and related to the building of a geographic information system. Successful completion of FOR 220 should help students compete for summer jobs requiring measurement skills. PREREQ: MTH 105, FOR 111.

FOR 240. *FOREST BIOLOGY (4). Forest plants and animals, communities, and ecosystems, their functioning and their relationship to resource management. REQ: Field Trips. PREREQ: FOR 141 or equivalent. (Bacc Core Course)

FOR 241. DENDROLOGY (5). Learn to identify the principal forest trees of North America, and the principal trees and shrubs of the Pacific Northwest—including the ranges over which they grow, important ecological characteristics, and principal uses. Also learn about forested regions of the world, and the structure and function of forest plants. REQ: Field trips.

Upper Division Courses

Courses numbered 500 and above may be taken for graduate credit.

FOR 321. FOREST MENSURATION (5). Theory and practice of sampling and cruising techniques; stratified and nonstratified sampling systems with fixed plots, variable plots, and 3-P designs. PREREQ: FOR 220, ST 351, ST 352.

FOR 322. FOREST MODELS (3). Introduction of static and dynamic forest models: defining what they are, how they might be used, and, in general terms, how they are developed. PREREQ: FOR 321, ST 351, ST 352.

FOR 341. FOREST ECOLOGY (4). Basic physiological characteristics of trees; succession, climax, and related concepts; vegetation classification; stand structure, diversity, competition, growth; soils-forests interactions; biomass and nutrient distribution, energy relations, nutrient element dynamics; ecology of disturbances. PREREQ: BI 201, BI 202, BI 203, FOR 241, CSS 305. COREQ: FOR 442, FOR 443, FOR 355, FOR 406-4; 2-day field trips.

FOR 365. *ISSUES IN NATURAL RESOURCES CONSERVATION (3). Background of major current issues in natural resources conservation with emphasis on forests, soils, and water; focus on analyzing facts and opinions related to issues; basics of terrestrial and aquatic ecology; recreation management; recent and current issues of soil, water, and forest use and management. (Bacc Core Course)

FOR 390. FORESTRY FOR TEACHERS (3). Cooperative learning and critical thinking skills used in discussions and labs to introduce forestry concepts to pre-teachers of K-12 students. Includes forest ecology, forest products, management practices, and conservation of forest resources. REQ: Cascades, Coast Range field trips.

FOR 401. RESEARCH (1-16).

FOR 405. READING AND CONFERENCE (1-16).

FOR 406. PROJECTS (1-16). Section 1: Integrated Projects; **Section -2:** Starker Lectures. Graded P/N.

FOR 407. SEMINAR (1-16). Section 2: Presentation Skills graded; **Section 6:** Professionalism; **Section 3:** Natural Resources & Environ Policy Issues; **Section 4:** Forestry and Wildlife (2 cr.); **Section 5:** International Forestry; Graded P/N.

FOR 419/FOR 519. SELECTED TOPICS IN FOREST RESOURCES (1-4). Topics of current importance in forestry resources—issues, education, policies, economics, management, business, social values, silviculture, and biometrics. Topics will change from term to term. May be repeated with different topics for credit. PREREQ: Senior or graduate standing.

FOR 420/FOR 520. ADVANCED AERIAL PHOTOS AND REMOTE SENSING (3). Planning the photo mission, height measurements, photo mensuration, introduction to remote sensing; use of an analytic stereoscopic plotter to make precise photo measurements and planimetric and topographic maps from photos. PREREQ: A photointerpretation course (F 220 or GEO 415/515 or the equivalent; a remote sensing course (GEO 444/GEO 544) or the equivalent.

FOR 421/FOR 521. ADVANCED GIS APPLICATIONS IN FORESTRY (3). Geographic information systems (GIS) literature review, seminars, and project work involving forest resources, wildlife habitat, and landscape ecology using remotely sensed data, digital elevation models, and other digitized data. PREREQ: A course in photointerpretation (FOR 220) and a GIS course (GEO 465/GEO 565) or the equivalent.

FOR 430/FOR 530. FOREST RESOURCE ECONOMICS I (4). Basic arithmetic of interest and capital budgeting. Welfare economics of forest resource management and production. Economics of timber management and scheduling, nonmarket valuation, and multiple use forestry. PREREQ; EC 201, MTH 245.

FOR 431/FOR 531. FOREST RESOURCE ECONOMICS II (4). Forest product and timber price analysis; contractual arrangements in timber sales and purchasing; spatial and locational impacts on forest production and manufacturing; supply and demand of forest products; impact of forest management and policy decision on public welfare. PREREQ: FOR 430, ST 352, EC 202.

FOR 439/FOR 539. INDUSTRIAL FORESTRY (3). Topics in industrial forest management in the Pacific Northwest, including property and income taxation, labor problems, and timber sales and contracts. PREREQ: Senior standing. Not offered every year.

FOR 441. SILVICULTURE PRINCIPLES (4). Nursery operation, vegetation management; herbivores; fire; seeding and planting techniques. Introduction to principles and techniques involving vegetation control, thinning, fertilizing, and harvesting; environmental considerations related to forest stand treatments. PREREQ: FOR 141, FOR 240.

FOR 442/FOR 542. SILVICULTURE: REFORESTATION (4). Seed, seedlings, and cuttings; nursery operation, planting techniques, seeding and vegetation management; herbivores, uses of fire in reforestation. REQ: Field trips. PREREQ: BI 211, BI 212, BI 213; CSS 305; FOR 322; COREQ: FOR 443, F 441, FOR 355, FOR 406-4; 2-day field trips.

FOR 443/FOR 543. SILVICULTURAL PRACTICES (4). Manipulation of immature and mature forest stands for various resource management objectives; principles and techniques involving vegetation control, thinning, fertilizing, and harvesting; environmental considerations related to stand treatments. PREREQ: FOR 322. COREQ: FOR 442, FOR 341, FOR 355, FOR 406-4; 2-day field trips.

FOR 446/FOR 546. FIRE ECOLOGY AND ENVIRONMENT (3). Impact of fire on vegetation succession; effects of fire on soil, nutrient cycling, forest development; use of fire as a silvicultural and hazard treatment tool. PREREQ: RNG 341; FOR 443.

FOR 457/FOR 557. TECHNIQUES FOR FOREST RESOURCE ANALYSIS (4). Use of linear programming, nonlinear programming, dynamic programming, and simulation to solve complex forest management problems, with emphasis on intertemporal multiple use scheduling. Forestry transportation problems, multiple use allocation, and investment analysis. REQ: Field trips. PREREQ: FOR 430.

FOR 459/FOR 559. FOREST RESOURCE PLANNING AND DECISION MAKING (4). Integration of biological, economic, and amenity characteristics of the forest system in resource management planning and decision making. Senior capstone class-projects. REQ: Field trips. PREREQ: Senior standing in forestry.

FOR 460 ^FOREST POLICY (4). Policy formulation and analysis for forest resources; consideration of policy affecting land management approaches to planning, management, and social and economic development; major forest policy areas covered include outdoor recreation, range, timber, wilderness, and wildlife and fish. PREREQ: Senior standing. (Writing Intensive Course)

GRADUATE STUDIES

Graduate and research programs in the Department of Forest Resources focus on forest biometrics, forest economics, forest management, operations research, forest modeling, forest policy, forest recreation, community and resource development, natural resource education and extension, geographic information systems, remote sensing, silviculture, soils, and resource-based tourism. Degree programs lead to the Master of Forestry (M.F.), Master of Arts in Interdisciplinary Studies (M.A.I.S.), Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in Forest Resources.

Graduate Courses

FOR 501. RESEARCH (1-16).

FOR 503. THESIS (1-16).

FOR 505. READING AND CONFERENCE (1-16).

FOR 506. PROJECTS (1-16). Section 2: Starker Lectures. Graded P/N.

FOR 507. SEMINAR (1-16). Section 2: Presentation Skills (graded); **Section 3:** Natural Resources & Environ Policy Issues; **Section 4:** Forestry and Wildlife (2 cr); **Section 5:** International Forestry; **Section 6:** Professionalism; **Section 10:** American Forestry; **Section 11:** Thesis: Seminar; Graded P/N.

FOR 524. ADVANCED FOREST MENSURATION (3). Growth determination; mensurational aspects of level of growing stock; variable plot and 3P sampling; current forest inventories; use of the Tele-Relaskop. REQ: Field trips. PREREQ: FOR 322, ST 451.

FOR 525. FOREST MODELING (3). Evaluation of regression techniques and assumptions; examination of general model forms; techniques for modeling growth, mortality, recruitment, volume, residues, and stand structure. PREREQ: ST 452, FOR 524.

FOR 533. ECONOMICS OF PRIVATE FORESTRY (3). Economic and social characteristics of owners of small woodlands. Study of credit, incentives, leasing, and other measures to increase production on small woodlands. PREREQ: FOR 430. Not offered every year.

FOR 534. ECONOMICS OF THE FOREST RESOURCE (3). Economics aspects of forest production, regulation, and silvicultural applications. Microeconomic interactions of forest production and regulation and environmental constraints. PREREQ: FOR 430, FOR 431 or equivalent.

FOR 535. MARKET STRUCTURE AND PRICES IN FORESTRY (3). Applied forecasting and price analysis as they apply to the forest products industries. Industry structure, conduct, and performance; demand and supply factors and unique pricing strategies; lumber futures; and industry trends. PREREQ: FOR 431 or equivalent. Offered alternate years.

FOR 536. NATURAL RECOURSE DECISION MAKING (4). Methods of economic analysis, computer programming and interpretation, problem analysis, and decision making useful in tracing effects of silvicultural decisions. PREREQ: B.S. in forestry or related field, two years experience as silviculturist; B.S. in nonrelated field, five years experience as silviculturist. Silviculture Institute students only.

FOR 536. HARVEST SCHEDULING DEVELOPMENT AND ANALYSIS (3). Harvest scheduling theory, techniques, and development. Harvest schedule synthesis and analysis. PREREQ: FOR 534. Offered alternate years.

FOR 537. FOREST RECREATION ECONOMICS (3). Public goods and externalities in forest resources. Institutional analysis of forest amenities. Demand and valuation of forest amenity resources. Theory and application of nonmarket valuation techniques.

FOR 538. DYNAMIC RESOURCE SCHEDULING (3). Technique and theory of optimal control applied to minerals, crops, forests and fisheries, dynamic programming, calculus of variations, Pontryagin principle. Offered alternate years.

FOR 558. CONCEPTS OF FOREST RECREATION PLANNING AND MANAGEMENT (3). Examines research which forms the conceptual basis for tools, techniques, and approaches used in recreation planning and management. PREREQ: Senior standing.

FOR 561. FOREST POLICY ANALYSIS (3). Basic elements of forest policy problems, including resource allocation and efficiency, distribution and interpersonal equity, taxation, regulation and control, and planning and uncertainty; emphasis on policy analysis and its uses in policy decisions. PREREQ: FOR 534. CROSSLISTED AS FP 561.

FOR 590. FORESTRY EDUCATION FOR TEACHERS (3). Explores a range of information and activities to bring general forest understanding into the classroom. Project Learning Tree and the Forestry Education Project are used along with other natural resource based K-12 curricula.

FOR 601. RESEARCH (1-16).

FOR 603. THESIS (1-16).

FOR 605. READING AND CONFERENCE (1-16).

FOR 606. PROJECTS (1-16).

FOR 607. SEMINAR (1-16) Section 11: Thesis Seminar.

FOREST RECREATION RESOURCES CURRICULUM

Freshman Year (48)

EC 201. Principles of Economics (3)
FOR 111. Introduction to Forestry (4)
FOR 112. Forestry Computer Applications (3)
FOR 241. Dendrology (5)
FW 251. Prin of Wildlife Conser (3)
MTH 241. Calculus for Mgmt and Soc Sci (4)
GEO 199. SS: Exploring Arc/Info. GIS (3)
Physical science (4)
Writing I, II (6)
Fitness (3)
Electives/option/minor (2)
Baccalaureate Core curriculum (8)

Sophomore Year (48)

FOR 220. Aerial Photo Interp and For Meas (4)
FOR 240. Forest Biology (4)
OR 251. Rec Res Mgmt (4)
RNG 341. Rangeland Resources (3)
ST 351. Intro to Stat Methods (4)
Speech (3)
Baccalaureate Core curriculum (8)
Electives/option/minor (18)

Junior Year (48)

FOR 323. Recreation Research Methods (3)
FOR 351. Rec Behav and Mgmt (4)
FOR 352. Wilderness Management (3)
FOR 353. Field School (3)
FOR 356. Recreation Resource Planning (5)
FOR 365. Issues in Natural Resource Conservation (3)
FOR 391. Natural Resource Communication (3)
FOR 407-20. Seminar: Career Develop (1)
FOR 410. Forest Recreation Internship (8)
FOR 441. Silviculture Principles (4)
FOR 444. Ecological Aspects of Park Mgmt (3)
Electives/option/minor (8)

Senior Year (48)

FOR 430. Forest Resource Economics I (4)
FOR 432. Economics of Recreaton Resources (4)
FOR 451. History and Cultural Aspects of Rec (4)
FOR 453. FManaged Forest and Wildlife Interactions (4)
FOR 457. Techniques or Forest Resource Analysis (4)
FOR 459. For Res Plan and Decision Mak (4)
FOR 460. Forest Policy (WIC) (4)
Electives/option/minor (17)
Baccalaureate core curriculum (3)

OPTIONS/MINORS

Students majoring in forest recreation resources must select an option or minor from among the programs listed below; an individualized option is possible and must be approved by the department.

BUSINESS ADMINISTRATION (27)

See listing under College of Business for minor and option requirements.

CULTURAL RESOURCE MANAGEMENT OPTION (34)

ANTH 100. Intro to Arch and Phys Anth (3)
ANTH 110. Intro to Cultural Anth (3)
ANTH 431. Arch/Method and Theory (3)
ANTH 435. Cultural Resources: Policies and Procedures (3)
HST 420. Historiography (4)
Plus a minimum of 9 credits from each of these two groups:

Anthropology

ANTH 230. Time Travelers (3)
ANTH 380. Cultures in conflict (3)
ANTH 411. World Cult: North America (4)
ANTH 432. Arch of Domest and Urban (3)
ANTH 433. First Americans, Last Front (3)
ANTH 436. Northwest Prehistory (3)
ANTH 472. Contemporary Indian Issues (3)
ANTH 481. Natural Resources and Community Values (3)

History

HST 366, HST 367. Hist of Ameri Indians (6)
HST 467, HST 468. Hist of the Ameri West (6)
HST 469. History of the Pacific Northwest (3)
HST 481. Environ History of the U.S. (4)
HSTS 418. Science & Utopia (3)
HSTS 421. Impact of Technology on American Culture (3)
HSTS 460, HSTS 461, HSTS 462. American Thought and Culture (9)

EARTH INFORMATION SCIENCE AND TECHNOLOGY (EIST)

UNDERGRADUATE MINOR

See Interdisciplinary Studies section in this catalog.

UNDERGRDUATE OPTION

(21 Credits, including 15 upper division) Forest Recreation Resources majors must take the five required core courses, plus two advanced courses from the list found in the Interdisciplinary Studies seciton of this catalog. The two advanced courses are selected in consultation with a departmental faculty adviser so as to best meet the student's professional interests.

ENVIRONMENTAL RESOURCE INTERPRETATION OPTION (30)

ANTH 100. Intro to Arch and Phys Anth (3)
ANTH 110. Intro to Cult Anth (3)

ED 463. Environmental Education (3)
FOR 390. Forestry for Teachers (3)
FOR 493. Environmental Interpretation (4)
FOR 495. Interpretive Projects (2)
Select a minimum of 6 credits from each group:

Natural History
BI 301. Human Impact/Ecosystems (4)
ENT 350. Biology of Insects (4)
FW 311. Wildlife Biology: Birds (4)
GEO 202. Geology of Surface of Earth (4)
GEO 305. Geology of Volcanic Cascades (3)
Z 371, Z 372. Vertebrate Biology (5)
Z 473. Herpetology (3)

Cultural Resources
ANTH 230. Time Travelers (3)
ANTH 431. Arch/Meth and Theory (3)
ANTH 433. First Americans, Last Front (3)
HST 366, HST 367. Hist of Amer Indians (6)
HST 467, HST 468. American West (6)
HST 469. History of the Pacific Northwest (3)

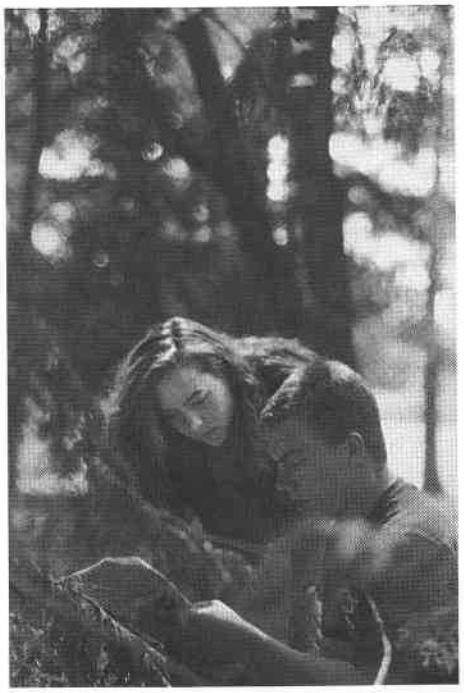
FOREST RESOURCES OPTION (27)
FE 210. Intro. to Forest Surveying (3)
FE 430. Watershed Processes (4)
FOR 321. Forest Mensuration (5)
FOR 431. Forest Resource Economis II (4)
FOR 442. Silviculture: Reforestation (5)
Select 6 credits from the following:
BOT 415. Forest Insect and Disease Mgmt (5)
FOR 439. Industrial Forestry (3)
FOR 443. Silvicultural Practices (4)
RNG 436. Wildland Fire Science (3)

LANDSCAPE DESIGN OPTION (26)
HORT 112. Intro to Turf and Landscape Mgmt (2)
HORT 226, HORT 227, HORT 228. Landscape Plant Materials (9)
HORT 280. Landscape Design Theory (2)
HORT 281. Landscape Design (2)
HORT 301. Principles of Landscape Technology (4)
HORT 315. Prin and Pract of Landsc Maint (4)
HORT 358. Landscape Construction (3)

LAW ENFORCEMENT OPTION (25)
COMM 440. Theories of Conflict and Conflict Mgmt (3)
PHL 205. Ethics (4)
SOC 340. Dev Behav and Soc Control (3)
SOC 440. Juvenile Delinquency (3)
SOC 441. Criminology and Penology (3)
SOC 448. Law and Society (3)
Select 6 credits from:
SOC 324. Groups and Organizations (3)
SOC 421. Social Change and Modernization (3)
SOC 424. Social Psychology (3)
SOC 426. Social Inequality (4)
SOC 437. Minority Groups and Issues (3)
SOC 470. Collect Behav and Soc Mvmts (3)

Attendance at a law enforcement training school such as the Santa Rosa (California) Training Center (NPS oriented) or Skagit Valley College (Washington) (State Park oriented) is required for one term. Students are advised to apply to the Oregon State Police cadet program to gain work experience

PUBLIC ADMINISTRATION OPTION (30-33)
PS 101. American Politics (4)
PS 102. American Government (4)
PS 300. Political Analysis (5)
PS 316. Public Opinion and Politics (4)
PS 472, PS 473. Public Administration (8)



Plus two of the following:
PS 371. Public Policy Problems (4)
PS 474. Bureau Politics and Policy Proc (4)
PS 475. Politics of Environ Problems (4)
PS 479. Topics in Publ Pol and Publ Adm (1-4)
EC 435. Public Economy (4)
PS 414. Interest Groups (4)
PS 415. Politics and the Media (4)
PS 476. Science and Politics (4)
AREC 477. Econ., Politics & Government (3)
EC 435. Public Economy (4)

RANGE RESOURCES OPTION (23-25)
See listing under Rangeland Resources in this catalog for minor and option requirements.

RESOURCE ECONOMICS OPTION (29)
See listing under Agriculture and Resource Economics in this catalog for minor and option requirements.

RESOURCE PLANNING OPTION (28)
BA 432. Environ Law: Water and Air (4)
EC 490. Regional Economics (4)
FE 430. Watershed Processes (4)
GEO 261. Map Interpretation (3)
GEO 360. Cartography (4)
GEO 420. Geography of Resource Use (3)
GEO 423. Land Use (3)
GEO 465. Geographic Information Systems (3)

WILDLIFE RESOURCES OPTION (28-30)
See listing under Fisheries and Wildlife in this catalog for minor and option requirements.

PHILOSOPHY OPTION
See listing under Department of Philosophy, College of Liberal Arts for minor and option requirements.

TOURISM OPTION (30-32)
BA 390. Marketing (4)
BA 492. Consumer Behavior (4)
EC 490. Regional Economics (4)
FOR 443. Nature Based Tourism (3)
GEO 484. Travel and Tourism Impacts (3)
GEO 485. Tourism and Recreation Resources (3)
SOC 454. Leisure and Culture (3)
Plus two from the following group:
BA 497. International Marketing (4)
BA 498. Services Marketing (4)
GEO 423. Land Use (3)
GEO 426. Third-World Resource Development (3)
GEO 451. Environmental Site Planning (3)
GEO 452. Principles and Practices of Rural and Resource Planning (3)
PS 475. Politics of Environmental Problems (4)

MINOR IN FOREST RECREATION RESOURCES (27)

(Not for Forest Resources students)

Core
FOR 251. Recreation Resource Management (4)
FOR 351. Rec Behav and Mgmt (4)
FOR 356. Recreation Resource Planning (5)
FOR 391. Natural Resource Communication (3)
Select at least 11 credits from:
FOR 352. Wilderness Management (3)
FOR 443. Nature Based Tourism (3)
FOR 444. Ecol Aspects of Park Mgmt (3)
FOR 432. Econ of Rec Res (4)
FOR 451. Hist and Cult Aspects of Rec (4)
FOR 493. Environmental Interpretation (4)
FOR 495. Interpretive Projects (2)
FOR 460. Forest Policy (4)
FOR 365. Iss in Nat Res Conservation (3)

COURSES

Lower Division Courses

FOR 251. RECREATION RESOURCE MANAGEMENT (4). Overview of recreation resource management including study of land and water resources used for outdoor recreation. The planning and management of natural and cultural resources for long-term resource productivity, with a focus on rural and wildland areas of the forest, range and coast.

Upper Division Courses

Courses numbered 500 and above may be taken for graduate credit.

FOR 319. SELECTED TOPICS. (1-3). Contemporary recreation resource management issues for undergraduate students. Topics vary from term to term. May be repeated for credit. Graded P/N.

FOR 323. RECREATION RESEARCH METHODS (3). Research methods applied to the study of outdoor recreation issues and problems; interpretation of research results. PREREQ: FRR 251, ST 351.

FOR 351. RECREATION BEHAVIOR AND MANAGEMENT (4). Principles of human behavior as used in the analysis of recreation management issues. Sociological and psychological approaches are emphasized.

FOR 352. WILDERNESS MANAGEMENT (3). Wilderness as a land use concept. Wilderness history, preservation, planning and management. Wilderness in the context of other land uses.

FOR 353. FIELD SCHOOL (3). A field course focused on current management in park and recreation areas. A major field trip is required. PREREQ: FRR 251. Additional fee.

FOR 354. AMENITY RESOURCE MANAGEMENT (3). Management of amenity resources such as recreation, fish, wildlife, and visual aesthetics in the context of multiple use land management. PREREQ: F 111, FW 251, RNG 341 or FRR 251. Not for FM or FRR majors.

FOR 355. MANAGEMENT FOR MULTIPLE RE-

SOURCE VALUES (4). Management of a variety of resource attributes in a multiple use context, including considerations for recreation, fish, wildlife aesthetics, watersheds, and forest products. PREREQ: F 111, FW 251, RNG 341 or FRR 251. COREQ: F 341, F 432, F 433, F 406I. Not for FRR majors.

FOR 356. RECREATION RESOURCE PLANNING (5). Theory and function of recreation resource planning. Techniques for collection, storage, analysis and display of planning data. Practice in use of recreation planning models. PREREQ: FRR 251, ST 351.

FOR 391. NATURAL RESOURCE COMMUNICATIONS. (5). Concepts and techniques for communication with various constituents in the natural resources arena. Principles of public relations, interpretation, and public participation are presented.

FOR 405/FOR 505. READING AND CONFERENCE (1-16).

FOR 406/FOR 506. PROJECTS (1-16).

FOR 407/FOR 507. SEMINAR (1-2). Section 20: Career Development; **Section 21:** Senior Seminar. Graded P/N.

FOR 408/FOR 508. WORKSHOPS (1-3).

FOR 410. FOREST RECREATION RESOURCES INTERNSHIP (8). Full-time supervised professional experience emphasizing functional proficiency under joint sponsorship of university and agency personnel. PREREQ: FOR 251, FOR 351, FOR 356, FOR 391, FOR 407. Graded P/N.

FOR 419/FOR 519. SELECTED TOPICS (1-3). Contemporary recreation resource management issues for advanced undergraduate and graduate students. Topics vary from term to term. May be repeated for credit. PREREQ: Senior or graduate standing.

FOR 432/FOR 532. ECONOMICS OF RECREATION RESOURCES (4). Application of economic concepts to forest recreation management and resource allocation. Demand, supply, and valuation of both market and non-market forest recreation resources. Benefit-cost analysis applied to a recreation management project. PREREQ: EC 213, ST 351.

FOR 444/FOR 544. ECOLOGICAL ASPECTS OF PARK MANAGEMENT (3). Ecological principles applied to the management of park recreation uses. The relationship between biological and physical science information and recreation management decisions is explored. PREREQ: FOR 251, plus an ecology course.

FOR 451/FOR 551. HISTORY AND CULTURAL ASPECTS OF RECREATION (4). Role of conservation and outdoor recreation in U.S. environmental history. American attitudes toward nature; evaluation of major governmental land and water policies; evolution of the national parks and forests systems; significant leaders in the parks movement; role of cultural resources in recreation and parks. PREREQ: FOR 251.

FOR 453/FOR 553. NATURE BASED TOURISM (3). The relationship between natural resource based recreation and tourism. Issues of tourism planning, management and impacts are explored. PREREQ: FOR 251.

FOR 459/FOR 559. FOREST RESOURCE PLANNING AND DECISION MAKING (4). Integration of biological, economic, and amenity characteristics of the forest system in resource management planning and decision making. Senior capstone class—projects. REQ: Field trips. PREREQ: FOR 356, FOR 391, FOR 432, FOR 444, FOR 460.

FOR 493/FOR 593. ENVIRONMENTAL INTERPRETATION (4). Interpretation of natural and cultural features in parks, museums, and similar settings. Emphasis on learning and applying effective communication techniques in the development of brochures, exhibits, talks, museums, and visitor centers. PREREQ: FOR 391.

FOR 495/FOR 595. INTERPRETIVE PROJECTS (2). Development of specific natural and cultural resource interpretive projects including interpretive plans, brochures, audio-visual programs and displays. PREREQ: FOR 493/FOR 593.

NATURAL RESOURCES

The College of Forestry, in conjunction with the Colleges of Agricultural Sciences, Liberal Arts, and Science, offers a general natural resources degree that provides a broad liberal education with a natural resources orientation. The curriculum is designed to produce graduates who have an understanding of a broad range of natural resource problems, are able to work with issues and experts in a variety of resource fields, and deal with social and political components of resource management.

Students take a series of natural resources and other core courses to provide a common background, followed by a series of required upper division courses from various natural resource groups to provide breadth. Choices within each group allow for student interests and needs. Completion of an interdisciplinary speciality area is then required. This may be chosen from a list of pre-approved specialty areas offered by the various participating colleges, or designed by the student in conjunction with a program adviser. Current pre-approved specialty areas offered by the College of Forestry include forest ecosystems, natural resource education, and recreation ecosystem planning.

See the Interdisciplinary Studies section of this catalog for a more detailed description of this program.

FOREST SCIENCE

Logan Norris, Head
Forest Science Lab 020
Oregon State University
Corvallis, OR 97331-7501
(503) 737-2244

Faculty
Professors Adams, Emmingham, E. Hansen, Hobbs, McComb, Newton, Norris, Perry, Radosevich, Stafford, Sollins, Thielges, Trappe, Waring, Zaerr; *Associate Professors* Cromack, Filip, Griffiths, Hibbs, R. Rose, Strauss; *Assistant Professors* Aitken, Harmon, Knowe, Ross, Rousch, Webb, Weber

Adjunct Faculty
Professor: Showalter; *Associate Professors* M. Atkinson, Bondi, A. Campbell, Cloughesy, Dost, Fitzgerald, J.A. Jones, Myrold, Oester, Ripple, Tesch

Courtesy Faculty
Professors Blair, Copes, Collopy, Ryan, Sedell, Swanson; *Associate Professors* R. Campbell, Barmann, Dixon, Kelsey, Li, Liegel, Molina, Owston, Sorensen, Thies; *Assistant Professors* Anderson, Antos, Borman, Bradshaw, Castellano, Cohen, Ho, Means, Minore, Rygiewicz, St. Clair, Spies, Turner

Graduate Major

Forest Science (M.F., M.S., Ph.D.)
Graduate Areas of Concentration
Forest Biology
Forest Ecology
Forest Genetics
Forest Science (M.F., M.S. only)
Integrated Forest Protection
Silviculture
Silviculture/Harvesting (Ph.D. only)
Tree Physiology

The Department of Forest Science offers programs leading to the Master of Forestry (M.F.), Master of Science (M.S.), and Doctor of Philosophy (Ph.D.) degrees. The M.F. program emphasizes three areas: biology, silviculture, and integrated forest protection. The M.F. in silviculture is administered jointly with the Department of Forest Resources. Students in the three M.F. programs prepare for careers as professional biologists, silviculturists, or pest managers capable of analyzing opportunities in the context of the natural resource management objectives of a landowner, with sensitivity to all forest resource values—physical, biological, economic, and environmental. The M.S. and Ph.D. programs, structured specifically for those interested in careers in research, teaching, and specialized areas of forest science and forestry practice, are available in five areas of concentration: forest ecology, forest genetics (including biotechnology), forest physiology, silviculture, and integrated forest protection. A special doctoral program, administered cooperatively with the Department of Forest Engineering, is offered in silviculture/harvesting systems. This program is concerned with both biological and engineering aspects of forest harvesting and subsequent reforestation. The Department of Forest Science also participates in the Master of Arts in Interdisciplinary Studies (M.A.I.S.) graduate program.

Research in the Department of Forest Science focuses on fundamental and applied research to support forest practices in areas of reforestation, silviculture of young and mature natural stands and plantations, and land capability classification. All biological levels of organization within natural and managed forest communities and individual trees are addressed by current departmental research projects.

Graduate study is structured specifically for those students interested in careers in research and teaching, and in specialized areas of forest science and practice. Emphasis in graduate education is placed on the ability to define and solve researchable problems in forest biology related to the practice of forestry. Graduate students are encouraged to participate actively in the department's large, diverse program of seminars, continuing education courses and workshops, international research, and other professional and educational activities.

COURSES

Upper Division Courses

Courses numbered 500 and above may be taken for graduate credit.

FS 444/FS 544. FOREST GENETICS (4). Genetic principles as applied to forest trees: role of evolutionary forces on patterns of natural variation, impacts of management on forest gene pools, tree breeding theory and practice, biotechnology. REQ: Field trips. PREREQ: F 341 or BOT 341.

FS 450/FS 550. INTEGRATED FOREST PROTECTION (4). Management of forest pests (insects, diseases, weeds, and vertebrates) with an ecological perspective and in a silvicultural context. PREREQ: F 341, BOT 415/ENT 415.

FS 453/FS 553. MANAGED FOREST AND WILDLIFE INTERACTIONS (4). Management and ecology of terrestrial vertebrates in forest ecosystems. Effect of silvicultural practices on habitat in managed forests. Management of habitat to promote diversity and abundance of forest wildlife. PREREQ: F 341 or equivalent course in ecology. CROSSLISTED as FW 453/FW 553.

Graduate Courses

FS 501. RESEARCH (1-16).

FS 503. THESIS (1-16).

FS 505. READING AND CONFERENCE (1-16). **Section 2**: graded P/N.

FS 506. PROJECTS (1-16).

FS 507. SEMINAR (1-16). Some sections graded P/N.

FS 521. NATURAL RESOURCE RESEARCH PLANNING (2). Research project development and analysis and study planning, investigative procedures, the principles and ethics of natural resource science, principles and practices in scientific communication.

FS 523. NATURAL RESOURCE DATA ANALYSIS (4). Hands-on experience in applied statistical data analysis and research data management. Students are encouraged to use data sets from their own research for final projects. Widely used, commercially available statistical software packages, e.g., SAS are used. Emphasis is placed on micro- and mini-computers in the practical application and actual implementation of statistical analysis techniques. PREREQ: ST 412/ST 512, and concurrent registration in ST 415/ST 515.

FS 531. ECOSYSTEM APPROACH TO FOREST MANIPULATION (4). Bioecology of forest systems as they relate to manipulation of the forest by practicing silviculturists. PREREQ: B.S. in forestry or related field and two years experience as a practicing silviculturist or B.S. in nonrelated field and five years experience as a practicing silviculturist. For Silviculture Institute students only.

FS 533. FOREST REGENERATION AND STAND MANAGEMENT (4). Current forest biology information in conjunction with exercises to enhance the silviculturist's ability to gather and integrate information on forest sites, to establish alternatives for site manipulation, and to select the approach best suited for proper management of the site. PREREQ: B.S. in forestry or related field and five years experience as a practicing silviculturist or B.S. in nonrelated field and five years experience as a practicing silviculturist. For Silviculture Institute students only.

FS 542. PHYSIOLOGICAL LABORATORY TECHNIQUES (1). Instruction in use and operation of instruments and techniques for conducting physiological research on seedlings, trees, and plant tissue. PREREQ: FS 541 (may be taken concurrently).

FS 543. ADVANCED SILVICULTURE (4). The scientific basis of forest regeneration and silvicultural practices and prescriptions in immature and mature stands. REQ: Field trips. PREREQ: FOR 432, FOR 433.

FS 545. ADVANCED FOREST COMMUNITY ECOLOGY (4). Dynamics of undisturbed forest ecosystems, responses of ecosystems to perturbation, optimization of response for attainment of management objectives. REQ: Field trips. PREREQ: FOR 433, BOT 441, or BOT 442, or BOT 443, or equivalent.

FS 546. ECOSYSTEM ANALYSIS AND APPLICATION (4). The structure and function of forests and associated streams in natural-managed ecosystems. Nutrient cycling processes and their long-term effects on forest growth and yield. Emphasizes current research and growth simulation models.

FS 548. WEED ECOLOGY AND MANAGEMENT (2). Plant ecology and physiology of competing vegetation in both agriculture and forestry. PREREQ: BOT 331, or BOT 341. CROSSLISTED as CRS 548.

FS 552. CURRENT RESEARCH IN FOREST SCIENCE (2). Introduction to current research in the basic disciplines within forest science (ecology, genetics, physiology, silviculture, and protection) Graded P/N.

FS 601. RESEARCH (1-16).

FS 603. DISSERTATION (1-16).

FS 605. READING AND CONFERENCE (1-16).

FS 606. PROJECTS (1-16).

FS 607. SEMINAR (1-16).

FS 646. ADVANCED FOREST ECOSYSTEM ANALYSIS (4). The structure and function of forests and associated streams in natural and managed ecosystems. Nutrient cycling processes and their long-term effects on forest growth and yield. Emphasizes current research and growth simulation models. PREREQ: F 341; SLS 420; MB 448. REQ: Field trips.

FS 691. SELECTED TOPICS IN FOREST SCIENCE (TBA). In-depth studies of specific topics within a field of specialization. Examples include biotechnology in forestry, mycorrhizal ecology, tree improvement, landscape ecology, global climatic change in relation to forestry, advanced silviculture prescriptions agroforestry and others.

FOOTNOTES

☆Licensed Professional Engineer

✣Required courses for professional engineering program.

The College of Health and Human Performance offers undergraduate degree programs in exercise and sport science, health promotion and education, environmental health and safety, and health care administration.

Students may earn the Bachelor of Science (B.S.) degree in exercise and sport science with an option in athletic training, fitness program management, physical activity and development, pretherapy, sports leadership, or applied exercise and sport science; a B.S. degree in environmental health and safety with an option in environmental health or occupational safety; a B.S. degree in health promotion and education with an option in child and adolescent health, worksite health promotion, community health, or applied health; a B.S. degree in health care administration with an option in long-term care administration or general health care administration. Both the Master of Science and Doctor of Philosophy degrees are offered in areas of health and human performance.

The College offers: (a) undergraduate and graduate courses in exercise and sport science and public health that may be included in degree programs; (b) undergraduate and graduate courses in exercise and sport science and public health for students enrolled in other colleges; (c) minors in selected areas of exercise and sport science and public health; (d) basic instruction in public health and in physical activity for all OSU students; (e) intramural sports and recreational activities for all students, faculty, and staff members; and (f) a faculty/staff fitness program.

International Degree

Undergraduates with majors in the College of Health and Human Performance can earn a second degree in International Studies. See the Interdisciplinary Studies section of this catalog for more information.

Professional Courses

The College of Health and Human Performance offers undergraduate and graduate courses in exercise and sport science and in public health. Exercise and sport science, an applied body of knowledge based on the sciences, social sciences, and humanities, is concerned with the effect of human movement, exercise, and performance on people and society. Public health, a collective, applied body of knowledge based on the life and social sciences, is concerned with the effects of people's activities and the environment on personal and community well-being.

Qualified students with majors in other colleges may elect courses in public health, exercise and sport science, or physical activity for individual interest. Students may complete a minor in environmental health, community health, worksite health promotion, applied health, health sciences, occupational safety or athletic administration. For information concerning courses and programs, consult with an adviser in the College of Health and Human Performance. For requirements for advanced degrees, see Graduate School.

Teacher Education

Students who plan to pursue careers as public school teachers in health or physical education, grades preprimary through twelve, must complete the Master of Arts in Teaching (M.A.T.) teacher education program. Students should follow this process:

1. Select an academic major in the area (health or exercise and sport science) in which the student wishes to teach.
2. Complete the baccalaureate degree.
3. In consultation with an academic adviser, select field experiences.
4. Apply for admission to the professional education program.

Requirements for admission to the professional education program include:

1. Demonstration of basic skills in reading, writing and mathematics by passing the California Basic Educational Skills Test (CBEST).
2. Passing score on NTE subject area test.
3. Holding a baccalaureate degree.
4. Admission as a regular graduate student.
5. Favorable recommendations from immediate supervisors regarding ability to work with school-aged children.
6. Recommendations and statement on "good character."
7. Subject matter competence as specified by the appropriate department.

A major in public health or exercise and sport science is a recommended academic major for students who wish to be elementary classroom teachers. Consult an adviser in the College of Health and Human Performance for further information.

Careers

The fields of exercise and sport science, public health, and related areas of study offer a variety of career opportunities to students who enjoy working with people and are concerned with their well-being and development.

Job opportunities for the public health specialist range from teaching in schools and colleges to planning community health education programs. Public health specialists also coordinate efforts related to environmental health and design programs for reduction of health hazards and injuries in both the private and public sectors. The health care administration specialist is prepared to assume administrative positions in long-term care facilities, or administrative and middle management careers in private health care organizations and public health service agencies. For the exercise and sport science specialist, options include fitness program management, pre-therapy, teaching, athletic training, and leadership positions in sport and exercise programs.

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Administration

Michael G. Maksud
Dean

Kathleen F. Heath
Assistant Dean, Undergraduate Studies

Linda Johnson
Head Adviser

Footnotes for this section on page 249.

ADVISING

Academic advising is regarded as an important responsibility of faculty in the College of Health and Human Performance. Each student in the college is assigned an adviser. The purpose of the advising program is to assist students in all aspects of their academic programs. A student is required to meet with an adviser prior to approval to register. Students also are encouraged to consult advisers for assistance with career planning and academic problems.

BASIC INSTRUCTION

***HHP 231. LIFETIME FITNESS FOR HEALTH (3).** Fulfills the fitness component of the general education requirements in the baccalaureate core. This course is designed to "encourage personal awareness and responsibility for maintenance of health and physical well-being" (University Goals). The student is helped, through this course, to assume personal responsibility for an active and healthy lifestyle through the development and practice of a range of fitness concepts and health behaviors.

INTRAMURAL SPORTS AND RECREATIONAL ACTIVITIES

The Department of Intramural Sports and Recreational Activities provides a variety of opportunities for students to participate in organized sports events. Over 35 sport activities offered each year range from the major team sports to racquet sports, aquatic events, runs, cycling, and special events. Previous skill or experience is not necessary as most events offer divisions to accommodate various skill levels. For more information contact the Intramural Sports office in Langton Hall, Room 131.

USE OF FACILITIES

Regular registration fees entitle every student to the use of gymnasiums, showers, and other facilities. Also provided are towels, and gym clothing. Every student may keep a basket in the locker room for his or her exclusive use; students are urged to use recreational facilities extensively.

SCHOLARSHIPS

The College of Health and Human Performance offers a variety of scholarships to deserving students. Additional information and application forms are available from the College of Health and Human Performance, Women's Building, Room 120.

MASTER OF ARTS IN TEACHING HEALTH EDUCATION AND PHYSICAL EDUCATION

The Master of Arts in Teaching (M.A.T.) in the areas of Health Education and Physical Education is housed primarily in the College of Health and Human Performance. The program is coordinated through The School of Education in the College of Home Economics and Education.

The M.A.T. is a graduate professional degree involving both graduate courses and extensive practical experience in the public schools at all levels, K-12. The 63 credits required in the program include 24 credits in health education or physical education pedagogy, 18 credits of internship in the public schools, 12 credits in professional education courses, and 9 credits of selected public health or exercise and sport science courses. The cohort of students enters the program during summer term and completes certification and master's degree requirements the following June.

The Health Education program places a strong emphasis on health education in elementary and middle schools in addition to the traditional secondary school focus. Students involved in the program have opportunities to interact with and instruct children and youth across the public school age span. They develop knowledge and skills essential for working with communities in order to further the development of comprehensive school health education programs.

The Physical Education program offers students the opportunity to gain a true K-12 certification as students will participate in continuous on-site supervised internships in elementary, middle and high school settings. In association with the nationally recognized graduate program in Movement Studies for the Disabled, students will work with special needs children and youth in physical education environments. Activities in the Instructional Analysis Laboratory offer students the opportunity to improve their teaching behavior through analysis.

A strong public school partnership including collaboration with area public school teachers is an essential feature of both programs. Master teachers are selected from the schools and invited to participate in this joint effort to prepare outstanding teachers.

Admission requirements for the program are listed under the Teacher Education section on the preceding page.

COURSES

■ HEALTH EDUCATION

HLED 407/HLED 507. SEMINAR (1-3).

HLED 510. PROFESSIONAL INTERNSHIP: HEALTH EDUCATION (1-16). A full-time field experience in which the intern will integrate academic study with classroom teaching experience to learn specific competencies relating to functioning well in the context of the classroom and the school, and demonstrate this competency through the assessment of work by supervisors and by evidence collected and presented in work samples. PREREQ: Admission to MAT Program.

HLED 580. TRENDS AND RESEARCH ISSUES IN HEALTH EDUCATION (3). Introductory course in health education in a school setting; historical and philosophical foundations for school health education; current trends explored; research directions examined; health education as a chronology of developmental progress. PREREQ: Admission to MAT Program.

HLED 581. PLANNING, ESTABLISHING AND EVALUATING HEALTH EDUCATION INSTRUCTION (3). Emphasizes processes for planning and establishing instructional environments, as well as processes for evaluating health education instruction. PREREQ: Admission to MAT Program.

HLED 583. INTRODUCTION TO INSTRUCTIONAL METHODOLOGY AND ANALYSIS IN HEALTH EDUCATION (3). This is a laboratory-based class. Course content is directed toward analysis of teaching and introductory teaching methodologies. Students participate in group and self-analysis of teaching methodologies in a laboratory setting (Teaching Analysis Lab). PREREQ: Admission to MAT Program.

HLED 584. CURRICULUM DESIGN AND COMMUNITY INVOLVEMENT (1). Exploration of health education curricula design and development; special consideration to factors which influence the direction of curricula; acceptance of health education curricula by multiple community factions; philosophical basis for curricular development; Comprehensive school health education (as subject specific): community processes for curricular development. PREREQ: Admission to MAT Program.

HLED 585. PLANNING, ESTABLISHING AND EVALUATING HEALTH EDUCATION CURRICULUM (3). Focus of this course is on planning, implementation and evaluation of a comprehensive school health education curriculum. This course includes analysis of various district-based plans, as well as analysis of the Oregon Common Curriculum Goals, and Common Knowledge and Skills in Health Education. This course provides students with essential skills needed to develop a comprehensive PP-12 school health education curriculum. PREREQ: Admission to MAT Program.

HLED 587. DEVELOPMENT OF INSTRUCTIONAL METHODOLOGY AND ANALYSIS IN HEALTH EDUCATION (3). Laboratory based class; content is directed toward the development of existing teaching methodologies and acquisition of methods which build on those identified in HLED 583. Students participate in group and self-analysis of teaching methodologies in a teaching laboratory setting (Teaching Analysis Lab) and in a health sciences laboratory. PREREQ: Admission to MAT Program.

HLED 588. FACING CONTEMPORARY HEALTH ISSUES (3). Emphasis on instructional means of dealing with contemporary and often changing health issues; the implications of these issues to participants in the education setting; adaptation of instructional development process; and management considerations pertinent to contemporary health issues. PREREQ: Admission to MAT Program.

HLED 589. HEALTH EDUCATION LEADERSHIP IN PLANNING, IMPLEMENTING AND EVALUATING HEALTH EDUCATION PROGRAMS (3). Health education programs, their planning, implementation and evaluation. School specific, as well as "add-on" programs; leadership as a factor in planning, implementing and evaluating; the school health coordinator; health evaluation mechanisms and concerns addressed. PREREQ: Admission to MAT program.

HLED 591. REFINEMENT OF INSTRUCTIONAL METHODOLOGIES AND ANALYSIS IN HEALTH EDUCATION (2). Laboratory based class; content is directed toward the refinement of existing teaching methodologies and the acquisition of advanced methods which build on those identified in HLED 583 and HLED 587. Students participate in group and self-analysis of teaching methodologies in a teaching laboratory setting (Teaching Analysis Lab) and in the university classroom. PREREQ: Admission to MAT Program.

HLED 592. THE HEALTH EDUCATOR AS A PROFESSIONAL (2). This is a summative course of the Fifth-Year Teacher Education Program in Health Education. This course addresses the challenges and convictions related to the teaching profession as well as issues which often specifically confront health educators as professionals. PREREQ: All HLED courses in the Fifth-Year Teacher Preparation Program - Health Education and admission to MAT Program.

■ PHYSICAL EDUCATION

PED 407/PED 507. SEMINAR: PHYSICAL EDUCATION (1-3).

PED 510. PROFESSIONAL INTERNSHIP: PHYSICAL EDUCATION (1-15). A full-time field experience in which the intern will integrate academic study with classroom teaching experience to learn specific competencies relating to functioning well in the context of the classroom and the school, and demonstrate this competency through the assessment of work by supervisors and by evidence collected and presented in work samples. PREREQ: Admission to MAT Program.

PED 461/PED 561. CURRENT TRENDS AND RESEARCH ISSUES IN PHYSICAL EDUCATION (3). Current trends and research issues in school physical education, focus on national, state, and local trends, the need for physical activity to promote wellness, general guidelines of curriculum development, introduction to instructional components, research on teacher effectiveness, and developing systematic observation skills. PREREQ: Admission to Professional Teacher Education Program.

PED 462/PED 562. ANALYSIS OF MOVEMENT SKILLS (3). Isolating and analyzing movement tasks; organizing tasks into teachable components; arranging sequences into logical progressions for students; using informaiton feedback to refine skills; extending, refining, and applying movement tasks. PREREQ: Admission to Professional Teacher Education Program.

PED 563. INSTRUCTIONAL ANALYSIS TECHNIQUES I (3). Introduction to techniques of instructional analysis. This course provides in-depth information and training in systematic observation techniques, raw data conversion, and inter/intraobserver reliability. PREREQ: Admission to MAT Program.

PED 564. INSTRUCTIONAL ANALYSIS TECHNIQUES II (3). Laboratory/seminar experience to accompany student teaching winter and spring terms. Provides continued application of systematic observation techniques throughout the student teaching experience.

PED 565. MEASUREMENT AND EVALUATION IN THE INSTRUCTIONAL PROCESS (3). Introductory course in measurement and evaluation for physical education teachers. Focus on measurement and evaluation in the cognition, affective and psychomotor domains as applied to the physical education instruction setting. PREREQ: EXSS 471 or equivalent.

PED 566. INSTRUCTIONAL SKILLS I (3). Skills of planning, implementing and evaluating programs of instruction in physical education, grades K-12. PREREQ: Admission to MAT Program.

PED 567. INSTRUCTIONAL SKILLS II (2). Applying and refining skills of planning, implementing and evaluating programs of instrucion in physical education, grades K-12. PREREQ: Admission to MAT Program.

PED 568. ADMINISTRATIVE AND CURRICULAR PRACTICES IN PHYSICAL EDUCATION (3). Curricular programs and variations from kindergarten through grade twelve, administrative policies and practices. PREREQ: Admission to MAT Program.

PED 569. THE PHYSICAL EDUCATOR AS A PROFESSIONAL (1). Transitioning to teaching, developing a portfolio, certification, obtaining a position, teacher burnout, professionalism, problems of first year teachers, developing patterns of behavior which lead to a successful career. PREREQ: Admission to MAT Program.

EXERCISE AND SPORT SCIENCE

Anthony Wilcox, Chair
Langton Hall 220
Oregon State University
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(503) 737-2643

Faculty

Professors Dunn, Maksud; *Associate Professors* Heath, McCubbin, Michael, Rose, Soleau, Suttie, Wilcox, Winkler, Wood; *Assistant Professors* Borsa, Collier, Cusimano, Ebbeck, Hancock, Harter, Smith, Snow-Harter, van der Mars; *Instructors* Asbell, Dark, Dezzani, Fisher, Maddalozzo; *Research Associate* Fox

Adjunct Faculty

Burkhart, Bob, R.P.T., Corvallis; Calder, Clarence A., Ph.D., Corvallis; Fruend, Harry, Ph.D., Corvallis; Fusetti, Lydia A., M.D., Corvallis; Gleason, Carol I., B.S., Corvallis; Lague, Richard E., R.P.T., Corvallis; Ross, Leonard A., D.P.M., Corvallis; Neumann, Holm, W., Ph.D., M.D., Corvallis; Ritson, Robert J., Ph.D., Salem; Stanley, Rick, M.D., Albany

Undergraduate Major

Exercise and Sport Science (B.S.)
Options
Athletic Training
Fitness Program Management
Physical Activity and Development
Pretherapy
Sports Leadership
Applied Exercise and Sport Science

Minor

Athletic Administration

Graduate Majors

Health Education and Physical Education (M.A.T.)
Human Performance (M.S., Ph.D.)
Graduate Areas of Concentration
Exercise Science
Human Movement Studies
Movement Studies for the Disabled
Movement Studies for the Disabled (M.S.)

The Department of Exercise and Sport Science offers programs leading to a baccalaureate degree (B.S.) for students seeking careers in human performance, exercise science, and sport-related fields. It also offers the M.S. degree in Movement Studies for the Disabled and participates in the Master of Arts in Interdisciplinary Studies (M.A.I.S.) graduate program; see Graduate School. The department offers a graduate major in human performance for students working toward the Master of Science and Doctor of Philosophy degrees. Major fields of study are exercise science, human movement studies and movement studies for the disabled. The department promotes research and expansion of knowledge in the areas of exercise physiology, biomechanics, therapeutic programs, athletic training, sport psychology, sport sociology, motor behavior, and other fields of specialization.

The department supports a Special Physical and Motor Fitness Clinic, which provides specialized physical activity programs for children and youth.

UNDERGRADUATE STUDIES

Preparation

A strong high school or transfer background in science, mathematics, and English is necessary. An interest in physical activity, a liking for people, and a willingness to work with groups are prerequisites for success.

Admission

Any student who has met the admission requirements of Oregon State University may be admitted to a pre-exercise and sport science program of study. To transfer from another OSU college or school, the student must have the approval of the Head Adviser in Exercise and Sport Science and the Dean of the College of Health and Human Performance.

Admission to Exercise and Sport Science

In addition to being admitted to the college, the student must be accepted into a program of studies in exercise and sport science. Applications may be obtained from the Professional Office, Langton Hall 220. To be accepted into the program, a student must:

a. Complete 6 credits of professional exercise and sport science courses with a minimum GPA of 2.50.

b. Complete 40 credits of course work applicable toward a degree program in exercise and sport science with a GPA of 2.25.

c. Receive a recommendation from two faculty members and an adviser from the Department of Exercise and Sport Science.

d. Complete required interview.

Academic performance is not the sole criterion for admission to and continuation in certain courses and programs in the Department of Exercise and Sport Science, such as practicum classes and internships. The department may find it necessary to evaluate a person's background to determine his or her likelihood of maintaining standards of professional conduct that are necessary in the profession. This evaluation may take into account current performance as well as past experience and actions that could affect a student's ability to perform in a particular course or program.

Retention

Students are expected to make satisfactory progress toward a degree. Satisfactory progress includes, but is not limited to:

1. Maintaining a minimum program GPA of 2.25.

2. Maintaining a minimum GPA of 2.50 in professional exercise and sport science courses.

Students' records will be reviewed at the end of every term; students who do not meet the above standards will be suspended from the college after a one term probationary period.

CURRICULUM REQUIREMENTS

The basic exercise and sport science curriculum meets University requirements for the bachelor's degree and provides general education needed for professional preparation. In addition to the general education and professional courses listed in the core program, undergraduate major students complete an option selected from athletic training, fitness program management, physical activity and development, pretherapy, sports leadership, or applied exercise and sport science. Substitutions or changes in the courses listed in each option require approval of the student's faculty adviser, the department chair and the dean.

Baccalaureate Core Requirements (48)

Skills
Writing I (3)
Writing II (3)
Writing III/speech (3)
Mathematics (3)
Fitness (3)
Writing intensive course

Perspectives
Physical science (lab) (4)
Biological science (lab) (4)
Plus choice of either of above (4)
Western culture (3)
Cultural diversity (3)
Literature and the arts (3)
Social processes and institutions (3)
Difference, power and discrimination (3)

Synthesis
Contemporary global issues (3)
Science, technology, and society (3)

OPTIONS

ATHLETIC TRAINING OPTION

The athletic training area of study prepares the student for a career as an allied health practitioner whose professional duties include the prevention, recognition, immediate treatment, and rehabilitation of injuries sustained during athletics or physical activity. The program at OSU is approved by the National Athletic Trainers' Association (NATA).

All new and transfer students interested in this program must apply for admission to the pre-athletic training curriculum. Upon satisfactory completion of prerequisite course work and a yearlong directed observation clinical program, qualified students apply for admission to the athletic training education program, typically at the conclusion of the sophomore year. Consult an adviser or the athletic training program director for program guidelines and application instructions.

The athletic training education program is two-fold, involving extensive academic course work and clinical experience. To qualify for the national certification examination offered by the NATA, students must complete the baccalaureate degree, the curriculum listed herein, and a minimum of 800 hours of clinical experience under the direct supervision of a certified athletic trainer. (No more than 400 hours of clinical experience may be earned in any one academic year.) Consult the program director for additional information regarding NATA membership and certification.

Curriculum
Requirements for the four-year program are listed below.

Baccalaureate Core Requirements (34)
14 of the 48 credits required in the baccalaureate core may be fulfilled by courses in the athletic training option.

Exercise and Sport Science Core (45)
EXSS 194. Pro Act/Basic Movement Skills (1)
EXSS 271. Prin of Comput in EXSS (3)
EXSS 312. Sociocul Dimens of Phys Act (3)
EXSS 313. Lifespan Motor Development (4)
EXSS 322. Anatomical Kinesiology (4)
EXSS 323. Biomechanics of Spts & Exer (4)
EXSS 324. Physiology of Exercise (3)
EXSS 325. Fitness Assessment and Exercise Prescription (2)
EXSS 370. Psychology of Sport and Physical Activity (3)
EXSS 394. Pro Act/Resistance Training (2)
EXSS 410. Internship (9)
EXSS 411. Mvmt Skill Learning & Control (4)
EXSS 481. Analy Crit Issues in EXSS (3)

Athletic Training Option Courses (37)
EXSS 307. Seminar/Pre-Internship (1)
EXSS 356. Care & Prev of Athl Inj (3)
EXSS 357, EXSS 358, EXSS 359. Athl Tr Practicum (9)
EXSS 424. Applied Exercise and Sport Phys (3)
EXSS 442. Athletic Training Programs (3)
EXSS 443. Therapeutic Modalities (3)
EXSS 444. Adapted Physical Activity (4)
EXSS 445. Therapeutic Exercise (3)
EXSS 450. Advan Assess of Ath Inj (4)
EXSS 471. Evaluation of Exer & Sp Sc (4)

Supporting Courses (14)
H 170. Personal Health (3)
H 386. Adv First Aid/First Resp (3)
NFM 225. Human Nutrition (4)
PHAR 210. Terminology of the Hlth Sc (2)
PHAR 215. Cnsmer Drugs & Rel Hlth Issues (2)

Science and Social Science (38)
CH 121, CH 122, CH 123. General Chem or CH 221, CH 222, CH 223. General Chem (15)
Z 331, Z 332, Z 333. Human Anat & Phys (9)
Z 341, Z 342. Hum Anat and Physiology Lab (4)
PSY 201, PSY 202. General Psychology (6)
MTH 112. Elementary Functions (4)

Electives[1] (24)

FITNESS PROGRAM MANAGEMENT OPTION

Students who seek careers providing leadership for directing and managing physical fitness programs in business and industrial environments select the fitness program management option. In industry, the concern for physical fitness extends to all personnel. As a commercial endeavor, physical fitness activities are provided for people of all ages.

Curriculum
Requirements for the four-year program are listed below:

Baccalaureate Core Requirements (34)
14 of the 48 credits required in the baccalaureate core may be fulfilled by courses in the fitness program management option.

Exercise and Sport Science Core (45-51)
EXSS 194. Pro Act/Basic Movement Skills (1)
EXSS 271. Princ of Comput in EXSS (3)
EXSS 313. Lifespan Motor Development (4)
EXSS 322. Anatomical Kinesiology (4)
EXSS 323. Biomech of Sports & Exer (4)
EXSS 324. Physiology of Exercise (4)
EXSS 325. Fitness Assessment and Exercise Prescription (2)
EXSS 370. Psy of Sport and Phys Act (3)
EXSS 394. Pro Act/Resistance Training (2)
EXSS 410. Internship (9-15)
EXSS 411. Mvmt Skill Learning & Control (4)
EXSS 414. Fitness & Aging: Dev & Prog Persp (3)
EXSS 481. Analy Crit Issues in EXSS (3)

Fitness Program Management Option Courses (25)
PAC Courses Approved by Adviser (4)
EXSS 252. Role of Fitness in American Soc (3)
EXSS 307. Pre-Internship (1)
EXSS 333, EXSS 334. EXSS Practicum (4)
EXSS 340. Org & Adm of Sports Prog (4)
EXSS 356. Care & Prev Athl Injuries (3)
EXSS 424. Appl Exer & Sport Phys (3)
EXSS 434. Phys of Streng Dev or
EXSS 436. Cardiovascular Dynamics (3)

Supporting Courses (22)
H 263. Psychsoc Dimens of Health (3)
H 386. Adv First Aid/First Resp (3)
NFM 225. Human Nutrition (4)
Courses selected with adviser approval (12)

Science and Social Science (41)
CH 121, CH 122, CH 123. Gen Chem or CH 221, CH 222, CH 223. Gen Chem (15)
Z 331, Z 332, Z 333. Hum Anat & Phys (9)
Z 341, Z 342. Hum Anat and Physiology Lab (4)
PSY 201, PSY 202. General Psychology (6)
PSY 360. Social Psychology or
PSY 380. Human Adjustment (3)
MTH 112. Elementary Functions (4)

Electives[1] (19-25)

PHYSICAL ACTIVITY AND DEVELOPMENT OPTION

Students who seek careers in teaching physical education select the physical activity and development option. This undergraduate program provides the academic major and prerequisite skills needed for entry into the five-year teacher education program. Students are encouraged to use elective credits to complete another teaching area.

Curriculum
Requirements for the four-year program are listed below:

Baccalaureate Core Requirements (34)
14 of the 48 credits required in the baccalaureate core may be fulfilled by courses in the Physical Activity and Development Option.

Exercise and Sport Science Core (42)
EXSS 194. Pro Act/Basic Movement Skills (1)
EXSS 271. Princ of Comp in EXSS (3)
EXSS 312. Sociocult Dimens of Phys Act (3)

EXSS 313. Lifespan Motor Development (4)
EXSS 322. Anatomical Kinesiology (4)
EXSS 323. Biomech of Sports & Exercise (4)
EXSS 324. Physiology of Exercise (3)
EXSS 325. Fitness Assessment and Exercise Prescription (2)
EXSS 333, EXSS 334. EXSS Practicum (4)
EXSS 370. Psych of Sport & Phys Act (3)
EXSS 394. Pro Act/Resistance Training (2)
EXSS 411. Mvmt Skill Learning & Control (4)
EXSS 481. Anal Crit Issues in EXSS (3)

Exercise and Sport Science Option Courses (31)
EXSS 211. Hist and Phil Dimens of Phys Act (3)
EXSS 340. Organiz & Admin of Sports Prog (4)
EXSS 356. Care & Prev Athl Injuries (3)
EXSS 360. Sport Skill Analysis (4 courses) (8)
EXSS 394. Pro Act/Aquatics (2)
EXSS 420. Physical Activity for Children (3)
EXSS 444. Adapted Physical Activity (4)
EXSS 471. Test & Meas in EXSS (4)

Science and Social Science Courses (38)
CH 121, CH 122, CH 123. General Chem or CH 221, CH 222, CH 223. General Chem (15)
Z 331, Z 332, Z 333. Hum Anat & Phys (9)
Z 341, Z 342. Hum Anat and Physiology Lab (4)
PSY 201, PSY 202. General Psychology (6)
MTH 112. Elementary Functions (4)

Electives[1] (47)

PRETHERAPY OPTION

Students who seek careers in physical, occupational, or corrective therapy select the pretherapy option. Admission to a therapy school for further education and licensing may be sought after completion of the third, or fourth year of the program.

Curriculum
Requirements for the four year program are listed below:

Baccalaureate Core Requirements (30)
18 of the 48 credits required in the baccalaureate core may be fulfilled by courses in the pretherapy option.

Exercise and Sport Science Core (42)
EXSS 194. Pro Act/Basic Movement Skills (1)
Professional Activity Courses (2)
EXSS 211. Phil Dimens of Phys Act (3)
EXSS 271. Princ of Comp in EXSS (3)
EXSS 312. Sociocul Dimens of Phys Act (3)
EXSS 313. Lifespan Motor Development (3)
EXSS 322. Anatomical Kinesiology (4)
EXSS 323. Biomech of Sports & Exer (4)
EXSS 324. Physiology of Exercise (3)
EXSS 325. Fitness Assessment and Exercise Prescription (2)
EXSS 333, EXSS 334, EXSS 335. Exercise and Sport Science Practicum (6)
EXSS 370. Psychology of Sport and Exercise (3)
EXSS 411. Mvmt Skill Learning & Control (4)
EXSS 481. Analy Crit Issues in EXSS (3)

Pretherapy Option Courses (18)
EXSS 132. Pretherapy (2)
EXSS 414. Fitness & Aging: Dev & Prog Perspec (3)
EXSS 443. Therapeutic Modalities (3)
EXSS 444. Adapted Physical Activity (4)
EXSS 445. Therapeutic Exercise (3)
ST 201. Principles of Statistics (3)

Science and Social Science Courses (61-79)
CH 121, CH 122, CH 123. General Chem or CH 221, CH 222, CH 223. General Chem (15)
PH 201, PH 202, PH 203. General Physics (Pre-physical therapy only) (15)
Biological science (9-12)
Z 331, Z 332, Z 333. Hum Anat & Phys (9)
Z 341, Z 342, Z 343. Hum Anat and Physiology Lab (6)
PSY 201, PSY 202. General Psychology (6)
PSY 350. Human Life Span Dev (3)
PSY 330. Brain & Behav (3)
PSY 481. Abnormal Psych (3)
SOC 204. Intro to Sociology (3)
MTH 112. Elem Functions (4)

Electives[1] (23-41)

WICHE PROGRAMS FOR OCCUPATIONAL AND PHYSICAL THERAPY

Students selecting the pretherapy area of emphasis in the Department of Exercise and Sport Science may be interested in the WICHE Professional Student Exchange Program. This interstate cooperative allows students to obtain professional training not available in their home states and to pay resident tuition at state supported institutions, or reduced tuition at private institutions.

For further information about the WICHE program write to: Certifying Officer for Oregon, WICHE Student Exchange Program, Oregon State System of Higher Education, P.O. Box 3175, Eugene, OR 97403-0175.

SPORTS LEADERSHIP OPTION

Students who seek careers in organizing and coaching various sports in public or private settings such as sports clubs, community centers, YMCA, YWCA, youth agencies, resort areas, recreation centers, and other places choose the sports leadership option. This program provides well-trained personnel to fill leadership roles in nonschool sports programs for persons of all ages.

Curriculum
Requirements for the four-year program are listed below:

Baccalaureate Core Requirements (34)
14 of the 48 credits required in the baccalaureate core may be fulfilled by courses in the sports leadership option.

Exercise and Sport Science Core (50-56)
EXSS 194. Pro Act/Basic Movement Skills (1)
Professional Act Course (2)
EXSS 271. Princ of Computing in EXSS (3)
EXSS 312. Sociocul Dimens of Phys Activity (3)
EXSS 313. Lifespan Motor Development (4)
EXSS 322. Anatomical Kinesiology (4)
EXSS 323. Biomech of Sports & Exer (4)
EXSS 324. Physiology of Exercise (4)
EXSS 325. Fitness Assessment and Exercise Prescription (2)
EXSS 370. Psychology of Sport and Physical Activity (3)
EXSS 394. Pro Act/Resistance Training (2)
EXSS 410. Internship (9-15)
EXSS 411. Mvmt Skill Learning & Control (4)
EXSS 414. Fitness & Aging: Dev & Prog Perspec (3)
EXSS 481. Analy Crit Issues in EXSS (3)

Sports Leadership Option Courses (28)
EXSS 211. Hist and Phil Dimen of Phys Act (3)
EXSS 307. Seminar/Pre-Internship (1)
EXSS 340. Organ & Admins of Sports Prog (4)
EXSS 352. Sport in American Life (3)
EXSS 360. Sport Skill Analysis (4 courses) (8)
EXSS 455. Facilities (3)
Select two of the following:
EXSS 452. Sport and Society
EXSS 453. Functions of Play
EXSS 463. Admin in EXSS (6)

Supporting Courses (6)
H 386. Advan First Aid/First Resp (3)
BA 352. Organiz Behav (3)

Science and Social Science Courses (41)
CH 121, CH 122, CH 123. General Chem or CH 221, CH 222, CH 223. General Chem (15)

Z 331, Z 332, Z 333. Human Anat & Phys (9)
Z 341, Z 342. Hum Anat and Physiology Lab (4)
PSY 201, PSY 202. General Psychology (6)
SOC 324. Groups and Organiz (3)
MTH 112. Elementary Functions (4)

Electives[1] (27-33)

APPLIED EXERCISE AND SPORT SCIENCE OPTION

Qualified students who seek professional careers other than those described above may complete an option including the core and not less than 24 credits of approved courses, unified by the requirements of the academic and professional goal. Such programs require the approval of the adviser, head adviser, and department chair. Qualified students may arrange a program with greater concentration in business, communications, statistics, physiology, chemistry, nutrition, environmental studies, or the arts where the courses are unified by the requirements of professional positions such as in adult fitness, sports communications, or scientific research in human performance. The specific courses designed to meet baccalaureate degree requirements must be approved prior to completion of the last 30 credits of course work for the degree.

Minors

An undergraduate minor in athletic administration is offered for students who complete undergraduate major programs in other colleges, schools, or departments.

ATHLETIC ADMINISTRATION

The athletic administration minor provides professional preparation for students who seek sport and athletic administrative positions while completing an undergraduate major in another field. The expansion in participation, investment, and involvement by all society in the success of athletic programs requires increased competence from program administrators.

Required courses in the athletic administration minor are:
EXSS 211. Hist and Phil Dimen of Phys Act (3)
EXSS 313. Lifespan Motor Development (4)
EXSS 352. Sport in American Life (3)
EXSS 370. Psych of Sport & Physical Act (3)
EXSS 406. Projects: Athletic Admin (4)
EXSS 452. Sport and Society (3)
EXSS 455. Facilities (3)
EXSS 463. Admin of Exercise & Sport Sci (3)
BA 215. Fundamentals of Accounting (4)

Graduate Program

The Department of Exercise and Sport Science offers M.S. and Ph.D. degrees in Human Performance and a M.S. degree in Movement Studies for the Disabled. Graduate areas of concentration available through the department include exercise science (biomechanics, exercise physiology), human movement studies (motor behavior, sport studies, sport pedagogy, sport psychology) and movement studies for the disabled (assessment and programming, exercise science, motor behavior, sport psychology). The department participates in a Master of Arts in Interdisciplinary Studies degree offered through the Graduate School.

Courses

■ FITNESS REQUIREMENT FOR BACCALAUREATE CORE

HHP 231, Lifetime Fitness for Health, fulfills the fitness requirement in the baccalaureate core implemented for students entering in 1990.

HHP 231. LIFETIME FITNESS FOR HEALTH (3). The role of physical activity and health behaviors in the well being of the human body; principles for developing and maintaining physical fitness.

■ PHYSICAL ACTIVITY

Physical activity courses are designed to promote general health, physical fitness and individual motor skills that will help students make intelligent decisions regarding current and future lifestyles. Three terms of PAC courses are required of University students for graduation under the General Education requirements implemented prior to 1990. A total of 11 credits of PAC may be counted toward graduation.

PAC 100. ADAPTED PHYSICAL ACTIVITY (1). A special class for those with physical handicaps and those who sustain injuries in regular PAC sections during the term.

PAC 101. AQUA-AEROBICS (1). Improvement of strength, flexibility, and cardiovascular endurance through the use of nonswimming exercises in the water.

PAC 102. DEEP WATER AEROBICS (1). A variation of traditional water aerobics utilizing jogging in the pool.

PAC 103. AQUA FITNESS/GAMES (1). Cardiovascular fitness developed through participation in wide variety of high energy water sports; principles of cardiovascular fitness.

PAC 107. BADMINTON I (1). Beginning level instruction; skills in singles and doubles play.

PAC 108. BADMINTON II (1). Advanced skill development in badminton. PREREQ: Fundamental skills, rules and strategy of singles and doubles play.

PAC 110. BASKETBALL (1). Fundamental offensive and defensive skills, some competitive play.

PAC 111. BASKETBALL COMPETITIVE/MR (1). Team play, individual and team skills developed and refined, competitive round robin tournaments. For skilled individuals.

PAC 113. BASKETBALL II/WR (1). Team play, individual and team skills developed and refined, competitive play using womens rules. PREREQ: Competitive experience.

PAC 115. MOUNTAIN BIKING (1). Touring trails in Corvallis area; riding techniques, safety, maintenance, environmental concerns. Required equipment: mountain bike, repair kit, helmet.

PAC 116. BOWLING I (1). Fundamentals of the game including spot bowling, natural hook and straight ball delivery, scoring, handicap computation, spare pickup, and error correction. Additional fee; equipment supplied.

PAC 117. BOWLING II (1). Individual instruction and error correction; instruction in league organization. Additional fee; equipment provided. PREREQ: Bowling I or 115 average.

PAC 120. CANOEING I (1). Canoe safety skills, basic paddling strokes, endurance paddling. PREREQ: Ability to swim 400 yds in 14 minutes or less.

PAC 121. CONDITIONING (1). Total body approach to fitness, cardiorespiratory conditioning, muscular strength and endurance; flexibility emphasized.

PAC 123. SKI CONDITIONING (1). Conditioning activities for skiing. Exercises emphasizing strengthening of legs and cardiovascular endurance. Jogging, running, and weight training activities are used.

PAC 127. CREW I (1). Basic rowing technique, conditioning, terminology and safety for the student with no rowing background. PREREQ: Ten minutes continuous lap swim, five minute treading water.

PAC 129. AEROBIC MACHINE WORKOUT (1). Fitness through cycling on cycle ergometers.

PAC 130. CYCLING (1). Touring Corvallis area; bicycle safety, cycling technique, and bicycle maintenance.

PAC 131. STEP AEROBICS (1). Low-impact, high intensity workout adjustable to all fitness levels utilizing adjustable height benches.

PAC 132. POWER STEP AEROBICS (1). Advanced high intensity step workout that includes plyometric jumps and movements through a wide range of motion. PREREQ: PAC 131 or equivalent.

PAC 133. DANCE, AEROBICS (1). Cardiorespiratory fitness; dancing to music, safe exercise procedures and having fun.

PAC 134. DANCE, BALLROOM I (1). Posture and alignment, fundamentals of leading and following, basic steps and variations for: Foxtrot, Swing, Tango, Cha Cha, and Rumba.

PAC 135. DANCE BALLROOM II (1). Additional steps and patterns of popular ballroom dances. PREREQ: Ballroom I.

PAC 136. DANCE BALLROOM III (1). Styling; additional dances; advanced dance figures; composition and choreography; performance opportunities. PREREQ: Ballroom II.

PAC 137. LATIN DANCE (1). Latin dances including Cha Cha Cha, Mambo, Samba, Rhumba, Menegue, Bolero, Salso, and Paso Doble. Emphasis on proper styling and technical execution of each dance; effective leading and following techniques. PREREQ: Ballroom I.

PAC 138. PERFORMANCE BALLROOM DANCE (1). Advanced instruction; refining steps and routines preparing for potential public performance.

PAC 139. BALLET I (1). Introduction to basic ballet technique and aesthetics, terminology, alignment, stretch and strength exercises. No previous dance experience is necessary.

PAC 140. DANCE, BALLET II (1). Review and practice of beginning ballet technique, introduction of more advanced stretches, steps, and combinations. PREREQ: Ballet I or previous ballet experience.

PAC 141. DANCE, BALLET III (1). Intermediate and advanced ballet technique, comprehensive exploration of the discipline. PREREQ: Ballet II, previous comparable experience or consent of instructor.

PAC 142. DANCE/COUNTRY WESTERN LINE (1). Popular country western line dances.

PAC 143. NEW YORK STYLE JAZZ DANCE (1). A soft modern jazz dance style to popular among New York City dancers. PREREQ: Previous dance experience or consent of instructor.

PAC 144. DANCE, COUNTRY WESTERN (1). Couple dances done Texas-style; swing, two-step, waltz, schottische, and polka.

PAC 145. DANCE/COUNTRY WESTERN II (1). For experienced country western dancers.

PAC 146. DANCE/PERFORMANCE COUNTRY DANCE (1). Advanced instruction; refining of steps and routines preparing for potential public performance. Department approval required.

PAC 149. DANCE IMPROVISATION: CHOREOGRAPHY (1). Developing skills of expressing creativity through movement; emphasis on personalized movement; mind/body connection and the artistic process.

PAC 151. DANCE, JAZZ I (1). Introduction to jazz dance, technique, isolations, and combinations. Different jazz styles are explored. No previous dance experience is necessary.

PAC 152. DANCE, JAZZ II (1). Intermediate jazz technique, isolations and combinations. PREREQ: Jazz I or comparable experience.

PAC 153. DANCE, JAZZ III (1). Advanced approach to jazz technique; challenging warm ups, combinations, and dances. Performance opportunity. PREREQ: Jazz II, comparable experience, or consent of instructor.

PAC 155. DANCE, MODERN I (1). Introduction to modern dance movement fundamentals. Technique, stretch, strength, and alignment are included, as well as an appreciation for movement expression. No previous dance experience is necessary.

PAC 156. DANCE, MODERN II (1). An intermediate level of modern dance technique and movement expression. PREREQ: Modern Dance I or comparable experience.

PAC 157. DANCE, MODERN III (1). Modern dance advanced technical skills, compositions, and combinations. PREREQ: Previous intermediate modern dance experience or consent of instructor.

PAC 158. FLOOR HOCKEY I (1). Skills, strategies and competition with a unique adaptation of ice hockey on wood; fitness with fun and excitement.

PAC 159. FLOOR HOCKEY II (1). Emphasis is on competitive play for those who have mastered basic skills in Floor Hockey I or its equivalent.

PAC 160. HOCKEY: IN LINE SKATE (1). Ice hockey on land using in-line skates. Skills, games, and tournaments. Department approval required.

PAC 161. DANCE/AFRICAN STYLE (1). Basic dance steps and patterns from regions of Africa; background information on cultural aspects; class may specialize in a specific region of Africa.

PAC 162. WEST COAST SWING (1). Focus on style, technique and many different step patterns of the West Coast Swing dance. PREREQ: Intermediate dance level.

PAC 163. FENCING I (1). Basic foil fencing skills, strategies, attacks and parries.

PAC 164. FENCING II (1). Advanced attacks, parries, and strategy for competitive fencing.

PAC 166. FLY FISHING (1). Casting and fishing techniques, lure making, equipment selection, terminology, and regulation for fishing in Oregon's marine environment.

PAC 167. FLY FISHING/ADVANCED (1). Advanced fly casting and fly fishing techniques for trout, fly-typing, equipment selection, basic aquatic organism identification, terminology, and regulations for fishing in Oregon's freshwater environment.

PAC 168. STEELHEAD FISHING (1). Casting and fishing techniques, lure making, equipment selection, terminology, and regulations for fishing in Oregon's marine environment for steelhead.

PAC 171. ULTIMATE FRISBEE (1). Fundamentals for the beginning and intermediate player; individual skill development, rules, game play, and strategy.

PAC 172. ULTIMATE FRISBEE II (1). For those who have mastered the fundamental skills of the sport and wish to compete at a higher level.

PAC 173. GOLF I (1). Basic fundamental principles in all phases of golf; rules, terminology, etiquette, safety and scoring. Equipment provided.

PAC 174. GOLF II (1). Individual practice and course play; skill refinement as continuation of Golf I. Equipment available. Course play expected, additional fee. PREREQ: Golf I.

PAC 175. GOLF III (1). Advanced skills, knowledge involved in competitive play. Course play expected, additional fee. PREREQ: HDCP below 12; competitive play.

PAC 176. GYMNASTICS (1). Fundamental techniques on floor and apparatus.

PAC 177. GYMNASTICS II (1). Techniques of gymnastics performances on floor and apparatus. PREREQ: Previous experience or Gymnastics I.

PAC 183. KARATE (1). Exercise and techniques plus evaluation of private karate club programs.

PAC 184. PILATES TECHNIQUE OF MUSCULAR CONTROL (1). Techniques for improving strength, flexibility, coordination, alignment, and balance through floor exercises and Yoga-like stretches. Focuses on coordination of deep breathing with flowing movement from a strong abdominal center.

PAC 185. RELAXATION (1). Introduction to relaxation techniques; common applications.

PAC 186. POSTURE AND RELAXATION (1). Awareness, flexibility and strength exercises to improve body alignment; introduction to relaxation techniques; common applications.

PAC 187. RACQUETBALL I (1). Individual skills; rules, court positioning, player movement, strategy, competitive play. Additional fee.

PAC 188. RACQUETBALL II (1). Competitive play; kill shots, court positioning, player movements. PREREQ: Competitive experience or good skill level. Additional fee.

PAC 190. ROCK CLIMBING/CONDITIONING (1). Physical conditioning for, and instruction in, the skills and techniques of rock climbing; environmental impact issues; on campus laboratory. Additional fee may be required for off campus practice.

PAC 191. RIDING I (1). Introduction to either English or Western riding position and control of the horse at the walk, trot and canter. CROSSLISTED AS ANS 191. Additional fee.

PAC 192. RIDING II (1). Review of the basics of either English or Western riding, improves riders position and control at the trot and canter and introduces riding over fences or patterns. CROSSLISTED AS ANS 192. Additional fee.

PAC 193. INTRODUCTORY DRESSAGE (1). Terminology and techniques of Dressage. CROSSLISTED AS ANS 193. Additional fee.

PAC 194. RIDING AND JUMPING (1). Riders are coached through several exercises designed to improve their riding ability. CROSSLISTED AS ANS 194. Additional fee.

PAC 195. RUGBY (1). Introduction to basic rules and fundamental skills of passing, tackling, and positional play. Involves basic conditioning and minimal contact. Men's rules.

PAC 196. INLINE SKATING (1). Aerobic fitness exercise class utilizing rollerblades instead of running, jogging, cycling or swimming.

PAC 198. RUNNING/JOGGING (1). Cardiorespiratory fitness with scenic running routes; training, nutrition, and physiology.

PAC 199. STAGE MOVEMENT (1). Stage movement for musicals, choreography, performance, and projection techniques. PREREQ: Acceptance into the current University musical.

PAC 201. RUNNING, 10K TRAINING (1). Conditioning and training program for road racing.

PAC 202. FITNESS WALKING (1). Establishment of personal fitness programs through walking with emphasis on warm-up, warm-down and aerobic components.

PAC 204. SELF DEFENSE (1). Non-violent self defense. Develop self confidence and skills for assault situations. Conditioning and practical skills. Men and women, all levels.

PAC 208. DOWNHILL SKIING/BG/IM/ADV (1). Eight days at a ski area, 1-1/2 hour lesson daily, students grouped according to skill level: beginner, intermediate, advanced, racer. Special fee covers bus transportation, and lifts. Additional fee for rentals.

PAC 209. CROSS COUNTRY SKIING (1). Eight days at a ski area, 1-1/2 hour lesson daily, students will learn and practice flat track, uphill and downhill technique, and gain knowledge of back country touring and skating. Special fee covers bus transportation and facility usage. Additional fee for rentals.

PAC 210. SNOWBOARDING (1). Eight days at a ski area, 1½ hour lesson daily, students grouped according to skill level: beginning, intermediate, advanced. Special fee covers bus transportation and lifts. Additional fee for rentals.

PAC 211. SOCCER I (1). Basic skills of controlling the ball; conditioning; lead-up games; team play.

PAC 212. SOCCER II (1). Review of basic skills of offense and defense in controlled game play; concepts of team position and play, pressure and attack. PREREQ: Previous soccer experience.

PAC 213. SOCCER III (1). High level soccer skills; team play and transition concepts; set plays and alignments for both offense and defense. PREREQ: Soccer II or competitive playing experience.

PAC 218. LAP SWIM AND STROKE ASSISTANCE (1). Non-competitive swim, exercise program with individual stroke skill assistance.

PAC 219. SWIM, NON SWIMMER (1). Skills for self-rescue; fundamental skills in swimming and safety. Designed for people with a fear of water. Recommended S/U grading.

PAC 220. SWIM I (1). Swimming concepts, survival and breathing techniques, front crawl and elementary backstroke as minimum instruction. PREREQ: Minimal swimming skill.

PAC 221. SWIM II (1). Conditioning; swimming strokes (particularly front crawl, sidestroke, and breaststroke); swimming skills. PREREQ: 75 yd. front crawl. Swim I skills.

PAC 223. EMERGENCY WATER SAFETY/SURVIVAL (1). To provide students with general water safety information and to help students become fully familiar with potential hazards of water activities, to prevent accidents, and to respond effectively if an emergency does occur.

PAC 225. SWIM TRAINING WORKOUT (1). Competitive skills and strokes; emphasis on training. PREREQ: Swim III; ability to do interval training.

PAC 226. OPEN WATER SCUBA/LECTURE (1). Instruction in physiology, water environment, equipment, and techniques necessary for fundamental open water scuba diving. Instruction may lead to P.A.D.I. certification. Required laboratory. Additional fee.

PAC 227. OPEN WATER SCUBA/LAB (1). Instruction and practice in techniques, skills, equipment usage necessary for fundamental open water scuba diving. Instruction may lead to P.A.D.I. certification. Required lecture. PREREQ: 200-yard swim and 10 minute survival skills. Additional fee, includes open water dive trip.

PAC 228. ADVANCED/OPEN WATER SCUBA (1). Classroom lecture and laboratory in hypothermics, natural navigation, dive physiology, compass navigation, night and limited visibility procedures, boat diving, search and salvage techniques, deep diving procedures, health for diving, and an introduction to dive rescue. Successful completion of this course can lead to P.A.D.I. certification.

PAC 229. SCUBA/RESCUE DIVER (1). Techniques, skills, knowledge, and practice in self-rescue and rescue of others in underwater emergencies; may lead to P.A.D.I. certification; lecture and pool laboratory; open water dive required. PREREQ: Advanced Open Water or equivalent.

PAC 230. TRIATHLON TRAINING (1). A performance training class designed to prepare individuals to participate in local triathlon competitions during the term. PREREQ: Individuals should be capable of swimming 1000 yards, running 3 miles and cycling 12 miles at the start of the class.

PAC 231. TRACK/COMPETITIVE CROSS COUNTRY (1). Training, including hills, intervals, and track workouts in preparation for cross country competition. Participation in some cross country meets is expected.

PAC 232. TRACK/OFF-SEASON CONDITIONING (1). Winter conditioning workouts for track and field events. Suggested for students interested in competitive track.

PAC 233. TRACK AND FIELD COMPETITION (1). Workouts, training, technique in preparation for outdoor track and field competition. Competition in some track and field meets is expected.

PAC 234. TENNIS I (1). Introduction to fundamental strokes and basic concepts in tennis.

PAC 235. TENNIS II (1). Review and refinement of fundamental strokes; volley, lob, return of serve; introduction to singles and doubles play. PREREQ: Tennis I.

PAC 236. TENNIS III (1). Focus on ground stroke serve consistency; approach shots and overheads; tactics for net and baseline play. PREREQ: Tennis II.

PAC 237. TENNIS IV (1). Advanced stroke production; serve placement; singles and doubles competitive play. PREREQ: Tennis III or advanced level skill.

PAC 240. VOLLEYBALL I (1). Fundamental individual and team skills; rules, court positions and movements; round robin play.

PAC 241. VOLLEYBALL II (1). Fundamental skills and knowledges refined; intermediate skills developed, competitive play. PREREQ: Volleyball I and good fundamental skills.

PAC 242. VOLLEYBALL III (1). Skill refinement and development; intense, highly competitive drills and game situations, doubles through sixes play.

PAC 243. VOLLEYBALL IV (1). Skill refinement and development through intense, highly competitive drills and game situations, doubles through sixes play. PREREQ: Instructor permission.

PAC 244. WALLYBALL (1). Fast moving, exercise variation of volleyball played in a racquetball court.

PAC 247. INTRODUCTION TO CIRCUIT WEIGHT TRAINING (1). Fast paced aerobic weight exercise program. No prior experience required.

PAC 248. WEIGHT TRAINING I (1). Exercise techniques in both free and fixed equipment; safety procedures, terminology, and principles of exercise.

PAC 249. WEIGHT TRAINING II (1). Intermediate level of weight training in free and fixed weights. PREREQ: Weight Training I.

PAC 251. WEIGHT TRAINING III (1). Advanced level of training and instruction with emphasis on the power lifts (bench press, dead lift and squat). PREREQ: Weight Training II.

PAC 252. WEIGHT TRAINING (POWER LIFTING) IV (1). Advanced level of training and instruction with emphasis on the power lifts. PREREQ: Weight Training II or good background in competitive weight training.

PAC 254. WRESTLING (1). Collegiate wrestling Fall and Winter terms; freestyle and Greco wrestling Spring term. All levels.

PAC 255. YOGA I (1). Principles and practice of basic yoga postures and techniques of posture alignment.

PAC 256. YOGA II (1). Intermediate level course to improve yoga practice and develop balance and alignment in more advanced postures. PREREQ: Yoga I or previous experience in

PAC 257. YOGA III (1). Advanced level of instruction and performance in balance and alignment.

PAC 270. TAICHI (1). Traditional Chinese martial art form; series of 88 moves with continually soft, slow, steady motions broken into separate movements and combinations intended to unite body and mind.

■ EXERCISE AND SPORT SCIENCE

Lower Division

EXSS 131. INTRODUCTION TO EXERCISE AND SPORT SCIENCE (3). Overview of the field; career opportunities in exercise and sport science and other professions dealing with the discipline of human movement; orientation to support services.

EXSS 132. PRETHERAPY (2). Selected paramedical fields; objectives, goals and modalities as they relate to the various needs of patients. Personal and professional qualifications associated with various therapies; emphasis on occupational therapy and physical therapy and their relationship to the medical field.

EXSS 194. PROFESSIONAL ACTIVITIES (1). Movement fundamentals, basic rhythms, track and field.

EXSS 199. SPECIAL STUDIES (1-16).

EXSS 211. PHILOSOPHICAL DIMENSIONS OF PHYSICAL ACTIVITY (3). Significant people, events, and institutions affecting sport and exercise in the United States; nature and meaning of sport and exercise and the related ethics and values.

EXSS 235. LIFEGUARD TRAINING (2). Rescue skills, defenses and escapes, search and rescue, victim removal and resuscitation, pool operation and maintenance. PREREQ: Current CPR and First Aid certification, ability to swim 500 yards.

EXSS 236. WATER SAFETY INSTRUCTION (3). Physical laws, stroke analysis, safety skills, skill progressions, variety of teaching approaches. PREREQ: Pass intermediate swim.

EXSS 252. ROLE OF FITNESS IN AMERICAN SOCIETY (3). Examination of the role of physical fitness in American society and in its institutions including education, economic, and family; the societal factors affecting fitness activities; the delivery systems of fitness; and fitness as a component of wellness education.

EXSS 271. PRINCIPLES OF COMPUTING IN EXERCISE AND SPORT SCIENCE (3). Overview of computer hardware and software structures with emphasis on applications in exercise and sport science.

EXSS 294. PROFESSIONAL ACTIVITIES (2). Basketball, volleyball, football, gymnastics, hockey, soccer.

Upper Division

EXSS 301. RESEARCH (1-16).

EXSS 305. READING AND CONFERENCE (1-16).

EXSS 306. PROJECTS (1-16).

EXSS 307. SEMINAR (1-3). Section 2: SEMINAR PREINTERNSHIP; 1 credit.

EXSS 312. SOCIOCULTURAL DIMENSIONS OF PHYSICAL ACTIVITY (3). Physical activity in contemporary society. Relationships with the social processes; interrelationships between physical activity and the cultural institutions. PREREQ: social processes course.

EXSS 313. LIFESPAN MOTOR DEVELOPMENT (4). Physical, neurological and physiological changes occurring throughout childhood and adolescence and their resultant effects upon motor skill learning and performance. PREREQ: EXSS 322.

EXSS 322. ANATOMICAL KINESIOLOGY (4). Anatomical aspects of human movement; actions of bones and muscles in motor activities. PREREQ: Z 331,Z 341.

EXSS 323. BIOMECHANICS OF SPORTS AND EXERCISE (4). The physical laws and mechanical aspects governing human motor function; analytical processes emphasized. PREREQ: Z 331, Z 341, MTH 112.

EXSS 324. PHYSIOLOGY OF EXERCISE (3). Physiological effects of physical activity on the human body. PREREQ: Z 332, CH 121,CH 122,CH 123 or CH 221,CH 222,CH 223.

EXSS 325. FITNESS ASSESSMENT AND EXERCISE PRESCRIPTION (2). Introduction to field-based physical fitness assessment; application of physiological principles to design safe and effective exercise programs for the apparently healthy as well as for individuals with obesity, coronary disease, diabetes, and other degenerative diseases. PREREQ: EXSS 324 or take concurrently with EXSS 324.

EXSS 333. EXERCISE AND SPORT SCIENCE PRACTICUM (2). Field experience under professional supervision. PREREQ: Instructor approval. May be repeated for credit.

EXSS 334. EXERCISE AND SPORT SCIENCE PRACTICUM (2). Field experience under professional supervision. PREREQ: Instructor approval. May be repeated for credit.

EXSS 335. EXERCISE AND SPORT SCIENCE PRACTICUM (2). Field experience under professional supervision. PREREQ: Instructor approval. May be repeated for credit.

EXSS 340. ORGANIZATION AND ADMINISTRATION OF SPORTS PROGRAMS (4). Organization of sports programs; personnel, facilities, equipment, program aims and objectives, program organization and evaluation, units of competition, methods of competition.

EXSS 352. SPORT IN AMERICAN LIFE (3). Nature of sport in contemporary society; interrelationships between sport and cultural institutions. PREREQ: 6 credits social science.

EXSS 356. CARE AND PREVENTION OF ATHLETIC INJURIES (3). Theoretical and practical aspects of the prevention, treatment, and rehabilitation of athletic injuries. PREREQ: Z 331, Z 341. REC: PHAR 210.

EXSS 357. ATHLETIC TRAINING PRACTICUM (3). Laboratory application of athletic training for prevention, treatment, and rehabilitation of athletic injuries with follow-up seminars. PREREQ: EXSS 356 and acceptance into athletic training curriculum.

EXSS 358. ATHLETIC TRAINING PRACTICUM (3). Laboratory application of athletic training for prevention, treatment, and rehabilitation of athletic injuries with follow-up seminars. PREREQ: EXSS 356 and acceptance into athletic training curriculum.

EXSS 359. ATHLETIC TRAINING PRACTICUM (3). Laboratory application of athletic training for prevention, treatment, and rehabilitation of athletic injuries with follow-up seminars. PREREQ: EXSS 356 and acceptance into athletic training curriculum.

EXSS 360. SPORT SKILL ANALYSIS (2). Introduction to a variety of sports skills; opportunities for sports skill analysis. May be repeated for credit.

EXSS 361. COACHING AND OFFICIATING OF SPORT (2). Sport fundamentals; organization; practice sessions; strategy and tactics; rule knowledge; and officiating mechanisms and responsibilities. May be repeated for credit for different sports.

EXSS 370. PSYCHOLOGY OF SPORT AND PHYSICAL ACTIVITY (3). Interaction between psychological variables and human motor performance.

EXSS 394. PROFESSIONAL ACTIVITIES (2). Aquatics, developmental activities, self-defense, tennis, golf, wrestling.

EXSS 401. RESEARCH (1-16).

EXSS 405. READING AND CONFERENCE (1-16).

EXSS 406. PROJECTS (1-16).

EXSS 407. SEMINAR (1-16).

EXSS 408. WORKSHOP (1-16).

EXSS 410. INTERNSHIP (6-15). Planned experiences at selected cooperating agencies, companies or institutions; supervised by university and program personnel; supplementary conference, reports and appraisal required. PREREQ: Senior standing in exercise and sport science, one semester residence in program, cumulative GPA of 2.25, adviser approval.

EXSS 411. MOVEMENT SKILL LEARNING AND CONTROL (4). Motor control and learning, including neural mechanisms, practice, feedback, retention, and transfer; application of theoretical concepts emphasized. PREREQ: EXSS 322.

EXSS 412/EXSS 512. APPLIED MOTOR LEARNING (3). Application of research and theory to the teaching of motor skills with emphasis on development of instructional strategies related to modeling, knowledge of results, practice, and motivational aspects of learning. PREREQ: EXSS 411.

EXSS 414. FITNESS AND AGING: DEVELOPMENTAL AND PROGRAMMING PERSPECTIVES. (3). Examination of neurological, physiological, and psychological changes occurring after adolescence and implications for the planning, implementation, and evaluation of physical activity programs for the adult population.

EXSS 415/EXSS 515. MOTOR CONTROL AND MOVEMENT DYSFUNCTION (3). Contemporary motor control theories and their application to the development of instructional and training programs for individuals with movement disorders caused by neurological disease and/or trauma. PREREQ: EXSS 411, EXSS 444/EXSS 544.

EXSS 420. PHYSICAL ACTIVITY FOR CHILDREN (3). Elementary school physical education practices with an emphasis on effective instructional strategies and developmentally appropriate activities for children, ages 5-12.

EXSS 424. APPLIED EXERCISE AND SPORT PHYSIOLOGY (3). Physiological adaptations to exercise regimens for sport and fitness, with consideration of factors that affect physical performance and the methods for evaluating physiological capacities. PREREQ: EXSS 324.

EXSS 425/EXSS 525. BIOMECHANICS OF THE SKELETAL SYSTEM (3). Application of biomechanical principles in the analysis of bone, cartilaginous and collagenous tissues, and of reactions occurring at joints, with emphasis on the current research literature. PREREQ: EXSS 323. Not offered every year.

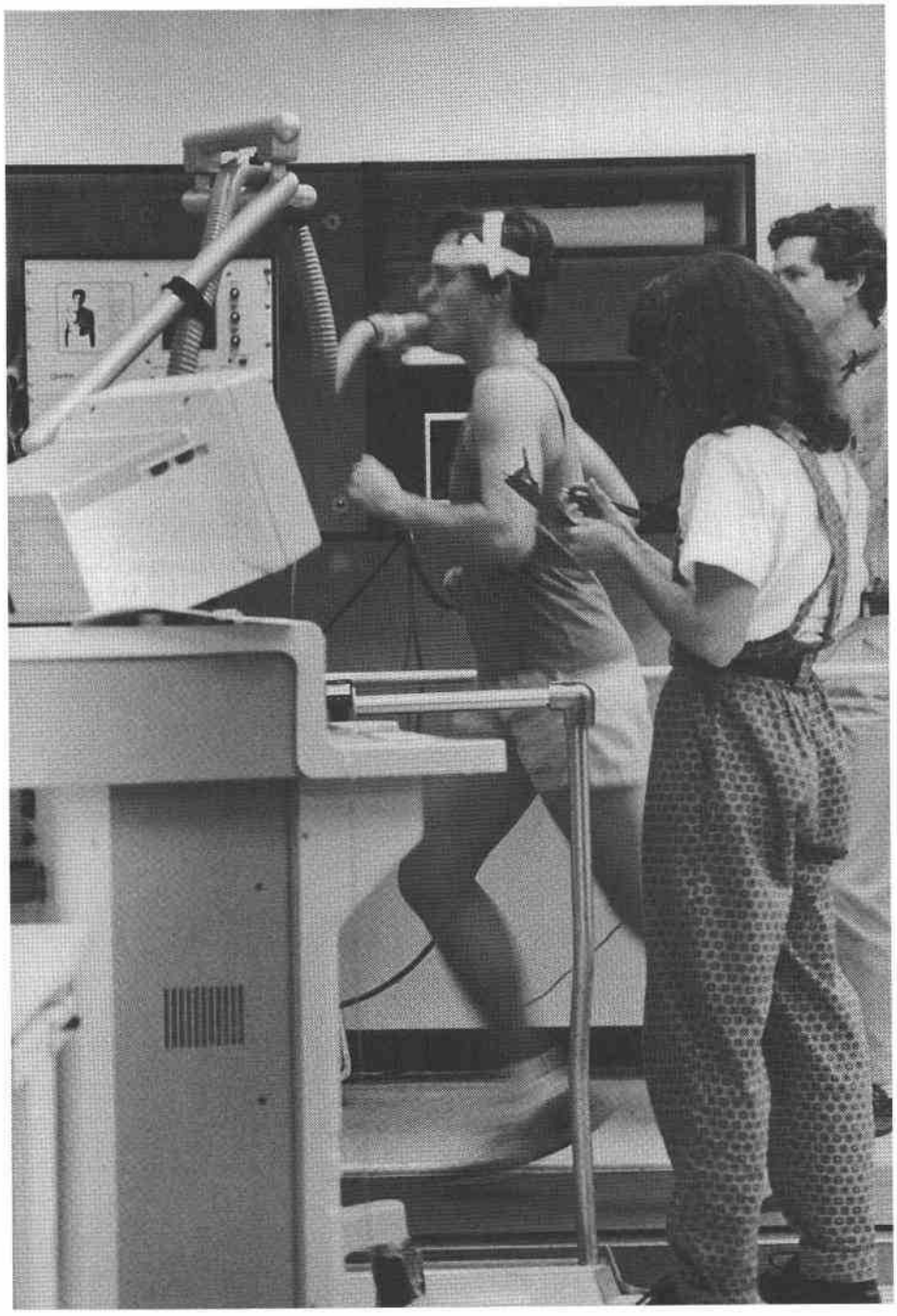
EXSS 426/EXSS 526. BIOMECHANICAL ANALYSIS TECHNIQUES (3). Techniques for collecting and analyzing quantitative human movement data from high-speed film, including theories supporting three-dimensional analysis and data-smothing methodologies. PREREQ: EXSS 411, EXSS 323.

EXSS 434/EXSS 534. PHYSIOLOGY OF STRENGTH DEVELOPMENT (3). Theory and methodology of strength development. PREREQ: EXSS 424.

EXSS 436/EXSS 536. CARDIOVASCULAR DYNAMICS (3). Responses of the cardiovascular system to exercise and principles of exercise testing prescription. PREREQ: EXSS 424.

EXSS 437/EXSS 537. RESPIRATORY DYNAMICS (3). Responses of the respiratory system during work and exercise; role of ventilation in energy metabolism and the influence of environmental factors on pulmonary function. PREREQ: EXSS 424.

EXSS 442. ATHLETIC TRAINING PROGRAMS (3). Medical-legal implications, professional personnel relationships, scope of employment, current issues and problems associated with athletic training. PREREQ: EXSS 357.



EXSS 443. THERAPEUTIC MODALITIES (3). Indications, contraindications, techniques, and effects of various physical agents involved in the care and treatment of injuries. PREREQ: Admission to the athletic training curriculum or enrollment in a pretherapy option (Department of Exercise and Sport Science or College of Science). Not taught every year.

EXSS 444/EXSS 544. ADAPTED PHYSICAL ACTIVITY (4). Overview of cognitive, neuromuscular, sensory and orthopedic impairments; design and implementation of physical activity programs for individuals with disabilities. PREREQ: EXSS 411, EXSS 324.

EXSS 445/EXSS 545. THERAPEUTIC EXERCISE (3). Principles and techniques of therapeutic exercises; activities and programs for a variety of conditions which require rehabilitation. PREREQ: EXSS 444/EXSS 544.

EXSS 450. ADVANCED ASSESSMENT OF ATHLETIC INJURIES (4). Advanced course designed to develop knowledge and skills related to the recognition, assessment, treatment, and appropriate medical referral of athletic injuries and illnesses. PREREQ: EXSS 356.

EXSS 451/EXSS 551. COMPETITIVE ATHLETICS (3). Analysis of competitive athletic programs in schools and colleges with emphasis on new developments and findings. PREREQ: EXSS 312.

EXSS 452/EXSS 552. SPORT AND SOCIETY (3). Investigation of sport as a social phenomenon, including small groups in sport, sport organizations, sport subcultures, socializing institutions, and an in-depth analysis of interscholastic and intercollegiate sport programs. PREREQ: EXSS 312 and 6 credits of sociology.

EXSS 453/EXSS 553. FUNCTIONS OF PLAY (3). Incidence, nature, forms, functions, and theories of play in society. PREREQ: EXSS 312.

EXSS 455/EXSS 555. FACILITIES (3). Planning construction of indoor and outdoor physical activity facilities; relationship of staff, architect, and community; analysis of gymnasium and field space.

EXSS 456/EXSS 556. THE OLYMPIC GAMES (3). Examination of the modern Olympic Games in society with an emphasis on recent Olympiads. Offered even-numbered years. PREREQ: 6 credits of social science.

EXSS 463/EXSS 563. ADMINISTRATION IN EXERCISE AND SPORT SCIENCE (3). Analysis of administrative methods with unique applications to the administration of programs in the school, in commercial and industrial settings, and in sport and recreational programs. PREREQ: BA 302, or EXSS 340.

EXSS 471. TESTS AND MEASUREMENTS IN EXERCISE AND SPORT SCIENCE (4). Techniques for constructing, evaluating, and administering tests in the cognitive, affective, and psychomotor domains; analysis and interpretation of test data. PREREQ: Senior standing, college algebra.

EXSS 472/EXSS 572. COMPUTER UTILIZATION IN HEALTH AND EXERCISE AND SPORT SCIENC (3). Implementation of computer hardware and software in research applications among the subdisciplines of health and exercise and sport science. PREREQ: EXSS 271, ST 201.

EXSS 474/EXSS 574. STRESS PHYSIOLOGY INSTRUMENTATION (1). Instrumentation, calibration, validity and reliability of human performance measurement in metabolism, exercise testing, body composition, and pulmonary function. PREREQ: EXSS 433. May be repeated for credit.

EXSS 481. ^ANALYSIS OF CRITICAL ISSUES IN EXERCISE AND SPORT SCIENCE (3). Analysis of current literature, professional issues, and societal interrelationships in exercise and sport science; intensive course designed to emphasize writing as a tool for learning and the products of writing. PREREQ: Senior standing. (Writing Intensive Course)

EXSS 491. SELECTED TOPICS (1-3). Impact of human movement development on people, their movement behavior, and environment. Topics vary from semester to semester and year to year. May be repeated for credit when topics differ. PREREQ: Senior standing.

Graduate

EXSS 501. RESEARCH (1-16).

EXSS 503. THESIS (1-16).

EXSS 505. READING AND CONFERENCE (1-16).

EXSS 506. PROJECTS (1-16).

EXSS 507. SEMINAR (1-16). Section 1: SEMINAR. Graduate research seminar which emphasizes student oral presentations of current research topics in exercise and sport science. One credit required for all graduate students. **Section 2:** CURRENT DEVELOPMENTS (1). Discussion of contemporary issues in the exercise and sport science literature. Topics vary by term. May be repeated for credit. Two credits required of all doctoral students. **Section 9:** INTERNATIONAL ASPECTS (1). Discussion of of international aspects of study in exercise and sport science. Required of all doctoral students.

EXSS 508. WORKSHOP (1-16).

EXSS 511. HUMAN MOVEMENT, PERCEPTION AND COGNITION (3). Current theories underlying control of human movement and acquisition of motor skill; role of perception, attention and memory upon skill acquisition and performance. PREREQ: EXSS 411 or EXSS 412 or equivalent.

EXSS 513. NEUROLOGICAL MECHANISMS OF VOLUNTARY MOTOR CONTROL (3). Study of specific areas within the central and peripheral nervous system responsible for the control of human movement and learning and performance of motor skills. PREREQ: EXSS 411, PSY 350.

EXSS 523. BIOMECHANICS OF MOTOR ACTIVITIES (3). Kinematic and kinetic analysis of volitional human movement with emphasis on analytical techniques and quantitative problem solving. PREREQ: EXSS 323 or PH 201.

EXSS 533. ADVANCED EXERCISE PHYSIOLOGY (3). Physiological adaptations to physical exercise and training; emphasis on recent research. PREREQ: EXSS 424.

EXSS 547. MAINSTREAMING IN EXERCISE AND SPORT SCIENCE (3). Effectiveness of integrated exercise and sport science and sport experiences on handicapped and non-handicapped participants. PREREQ: EXSS 444/EXSS 544.

EXSS 548. ASSESSMENT AND PROGRAMMING FOR SPECIAL POPULATIONS (3). Use of appropriate assessment procedures for developing effective psychomotor programs for the disabled. PREREQ: EXSS 444,EXSS 471.

EXSS 549. PHYSICAL ACTIVITY FOR THE SEVERELY DISABLED (3). Effectiveness of motor programs, instructional strategies, behavior management practices, and data analysis systems on the psychomotor performance of the severely disabled. PREREQ: EXSS 444/EXSS 544.

EXSS 554. HISTORY OF EXERCISE AND SPORT SCIENCE (3). History of exercise and sport science from early societies to modern times; analysis of the contributions of the leaders toward the development of exercise and sport science in the United States. PREREQ: EXSS 312 or 6 credits of upper division history.

EXSS 560. MOTIVATION IN PHYSICAL ACTIVITY (3). A social psychological approach to understanding the role of self-perceptions and cognitions in explaining motivated behavior in the sport and exercise settings. PREREQ: EXSS 370.

EXSS 561. PSYCHOSOCIAL FACTORS IN PHYSICAL ACTIVITY (3). A social psychological approach to understanding the role of social interactions and contextual factors in explaining human behavior in the sport and exercise settings. PREREQ: EXSS 560.

EXSS 562. LIFESPAN SPORT AND EXERCISE PSYCHOLOGY (3). Social-psychological issues across the lifespan in the context of sport and exercise. PREREQ: EXSS 561.

EXSS 565. PSYCHOMOTOR INSTRUCTIONAL SYSTEMS (3). Planning, designing and producing instructional systems to achieve predictable psychomotor learning. PREREQ: EXSS .

EXSS 573. MEASUREMENT IN HUMAN MOVEMENT (3). Measurement theory applied to the study of human movement. Principles and methods for assessing validity and reliability of norm-referenced and criterion-referenced tests in the motor domain. PREREQ: EXSS 471, ST 451.

EXSS 575. RESEARCH IN HUMAN MOVEMENT (3). Investigation and evaluation of research methods applicable to human movement study and professional physical education. PREREQ: EXSS 471, ST 451.

EXSS 580. ANALYSIS OF TEACHING BEHAVIOR IN SPORT AND PHYSICAL EDUCATION (3). Introduction to current strategies used to analyze and evaluate instruction in sport and physical education settings.

EXSS 591. SELECTED TOPICS (1-3). Topics vary; include recent advances in exercise science, motor behavior, and sport studies and their application to special fields of study. May be repeated for credit when topics differ. PREREQ: Graduate standing.

EXSS 601. RESEARCH (1-16).

EXSS 603. THESIS (1-16).

EXSS 605. READING AND CONFERENCE (1-16).

EXSS 606. PROJECTS (1-16).

EXSS 607. SEMINAR (1-16). Section 1: Graduate Research (1). Seminar which emphasizes student oral presentations of current research topics in exercise and sport science. One credit required of all graduate students. **Section 3:** Current Developments (1). Discussion of contemporary issues in the exercise and sport science literature. Topics vary by term. May be repeated for credit. Two credits required of all doctoral students. **Section 9:** International Aspects (1). Discussion of international aspects of study in exercise and sport science. Required of all doctoral students.

PUBLIC HEALTH

Annette Rossignol, Chair
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(503) 737-3824

Faculty

Professors: Rossignol; *Associate Professors* Donatelle, Lawson, Tricker, Veltri; *Assistant Professors* Beeson, Chi, Friedman, Hafner-Eaton, Harding, Neumann, Prows; *Instructors* Beeson, Garets, Hogan, Jarvis, Spencer

Adjunct Faculty

Chase, Karen, M.S.; Fugi, Gerald, D.D.M., Hendricks, Charles, Ph.D., Corvallis; Holstedt, Peggy, M.S., Salem; Knox, George, M.D., Corvallis; Stevens, Nancy, Ph.D., Portland; Terhune, Charles, M.D., Corvallis; Webster, Claudia, Portland; Wang, Michael, Ph.D., Wilson, Robert, R.S., Corvallis; Wright, Gary, M.D.

Undergraduate Majors

Environmental Health and Safety (B.S.)
Options
Environmental Health
Occupational Safety

Health Promotion and Education (B.S.)
Options
Applied Health
Child and Adolescent Health
Community Health
Worksite Health Promotion

Health Care Administration (B.S.)
Options
General Health Care Administration
Long Term Care Administration

Minors

Applied Health
Community Health
Environmental Health
Health Science
Occupational Safety
Worksite Health Promotion

Graduate Majors

Health (M.S., Ph.D.)
Community Health
Health Education

Environmental Health Management (M.S.)
Graduate Areas of Concentration
Environmental Health Management
Environmental Epidemiology
Occupational Safety

Health and Safety Administration (M.S.)
Graduate Areas of Concentration
Health Care Administration
Health Promotion
Safety Management

Master of Public Health (M.P.H.)
Graduate Areas of Concentration
Epidemiology/Biostatistics
Health Behaviors
Health Policy and Management
Occupational Health and Safety
Public Health Promotion and Education
Maternal and Child Health
Gerontology
International Health

The Department of Public Health offers study programs leading to baccalaureate (B.S.) and advanced degrees (M.S., M.P.H. Ph.D.) for non-clinical professionals seeking public health careers. It also participates in the Master of Arts in Interdisciplinary Studies (M.A.I.S.) and Master of Arts in Teaching (M.A.T.) graduate degree programs (see Graduate School), and provides minors at both the undergraduate and graduate level. The department promotes research and expansion of knowledge in the areas of health promotion, health education, environmental health, occupational safety, and health care administration. In addition, department faculty are actively engaged in a wide range of research, teaching, and service activities related to personal and community health; disease and injury control; epidemiology; child and adolescent health; women's health; international health; traffic safety education; substance abuse; health policy and management; risk and loss management; and health behaviors.

Undergraduate Studies

The undergraduate health curriculum includes study of the humanities and the biological, physical, and social sciences as well as intensive study in at least one professional public health area. Each undergraduate student must complete a set of three core public health courses designed to provide a basic understanding of personal health priorities, epidemiology and health data analysis, and human disease. In addition, each student completes a major area of study selected from environmental health and safety, health promotion and education, or health care administration. Options are provided within each major area. These options provide students with the opportunity to pursue in-depth study of selected areas of public health. Normally, all major areas of study require one term of internship.

Curriculum

General Program Requirements (192)

Baccalaureate Core Requirements (48)
Skills
Writing I (3)
Writing II (3)
Writing III/speech (3)
Mathematics (3)
Fitness (3)
Writing intensive course
Perspectives
Physical science (lab) (4)
Biological science (lab) (4)
Plus choice of either of the above (4)
Western culture (3)
Cultural diversity (3)
Literature and the arts (3)
Social processes and institutions (3)
Difference, power and discrimination (3)
Synthesis
Contemporary global issues (3)
Science, technology, and society (3)

Department of Public Health Core (9-10)
H 175. Personal Health Priorities (3)
H 220. Intro to Epidem & Hlth Data Analysis (3) or BA 275. Quantitative Business Methods (4)
H 320. Introduction to Human Disease (3)

Major Area of Study (132)
Students select a major area of study from among environmental health and safety, health promotion and education, or health care administration. Within the major area of study, students elect an option that provides for in-depth professional training in a selected field of public health. Substitutions or changes in the required courses or in the major option require written approval by the faculty adviser, the department chair, and the college dean.

Major Areas of Study

Environmental Health and Safety

Students who major in environmental health and safety select an option from environmental health or occupational safety. The Environmental Health Option prepares students for work with organizations concerned with the relationship of the environment and human health as well as protection of the environment. Environmental health professionals work to control environmental hazards and to maintain environmental factors that contribute to health, safety, comfort, and well-being. The curriculum provides a broadly based background in the traditional yet essential concepts of epidemiology, disease transmission, drinking water quality, food protection, housing quality, occupational health, and solid and hazardous waste control, as well as for study of contemporary problems associated with the health-threatening effects of global environmental contamination. The curriculum is accredited by the National Environmental Health Science and Protection Accreditation Council.

Environmental Health Option

Baccalaureate Core Requirements (27)
21 of the 48 credits required in the baccalaureate core may be fulfilled by courses in the environmental health curriculum.

Department of Public Health Core (9)
H 175. Personal Health Priorities (3)
H 220. Intro to Epidem & Hlth Data Analysis (3)
H 320. Introduction to Human Disease (3)

Environmental Health and Safety Core (31)
H 181. Safety Principles & Foundations (3)
H 281. Elements of Industrial Hygiene (3)
H 344. Intro to Environmental Science (3)
H 385. Safety and Hlth Stnds & Laws (3)
H 407. Pre-Internship (1)
H 410. Internship (12)
H 440. Environmental Health (3)
H 445. Occupational Health (3)

Environmental Health Option Courses (16)
H 425. Principles of Epidemiology (3)
H 441. Environmental Health (3)
H 443. Environ Sampling and Analysis (4)
H 446. Industrial Hygiene Instrumentation (3)
H 447. Solid & Hazardous Waste Mgmt (3)

Supporting Courses (71)
CH 121, CH 122, CH 123. Gen Chemistry (or) CH 221, CH 222, CH 223. Gen Chem (15)
MTH 111. College Algebra (4)
MTH 245. Mathematics for Management, Life and Social Sciences (4)
MTH 241. Calculus for Management and Social Science (4)
Z 331, Z 332. Human Anatomy & Physio (6)
Elective in water resources (3)
MB 230. Intro to Microbiology (4)
WR 327. Technical Writing (3)
AC 450. Environmental Toxicology (3)
CH 331, CH 332. Organic Chemistry (8)
BI 101, BI 102, BI 103. General Biology (12)
PH 201. General Physics (5)

Electives (38)

Total (192)

Occupational Safety Option

The Occupational Safety option provides academic and practical education for students interested in seeking professional positions in occupational safety. The program emphasizes recognition and problem solving involving safety and health hazards, industrial hygiene, environmental hazard control, accident phenomena, safety practices, and other safety and loss minimization programs in industry, transportation, business, and other environments. This option is accredited by the American Society of Safety Engineers.

Baccalaureate Core Requirements (24)
24 of the 48 credits required in the baccalaureate core may be fulfilled by courses in the Occupational Safety Curriculum.

Department of Public Health Core (9)
H 175. Personal Health Priorities (3)
H 220. Intro to Epidem & Hlth Data Analysis (3)
H 320. Introduction to Human Disease (3)

Environmental Health & Safety Core (31)
H 181. Safety Principles & Foundations (3)
H 281. Elements of Industrial Hygiene (3)
H 344. Intro to Environmental Science (3)
H 385. Safety and Hlth Stnds & Laws (3)

H 407. Pre-Internship (1)
H 410. Internship (12)
H 440. Environmental Health (3)
H 445. Occupational Health (3)

Occupational Safety Option Courses (33)
H 380. Industrial and Manufacturing Proc (3)
H 446. Industrial Hygiene Instrumentation (3)
H 482. Problems and Research in Safety (3)
H 483. Safety Function Management (3)
H 485. Safety, Health and Environmental Law (3)
H 492. Training & Educ Perspectives in Safety (3)
H 493. Transportation & Motor Fleet Safety (3)
H 494. Applied Ergonomics (3)
H 496. The Process of Hazard Control I (3)
H 497. The Process of Hazard Control II (3)
H 498. Fire Protection and Prevention (3)

Supporting Courses (73)
BA 101. Introduction to Business (3)
BA 131. Productivity Software (2)
BA 230. Business Law I (4)
CH 121, CH 122, CH 123. General Chemistry (15)
CH 331. Organic Chemistry (4)
COMM 111. Public Speaking (3)
IE 341. Work Design, Measurement, & Human Factors (4)
MB 230. General Microbiology (4)
MTH 241. Calculus for Management and Social Science (4)
PH 201, PH 202, PH 203. General Physics (15)
PSY 201, PSY 202. General Psychology (6)
Z 331, Z 332. Human Anatomy and Physiology (6)

Electives (22)
Students are advised to select electives from a list of recommended electives to strengthen their preparation in the occupational safety field.

Total (192)

HEALTH PROMOTION AND EDUCATION

The Health Promotion and Education major provides a comprehensive academic experience for students interested in working in a variety of public health-related settings. Students selecting this major are prepared to plan, coordinate, implement, and evaluate health promotion and education programs in federal, state, and local health organizations, voluntary health agencies, business, and health education departments or hospitals. In addition, students receive academic and practical experiences that can lead to enrollment in the five-year teacher preparation program. Students who major in Health Promotion and Education select an option from child and adolescent health education, worksite health promotion, community health, or applied health.

Admission Criteria
To be accepted into the Health Promotion and Education program a student must:

1. Complete a minimum of 45 credits of course work applicable toward a degree in Health Promotion and Education with a cumulative (OSU and transfer, if applicable) GPA of 2.75 or higher, including a GPA of 2.75 or higher in the following pre-Health Promotion and Education course work:
H 175. Personal Health Priorities
H 220. Introduction to Epidemiology and Health Data Analysis
H 256. History, Theory and Practice of Health Promotion and Education
H 263. Psychosocial Dimensions of Health
PSY 201. General Psychology
SOC 204. Introduction to Sociology
NFM 225. Human Nutrition
BI 101, BI 102. General Biology
MB 230. Introductory Microbiology
CH 121 or CH 221. General Chemistry
ANTH 110. Introduction to Cultural Anthropology
WR 121. English Composition
All of the above courses must be taken graded.

2. Submit a written request for admission to the Health Promotion and Education program upon completion of the above courses. Students will receive written notification of their admission into the program.

Normally students must be admitted to the Health Promotion and Education Major prior to enrolling in the upper division classes. In cases where admission has not been granted, students must obtain the written consent of the instructor before being allowed to take upper division classes. Students from other majors may enroll in upper division public health classes if they have completed the required prerequisite course work. Students planning to enter the Health Promotion and Education program should register for the Pre-Health Promotion and Education program.

Baccalaureate Core Requirements (33)
15 of the 48 credits required in the baccalaureate core may be fulfilled by courses required in the Health Promotion and Education curriculum.

Department of Public Health Core (9)
H 175. Personal Health Priorities (3)
H 220. Intro to Epidem & Hlth Data Analysis (3)
H 320. Introduction to Human Disease (3)

Health Promotion and Education Core (85)
H 263. Psychosocial Dimensions of Health (3)
H 319. Hlth Policy Form & the Consumer (3)
H 323. Introduction Public Health (3)
H 344. Intro to Environmental Science (3)
H 364. Drugs, Society & Human Behavior (3)
H 407. Pre-Internship (1)
H 410. Internship (12)
H 421. Mental Health (3)
H 461. Sexuality: A Health Sci Perspective (3)
H 476. Planning Health Programs (4)
ANTH 102. Intro to Cultural Anthro (3)
CH 121, CH 122. General Chemistry (or) CH 221, CH 222. General Chemistry (10)
EXSS 324. Physiology of Exercise (3)
BI 101, BI 102. General Biology (8)
MB 230. Intro Microbiology (4)
NFM 225. Human Nutrition (4)
PSY 201. General Psychology (3)
SOC 204. Intro to Sociology (3)
Z 331, Z 332, Z 333. Human Anat and Physiol (9)

CHILD & ADOLESCENT HEALTH OPTION (27)
H 262. Consumer Health (3)
H 386. Adv First Aid/First Responder (3)
H 433. Organ, Finan, Delivery of Hlth Care (3)
H 460. Health Challenges Facing Youth (3)
H 466. Alcohol Studies (3)
H 492. Training & Educational Pers in Safety (3)
Courses selected with adviser from approved list (9)
Electives (43-50)
Students are advised to elect another academic area in order to pass more than one area on the National Teacher Examination.

WORKSITE HEALTH PROMOTION OPTION (24)
H 422. Control of Chronic Diseases (3)
H 425. Principles of Epidemiology (3)
H 433. Organ, Finan, Delivery of Hlth Care (3)
H 445. Occupational Health (3)
H 470. Intro to Worksite Health Promotion (3)
H 471. Biobehavioral Princ of Hlth Promo (3)
H 473. Stress & Hlth: Cntrl Indiv & Env Haz (3)
NFM 312. Issues in Nutrition and Health (3)
Note: In addition to the above courses, students specializing in worksite health promotion must complete course work in one concentration area in worksite health promotion. Areas of concentration include Health Behaviors, Behavioral Risk Management, Nutrition and Fitness, and Occupational Health and Safety.

COMMUNITY HEALTH OPTION (24)
H 423. Health Aspects of Gerontology (3)
H 433 Organ, Finan, Delivery of Hlth Care (3)
H 424. Health Data Analysis (3)
H 425. Principles of Epidemiology (3)
H 440. Environmental Health (3)
H 470. Intro to Worksite Health Promotion (3)
NFM 312. Issues in Nutrition and Health (3)
Course selected with adviser approval (3)
Note: In addition to the above courses, students specializing in community health must complete course work in one concentration area in community health. Possible concentration areas include: Health Behaviors, Substance Abuse and International Health.

APPLIED HEALTH OPTION-WOMEN'S HEALTH (27)
H 423. Health Aspects of Gerontology (3)
H 433. Organ, Finan, Delivery of Hlth Care (3)
H 465. Pub Hlth & Women: Soc & Pol Issues (3)
H 466. Alcohol Studies (3)
Courses selected with adviser from approved list (15)
Electives (44-50)
NOTE: Students are advised to complete a certificate in Women's Studies.

APPLIED HEALTH OPTION-HEALTH AND GERONTOLOGY (27)
H 422. Control of Chronic Disease (3)
H 423. Health Aspects of Gerontology (3)
H 433. Organ, Finan, Delivery of Hlth Care (3)
H 464. Perspectives on Death (3)
Courses selected with adviser from approved list (15)
Electives (44-50)
NOTE: Students are advised to complete a certificate in gerontology.

APPLIED HEALTH OPTION-HEALTH AND DEPENDENCIES (27)

H 466. Alcohol Studies (3)
H 470. Intro to Worksite Health Promotion (3)
H 477. Obesity & Weight Mgmt: A Theoretical Approach (3)
H 478. Alcohol & Drug Abuse in Community & Worksite Settings (3)
Courses selected with adviser from approved list (15)
Electives (43-49)

HEALTH CARE ADMINISTRATION

Health Care Administration is an undergraduate degree program that provides students with professional preparation for administrative positions in a variety of health care settings. These settings encompass the entire health care industry and range from long-term care facilities to hospitals to insurance carriers to programs operated by state and federal governments. Cooperative relationships are maintained with public and professional organizations and involve opportunities for student and faculty research and service. A selected group of practicing health care administrators and clinicians serve as a formal advisory group to the program in the areas of curriculum, policy, marketing, and student recruitment. The Health Care Administration program has full membership in the Association of University Programs in Health Administration. The curriculum comprises a series of courses relating to a set of common requirements and to a set of specialized options.

COMMON REQUIREMENTS

The common requirements for the program are a set of core courses drawn from areas of public health, business administration, science and social sciences, communications, humanities, and human development and family sciences.

OPTIONS

The program includes options in general health care administration and long-term care administration. Long-term care administration emphasizes knowledge of the foundations of aging, facility administration and management, physical and social environment, and patient care and welfare. This option prepares students for careers as administrators in nursing homes, retirement residential facilities, other multiservice long-term care facilities, and public and private programs and agencies. The Health Care Administration Program is one of very few undergraduate programs in the United States that offer this type of curriculum. In addition, the long-term care administration option enjoys a close working relationship with OSU's Gerontology Program. All HCA students who choose the long-term care option will, in addition to their degree, earn an undergraduate certificate in gerontology and must apply to receive it.

The general health care administration option provides an emphasis in management, finance, and human resource management. Students electing this option are prepared for administrative and middle management positions in ambulatory care facilities such as medical and dental group practices, community mental health centers and health maintenance organizations, and in traditional in-patient facilities such as hospitals. Students also are recruited into careers in local, state, and federal health programs as well as private voluntary health organizations and organizations specializing in the financing of health care.

INTERNSHIP

The Health Care Administration Program provides full-time internships in an approved facility or agency. The internships last one full term of study and are undertaken upon successful completion of the major portion of course work. Internships have been established throughout the state and elsewhere in medical clinics, hospitals, nursing homes, multiservice centers for the elderly, and state and federal health agencies. These working arrangements involve a formal agreement with a facility sponsor or preceptor. The internships enable students to integrate and apply academic theory and principles of specialization with practical work in their study option area; they often are instrumental in job placement upon graduation.

ADVISING

The curriculum is integrated and coordinated by the health care administration faculty. The faculty are responsible for student advising as well as the implementation of program policies and procedures.

ADMISSION CRITERIA

To be accepted into the program, a student must:

1. Complete 90 credits of course work applicable toward a degree in health care administration with an overall GPA of 2.8 or higher.

2. Complete the following pre-HCA courses with a GPA of 2.8 or higher:
H 175. Personal Health Priorities
H 210. Intro to Health Services & Organizations
H 250. Intro to Health Care Organization & Administration
BA 131. Business Productivity Software
BA 215. Fundamentals of Accounting
BA 275. Quantitative Business Methods
EC 201. Introduction to Microeconomics
EC 202. Introduction to Macroeconomics
MTH 245. Mathematics for Management, Life & Social Science
MB 230. Introductory Microbiology
All of the above courses must be taken graded

3. Submit a request for admission into the HCA program. The request must contain a statement of interest in enrolling in the program, and official copies of all academic transcripts.

BACCALAUREATE CORE REQUIREMENTS (38)

Approximately 10 of the 48 credits required by the Baccalaureate Core may be satisfied by HCA curriculum.

Department of Public Health Core (10)

H 175. Personal Health Priorities (3)
H 275. Quantitative Business Methods (4)
H 320. Introduction to Human Disease (3)

Health Care Administration (21)

H 210. Intro to Health Services & Organizations (3)
H 250. Intro to Health Care Organization & Administration (3)
H 323. Introduction to Public Health (3)
H 407. Seminar in Current Issues (2)
H 407. Pre Internship (1)
H 410. Internship (12)
H 425. Principles of Epidemiology (3)
H 430. Health Policy Analysis (3)
H 431. Health Care Marketing (3)
H 432. Health Care Finance (3)
H 434. Health Care Law & Regulation (3)
H 436. Health Services Admin & Mgt (3)
H 438. Health Systems Analysis (3)
H 456. Strategic Planning & Mgt in HC Orgs (3)
H 457. Financial Mgt of HC Orgs (3)
H 458. Reimbursement Systems (3)

Business (22)

BA 131. Business Productivity Software (2)
BA 215. Fundamentals of Accounting (4)
BA 315. Accounting for Decision Making (4)
BA 350. Organizational Systems (4)
BA 352. Organizational Behavior (4)
BA 452. Leadership and Team Building (4)

Supporting Courses (17)

EC 201. Intro to Microeconomics (3)
EC 202. Intro to Macroeconomics (3)
MB 230. Introductory Microbiology (4)
MTH 245. Math for Mgt, Life & Social Science (4)
HDFS 315. Perspectives on Aging (3)

Option Requirements
General Health Care Administration (27)

27 credits from list of recommended electives

Long Term Care (38)

H 467. Alternatives to Long Term Care (3)
H 468. Financing and Administration of Long Term Care (3)
NFM 225. Human Nutrition (4)
NFM 440. Meal Systems for the Elderly (3)
H 422. Control of Chronic Disease (3) or H 423. Health Aspects of Gerontology (3)
H 464. Perspectives on Death (3) or HDFS 314. Adult Development and Aging (3) or SOC 432. Sociology of Aging (3)
15 credits from a list of recommended electives
Note: Students in the Long Term Care option earn a gerontology certificate as part of their program. Application for this certificate must be made.

Total (192)

TRAFFIC SAFETY EDUCATION PROGRAM

Students wishing to qualify to teach driver and traffic safety education or seek employment in driver improvement programs should complete the following courses:

H 480. Driver & Traffic Safety Education (3)
H 481. Prog in Traffic Safety Education (3)
H 482. Problems & Research in Safety (3)

H 492. Training & Educ Persp in Safety or
H 595. Organ, Admin & Sprv of Safety Progs (3)

MINORS

The minors are designed for students from majors outside the Department of Public Health as well as for students who are majoring in the department and wish to complement their major option with a related public health minor.

ENVIRONMENTAL HEALTH MINOR (28)

H 181. Safety Princ & Foundations (3)
H 220. Intro to Epidem & Hlth Data Analysis (3)
H 320. Introduction to Human Disease (3)
H 344. Intro to Environmental Science (3)
H 425. Principles of Epidemiology (3)
H 440, H 441. Environmental Health (6)
H 447. Solid & Hazardous Waste Mgmt (3)
MB 230. Intro Microbiology (4)

OCCUPATIONAL SAFETY MINOR (27)

H 181. Safety Principles & Foundations (3)
H 281. Elements of Industrial Hygiene (3)
H 385. Safety & Health Stnds & Laws (3)
H 386. Adv First Aid/First Responder (3)
H 482. Problems & Research in Safety (3)
H 498. Fire Protection & Prevention (3)
A minimum of 9 credits must be selected from:
H 406. Projects (3)
H 445. Occupational Health (3)
H 446. Indust Hygiene Instrumentation (3)
H 470. Intro to Worksite Health Promotion (3)
H 471. Biobehavioral Princ of Hlth Prom (3)
H 480. Driver & Traffic Safety Educ (3)
H 481. Programs in Traffic Safety Educ (3)
H 483. Safety Function Management (3)
H 484. System Safety Analysis (3)
H 485. Safety, Health & Environmental Law (3)
H 487. Instr Competencies in Emerg Care (3)

COMMUNITY HEALTH MINOR (32)

H 175. Personal Health Priorities (3)
H 263. Psychosocial Dimensions of Health (3)
H 320. Introduction to Human Disease (3)
H 323. Introduction to Public Health (3)
H 344. Intro to Environmental Science (3)
H 364. Drugs, Society and Human Behavior (3)
H 461. Sexuality: A Health Science Persp (3)
H 470. Intro to Worksite Health Promotion (3)
H 476. Planning Health Programs (4)
NFM 225. Human Nutrition (4)

WORKSITE HEALTH PROMOTION MINOR (32)

H 175. Personal Health Priorities (3)
H 263. Psychosocial Dimensions of Health (3)
H 320. Introduction to Human Disease (3)
H 323. Introduction to Public Health (3)
H 364. Drugs, Society and Human Behav (3)
H 470. Intro to Worksite Health Promotion (3)
H 471. Biobehavioral Princ of Hlth Prom (3)
H 473. Stress & Hlth: Cntrl Indiv & Env Haz (3)
H 476. Planning Health Programs (4)
NFM 225. Human Nutrition (4)

APPLIED HEALTH MINOR (37)

H 175. Personal Health Priorities (3)
H 181. Safety Principles & Foundations (3)
H 320. Introduction to Human Disease (3)
H 344. Intro to Environmental Science (3)
H 364. Drugs, Society and Human Behavior (3)
H 421. Mental Health (3)
H 461. Sexuality: A Health Science Persp (3)
NFM 225. Human Nutrition (4)
Approved electives (12)

HEALTH SCIENCE MINOR (31)

H 181. Safety Principles & Foundations (3)
H 220. Intro to Epidem & Hlth Data Analysis (3)
H 320. Introduction to Human Disease (3)
H 424. Health Data Analysis (3)
H 425. Principles of Epidemiology (3)
H 426. Epidemiologic Methods (3)
H 445. Occupational Health (3)
NFM 225. Human Nutrition (4)
Z 331, Z 332. Human Anatomy & Physio (6)

GRADUATE PROGRAMS

The Department of Public Health offers the M.S. and Ph.D. degrees in Public Health with graduate areas of concentration in Community Health and Health Education. The department offers the M.S. in Environmental Health Management with areas of concentration in Environmental Health, Environmental Epidemiology and Occupational Safety. The department also offers the M.S. in Health and Safety Administration with areas of concentration in Health Promotion, Health Care Administration, and Safety Management. The department offers the Master of Public Health with areas of concentration in Epidemiology/Biostatistics, Health Behaviors, Health Policy and Management, Occupational Health and Safety, Public Health Promotion and Education, Maternal and Child Health, Gerontology and International Health. This degree is offered jointly by Oregon State University, Oregon Health Sciences University and Portland State University. In addition, the department participates in the Master of Arts in Interdisciplinary Studies degree program in cooperation with the Graduate School.

COURSES

Lower Division

H 170. PERSONAL HEALTH (3). Fundamental principles of the impact of individual lifestyle, environmental, psychosocial, biological, and health care system on human health. Emphasis on health promotion and disease prevention at the micro (individual) and macro (public) levels. Students may not receive credit for both H 170 and H 175.

H 175. PERSONAL HEALTH PRIORITIES (3). Application of health science to personal health issues; an examination of health behaviors, environmental influences; psychosocial influences, and genetic factors, health policy, economic and health care system influences on health promotion and disease prevention. Micro (individual) and macro (public) emphasis. Students may not receive credit for both H 170 and H 175.

H 181. SAFETY PRINCIPLES AND FOUNDATIONS (3). Study of principles of safety program; analysis of causation and effect factors and foundations needed to prevent injury; strategies for counteracting hazardous practices.

H 199. SPECIAL STUDIES (1-16).

H 210. INTRODUCTION TO HEALTH SERVICES AND ORGANIZATIONS (3). An overview of the United States health care system. Focus on organization of public and private sector health services at federal, state and local levels as well as emerging health care issues.

H 220. INTRODUCTION TO EPIDEMIOLOGY AND HEALTH DATA ANALYSIS (3). Introduction to the application of epidemiologic biometry and probability theory to the health sciences. Topics include quantitative analysis and inference, statistical and epidemiologic methodology, and quantitative study to evaluate and control health problems. Open to major or minor students in Public Health, or by consent. PREREQ: MTH 105 or higher mathematics.

H 250. INTRODUCTION TO HEALTH CARE ORGANIZATION AND ADMINISTRATION (3). An introduction to the administrative operations of health care organizations. Examines the various service settings and their organization, personnel and resources. PREREQ: H 210.

H 256. HISTORY, THEORY, AND PRACTICE OF HEALTH PROMOTION AND EDUCATION (3). History, current role, theoretical foundations, practice and future of health promotion and health education in the United States. Students will become familiar with new professional standards, competencies, issues, and controversies within the field. The general practice of health promotion and education will be viewed more specifically by examining program financing, program planning, delivery of direct services and program evaluation. School, occupational and clinically-based intervention efforts to improve health status for diverse population will be analyzed.

H 262. CONSUMER HEALTH (3). Health aspects of consumer protection; decision making regarding health products and services; superstitions and misconceptions, advertising, quackery, selection of medical and dental services. PREREQ: H 170 or H 175.

H 263. PSYCHOSOCIAL DIMENSIONS OF HEALTH (3). Examination of social, psychological, cultural, attitudinal, behavioral, and environmental factors that influence individual and public health. Overview of behavioral models that influence individual and societal decision-making and resultant health behaviors.

H 281. ELEMENTS OF INDUSTRIAL HYGIENE (3). A basic course in industrial hygiene. A survey of toxic agents and stresses on employees; emphasis on recognition, evaluation and control of environmental factors and stresses associated with the workplace. PREREQ: H 181.

Upper Division

H 309. PRACTICUM IN HEALTH CARE SERVICES (3-6). Supervised work experience in a health care service setting or health-related agency or program. Weekly progress reports and post-experience summary report and evaluation will be expected. Preplanned with instructor approval. Open to health care administration majors. PREREQ: Junior standing. Graded P/N.

H 310. HEALTH FIELD EXPERIENCES (3-6). Introductory field experience in a health or health-related worksite. Enrollment limited to department majors. PREREQ: H 175, H 220 and junior standing; consent of cooperating professional and faculty supervisor required. Graded P/N

H 312. *AIDS AND SEXUALLY TRANSMITTED DISEASES IN MODERN SOCIETY (3). Fundamental principles relating to etiology, nature, prevention, and control of AIDS and other sexually transmitted diseases in contemporary society; emphasis on social, psychological, legal, economic, and ethical issues surrounding these diseases. (Bacc Core Course)

H 319. HEALTH POLICY FORMATION AND THE CONSUMER (3). History of consumer protection laws and agencies; an examination of health care providers and facilities; consumer advocacy groups and their impact on policy decisions; health insurance and its role in consumer health; an examination of the media's role in consumer health.

H 320. INTRODUCTION TO HUMAN DISEASE (3). Fundamental principles relating to etiology, nature, prevention, and control of communicable and noncommunicable diseases in human populations. Special emphasis on disease prevention and health promotion in the high risk diseases of modern, industrialized society. PREREQ: An introductory course in microbiology.

H 323. INTRODUCTION TO PUBLIC HEALTH (3). History, evolution, and current status of health programs and services in the United States. Includes philosophical perspectives of the various health disciplines and the role of health education, health promotion, and public health in contemporary society.

H 344. INTRODUCTION TO ENVIRONMENTAL SCIENCE (3). Survey of the major environmental issues that affect human health; interrelatedness of personal and community health with ecological concern; environmental factors in the transmission of chronic and communicable diseases; hazards due to exposure to chemical and physical materials in our environment.

H 349. PEER HELPER SKILLS DEVELOPMENT (3). This course is designed to prepare the student for an active role as a peer helper in alcohol and drug abuse prevention and health education. Course work will include: drug, alcohol, addiction and other related health issues, basic listening and communication skills, conflict resolution, crisis recognition and referral. A major component of this course will be affective learning situations designed to promote self-awareness and personal growth. PREREQ: Instructor permission required.

H 364. DRUGS, SOCIETY AND HUMAN BEHAVIOR (3). Drug use and abuse; theories of addiction; basic principles of drug action regarding the use of sedative and stimulative compounds; alcohol; opiates; hallucinogens; designer drugs; cocaine; and over-the-counter products. Particular emphasis on the role of the individual's value orientation, decision-making, and self-responsibility in treatment and educational approaches to prevention. PREREQ: PSY 201 OR PSY 202; SOC 204.

H 369. SCHOOL HEALTH EDUCATION (3). Developing ability of the public school student to understand and guide personal health and to contribute to the health of the community. PREREQ: H 170; one year of biological science.

H 380. PROCESSES AND HAZARDS IN THE INDUSTRIAL WORK ENVIRONMENT (3). Hazards of materials and processes found in industrial settings with an emphasis on common unit operations encountered in the industrial work environment. PREREQ: H 181.

H 385. SAFETY AND HEALTH STANDARDS AND LAWS (3). Emphasis on the Occupational Safety and Health Act; study includes the scope and duties under the act, enforcement, and adjudication procedures and OSHA litigation; components of Oregon-OSHA.

H 386. ADVANCED FIRST AID/FIRST RESPONDER (3). Emergency treatment for various types of injuries; control of bleeding, artificial respiration, CPR, transportation, splinting, and bandaging. Course leads to Red Cross Advanced First Aid and CPR Certification. Open as a service course to all departments.

H 401/H 501. RESEARCH (1-16).

H 403/H 503. THESIS (1-16).

H 405/H 505. READING AND CONFERENCE (1-16).

H 406. PROJECTS (1-16).

H 407/H 507. SEMINAR (1-6). H 407, Section 1, Internship (1). Graded P/N

H 408/H 508. WORKSHOP (1-16).

H 409/H 509. PRACTICUM (1-6). Supervised work experience in a public health or health care administration setting. Open to majors in Public Health. PREREQ: Senior standing and consent. Graded P/N

H 410/H 510. INTERNSHIP (6-12). Directed field experience with participating community, worksite, or health agency, or program. Experience is individually arranged to meet student needs. PREREQ: Senior standing in Public Health Department, consent. Graded P/N

H 421/H 521. MENTAL HEALTH (3). Influence of genetics, society, peer pressure, and social mores on human behavior; emphasis on positive aspects of human behavior, psychopathology, recognition of mental illness, and possible means of prevention of mental health problems. PREREQ: Two terms of psychology.

H 422/H 522. CONTROL OF CHRONIC DISEASE (3). Epidemiology of the major chronic diseases, risk factors, potential methods of prevention, and efficacy of current methods of control and treatment. Includes an examination of contemporary research on social, psychological, ethical, economic, and health care issues and their relationship to chronic disease. PREREQ: Nine credits of health course work.

H 423/H 523. HEALTH ASPECTS OF GERONTOLOGY (3). Promotion of normal health in the aged; physiological aspects of the normal aging process; community, state and federal health programs and services for the aged. PREREQ: Nine credits of health course work.

H 425/H 525. PRINCIPLES OF EPIDEMIOLOGY (3). Measures of disease frequency; measures of effect; association and causation; sources of inaccuracy; experimental and observational study designs. PREREQ: H 220.

H 429/H 529. INTERNATIONAL HEALTH (3). Overview of the epidemiological, economic, political, sociological, and cultural factors that impact on international health. Special emphasis on the methods of prevention/intervention utilized in coping with health problems on an international level. PREREQ: Senior standing.

H 430/H 530. ^HEALTH POLICY ANALYSIS (3). Analysis of public policies affecting health care programs, services and organizations and the impact of those programs on citizens; processes by which health policy proposals are generated, promoted, defeated, modified and implemented. H 430 is a Writing Intensive Course. PREREQ: H 250.

H 431/H 531. HEALTH CARE MARKETING (3). Principles, elements and methods of marketing health care services. Role of the consumer, governing body, administration and medical staff as well as impact of professional ethics. PREREQ: BA 340.

H 432/H 532. HEALTH CARE FINANCE (3). Focus on the variety of public and private mechanisms for financing of the treatment of physical and mental illness; trends and constraints associated with each mechanism. Considers new developments in private health insurance, the potentialities of national health insurance and needs of special population groups. PREREQ: BA 340.

H 433/H 533. ORGANIZATION, FINANCING AND DELIVERY OF HEALTH CARE (3). Organization and administration of the U.S. health care system; trends, issues, social, technological, and political forces in both public and private sector and their influence in financing and delivery of health care. Not open to HCA undergraduate majors.

H 434/H 534. HEALTH CARE LAW AND REGULATION (3). Legal aspects of health care delivery; tort law and its applications; professional liability and liability liability insurance; laws relative to health care institutions, cost controls, antitrust and access. PREREQ: BA 230.

H 436/H 536. HEALTH SERVICES ADMINISTRATION AND MANAGEMENT (3). Administrative practice in health care settings with emphasis on long term care and acute care services. Provides a framework for health care systems and managerial process and roles. Focus on operations, planning, marketing, human resources, finance, productivity and control as well as emerging trends in health services. PREREQ: H 250, admission to HC Program. (Writing Intensive Course)

H 440/H 540, H 441/H 541. ^ENVIRONMENTAL HEALTH (3, 3). Environmental factors affecting public health. **H 440/H 540:** Risk assessment and communication; infectious agents in food; food protection and safety; assessment of pesticide risk; public health assessments; residential and institutional environmental hazards; urbanization and public health issues; insect and rodent control. (H 440 is a Writing Intensive Course.) **H 441/H 541:** Indoor and outdoor air quality management; human illness related to water resources and water pollution; private and public water supplies; swimming/recreational areas; private and public sewage disposal; radiation; emergency planning and right-to-know. Both integrate global environmental health problems, include ethical, political, and social forces involved in legislation and policy formation. Recommend taking in order. PREREQ: H 320, H 344.

H 443/H 543. ENVIRONMENTAL SAMPLING AND ANALYSIS (4). Field sampling methods and lab analyses of drinking water and surface water; physical and chemical parameters of water; microbiological criteria of drinking water. Discussion of related topics: e.g. hazardous materials sampling; inspection procedures for food/dairy establishments; health hazard assessment and documentation, regulatory procedures. PREREQ: H 440/H 540, H 441/H 541.

H 444/H 544. MEDICAL AND PUBLIC HEALTH ENTOMOLOGY (3). Arthropod pests of man and domestic animals, including biology of pests, disease transmission mechanisms, epidemiology of important arthropod-borne diseases, and prevention and control of pest related problems. PREREQ: Two terms of biology or general zoology.

H 445/H 545. *OCCUPATIONAL HEALTH (3). Current and historical topics in the area of occupational health, with particular emphasis on the types of materials that produce human health effects; clinical and epidemiologic data used to assess the public health importance of occupational pollutants and to evaluate control strategies. PREREQ: 9 credits of health-related course work. (Bacc Core Course)

H 446/H 546. INDUSTRIAL HYGIENE INSTRUMENTATION (3). Information and practice related to routine sampling procedures and measurement techniques used to evaluate chemical, physical, and biological hazards in places of work. PREREQ: H 281.

H 447/H 547. SOLID AND HAZARDOUS WASTE MANAGEMENT (3). Study of the relationship of public health, environmental, economic, and policy factors with solid and hazardous waste generation and disposal. Topics include: 1) historical development of solid waste problems, processing, disposal, legislation, and minimization strategies; 2) hazardous waste generation, development of policy, management strategies including waste reduction; hazard communication, auditing, 3) special topics including Superfund, medical wastes, radioactive waste, hazardous waste in Third World, Oregon's clandestine drug lab cleanup program. PREREQ: H 344.

H 449/H 549. HEALTH RISK COMMUNICATION (3). Designed to improve the effectiveness of health risk communication strategies in promotion of health and prevention of disease and disability. Review of applicable behavioral science theory, research on risk perception and persuasive communication; instruction in effective methods and techniques of risk communication; initial process by which risks are identified and assessed; scientific, institutional, political and social forces that affect the transfer of information in public health programs.

H 450/H 550. HEALTH CARE PLANNING (3). Introduction to the concepts, methods, implementation and evaluation strategies used in planning by health organizations. PREREQ: H 250.

H 451/H 551. CONSUMER HEALTH PROBLEMS (3). Consumer health protection; selection of health products and services, community sources of health information, health advertising, quackery, health care delivery programs, consumer health protection agencies. PREREQ: H 319 or equivalent.

H 452/H 552. PATHOPHYSIOLOGY (3). Overview of basic principles of disease pathology in human populations throughout the lifespan. Emphasis on infectious and noninfectious diseases, etiological factors, methods of prevention, risk reduction and health promotion in modern, industrialized society.

H 454/H 554. SELECTED TOPICS: HEALTH CURRICULUM DEVELOPMENT (3). Health education curriculum development in light of national and state goals and guidelines; professional organization criteria explored.

H 455/H 555. RISK FACTORS OVER THE LIFESPAN (3). Health enhancing behaviors across the life span; health concerns and problems at particular life stages which challenge the health of the nation; additional emphasis on specific at risk population/age groups. PREREQ: Nine credits of health course work.

H 456/H 556. STRATEGIC PLANNING AND MANAGEMENT IN HEALTH CARE ORGANIZATIONS (3). Theories and methodologies of long range planning and strategic management in health care organizations. PREREQ: Admission to HCA program.

H 457/H 557. FINANCIAL MANAGEMENT OF HEALTH CARE ORGANIZATIONS (3). Utilization of standard financial tools needed to manage the capital resources of health care organizations. Includes funding capital projects, product costing, budgeting methods, capital formation and investment strategies.

H 458/H 558. REIMBURSEMENT MECHANISMS (3). In-depth analysis of the methods of paying for health care services in the U.S.; includes hospital, physician and long term care health care services.

H 460/H 560. HEALTH CHALLENGES FACING YOUTH (3). Special health problems and the educational establishments, opportunities and responsibilities; focus on "at risk" populations. PREREQ: senior standing.

H 461/H 561. SEXUALITY: A HEALTH SCIENCE PERSPECTIVE (3). Exploration of the meaning of sexuality from a variety of contemporary health science perspectives; aspects of sex and sexuality fundamental to total health; issues central to the health educator role examined. PREREQ: senior standing.

H 463/H 563. ADMINISTRATION OF HEALTH PROGRAMS (3). Overview of general management principles as applicable to health-related settings. Management styles and general organizational patterns, barriers/constraints, in different settings, fiscal and personnel issues, public relations, and other administrative issues, such as legal and political influences.

H 464/H 564. PERSPECTIVES ON DEATH (3). Exploration of the meaning of death from a variety of contemporary perspectives; formulation of realistic plans in order to enhance quality of life and death for self and others. PREREQ: Two terms of psychology, senior standing.

H 465/H 565. PUBLIC HEALTH AND WOMEN: SOCIAL AND POLICY ISSUES (3). Public health concepts as they apply to the identification of special health needs of women. Epidemiological analysis of the major causes of morbidity and mortality of women; discussion of the impact of social and behavioral influences on women's health; analysis of the relationship of social and political trends to women's health and health services for women; comparison of national and international women's health issues. PREREQ: 9 credits in public health, including a course in health policy or consent.

H 466/H 566. ALCOHOL STUDIES (3). Physiology and health aspects of alcohol use and abuse; knowledge, values and other factors that influence use or abuse of alcohol; impact of alcohol use and abuse on society, the family and special populations such as women and adolescents; recognition of problem drinking and alcoholism; intervention; alcoholism treatment and recovery; abuse prevention. PREREQ: Senior standing.

H 467/H 567. LONG-TERM CARE ALTERNATIVES (3). Overview of the long-term care alternatives. Comparisons of nursing homes with community-based facilities: adult day care centers, respite to hospice facilities, social HMOs and other services; cost, quality of life and practicality are addressed. PREREQ: H 210 and HDFS 314 or HDFS 315.

H 468/H 568. FINANCING AND ADMINISTRATION OF LONG TERM CARE (3). Examines the financing and administration of long term care. Emphasis is on a system-wide overview and specific application to nursing facility management.

H 470/H 570. INTRODUCTION TO WORKSITE HEALTH PROMOTION (3). Overview of practical and operational aspects of planning, implementing, and evaluating health promotion/disease prevention programs in a variety of public and private organizations. General principles of risk management, programming for special needs/special populations, and the examination of the relative acceptability, efficacy, and costs/benefits of alternative health promotion/disease prevention strategies. PREREQ: 9 credits of health-related course work.

H 471/H 571. BIOBEHAVIORAL PRINCIPLES OF HEALTH PROMOTION (3). Application of physical, psychological, and behavioral sciences to health promotion and disease prevention strategies. Epidemiological examinations of factors that predispose, enable, and reinforce health-related behaviors; the role and nature of emotions; developmental aspects of health psychology; and the significance of social support and psychosocial factors in health behavior. PREREQ: Z 331, Z 332.

H 473/H 573. STRESS AND HEALTH: CONTROLLING INDIVIDUAL AND ENVIRONMENTAL HAZARDS (3). Overview of the physiological, psychological, and behavioral responses to stress and resultant impact on health. Theories of causation (intrinsic and extrinsic); legal and ethical aspects of stress-producing environments; stress and special populations; and the appropriate mechanisms for the development of programs and policies designed to control and facilitate positive stress management at the individual, community, and organizational levels. PREREQ: 6 credits of psychology and H 263, or consent.

H 474/H 574. PUBLIC HEALTH AND VIOLENCE IN SOCIETY (3). Examination of violence as a major public health issues of the 1990s. Historical, social, environmental, economic, behavioral and psychological aspects of assaultive violence, spousal abuse, rape and sexual assault, child abuse, child sexual abuse, elder abuse, suicide, the effects of the media on violence, drug abuse and violence, and related public health problems in contemporary American society. Emphasis on health and the efficacy of current efforts aimed at ameliorating these problems and potential for alternative public health models for prevention and intervention.

H 475/H 575. EVALUATION OF HEALTH PROMOTION AND EDUCATION PROGRAMS (3). Fundamental principles of evaluation theories; application of process, impact, outcome evaluations for determination of the efficacy and efficiency of selected prevention and intervention strategies for health promotion and education programs; emphasis on formative and summative evaluations using quantitative and qualitative measures. PREREQ: H 476.

H 476/H 576. ^PLANNING HEALTH PROGRAMS (4). Planning, development and implementation of health promotion and education programs in public and private community, industrial, and health care settings. Develop skills to identify health-related problems, assess needs, prioritize health promoting and disease-preventing strategies and plan effective programs. PREREQ: H 476, senior standing. For H 576, 9 credits of graduate course work in public health. (Writing Intensive Course)

H 477/H 577. OBESITY AND WEIGHT MANAGEMENT: A THEORETICAL APPROACH (3). An examination of theories which attempt to explain the etiology of obesity; an overview of disease pathogenesis and current modalities for prevention and treatment. PREREQ: H 263.

H 478/H 578. ALCOHOL AND DRUG ABUSE IN COMMUNITY AND WORKSITE SETTINGS (3). Social, physiological, psychological, economic, legal and medical implications of substance abuse in modern society. Emphasis placed on the etiology of substance abuse, current modalities of prevention and treatment, the role of employee assistance programs, the efficacy of drug testing, and special problems/concerns in community/worksite settings. PREREQ: H 364 or consent.

H 480/H 580. DRIVER AND TRAFFIC SAFETY EDUCATION (3). Driver and traffic safety instructional systems; needs assessment, task analysis, dual-control car procedures, systems development. PREREQ: consent.

H 481/H 581. PROGRAMS IN TRAFFIC SAFETY EDUCATION (3). Advanced driver and traffic safety programs; simulation models, multimedia systems, range programs, evaluative practices, and interrelationships of laboratory instruction. PREREQ: H 480.

H 482/H 582. ^PROBLEMS AND RESEARCH IN SAFETY (3). Applications of research strategy and methodology for resolving risks, dangers, and losses to the resources of the enterprise. H 482 is a Writing Intensive Course. PREREQ: Senior standing and consent. (Writing Intensive Course)

H 483/H 583. SAFETY FUNCTION MANAGEMENT (3). Overall management of the safety function; determination of the strategic direction for the safety function and the implementation and evaluation of strategic and tactical decision-making. PREREQ: Senior standing and consent.

H 484/H 584. SYSTEM SAFETY ANALYSIS (3). Study of man-machine-environment interfaces including accident investigation and workers' compensation systems. PREREQ: H 181, H 384, senior standing.

H 485/H 585. SAFETY, HEALTH AND ENVIRONMENTAL LAW (3). Legal and regulatory aspects of safety, occupational health, and environmental law, and the socio-economic impact achieved from the legislation. PREREQ: H 385 or graduate standing.

H 486/H 586. ENVIRONMENTAL AND BEHAVIORAL SAFETY ASSURANCE (3). Study of strategies and tactics for recognizing, evaluating and controlling environmental exposures to hazards emanating from the workplace, and behavioral management approaches needed to modify employee work practices. PREREQ: Senior standing.

H 487/H 587. INSTRUCTOR COMPETENCIES IN EMERGENCY CARE (3). A theory and technique course designed to provide advanced first aiders with the background and experiences essential for providing emergency care and CPR instruction in schools, governmental agencies, businesses and local communities. PREREQ: H 386 and current Advanced First Aid and Emergency Care Certification and/or EMS Certification.

H 491/H 591. SELECTED TOPICS (3). Recent changes and advances in public health and health care administration and their application to special fields of study. Topics vary from term to term and year to year. PREREQ: Senior standing.

H 492/H 592. TRAINING AND EDUCATIONAL PERSPECTIVES IN SAFETY (3). Analysis of the principles of learning and instructional theory and the application of these principles as they relate to the safety training process within the enterprise. PREREQ: Senior standing.

H 493/H 593. TRANSPORTATION AND MOTOR FLEET SAFETY (3). Current information relating to transportation safety issues including human factors, education, enforcement, and other highly interrelated components of the transportation system. Emphasis placed on motor fleet safety and types of losses in motor fleets.

H 494. APPLIED ERGONOMICS (3). A study of the dimensions of occupational ergonomics practice and applications that are intended to reduce worker-hardware-environmental mismatch problems that affect the effectiveness and efficiency of worker performance. PREREQ: H 281, H 385; one year of physics.

H 496/H 596. THE PROCESS OF HAZARD CONTROL I (3). The first in a two-course sequence, addressing the strategies, tactics, and specialized analytical (system safety) methods for recognizing evaluating, and controlling exposures to hazards emanating from the occupational environment. This first part focuses on strategy, structure, processes, competencies, incident (accident), investigation and recent developments. PREREQ: H 281, H 385. One year of college chemistry and physics.

H 497/H 597. THE PROCESS OF HAZARD CONTROL II (3). The second in a two-course sequence, addressing the strategies, tactics, and specialized analytical methods for recognizing, evaluating, and controlling exposures emanating from the occupational environment. H 497/ H 597 focuses on specialized system safety techniques and hazardous materials management principles, and analytical methods used in product safety evaluation. PREREQ: H 496/H 596.

H 498/H 598. FIRE PROTECTION AND PREVENTION (3). Fire hazards and causes; codes and standards; prevention and control techniques; fire detection and extinguishing systems; storage and human safety. PREREQ: Senior standing.

Graduate Courses

H 515. RESEARCH METHODOLOGY IN HEALTH AND SAFETY (3). Research methods used in health and safety studies with emphasis on the nature of research, problem identification and formulation, methods of observation and data collection, analysis and interpretation, research communications, and project development. PREREQ: /H 524.

H 524. HEALTH DATA ANALYSIS (4). Methods of health data collection, analysis, and interpretation, including descriptive statistics, probability, and hypothesis-testing and confidence interval estimation for normally distributed data. PREREQ: H 220, ST 201.

H 526. EPIDEMIOLOGIC METHODS (3). Principles and methods of epidemiologic analysis; standardization; stratified analysis; confounding and its control; planning and conducting epidemiologic research role of multivariate analysis in epidemiologic research. PREREQ: H 425/H 525.

H 535. HEALTH CARE INFORMATION SYSTEMS (3). Information systems in health care institutions, programs, and services; review of managerial information needs and data collection and reporting mechanisms.

H 537. MANAGEMENT OF HUMAN RESOURCES IN HEALTH CARE SETTINGS (3). Elements of managing personnel in health care settings, including the nature of the health professional, motivation, communications, compensation, legal issues, stress, time management, and achieving excellence.

H 542. ENVIRONMENTAL AND OCCUPATIONAL HEALTH (3). Fundamental issues in environmental and occupational health. Topics such as air/water pollution, overpopulation, waste disposal, food protection, radiation, pesticides, and occupational injury are presented by experts in each of the areas. Environmental and occupational hazards that affect human health are examined in the context of current social, political and regulatory pressures.

H 553. ADVANCED TOPICS: ISSUES IN HEALTH PROMOTION (3). Relationship of social, economic, legal, and political forces on the development and effectiveness of health promotion programs in various settings. PREREQ: H 470/H 570, H 471/H 571, or consent.

H 559. QUALITY ASSESSMENT AND ASSURANCE (3). Comprehensive approach to the study of quality assessment and assurance in the context of health services delivery, organization and research. History of quality assurance and assessment in medicine and health services; contemporary issues of malpractice, patient satisfaction, public release of mortality data, geographic and other variations of quality and the costs of quality.

H 562. ADVANCED TEACHING STRATEGIES (3). Advanced methods and materials for implementing altered health behaviors in individuals and groups; method and material selection, use and evaluation; laboratory techniques and development of materials; focus on health education/promotion. PREREQ: Graduate standing.

H 569. MATERNAL AND CHILD HEALTH (3). Women's reproductive health and health of children stressing causation, management, and prevention of public health problems. Epidemiological analysis of major causes of morbidity and mortality in children and women of child-bearing age; impact of social, political and economic influences on the health of women and children; comparison of issues and problems of industrialized versus developing nations. Consideration of health issues of interest to the many diverse racial and ethnic groups of women and children in the U.S. as well as the global village.

H 572. PROPOSAL WRITING IN HEALTH AND HUMAN SERVICES (3). Development of proposal writing skills in health-related areas. Emphasis on funding sources, proposal guidelines, support of appropriate community, state and corporate groups, review of appropriate literature, methodology, budgetary requirements and evaluation procedures. PREREQ: A research methods course or consent.

H 575. HEALTH PROGRAM EVALUATION (3). Foundations of measurement theory including economic appraisal; application of theory and evaluation principles in analyzing the effectiveness of health promotion programs. PREREQ: H 470 or H 476 or H 350 or consent.

H 579. WRITING FOR PUBLICATION (3). Stylistic, technical, and ethical considerations relative to writing for professional publication in health-related journals. PREREQ: Consent.

H 588. SURVEY OF THE SAFETY FUNCTION (3). A critical survey of strategy and structure of the safety function; special attention is placed on models for improving decision-making and operating action capabilities and on approaches for justifying the organizational existence of the safety function within any enterprise. PREREQ: Graduate standing.

H 589. EMERGENCY AND DISASTER MANAGEMENT (3). Examination of emergency and disaster preparation models, research, and applications designed to minimize the effects of losses. PREREQ: Graduate standing.

H 595. ORGANIZATION, ADMINISTRATION, AND SUPERVISION OF SAFETY PROGRAMS (3). A course designed to give the student a solid foundation in organization, administration, and supervision of safety education. Problems, policies, curriculum, practices, techniques, and methods involved in safety education programs emphasized. PREREQ: Graduate standing.

H 601. RESEARCH (TBA).

H 603. THESIS (TBA).

H 605. READING AND CONFERENCE (TBA).

H 606. PROJECTS (TBA).

H 607. SEMINAR (TBA).

H 608. WORKSHOP (TBA).

H 610. INTERNSHIP (TBA).

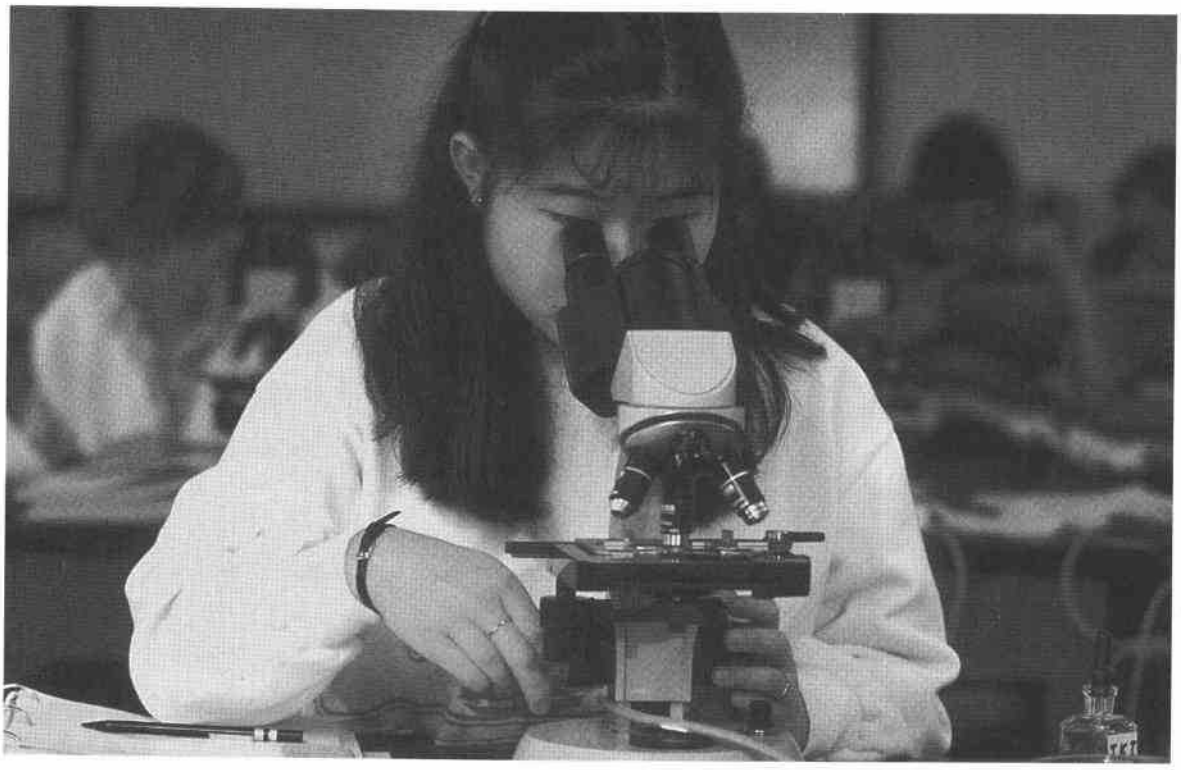
FOOTNOTES

*Baccalaureate Core Course

^Writing Intensive Course (WIC)

[1]EXSS 131, Intro to Exercise and Sport Science is a recommended elective for all students new to exercise and sport science.

[2]Or College of Business approved minor; approved minor or electives (38)



The College of Home Economics and Education prepares professionals for careers related to individual and family needs and resources. Graduates are employed in positions related to human needs for food, shelter, clothing, education, and interpersonal relationships. These careers may be in government, business, industry, school or agency settings.

This program of study addresses the changing psychological, social, physical, and educational needs of individuals and families across the life span, from a local, national and global perspective. In addition to resident instruction for undergraduate and graduate students, the college faculty are engaged in comprehensive research and extended education programs.

Degree Programs

Degrees are offered by the:

- Department of Apparel, Interiors, Housing, and Merchandising (AIHM)
- Department of Human Development and Family Sciences (HDFS)
- Department of Nutrition and Food Management (NFM)
- School of Education

The Bachelor of Science (B.S.) degree is offered in six home economics majors: apparel design, housing studies, human development and family sciences, interior merchandising, merchandising management, and nutrition and food management. These degree programs are accredited by the Council for Accreditation of the American Home Economics Association.

A Bachelor of Science (B.S.) degree in Technology Education is the undergraduate degree offered by the School of Education.

Advanced degrees in home economics include the Master of Science (M.S.), Master of Arts (M.A.), and Doctor of Philosophy (Ph.D.). The M.S. degree is offered in all departments and the M.A. in the Department of Apparel, Interiors, Housing and Merchandising. The Ph.D. is offered in apparel, interiors, housing, and merchandising; family resource management; human development and family studies; and nutrition and food management. All departments also participate in the Master of Arts in Interdisciplinary Studies (M.A.I.S.) graduate degree program.

The School of Education offers degree programs in Adult Education with an emphasis on Developmental Education, English as a Second or Foreign Language, or Professional and Technical Education in Business, Industry and Agencies (Master of Education, Ed.M.); Community College Leadership (Doctor of Education, Ed.D.); Counselor Education (Master of Science, M.S., Doctor of Philosophy, Ph.D.); and Teacher Education including Teacher Licensure (Bachelor of Science in Technology Education, B.S., Master of Arts in Teaching, M.A.T.), Standard Licensure (Master of Education, Ed.M.); and Research and Teaching (Master of Education, Ed.M.; and Doctor of Philosophy, Ph.D.). In addition, a minor emphasis in Adult Education is offered for those interested in Community College Instruction or Extension Program Development.

Teacher Education

The College of Home Economics and Education, in cooperation with the Colleges of Agricultural Science, Health and Human Performance, Liberal Arts, and Science offers graduate teacher licensure programs for students wishing to enter the teaching profession as well as for teachers wishing to complete standard licensure requirements. In addition, the School of Education offers some undergraduate course work for students who are exploring elementary and/or secondary education as a career goal. Undergraduate students interested in elementary education can choose to complete a Bachelor's degree in Human Development and Family Sciences with the Early Childhood Education option, or a degree in General Science in the College of Science, or a degree in Liberal Studies in the College of Liberal Arts as preparation for applying for admission to the M.A.T. in Elementary Education.

Undergraduate Field Study and Internships

Upper division students in home economics may earn credit for off-campus, supervised work experience related to their career goals. A maximum of 18 credits may be applied toward graduation. Approval must be given prior to registration. Students wishing to explore careers in teaching may enroll in special field practicum classes. Details are available from advisers.

Scholarships

The College of Home Economics and Education offers a variety of scholarships to deserving students. Many are reserved for students in designated majors or for first-year transfer students. A listing of scholarships and application forms are available from the student services office in Milam Hall 116 and from the Assistant Director of the School of Education. Also, see the Scholarship section in the front of this catalog.

Additional Programs

In addition to the specialized majors and options listed below for the home economics departments, students are encouraged to consider other choices which allow programs to meet specific needs.

Home Economics Communication is intended for students who want to combine the various subject areas of home economics with communication skills. For more information on this option, refer to the B.S. in Human Development and Family Sciences.

International Studies is a new degree at Oregon State University which allows students in any undergraduate program to internationalize their field of study by combining a traditional degree with an international degree. As an example, a student earning a B.S. in Nutrition and Food Management could also earn a B.S. in

Footnotes for this section on page 271.

Milam Hall 114
Oregon State University
Corvallis, OR
97331-5109
(503) 737-3551

Administration

Kinsey B. Green
Dean

Lois A. Goering
Associate Dean for Extension Home Economics

Sandra A. Helmick
Associate Dean for Instruction and Research

Kim McAlexander
Head Adviser

International Studies in Nutrition and Food Management. Information is available from the Student Services office in Milam Hall 116. Also see the Interdisciplinary Studies section of this catalog.

Family Resource Management is a field of study that can be pursued by undergraduates through the Family Finance option in the B.S. in Human Development and Family Sciences degree. Graduate work leading to interdepartmental M.S. and Ph.D. degrees is also available. At the master's level, areas of emphasis include family and consumer economics, home management, housing, and food systems management. The doctoral program focuses broadly on family resource management and its effect on individual and family well-being, with specialized dissertation areas.

The Program on Gerontology, administered through the College of Home Economics and Education, offers course work to undergraduate and graduate students throughout the university. See the Gerontology section of this college.

GRADUATION REQUIREMENTS

To graduate with a B.S. degree in any of the home economics majors, a student must complete 192 credits, of which 60 are upper division, and fulfill the following requirements:

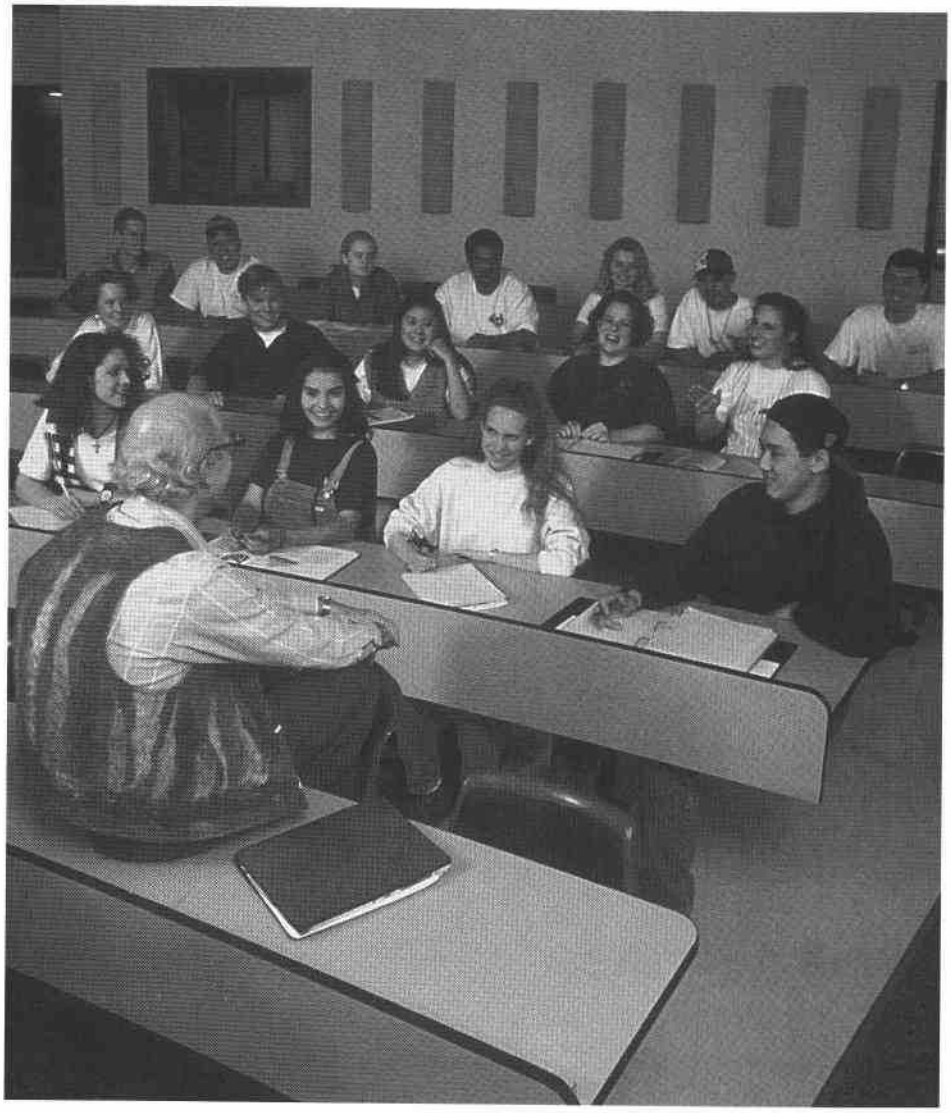
University Baccalaureate Core (48)

Home Economics Professional Core (12)
Approved speech course (3)
Department requirements (listed below for each major)

Entering students interested in a degree in one of the home economics majors are admitted to pre-professional studies. To be considered as a candidate for a degree, a student must complete 45 credits of designated courses with a minimum cumulative grade point average of 2.2. The list of designated courses for each major is available in the Undergraduate Advising Office, Milam 116.

First-year Program

First-year students usually take 48 credits in their first three terms, selected from the following in consultation with their adviser:



Baccalaureate Core
Skills:
WR 121. English Composition (3)
MTH 105. Intro to Contemporary Math or higher mathematics course (3)
HHP 231. Lifetime Fitness for Health (3)
Perspectives:
Physical or biological science (minimum 12)
Western Culture (3)
Literature and the Arts (3)
Social Processes and Institutions (3)
HOEC 100. Perspectives in Home Ec (1)
HOEC 201. Individual & Family Dev (3)
Other courses from major or baccalaureate core (14)

HOME ECONOMICS PROFESSIONAL CORE COURSES

Lower Division

HOEC 100. PERSPECTIVES IN HOME ECONOMICS (1). Introduction to home economics as a dynamic profession, worldwide in scope, which prepares students to work with individuals and families in a wide variety of business, education, and human services related careers. Students identify goals and competencies which serve as a basis for academic and career decisions.

HOEC 201. *INDIVIDUAL AND FAMILY DEVELOPMENT (3). Using a lifespan developmental approach, this course is a study of individual and family development, dynamics, and relationships, both within the family and as part of the larger environment. (Bacc Core Coure)

HOEC 202. RESOURCES AND WELL-BEING (3). The professional integration of human and material resources relating to finances, shelter, clothing, and foods. The influences of the near and far environment on the individual and family.

Upper Division

HOEC 300. MANAGEMENT OF RESOURCES (3). This course examines the process of management through a systems approach and its importance for and influence on family well-being. A variety of environmental influences will be examined with regard to meeting the needs of individuals and families. Case study with projects will be provided to allow students to exercise critical analysis skills. PREREQ: HOEC 100, HOEC 201, HOEC 202, junior standing.

HOEC 400. PROFESSIONAL ISSUES IN HOME ECONOMICS (2). This course examines the scope of home economics as a dynamic profession which integrates diverse occupational specializations to meet the changing needs of individuals and families. A wide range of societal and professional issues, persepctives, strategies, and trends will be analyzed and integrated to prepare students for the profession. PREREQ: HOEC 300, senior standing.

Graduate

HOEC 533. FAMILY POLICY AND PROGRAM DEVELOPMENT (3). Principles, processes, and practices in the creation of family policies and subsequent programs which address well-being across the lifespan. Offered alternate years.

HOEC 534. FAMILY POLICY AND PROGRAM EVALUATION (3). Models of evaluation and application of research methods to assessment of family policies and programs. PREREQ: HDFS 531 or introduction to research/statistics; HOEC 533 recommended. Offered alternate years.

APPAREL, INTERIORS, HOUSING, AND MERCHANDISING

Sally Francis, Head
Milam Hall 224
Oregon State University
Corvallis, OR 97331-5101
(503) 737-3796

Faculty
Professors Burns, Francis, Koester; *Associate Professors* Brandt, Bryant, Pedersen; *Assistant Professors* Caughey, Jordan, Sward

Undergraduate Majors

Apparel Design (B.S.)
Interior Merchandising (B.S.)
Merchandising Management (B.S.)
Housing Studies (B.S.)
Options
Housing Design
Housing Services

Graduate Majors

Apparel, Interiors, Housing, and Merchandising (M.A., M.S., Ph.D.)
Areas of Concentration (M.A., M.S.)
Cultural/Historic Aspects of the Near Environment
Human Behavior and the Near Environment
Design in the Near Environment
Merchandising Management
Areas of Concentration (Ph.D.)
Cultural/Historic Aspects of the Near Environment
Human Behavior and the Near Environment

Family Resource Management (M.S., Ph.D.)
Area of Concentration (M.S., Ph.D.)
Housing

The Department of Apparel, Interiors, Housing and Merchandising offers undergraduate instruction in the areas of apparel design, interior merchandising, housing studies and merchandising management. Advanced courses prepare students for positions in retailing of apparel and home furnishings, housing design and policy, apparel production, promotional work for manufacturers, and for graduate work leading to research and college teaching.

The department offers the M.S., M.A., and Ph.D. degrees. Areas of emphasis for the M.S. and M.A. degrees include Cultural/Historic Aspects of the Near Environment, Human Behavior and the Near Environment, Design in the Near Environment, and Merchandising Management. Areas of emphasis for the Ph.D. degree include Cultural/Historic Aspects of the Near Environment and Human Behavior and the Near Environment.

Pre-Professional Studies
To be considered for admission to a degree-granting major, a student must complete 45 credits with a minimum cumulative grade point average of 2.2. The list of designated courses is available in the Undergraduate Advising Office, Milam 116.

APPAREL DESIGN
Baccalaureate Core (48)
Home Economics Core (12)
WR 214. Writing in Business (3) or WR 222. English Composition (3) or WR 323. English Composition (3) or WR 327. Technical Writing (3)
COMM 111. Public Speaking (3) or COMM 114. Argument and Critical Discourse (3)
HST 102, HST 103. Hist of Western Civ (6)
EC 201, EC 202. Principles of Economics (6)
ART 115. Design I (4)
ART 131. Drawing I (4)
ART 234. Drawing II/Figure (3)
ART 241. Photography I (4)
ART 367. History of Design (3)
PSY 201 or PSY 202. General Psychology (3)
ANTH 110. Intro Cultural Anth (3) or SOC 204. Intro to Soc (3)
MTH 111. College Algebra (4)

Apparel Design (65-68)
AIHM 225. Construction Lab (1)
AIHM 226. Analysis of Apparel Const (3)
AIHM 227. Apparel Construction (4)
AIHM 255. Textiles (5)
AIHM 270. Fashion and Society (4)
AIHM 319. Comp Asst Design & Drafting (3)
AIHM 321. Fash Illustr and Design (3)
AIHM 327. Flat Pattern Design (4)
AIHM 360. Twentieth Century Fashion (3)
AIHM 370. Textile & Appar Mkt Analysis (4)
AIHM 421. Adv Fash Illust & Design (3)
AIHM 427. Draping (4)
Select two from:
AIHM 425. Special Clothing Needs (4)
AIHM 428. Apparel Prod Processes (3)
AIHM 429. Adv Prob in Apparel Design (3)
Select one from:
AIHM 460. Historic Costume (3)
AIHM 465. Historic Textiles (3)
AIHM 466. Cr Cultl Stud of T & C (3)
Select one from:
AIHM 450. Adv in Textile Tech (3)
AIHM 453. Eval of Textile Perform (3)
AIHM 455. Econ of Textile & Apparel Indus (3)
AIHM 470. Retail Merchandising (4)
AIHM 410, Section 3. Field Exp: Apparel Design or 12 additional credits from listed "Select" groups with at least 7 credits of AIHM and no more than 5 credits of BA courses and not counted twice

Business Administration (13-17)
BA 390. Marketing (4)
Select three from:
BA 131. Business Prod Software (2)
BA 215. Fundamentals of Accounting (4)
BA 347. International Business (4)
BA 350. Organization Systems (4)
BA 352. Organizational Behavior (4)
BA 492. Consumer Behavior (4)
BA 497. International Marketing (4)

Electives (16-23)
Sufficient (together with baccalaureate and home economics cores) to ensure 192 total credits (60 upper division)

HOUSING STUDIES
Baccalaureate Core (48)
Home Economics Core (12)
ART 115. Design (4)
WR 214. Writing in Business or WR 222. English Composition or WR 323. English Composition or WR 327. Technical Writing (3)
COMM 111. Public Speaking (3) or COMM 114. Argument and Critical Discourse (3)
HIST 102. History of West Civ (3)
EC 201, EC 202. Prin of Economics (6)
PS 203. State & Local Government (4)
PSY 201, PSY 202. Gen Psych (3,3)
SOC 204. Introduction to Sociology (3)

Housing Studies (46-55)
AIHM 255. Textiles (5) or NFM 225. Human Nutrition (4)
BA 131. Intro to Business Comp Systems (3) or ST 201. Prin of Statistics (3) or CS 101. Comp: Appl & Impl (4)
BA 230. Business Law (4) or BA 431. Real Estate Law (3)
AIHM 178. Housing & Architectural Phil (3)
AIHM 180. Arch House Planning (3)
HDFS 271. Consumers in Society (3)
AIHM 218. Building Construction (3)
AIHM 219. Resident Space Plan (3)
AIHM 340. Interior Environ Systems (3)
HDFS 381. Pers & Fam Finance (3)
AIHM 378. Consumer Housing (3)
AIHM 406, AIHM 409, AIHM 410, Section 4, Field Exper, Proj, or Prac (3-9)
AIHM 478. Housing Finance (3)
AIHM 479. Hous Serv for Elderly & Disabled (3)
HDFS 341. Family Development (3) or HDFS 315. Perspectives on Aging
GEO 423. Land Use (3)

Complete one of the following options:
Housing Design Option (30)
AIHM 179. Architectural Drawing (3)
AIHM 220. Kitchen Planning (3)
AIHM 318. Bathroom Planning (3)
AIHM 319. Comp Asst Des & Draft (3)
AIHM 320. Adv Comp Asstd Des & Draft (3)
AIHM 379. Built Envmt of Wstrn Cultures (3)
AIHM 380. Built Envmt of Wstrn Cultures (3)
AIHM 418. Adv Housing Des & Client Comm (3)
AIHM 240. Introduction to Interiors (3)
Select 6 credits from:
HST 101. Hist of Western Civ (3)
HST 103. Hist of Western Civ (3)
MTH 112. Elementary Functions (4)
AIHM 255. Textiles (5)[1] or NFM 225. Nutrition (4)[1]
AIHM 352. Textiles for Interiors (3)
BA 347. International Business (4)
BA 352. Organizational Behavior (4)
BA 390. Marketing (4)
HDFS 473. Consumer Economics (3) or BA 492. Consumer Behavior (4)
AIHM 480. Hsng Probs & Public Policy (3)
HORT 280. Landscape Design Theory (3)
HORT 281. Appl Landscape Design Theory (3)
HORT 291. Site Design and Management (3)

Housing Services Option (27-28)
AIHM 480. Hsing Probs & Public Policy (3)
HDFS 360. Applied Research Methods or ST 201. Principles of Statistics (3)
HDFS 461. Program Devel & Evaluation (3)
HDFS 472. Consump Patterns & Living Stds (3)
HDFS 473. Consumer Economics (3)
Select 12 credits from:
BA 215. Fundamentals of Accounting (4)
BA 340. Finance (4)
BA 350. Managing Organizations (4)
EC 330, EC 331. Money & Banking (3,3)
EC 435. The Public Economy (4)
EC 490. Regional Economics (4)
EC 491. Urban Economics (4)
AIHM 179. Architectural Drawing (3)
AIHM 220. Kitchen Planning (3)
AIHM 255. Textiles (5)[1] or NFM 225. Nutrition (4)[1]
AIHM 318. Bathroom Planning (3)
AIHM 319. Cmptr Assistd Des & Drftng (3)
AIHM 320. Adv Cmptr Asst Des & Drftng (3)
AIHM 379. Blt Envrn of Wstrn Cltrs (3)
AIHM 380. Blt Envrn of Wstrn Cltrs (3)
AIHM 418. Adv Hsng Desg/Client Commun (3)
GEO 300. Environ Conservation (3)
GEO 321. Chang Human Landscape (3)
HDFS 314. Adult Develop & Aging (3)
HDFS 315. Perspectives on Aging (3)[1]
HDFS 361. Lifespan Issues (3)
HDFS 461. Prog Devel & Eval (4)
PS 311. Legislative Politics (4)
PS 332. Municipal Government (3)
PS 472. Public Administration (4)
PS 473. Public Administration (4)
SOC 360. Population Trends & Policy (3)
SOC 421. Social Change (3)
SOC 475. Rural-Urban Sociology (3)

Electives (15-27)
Sufficient (together with baccalaureate and home economics cores) to ensure 192 total credits (60 upper division)

INTERIOR MERCHANDISING
Baccalaureate Core (48)
Home Economics Core (12)
WR 214. Writing for Business or WR 222. English Composition or WR 323. English Composition or WR 327. Technical Report Writing (3)
COMM 111. Public Speaking (3) or COMM 114. Argument and Critical Discourse (3)
BI 101. General Biology (4)
HST 101, HST 102, HST 103. Hist of West Civ (9)
ART 204, ART 205, ART 206. Intro to Art Hist (9)
SOC 204. General Sociology (3)
PSY 201 or PSY 202. General Psychology (3)
MTH 111. College Algebra (4)

Interior Merchandising (78)
ART 115. Design I (4)
ART 117. Design II (4)
ART 131. Drawing I (4)
ART 231. Drawing II (3)
AIHM 178. House Plng and Arch Phil (3)
AIHM 179. Architectural Drawing (3)
AIHM 180. Architec House Planning (3)
AIHM 218. Building Constr (3)
AIHM 240. Introduction to Interiors (3)
AIHM 244. Presentation Techniques (4)
AIHM 255. Textiles (5)
AIHM 319. Comp Assist Des & Draft (3)
AIHM 340. Interior Environ Systems (3)
AIHM 344. Studio I: Resident Design (4)
AIHM 345. Inter Profes Pract & Proc (3)
AIHM 352. Textiles for Interiors (3)
AIHM 440. History of Interiors I (3)
AIHM 441. History of Interiors II (3)
AIHM 444. Studio II: Comm Design (4)
AIHM 465. Historic Textiles (3)
AIHM 410, Section 2. Field Experience (6-12) or *Select 12 credits from:*
AIHM 450. Adv in Text Technol (3)
AIHM 453. Eval of Text Performance (3)
HORT 291. Site Design & Management (4)
AIHM 379, AIHM 380. Built Environ of West Cult (3)
ART 241. Photography I (3)
ART 367. History of Design (3)
AIHM 220. Kitchen Planning (3)
AIHM 378. Consumer Housing (3)
AIHM 479. Housing Services for the Elderly & Disabled (3)

Business Administration and Economics (24-26)
EC 201, EC 202. Prin of Economics (3,3)
BA 215. Fund of Accounting (3)
BA 390. Marketing (4)
Select 3 courses from:
BA 230. Business Law (4)
BA 347. International Business (4)
BA 352. Organizational Behavior (4)
BA 492. Consumer Behavior (4)
BA 495. Retail Management (4)
BA 497. International Marketing (4)
Electives (14-16)
Sufficient (together with baccalaureate and home economics cores) to ensure 192 total credits (60 upper division)

MERCHANDISING MANAGEMENT
Baccalaureate Core (48)
Home Economics Core (12)
WR 214. Writing in Business or WR 222. English Composition or WR 327. Technical Writing (3)
COMM 111. Public Speaking (3) or COMM 114. Argument & Critical Discourse
HST 102, HST 103. Hist of West Civ (6)
PSY 201, PSY 202. Gen Psychology (6)
MTH 111. College Algebra (4)

Other Requirements (8)
ART 115. Design I (4)
MTH 245. Math for Mgmt, Life & Soc Sci (4)

Merchandising Management (52-54)
COMM 314. Argumentation or COMM 316. Advanced Persuasion (3)
AIHM 225. Construction Laboratory (1)
AIHM 226. Analysis of Apparel Const (3)
AIHM 240. Introduction to Interiors or AIHM 321. Fash Illust & Design (3)
AIHM 255. Textiles (5)
AIHM 270. Fashion & Society (4)
AIHM 360. Twentieth Century Fashion (3)
AIHM 370. Texti & Appl Mkt Anlys (4)
AIHM 450. Adv in Text Tech (3)
AIHM 455. Econ of Text & App Ind (3)
AIHM 470. Retail Merchandising (4)
AIHM 472. Merch Plan & Control (4)
AIHM 410, Section 1. Merch Mgmt Field Exp (12) or BA 350. Manag Org (4) and BA 352. Org Behavior (3) OR PSY 360. Social Psych (3)
And two additional courses from:
AIHM 421. Advanced Fash Illust & Des (3)
AIHM 425. Special Clothing Needs (4)
AIHM 453. Eval of Textile Perform (3)
AIHM 460. Historic Costume (3)
AIHM 466. Cross Cul Stdies of Txtls & Appr (3)

Business Administration and Economics (31-34)
BA 131. Productivity Software (2) or CS 101. Comp: Appl & Imp (4)
BA 215. Fundamentals of Acct (4)
BA 390. Marketing (4)
EC 201, EC 202. Prin of Econ (6)
Select four courses from:
BA 347. International Business (4)
BA 350. Organization Systems (4)[2]
BA 352. Org Behav (4)[2]
BA 450. Org Dynamics (4)
BA 493. Advertising Mgmt (4)
BA 452. Leadership & Team Building (4)
BA 492. Consumer Behavior (4)
BA 495. Retail Management (4)
BA 497. International Marketing (4)
EC 440, EC 441. International Finance Theory and Policy (6)

Electives (33-39)
Sufficient (together with baccalaureate and home economics cores) to ensure 192 total credits (60 upper division)
Recommended electives:
PHL 101. Critical Thinking (4)
ART 367. History of Design (3)

COURSES

Lower Division

AIHM 178. HOUSING AND ARCHITECTURAL PHILOSOPHY (3). Residential architecture. Single-family housing in relation to societal needs. Emphasis on planning principles and graphic communication in design.

AIHM 179. ARCHITECTURAL DRAWING (3). Residential and small frame structures, development of working and detail drawings from preliminary studies. Introduction to fundamental principles of construction, application of materials to design, and current developments in light-frame building construction.

AIHM 180. ARCHITECTURAL HOUSE PLANNING (3). Multi-family, condominium, and cooperative housing, with emphasis on programming and design of these types of environments. PREREQ: AIHM 178.

AIHM 218. BUILDING CONSTRUCTION (3). Material and methods, individual research and observation, sketching existing examples, discussion, nature and functions of structure relating to building design, structures under load with study of limits and physical adequacy appropriate to their use.

AIHM 219. RESIDENTIAL SPACE PLANNING (3).[3] Residential space and activity planning using established human performance and product standards. PREREQ: AIHM 180.

AIHM 220. KITCHEN PLANNING (3).[3] Planning kitchens which meet individual and family preferences. Application of basic kitchen design principles which will meet a variety of individual and family functional needs. PREREQ: AIHM 219.

AIHM 225. APPAREL CONSTRUCTION LABORATORY (1). Basic construction concepts and skills, the operation of the sewing machine, and terminology of construction techniques. REQ: Diagnostic tests administered first class meeting. Graded P/N.

AIHM 226. ANALYSIS OF APPAREL CONSTRUCTION (3). Analysis of quality of materials and construction in ready-to-wear and custom-made garments; comparison of processes involved in the development of apparel; concepts of sizing and principles of fit in men's, women's, and children's wear. PREREQ: AIHM 225,AIHM 255.

AIHM 227. APPAREL CONSTRUCTION (4). Principles of pattern adjustment and fitting of garments to the body. Application of construction techniques to situations encountered in actual garment construction, with emphasis on advanced construction techniques, decision making, and evaluation. PREREQ: AIHM 226.

AIHM 240. INTRODUCTION TO INTERIORS (3). Introduction to the principles of interior design, color theory, materials selection, space planning, and the profession of interior design. PREREQ: ART 115.

AIHM 244. PRESENTATION TECHNIQUES FOR INTERIORS (4). Practical graphic communication skills for preparation of interiors and their arrangement. Emphasis on a professional, non-mechanical approach for illustrating interior environments. Primary focus will be on pencil, ink, and marker techniques. PREREQ: ART 131, ART 115; AIHM 178.

AIHM 255. TEXTILES (5). Properties, identification, selection, use and care of textile fibers and fabrics. Analysis of fiber, yarn, fabric construction, color and finish in textiles. Lecture and laboratory.

AIHM 270. FASHION AND SOCIETY (4). Survey of the cultural, sociological, psychological, economic, and aesthetic influences on fashion and the fashion process.

Upper Division

AIHM 318. BATHROOM PLANNING (3).[3] Bathroom design and standards in planning space to meet a variety of family and individual functions and needs. Consideration of resource conservation, safety and special needs. PREREQ: AIHM 220.

AIHM 319. COMPUTER ASSISTED DESIGN AND DRAFTING (3). Instruction in computer assisted design and drafting techniques, and professional applications in areas such as housing, interiors, apparel design, and commercial and service facilities. Students will complete a project in their own area of professional interest. PREREQ: Drawing and design skills in a professional area; sophomore standing.

AIHM 320. ADVANCED COMPUTER ASSISTED DESIGN AND DRAFTING (3).[3] Customizing the CADD systems, basic programming. Use of auto lisp and data base management. Use of CADD programs in desktop publishing and word processing. Estimating with CADD. PREREQ: AIHM 319.

AIHM 321. FASHION ILLUSTRATION AND DESIGN (3). Basic fashion illustration techniques; designing clothing for the women's wear apparel industry using various sources of inspiration. PREREQ: AIHM 226,AIHM 270; ART 115.

AIHM 327. FLAT PATTERN DESIGN (4). Pattern design using the flat pattern method; pattern drafting and grading; advanced principles of fitting; development and construction of a design prototype. PREREQ: AIHM 227.

AIHM 340. INTERIOR ENVIRONMENTAL SYSTEMS (3).[3] The study of environmental systems of interiors including lighting, heating, and acoustics. PREREQ: AIHM 240, AIHM 178; AIHM 218.

AIHM 344. STUDIO I: RESIDENTIAL DESIGN (4).[3] Involves the creative application and use of residential space, development of basic client presentation skills, and specification knowledge of residential interior products. Synthesizes space planning and furnishing of residential interiors. Application of presentation skills and computer-aided design. Not offered every year. PREREQ: AIHM 179, AIHM 180, AIHM 218, AIHM 340.

AIHM 345. INTERIOR PROFESSIONAL PRACTICES AND PROCEDURES (3).[3] Study of interior merchandising procedures; ethics, business, and legal aspects. Professional opportunities and preparation to professional positions related to individual competencies. PREREQ: BA 215, BA 390.

AIHM 352. TEXTILES FOR INTERIORS (3). Types, qualities, and maintenance of functional and decorative fabrics for homes and public buildings. Use of specifications, standards, and legislation. PREREQ: AIHM 255.

AIHM 360. TWENTIETH CENTURY FASHION (3). Historic analysis of fashion from 1890 to the present in relation to the social and cultural environment; 20th century American and international fashion designers. PREREQ: AIHM 255, AIHM 270, HST 103.

AIHM 370. ^TEXTILE AND APPAREL MARKET ANALYSIS (4). Organization, operation, and merchandising activities of the domestic textile and apparel industries. Analysis of the marketing channel and the product/service mix of textile and apparel manufacturers. PREREQ: AIHM 226, AIHM 270, PREREQ/COREQ: BA 390. (Writing Intensive Course)

AIHM 378. ^CONSUMER HOUSING (3). Introduction to housing as a product, environment, process and service. Housing alternatives (with emphasis on home buying and financing) and consumer decision-making that contribute to individual, family, and community well-being. PREREQ: HDFS 271; sophomore standing. (Writing Intensive Course)

AIHM 379.* THE BUILT ENVIRONMENT OF WESTERN CULTURES (3). The development of building styles from 4000 BC to the Renaissance in western Europe and the effect of those styles on buildings styles of the 15th century in Europe and on later building styles in the United States, and on the living and working environment. Need not be taken in order. PREREQ: HST 102. Not offered every year. (Bacc Core Course)

AIHM 380.* THE BUILT ENVIRONMENT OF WESTERN CULTURES (3). The development of building styles from 15th to 19th century Renaissance in western Europe and the effect of those styles on later contemporary buildings of the 16th through 20th century in the United States and Europe, and on the living and working environment. Need not be taken in order. PREREQ: HST 102. Not offered every year. (Bacc Core Course)

AIHM 401. RESEARCH (1-16).

AIHM 402. INDEPENDENT STUDY (1-16).

AIHM 403. THESIS (1-16).

AIHM 405. READING AND CONFERENCE (1-16).

AIHM 406. PROJECTS (1-16).

AIHM 407. SEMINAR (1-16).

AIHM 408. WORKSHOP (1-16).

AIHM 409. PRACTICUM (1-16).

AIHM 410. FIELD EXPERIENCE (6-12).[3] On-the-job experience to integrate academic theory and to apply knowledge in a work situation with supervision by the participating field site and University supervisor. Application must be made prior to participation. REQ: Written consent of department; junior standing. **Section 2:** INTERIOR MERCHANDISING; (6,9,12). PREREQ: AIHM 444, 9 credits BA; **Section 3:** APPAREL DESIGN (12). PREREQ: AIHM 321, AIHM 427; **Section 4:** HOUSING (6,9.12). PREREQ: AIHM 219,. AIHM 378.

AIHM 418/AIHM 518. ADVANCED HOUSING DESIGN AND CLIENT COMMUNICATIONS (3).[3] Application of design techniques to clients' design problems. Students work with clients on remodeling projects and produce full working drawings. PREREQ: AIHM 219,AIHM 318,AIHM 319.

AIHM 421/AIHM 521. ADVANCED FASHION ILLUSTRATION AND DESIGN (3).[3] Section 3: Fashion illustration techniques using a variety of media; designing apparel for the men's wear, women's wear, and children's wear industries. PREREQ: AIHM 321.

AIHM 425/AIHM 525. SPECIAL CLOTHING NEEDS (4).[3] Physiological, socio-psychological, aesthetic, and economic factors influencing clothing needs for recreational and occupational clothing, for selected life cycle stages and for the physically challenged. PREREQ: AIHM 255.

AIHM 427/AIHM 527. DRAPING (4).[3] Garment design based on manipulation of fabric on a body form; emphasis on the interrelationships between fabric, garment design, and the human form. PREREQ: AIHM 327.

AIHM 428/AIHM 528. APPAREL PRODUCTION PROCESSES (3).[3] Production pattern making and production assembly processes for the apparel industry; pattern sizing related to human anatomy; hand, mechanical and computer-aided pattern grading, marker making; garment specification writing and garment cost analysis. PREREQ: AIHM 319, AIHM 327.

AIHM 429/AIHM 529. ADVANCED PROBLEMS IN APPAREL DESIGN (3).[3] Creation of unique garments from sketch through prototype using flat pattern and draping principles. Garment designs are developed to meet a specific need ranging from a functional garment for a person with a physical disability to a high-fashion couture garment. PREREQ: AIHM 427.

AIHM 440/AIHM 540. HISTORY OF INTERIORS I (3). History of furniture and interiors from pre-classical until the mid-19th century. PREREQ: AIHM 240, HST 101, HST 102, HST 103. Not offered every year.

AIHM 441/AIHM 541. HISTORY OF INTERIORS II (3). History of interiors from the mid-19th century until the present. PREREQ: AIHM 440/AIHM 540. Not offered every year.

AIHM 444/AIHM 544. STUDIO II: COMMERCIAL DESIGN (4).[3] Commercial and contract design and space planning for offices, retail spaces, health care facilities, hospitality spaces, and public institutions. Includes preparation of a design portfolio. PREREQ: AIHM 344, AIHM 345. Not offered every year.

AIHM 450/AIHM 550. ADVANCES IN TEXTILE TECHNOLOGY (3).[3] Analysis of recent literature on textile fibers, yarns, fabric construction, color, and finish. New textile products in varied applications. PREREQ: AIHM 255.

AIHM 453/AIHM 553. EVALUATION OF TEXTILE PERFORMANCE (3).[3] Investigation of physical properties of textile products, with evaluation of data in relation to specifications, standards, and serviceability. Study of quality control in production, manufacturing and retailing of textile goods. PREREQ: AIHM 255.

AIHM 455/AIHM 555. ECONOMICS OF THE TEXTILE AND APPAREL INDUSTRIES (3).[3] Economic analysis of the textile and apparel industries on a national and international basis. Effect of material and labor costs, supply and demand, and imports and exports on the production, distribution and consumption of textile products. PREREQ: EC 201, AIHM 370.

AIHM 460/AIHM 560. HISTORIC COSTUME (3). Analysis of apparel styles in relation to the social and cultural environments from recorded history to 1890. PREREQ: 6 credits from HST 101,HST 102,HST 103.

AIHM 465/AIHM 565. HISTORIC TEXTILES (3). Interrelationship of textiles and technological developments from ancient times to present. Museology techniques including cataloging, textile and costume care; exhibition techniques for heritage artifacts. PREREQ: 6 credits from HST 101, HST 102, HST 103.

AIHM 466/AIHM 566. CROSS CULTURAL STUDIES OF TEXTILES AND CLOTHING (3). Fabric structures and world costume in relation to cultural diversity; acculturative impact on ethnicity and societal framework. PREREQ: AIHM 255, ANTH 110 (cultural) or non-western cultures course.

AIHM 470/AIHM 570. RETAIL MERCHANDISING (4).[3] Principles of retail merchandising as applied to fashion-oriented soft goods. Planning, procuring, promotion, and managing merchandise inventories at the retail level. Organization, operation, and competitive behavior of soft goods retailers. PREREQ: AIHM 370.

AIHM 472/AIHM 572. MERCHANDISE PLANNING AND CONTROL (4).[3] Theory and quantitative analysis of inventory planning, pricing, and control for the profitable management of a soft goods department or retail store. Solution of management problems utilizing quantitative analysis and merchandising principles. PREREQ: AIHM 470, BA 131 or CS 101, BA 215, MTH 245.

AIHM 478/AIHM 578. HOUSING FINANCE (3). Methods and procedures by which consumers purchase their housing. Considerations of the financial and legislative environment in which the home-buying decision is made. PREREQ: EC 201, EC 202; HDFS 381; AIHM 378. Not offered every year.

AIHM 479/AIHM 579. HOUSING SERVICES FOR THE ELDERLY AND DISABLED (3). Shelter alternatives that meet the special housing needs and problems of elderly and handicapped persons. Emphasis on housing-service packages and community resources available along the continuum from independent living and aging-in-place to long term care facilities. PREREQ: AIHM 378 or 6 credits HDFS, SOC, or PSYCH.

AIHM 480/AIHM 580. HOUSING PROBLEMS AND PUBLIC POLICY (3). Analysis of local, state, and federal housing and community development programs and public-private partnerships that are directed at the housing problems of lower income people, minorities, and other special need populations. PREREQ: AIHM 378.

AIHM 490/AIHM 590. SELECTED TOPICS IN APPAREL, INTERIORS & MERCHANDISING (1-16).

AIHM 499. STUDY TOUR (1-6). Planned study tour with specific professional focus. PREREQ: Prior written consent of department head and advanced registration and deposit. Course prerequisites as appropriate to topic. Graded P/N.

Graduate

AIHM 501. RESEARCH (1-16).

AIHM 502. INDEPENDENT STUDY (1-16).

AIHM 503. THESIS (1-16).

AIHM 505. READING AND CONFERENCE (1-16).

AIHM 506. PROJECTS (1-16).

AIHM 507. SEMINAR (1-16).

AIHM 508. WORKSHOP (1-16).

AIHM 509. PRACTICUM (1-16).

AIHM 510. WORK EXPERIENCE; INTERNSHIP (1-16).

AIHM 577. FASHION THEORY (3). Examination of historical, sociological, psychological, marketing, and economic concepts, theories, and research that contribute to current understanding of the fashion process. PREREQ: AIHM 370. 6 credits of social science.

AIHM 582. AESTHETIC AND PERCEPTUAL THEORIES OF DESIGN (2). Analysis of design from the philosophical and theoretical bases formulated in art; art history; historic costume and interiors; apparel and interior design.

AIHM 585. HUMAN BEHAVIOR AND THE NEAR ENVIRONMENT (3). Application of concepts and theories from cultural anthropology, sociology, psychology, and social psychology to the study of clothing and interiors. The significance of the near environment in the dynamics of social interaction. PREREQ: 6 credits of social science.

AIHM 587. TRENDS AND ISSUES IN MERCHANDISING (3). Theoretical approach to the study of merchandising policies and practices. Management issues related to strategic planning, competitive positioning, and operational problems of textile and apparel businesses. PREREQ: AIHM 472.

AIHM 588. THEORIES IN HOUSING (3). Basic and applied theories developed and used in the field of housing are analyzed, using a conceptual framework that includes contributions from home economics plus root disciplines related to housing.

AIHM 593. LITERATURE IN APPAREL, INTERIORS, HOUSING & MERCHANDISING (3). Review and interpretation of research in apparel, interiors, housing, and merchandising. Identification of researchable topics. Introduction to thesis preparation. PREREQ: STAT 511.

AIHM 594. RESEARCH METHODS IN APPAREL, INTERIORS, HOUSING & MERCHANDIS (3). Philosophy and methods of research with emphasis on application of concepts to theories and problems in apparel, interiors and merchandising. Proposal writing. PREREQ: STAT 451.

AIHM 601. RESEARCH (1-16).

AIHM 602. INDEPENDENT STUDY (1-16).

AIHM 603. THESIS (1-16).

AIHM 605. READING AND CONFERENCE (1-16).

AIHM 606. PROJECTS (1-16).

AIHM 607. SEMINAR (1-16).

AIHM 608. WORKSHOP (1-16).

AIHM 609. PRACTICUM (1-16).

AIHM 610. INTERNSHIP/WORK EXPERIENCE (1-16).

AIHM 665. HISTORICAL/CULTURAL THEORIES AND RESEARCH METHODS IN AIHM (3). Critical analysis of historical and cultural paradigms, theories, and research methods. PREREQ: AIHM 566 and AIHM 540 or 541 or 560 or 565 or equivalent.

AIHM 677. THEORETICAL FRAMEWORKS IN FASHION AESTHETICS AND HOUSING (3). An in-depth study of current literature focusing on the synthesis and integration of fashion, aesthetics, and housing theories. Content varies with each offering. PREREQ: AIHM 577 or AIHM 582 or AIHM 588.

AIHM 685. ADVANCED TOPICS IN HUMAN BEHAVIOR AND THE NEAR ENVIRONMENT (3). Critical evaluation of the current literature on human behavior as it relates to aspects of the near environment (clothing, interiors, housing). Latest theoretical develops and research methods. Content varies with each offering. PREREQ: AIHM 585 or equivalent.

AIHM 687. THEORETICAL FOUNDATIONS FOR MERCHANDISING RESEARCH (3). Critical analysis of merchandising research; application of current theoretical developments and methodologies to the study of selected topics within merchandising management. PREREQ: AIHM 587 or equivalent.

AIHM 690. THEORY DEVELOPMENT IN AIHM (3). Critical analysis of the functions of science, scientific explanation, research, theory, and theory development within the fields of apparel, interiors, housing, and merchandising. PREREQ: AIHM 593, AIHM 594.

GERONTOLOGY

Karen Hooker, Director
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(503) 737-1099/1090

Certificate Program

Gerontology

Graduate Programs

Gerontology Minor
Area of Concentration
Gerontology

The University-wide Program on Gerontology offers an interdisciplinary approach to the study of aging. Because aging involves physiological, sociological and psychological processes, gerontology education and research is relevant to many disciplines. Career opportunities in gerontology are extremely diverse and include positions in community services, health sciences, nutrition and dietetics, housing, health and physical education, pharmacy, counseling, health care administration, business, public policy, and many other arenas. Recognizing the diversity of relevant disciplines and of career opportunities, the OSU Program on Gerontology offers course work in gerontology through eleven departments. The program is administered by the College of Home Economics and Education.

Undergraduate and graduate students have the opportunity to study gerontology in conjunction with their major field. Undergraduate students may earn a Certificate in Gerontology in any department. Gerontology is a field of study in the Master of Interdisciplinary Studies (M.A.I.S.) program. Graduate students in any field may earn an integrated minor in gerontology. Masters and doctoral students in Human Development can concentrate in adult development and aging.

To be considered a gerontology course, at least 50 percent of the content of a course must address gerontology related issues. Gerontology courses include:

AIHM 479/AIHM 579. Housing Services for Elderly & Disabled
ANTH 370. Family, Gender and Generation
COUN 583. Death, Dying and Grieving
ED 568. Education and Training for Adults
ED 578. Adult Development and Learning
EXSS 414/EXSS 514. Fitness and Aging
H 422/H 522. Control of Chronic Disease
H 423/H 523. Health Aspects of Gerontology
H 432/H 532. Health Care Finance
H 436/H 536. Health Services Admin and Mgmt
H 458/H 558 Reimbursement Mechanisms
H 464/H 564. Perspectives on Death
H 465/H 565. Public Health & Women: Social & Policy Issues
H 467/H 567. Long Term Care Alternatives
H 468/H 568. Financing and Administration of Long Term Care
HDFS 314. Adult Devel & Aging
HDFS 315. Perspectives on Aging
HDFS 407/HDFS 507. The Meaning of Aging
HDFS 415/HDFS 515. Perspectives on Aging
HDFS 422/HDFS 522. Topics in Adult Development and Aging (can be repeated)
HDFS 482/HDFS 582. Financial Planning for Later Years
HDFS 514. Social Gerontology
HDFS 617. Adv Topics in Adult Devel & Aging (can be repeated)
NFM 420/NFM 520. Nutrition and Disease
PHAR 461/PHAR 561. Nursing Home Pharmacy
PHL 444/PHL 544. Bioethics
PHL 455/PHL 555. Death and Dying
PHL 490/PHL 590. The Meaning of Aging
SOC 432/SOC 532. Sociology of Aging

In addition to gerontology courses, seminars, field study (310/410/510/610) and projects (406/506/606) in gerontology are offered through the Department of Human Development and Family Sciences (HDFS). Field study and projects in gerontology may also be available through other departments. Students may register for field study or projects credit in the department that best meets their needs for supervision given the nature of the experience.

Certificate Curriculum

Undergraduate students may earn a Certificate in Gerontology. This certificate includes a required core through which students are introduced to aging as an interactive process of physical, social and psychological forces.

Requirements

Core (9)

HDFS 315. Perspectives on Aging (3)
HDFS 314. Adult Development/Aging or SOC 432. Sociology of Aging (3)
H 423. Health Aspects of Gerontology or H 422. Control Chronic Disease (3)
Field Study or Field Projects in Gerontology (3-6)
Electives (9-12)
Selected from gerontology courses listed above or others approved annually by the Program on Gerontology

Students pursuing a certificate must apply to the Program on Gerontology. An overall minimum GPA of 2.5 is required at graduation. All gerontology courses must have grades of C or better. For more information and application for study, contact the Program on Gerontology, Bates Hall, (503) 737-1090/1099.

Graduate Study in Gerontology

An integrated minor in gerontology is available to graduate students from throughout the University in any major field of study. The minor requires 18-36 credits, including HDFS 514, Social Gerontology. The balance of the course work is selected from the graduate gerontology courses (listed above), field study or research.

Students majoring in Human Development and Family Studies may choose adult development and aging as a major area of concentration.

HUMAN DEVELOPMENT AND FAMILY SCIENCES

Alan Acock, Head
Milam Hall 322
Oregon State University
Corvallis, OR 97331-5102
(503) 737-4765

Faculty

Professors Acock, Pratt, Schmall, Sugawara, Walker; *Associate Professors* Hare, Holyoak, Morrow, Mumaw, Olson, Vuchinich; *Assistant Professors* Doescher, Moran, Richards, Southers, Zvonkovic; *Instructors* Sorte

Undergraduate Major

Human Development and Family Sciences (B.S.)
Options
Early Childhood Education
Family Finance
Home Economics Communication
Individual and Family Development

Certificate Program

Certificate in Gerontology

Graduate Majors

Family Resource Management (M.S., Ph.D.)
Home Economics (M.S.)
Home Economics Education (M.A.T.)
Human Development and Family Studies (M.S., Ph.D.)

Graduate Minor

Gerontology

Undergraduate Major and Options

The B.S. in Human Development and Family Sciences can be pursued in one of four options: Early Childhood Education, Family Finance, Home Economics Communications, or Individual and Family Development.

The Early Childhood Education option provides preparation for students interested in working with young children or in entering the School of Education's Master of Arts in Teaching (M.A.T.) program for elementary education.

The Individual and Family Development option prepares students for work in professional programs serving various age groups, human services and agencies, and for graduate study.

The Home Economics Communication option is intended for students interested in broader study of home economics subjects combined with communication skills to be applied to careers such as consumer affairs, education, extension, or positions requiring cross-cultural or international expertise.

The Family Finance option offers undergraduate study in family and consumer economics, financial planning and counseling, and home management.

Graduate Programs

Graduate programs leading to the M.S. and Ph.D. are also offered. Graduate degrees in Human Development and Family Studies emphasize lifespan human development, adult development and aging, child and adolescent development, family studies, or early childhood education. Emphasis is on preparation for professional careers in research, teaching, and human services. Human development, early childhood education, family studies, and gerontology can be used as minor areas in the M.A.I.S.

The M.S. in Home Economics is available for home economists in teaching, extension, business, and administration who seek advanced study on the integrative aspects of home economics across subject areas. The competencies can be used in positions in administration, international development, and public policy.

A Master of Arts in Teaching degree and licensure for teaching home economics is offered in cooperation with the School of Education.

The M.S. and Ph.D. in Family Resource Management is offered as an interdepartmental program. See Family Resource Management in the *Graduate Catalog*.

Undergraduate Degree Requirements

HUMAN DEVELOPMENT AND FAMILY SCIENCES

Baccalaureate Core (48)

Home Economics Core (12)

Human Development and Family Sciences Core (31-37) as follows:

HDFS 140. Contemporary American Families (3)
HDFS 240. Human Sexuality (3)
HDFS 360. Applied Research Methods (3)
HDFS 361. Lifespan Issues, Policies & Prog (3)
HDFS 381. Personal and Family Finance (3)
HDFS 410. Field Experience or HDFS 330. Direct/Exp/ECE and HDFS 430. Super/Exp/ECE (6-12)
HDFS 461. Program Development & Eval (4)
NFM 225. Human Nutrition (4)
SOC 204. Introduction to Sociology (3)
PSY 201. General Psychology (3)
ST 201. Principles of Statistics (3) or MTH 211, MTH 212, MTH 213. Found of Elem Math (9)
One of the following:
HDFS 311. Infant & Child Development (3)
HDFS 313. Adolescent Development (3)
HDFS 314. Adult Development & Aging (3)
HDFS 315. Perspectives on Aging (3)
One of the following:
HDFS 271. Consumers in Society (3)
HDFS 340. Relationship Development (3)
HDFS 341. Family Development (3)

HDFS 481. Financial Planning for Families with Children (3)
HDFS 482. Finan Planning for Later Years (3)
One of the following:
ANTH 110. Intro to Cultural Anth (3)
ANTH 210. Comparative Cultures (3)
ANTH 370. Age, Sex and Family (3)
ANTH 473. Culture, Gender and Self (3)
SOC 460. Comparative Societies (3)
HDFS 450. Families & Quality of Life Developing World (3)
HDFS 471. The World Consumer (3)
GEO 105. Geog of Non Western World (3)
Recommended:
At least one year of a foreign language.
CS 101. Computers: Applications and Implications (4)

Choose one of the following options

INDIVIDUAL AND FAMILY DEVELOPMENT OPTION (33-36)

Include all of the following not taken for major (6-9)
- HDFS 311. Infant/Child Development (3)
- HDFS 313. Adolescent Development (3)
- HDFS 314. Adult Development and Aging (3)
- HDFS 341. Family Development (3)

Choose 18 credits from the following:
Not to exceed 6 credits from:
- HDFS 310. Directed Experience/Human Development (3)
- HDFS 330. Directed Experience/ECE (3)
- HDFS 401. Research (TBA)
- HDFS 405. Reading and Conference (TBA)
- HDFS 406. Projects (TBA)
- HDFS 410. Field Experience (TBA)
- HDFS 430. Supervised Experience/ECE (9)

Any of the following:
- HDFS 312. Programs for the Early & Middle Childhood (3)
- HDFS 315. Perspectives on Aging (3)
- HDFS 340. Relationship Development (3)
- HDFS 420. Children with Special Needs (3)
- HDFS 421. Topics in Child and Adolescent Development (3)
- HDFS 422. Topics in Adult Development and Aging (3)
- HDFS 436. Parenting and Parent Educ (3)
- HDFS 440. Families and Work (3)
- HDFS 442. Gender and Fam Relationships (3)
- HDFS 444. Family Dysfunctions (3)
- HDFS 445. Topics in Family Studies (3)
- HDFS 464. Public Policy and Family Issues (2)
- HDFS 465. Topics in Family Policy (3)

Other courses (9)
- PSY 202. General Psychology (3)
- Any additional 6 credits of upper division in PSY and/or SOC.

Electives
Sufficient to ensure 192 credits, 60 upper division. List of recommended electives are available.

EARLY CHILDHOOD EDUCATION OPTION (33-42)

Include all of the following not taken for major requirements:
- HDFS 311. Infant/Child Development (3)
- HDFS 312. Programs for Early/Middle Childhood (3)
- HDFS 313. Adolescent Development (3)
- HDFS 314. Adult Development & Aging (3)
- HDFS 330. Directed Experience Early Childhood (3)
- HDFS 341. Family Development (3)
- HDFS 420. Children with Special Needs (3)
- HDFS 430. Supervised Experience/ECE (9)
- HDFS 436. Parenting and Parent Educ (3)
- MTH 211, MTH 212, MTH 213. Foundations of Elementary Math (9)

Other required courses (53-54 credits including courses that meet Bac Core requirements)
- CS 101. Computers: Applications & Implications (required if MTH 105 is not taken) (3)
- COMM 111. Public Speaking or COMM 114. Argument and Critical Discourse (3)
- MTH 391. Elementary Problem Solving (3)
- HST 203. Hist of the US (3) plus 2 other courses from Bac Core Western Culture (6)
- GEO 105. Geography of the Non Western World (3)
- GEO 106. Geography of the Western World (3)
- Three ENG courses from Bac Core (9)
- ED 309. Practicum (3)
- ED 411. Ed Psych/Learning and Dev (3)
- ED 312. Intro to Curric & Instruction (3)
- ED 313. Trends & Issues in Education (3)

Choose from the following:
- One science course from approved Bac Core Physical and Biological Sciences in addition to Bac Core requirement or one from the following:
- BI 301, BI 333, BI/BOT 489, ENT 300/BI 300/ ENT 451, F 365, FW 325, FW 252, FW 253, GEO 203, GEO 300, GEO 327, GEO 328, GS 302, GS 333, GS 489, MB 302, MB 303, PH 313, PH 331, PH 332, OC 331, RNG 477, SLS 390, Z 331, Z 332, Z 333, Z 345, Z 427.

Electives
Sufficient to ensure 192 credits, 60 upper division. List of recommended electives will be available.

HOME ECONOMICS COMMUNICATION OPTION (46)
- HDFS 382. Computer Applications in Family Finance (1)
- HDFS 462. Implementing Programs for Family Focused Profs (3)
- HDFS 464. Public Policy & Family Issues (3)
- ART 115. Design I (4)
- EC 201. Principles of Economics (3) or EC 202. Principles of Economics (3)
- WR 214. Writing in Business (3) or WR 222. English Composition

Choose 12 credits not taken previously from the following:
- ART 241. Photography I (3)
- ART 243. Photography II (3)
- COMM 111. Public Speaking (3)
- COMM 114. Argument & Critical Discourse (3)
- COMM 322. Small Group Problem Solving (3)
- COMM 324. Communication in Organ (3)
- COMM 326. Intercultural Communication (3)
- COMM 377. Sign Language Commun (3)
- WR 214. Writing in Business (3)
- WR 222. English Composition (3)
- WR 323. English Composition (3)
- WR 327. Technical Writing (3)

Additional communications or writing courses may be approved annually.

Eighteen additional credits selected in consultation with an adviser from an approved list of courses. Course work will be selected to prepare for career areas, including Education, Extension, Cross-cultural Home Economics, and others.

Electives
Sufficient to ensure 192 total credits, 60 upper division. List of recommended electives will be available.

FAMILY FINANCE OPTION (40)
- HDFS 271. Consumers in Society (3)
- HDFS 382. Computer Applications in Pers/Fam Finance (1)
- HDFS 472. Consumption Patterns & Living Standards (3)
- HDFS 481. Financial Planning for Families with Children (3)
- HDFS 482. Financial Planning for Later Years (3)
- HDFS 483. Financial Planning and Counseling Process (3)
- AIHM 378. Consumer Housing (3)
- BA 215. Fundamentals of Accounting (4)
- BA 340. Finance (4)
- EC 201. Principles of Economics (3)
- EC 202. Principles of Economics (3)
- PSY 202. General Psychology (3)
- PSY 350. Human Lifespan Development or PSY 380 Human Adjustment (3)
- PSY 483. Counseling & Interviewing Skills (4)

Electives
Sufficient to ensure 192 credits, 60 upper division. Recommended elective courses include:
- HDFS 315. Perspectives on Aging (3)
- HDFS 440. Families and Work (3)
- HDFS 471. The World Consumer (3)
- HDFS 473. Consumer Economics (3)
- BA 435. Insurance Planning for Individuals (4)
- BA 437. Employee Benefits and Estate Planning (4)
- BA 442. Investments (4)
- EC 330. Money & Banking (3)
- EC 331. Money & Banking (3)
- EC 495. Health Economics (3)

COURSES

Lower Division

HDFS 140. CONTEMPORARY AMERICAN FAMILIES (3). An introduction to family studies with application to personal life. Focuses on the diversity of American families using a family development orientation. Includes never-marrieds, single-parent families, remarrieds, couples without children, and two-parent families.

HDFS 199. SPECIAL STUDIES (1-16).

HDFS 240. HUMAN SEXUALITY (3). An introduction to human sexuality including physiological, psychological, social, and historical aspects of sexuality. Particular emphasis is placed on developmental and relationship aspects of sexuality.

HDFS 271. CONSUMERS IN SOCIETY (3). Development of the consumer role in the U.S., rights and responsibilities of today's consumer, factors influencing consumption attitudes and decisions, understanding the forces which operate in the marketplace and lerning how to influence them, analysis of the impact of consumer behavior on society.

Upper Division

HDFS 310. DIRECTED EXPERIENCE IN HUMAN DEVELOPMENT (3). Experience interacting with individuals at a particular point in the life span. Range of placement opportunities identified by department. PREREQ: 6 credits of human development. Graded P/N.

HDFS 311. INFANT AND CHILD DEVELOPMENT (3). Research and theory related to development from infancy (birth) through middle childhood (10 years). Includes discussion of biological, familial and sociocultural influences. PREREQ: HOEC 201.

HDFS 312. PROGRAMS FOR EARLY AND MIDDLE CHILDHOOD (3). Development and implementation of programs for children ages 3-9; emphasis on educational settings. PREREQ: HDFS 311.

HDFS 313. ADOLESCENT DEVELOPMENT (3). Advanced theories and reseach on physical, social and psychological development during adolescence; emphasizes influences of family, peers, schools and community. PREREQ: 6 credits or HDFS, SOC or PSY.

HDFS 314. ADULT DEVELOPMENT AND AGING (3). Advanced theories and research related to developmental changes and stability in early, middle, and late adulthood. Gender issues, personality, cognition, and adaptation. PREREQ: 6 credits of HDFS, PSY, or SOC.

HDFS 315. PERSPECTIVES ON AGING (3). Analysis of the social, economics, physical and psychological factors influencing the processes and consequences of aging. PREREQ: 6 credits of HDFS, SOC or PSY.

HDFS 330. DIRECTED EXPERIENCE IN EARLY CHILDHOOD DEVELOPMENT (3). Participation in early childhood education program focused on applying guidance techniques and development of educational activities for young children. PREREQ: HDFS 311, HDFS 312.

HDFS 340. RELATIONSHIP DEVELOPMENT (3). A developmental approach to the study of close relationships. Includes processes of attraction, interdependence, love, and commitment. A variety of close relationships are covered including friendships and romantic relationships—heterosexual, lesbian, and gay.

HDFS 341. FAMILY DEVELOPMENT (3). A developmental approach to family studies. Includes marriage, parent-child relations, families in later life, as well as other developmental issues and transitions related to family life experience. Diversity among families is stressed.

HDFS 350. HOME ECONOMICS COMMUNICATION TECHNIQUES (3). Communicating home economics concepts in various settings. Skills will include instructing, interviewing, counseling, and supervising.

HDFS 360. APPLIED RESEARCH METHODS (3). Basic research methods as they are applied in human development and family studies. PREREQ: 6 credits of HDFS, ST 201 or MTH 211, MTH 212, MTH 213.

HDFS 361. LIFESPAN ISSUES, POLICIES AND PROGRAMS (3). Introduction to the public policy process: how policies affect individuals and families across the lifespan. Selected policies that affect individuals in the general population and in special needs groups.

HDFS 381. PERSONAL AND FAMILY FINANCE (3). Understanding financial planning, income taxes, loans, credit and housing costs. Protection through insurance: property, liability, automobile, health, disability and life. Increasing income through investments: time deposits, government securities, stocks and bonds, mutual funds, and real estate. Planning for retirement and estate trasfer. PREREQ: Sophomore standing.

HDFS 382. COMPUTER APPLICATIONS IN PERSONAL AND FAMILY FINANCE (1). Use of microcomputers and personal and family financial management. Laboratory applications of concepts using existing commercial software and spreadsheet programs. PREREQ: HDFS 381.

HDFS 401. RESEARCH (1-6).

HDFS 402. (1-16).

HDFS 403. (1-16).

HDFS 405. READING AND CONFERENCE (1-6).

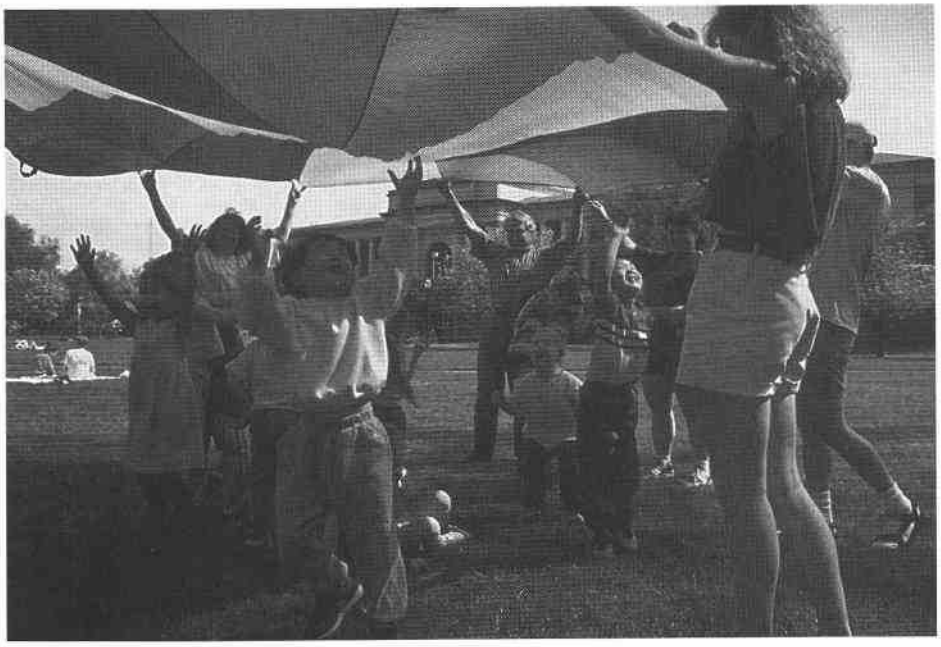
HDFS 406. PROJECTS (1-6).

HDFS 407. (1-16).

HDFS 408. (1-16).

HDFS 410. FIELD EXPERIENCE (3-15). Graded P. Supervised work experience with professional level responsibilities. Supplementary conferences, readings and reports. Supervised by agency/firm and instructor. PREREQ: Senior standing. Restricted to students in HDFS professional major/options. Graded P/N.

HDFS 420. CHILDREN WITH SPECIAL NEEDS (3). An overview of developmental issues and concerns related to children with special needs (disabled, gifted, abused and neglected, and other). PREREQ: 6 credits of HDFS, SOC or PSY. Offered alternate years.



HDFS 421/HDFS 521. TOPICS IN CHILD AND ADOLESCENT DEVELOPMENT (3). Examination of a particular area of study related to children. Topics may include gender role development, social competence, prosocial development, moral development, cognition, contemporary issues. PREREQ: 6 credits of HDFS, SOC or PSY. (May be repeated for credit.)

HDFS 422/HDFS 522. TOPICS IN ADULT DEVELOPMENT AND AGING (3). Examination of a particular area of study within adult development and aging. Topics may include: Women and Aging; Stress, Coping and Adaptation; Support Systems for the Elderly. PREREQ: 6 credits of HDFS, SOC or PSY. (May be repeated for credit.)

HDFS 430. SUPERVISED EXPERIENCE IN EARLY CHILDHOOD DEVELOPMENT (9). Participation in an early childhood program focused on student teaching, program development and evaluation, parent education and administration. PREREQ: HDFS 330.

HDFS 436. PARENTING AND PARENT EDUCATION (3). Parenting and parent education concepts for parents with children from infancy through adolescence. Resources and skills in parenting and in designing programs for parents at home and in child care settings emphasized. Importance of parent-child techer relationships in development and learning discussed. PREREQ: HDFS 311.

HDFS 440/HDFS 540. FAMILIES AND WORK (3). Examination of the bidirectional influences of work and family relationships, paid and unpaid work and varieties of work experiences including those associated with social class. How work differentially affects (and is affected by) diverse family structures. PREREQ: 6 credits of HDFS, SOC or PSY.

HDFS 442/HDFS 542. GENDER AND FAMILY RELATIONSHIPS (3). The role of gender in the lives of individuals and in family relationships and processes, including both mens and womens experience. Developmental issues are considered but the emphasis is on the effects rather than the causes of gender-role socialization. PREREQ: 6 credits of HDFS, SOC or PSY.

HDFS 443/HDFS 543. *UNITED STATES FAMILIES, GENDER, RACE, AND CLASS (3). Explores the influence of gender, race/ethnicity, and social class in individual life and family structures and processes; similarity and diversity among families emphasized. PREREQ: 6 credits of HDFS, SOC, or PSY. (Bacc Core Course)

HDFS 444/HDFS 544. FAMILY DYSFUNCTIONS (3). An examination of individual, interpersonal, and social problems which develop in the context of family life. These problems include marital distress, family violence, divorce, parenting difficulties, and child psychopathology. PREREQ: 6 credits of HDFS, SOC or PSY.

HDFS 445/HDFS 545. TOPICS IN FAMILY STUDIES (3). An overview of a particular area of study within family studies. Content varies with each offering. Topics may include divorce, family violence, family dynamics, intergenerational families. PREREQ: 6 credits of HDFS, SOC or PSY. May be repeated for credit.

HDFS 450. *FAMILIES AND QUALITY OF LIFE IN THE DEVELOPING WORLD (3). Analysis of quality of life for families in the developing world through an interdisciplinary approach. Quality of life indicators and influencing factors such as economic, social, political, cultural, environmental resources, health, and education. Satisfies Bacalaureat Core in Contemporary Global Issues. PREREQ: Social processes and institutions course. (Bacc Core Course)

HDFS 461. ^PROGRAM DEVELOPMENT AND EVALUATION (4). Implementation of process for planning and evaluating human service programs for all age groups. PREREQ: HDFS 360 or ST 311, restricted to students in HDFS professional major. (Writing Intensive Course)

HDFS 462. IMPLEMENTING PROGRAMS FOR FAMILY-FOCUSED PROFESSIONALS (3). Communicating home economics concepts through various media as a professional in diverse settings, including evaluation of program effectiveness. PREREQ: HDFS 461 and speech.

HDFS 463/HDFS 563. PROGRAM DEVELOPMENT FOR CROSS-CULTURAL SETTINGS (3). Adaptation of program development process and communication strategies in cross-cultural home economic-related educative roles, taking into account cultural orientation, needs assessment, communication technology, and resource availabaility. PREREQ: HDFS 350 or HDFS 461.

HDFS 464/HDFS 564. PUBLIC POLICY AND FAMILY ISSUES (3). Analyze current family issues that are affected by the decision makers in the public policy arena. Interact with elected and appointed government officials interested in family issues. PREREQ: One course in American government systems or political processes.

HDFS 465/HDFS 565. SPECIAL TOPICS: FAMILY POLICY (3). Advanced study of policy issues affecting families across the lifespan. Topics may be slected from among: Children, Families and the Law, Legislative Perspectives on Family Policy; Policy and Care for Dependent Family Members, other current issues. May be repeated for credit. PREREQ: HDFS 361 or equivalent; 6 additional credits of HDFS, SOC, PSY; upper division status.

HDFS 471.* THE WORLD CONSUMER (3). A multidiciplinary survey of consumer problems and issues emphasizing factors that influence global consumption values, patterns and trends. Students are challenged to examine their own consumer economic behavior and are encouraged to use course information pragmatically. Satisfies Bacc Core requirements in Contemporary Global Issues. PREREQ: Completion of all perspectives requirements in baccalaureate core. (Bacc Core Course)

HDFS 472/HDFS 572. CONSUMPTION PATTERNS ADN LIVING STANDARDS (3). Study of the consumption patterns of individuals and societies, and the factors which influence them. Understanding the development and relationships between expenditure patterns and budgets. Concepts of consumpation, savings, and accumulation of wealth. Measurement of levels and standards of living, and their components. PREREQ: HDFS 271, HDFS 381.

HDFS 473/HDFS 573. CONSUMER ECONOMICS (3). Economic theory as a basis for consumer choice. Current consumer economic issues, including information processing; product pricing; product quality and liability; legislation and regulation; ecological considerations of consumption; and implications for consumer education. PREREQ: HDFS 271.

HDFS 481/HDFS 581. FINANCIAL PLANNING FOR FAMILIES WITH CHILDREN (3). Methods of helping families with children plan investment, tax, and risk management strategies appropriate to their income, family composition, and stage in the family life cycle. Includes an analysis of the cost of raising a child; appropriate investments for saving for children's college educations; appropriate savings mediums for family emergency funds; tax strategies for child care expenses, etc. PREREQ: HDFS 381.

HDFS 482/HDFS 582. FINANCIAL PLANNING FOR LATER YEARS (3). Management of financial resources before and during retirment to meet family needs. Emphasis on personal tax-deferred retirement programs; means of calculating annual savings needed to reach retirement income objectives; pension design; government sponsored plans, including Social Security, Medicare; federal civil service; federal estate and gift taxation; and characteristics of wills, intestacty, and the probate process. PREREQ: HDFS 381.

HDFS 483/HDFS 583. FINANCIAL PLANNING AND COUNSELING (3). Analysis of financial management and counseling tools appropriate for individuals and families in varying circumstances. Special financial needs of families facing transitions such as marriage, divorce, unemployment, brankruptcy, birth, short and long term disability, death, and retirement will be considered. Preparation for application of planning and counseling skills to life situations. PREREQ: HDFS 481 or HDFS 482. PSY 350 or PSY 380, PSY 483.

Graduate

HDFS 501. RESEARCH (1-6).

HDFS 502. INDEPENDENT STUDY (1-6).

HDFS 503. THESIS (1-16).

HDFS 505. READING AND CONFERENCE (1-6).

HDFS 506. SPECIAL PROBLEMS; PROJECTS (1-6).

HDFS 507. SEMINAR (1-16).

HDFS 508. WORKSHOP (1-16).

HDFS 509. PRACTICUM (1-16).

HDFS 510. INTERNSHIP (3-15).

HDFS 511. THEORIES OF HUMAN DEVELOPMENT (3). Critical examination of various theories of human development. Emphasizes evolution of theories and impact on current human development research.

HDFS 512. CONCEPTS IN LIFESPAN DEVELOPMENT (3). A multidisciplinary approach to understanding human development across the lifespan. Emphasis on exploring how biological and environmental factors influence both change and constancy in cognitive, social, and personality development.

HDFS 514. SOCIAL GERONTOLOGY (3). (3). Advanced theories and research related to social development and change in middle and late adulthood. Gender, social roles, person-environment congruence, period and cohort influences are emphasized.

HDFS 523. TOPICS IN EARLY CHILDHOOD EDUCATION (3). Graded P. Examination of a particular area of study in early childhood education. Topics may include philosophy and models; children with special needs; parenting and parent education; curriculum development; teacher-child relations; administration of programs; guidance. Maybe repeated for credit.

HDFS 531. METHODS OF BEHAVIORAL RESEARCH (3). Philosophy and methods of behavioral research related to human development and family studies.

HDFS 546. THEORIES OF FAMILY STUDIES (3). Graded P. An overview of the major theoretical perspectives used in the study of families. Issues of theory construction and evaluation are also covered. The goal of this course is to enable the student to apply conceptual frameworks to a particular area of interest.

HDFS 548. ADVANCED FAMILY DEVELOPMENT (3). Study of contemporary American families from a developmental perspective. Covers marriage, parent-child relations, and transitions associated with family life. Attention is given to the diversity of family structures and processes.

HDFS 550. ADMINISTRATION OF HOME ECONOMICS (3). Administration of home economics in public schools, extension, business, higher education, and community agencies. Topics will include analysis of trends, program planning and evaluation, financial planning and control, personnel, public relations, and marketing. Case studies will focus on administative strategies. Student may register for HDFS 510 concurrently.

HDFS 551. INTERNATIONAL DEVELOPMENT AND FAMILIES (3). Brief history and overview of development processes in less industrialized countries provides context for analysis of issues such as health, food nutrition, education, gender roles, and natural resource population, education, gender roles, and natural resource environment. Role of professionals in technology transfer.

HDFS 570. FAMILY MANAGEMENT SYSTEMS (3). Theory, principles, and research in family management systems bilding on social systems concepts.

HDFS 571. THEORIES IN FAMILY ECONOMICS (3). Analysis of the determinants of family economic well-being. Theories and measurement of household income, income distribution, levels of living, poverty, and wealth. Analysis of household work patterns and their economic effects. Policies affecting economic choices and well-being. PREREQ: At least one course in microeconomics.

HDFS 580. SELECTED TOPICS: FAMILY RESOURCE MANAGMENT (3). May be repeated for credit.

HDFS 601. RESEARCH (1-6).

HDFS 602. INDEPENDENT STUDY (1-6).

HDFS 603. DISSERTATION (1-16).

HDFS 605. READING AND CONFERENCE (1-6).

HDFS 606. SPECIAL PROJECTS (1-6).

HDFS 607. SEMINAR (1-16).

HDFS 608. WORKSHOP (1-16).

HDFS 610. INTERNSHIP (3-15).

HDFS 616. ADVANCED TOPICS IN CHILD-ADOLESCENT DEVELOPMENT (3). Advanced critical study of theory and research related to specific topics of social and emotional development during infancy, childhood and/or adolescence. May be repeated for credit.

HDFS 617. ADVANCED TOPICS IN ADULT DEVELOPMENT AND AGING (3). Advanced critical study of theory and research related to specific topics of social and emotional development and stability in adulthood, including later life.

HDFS 632. ADVANCED RESEARCH METHODS (3). An in-depth study of a particular area of research methods related to human development and family study. PREREQ: HDFS 531.

HDFS 635. QUALITATIVE RESEARCH METHODS (3). An overview of qualitative methods in social science research. Covers issues of sampling, development of the problem, measurement, analysis, and interpretation. Issues of validity and reliability are also addressed.

HDFS 642. RELATIONSHIP DISSOLUTION (3). Examination of the processes by which close relationships are dissolved. Includes the dissolution of marriages, other romantic relationships, and friendships. Both causes and consequences of dissolution are covered.

HDFS 648. ADVANCED TOPICS IN FAMILY STUDIES (3). Graded P. An in-depth study of a particular area within family studies. Content varies with each offering. May be repeated for credit.

HDFS 670. DEVELOPMENT IN FAMILY MANAGEMENT THEORY (3). Current theory develoment in family management; development of management philosophy and analytical skills related to family managerial problems; application of research and measurement tools. PREREQ: HDFS 570.

HDFS 671. RESEARCH PERSPECTIVES IN FAMILY RESOURCE MANAGEMENT (2). Identification of research issues and priorities. Research resources in land grant-universities realted to the field of family resource management.

■ HOME ECONOMICS EDUCATION

Graduate

HED 510. PROFESSIONAL INTERNSHIP: HOME ECONOMICS EDUCATION (1-15). A full-time field experience in which the intern will integrate academic study with classroom teaching experience to learn specific competencies realting to functioning well in the context of the classroom and the school, and demonstrate this competency through the assessment of work by supervisors and by evidence collected and presented in work samples. PREREQ: Admission to MAT Program.

HED 514. CURRICULUM DESIGNS IN HOME ECONOMICS EDUCATION (3). Analysis of curricular approaches to home economics education; principles of curriculum development and strategies for implementing curricular changes.

HED 530. STRATEGIES OF INSTRUCTION IN HOME ECONOMICS EDUCATION (3). Application of research on diagnostic, prescriptive, and evaluative techniques in home economics education.

HED 540. SELECTED TOPICS IN HOME ECONOMICS EDUCATION (1-3). Current literature and research on a specific topic of concern to home economics education. May be taken for a maximum of nine credits.

HED 553. APPLIED INSTRUCTIONAL STRATEGIES (3). Helps students in the identification and development of advanced and effective instructional stategies/models. It includes development of goals, objectives and units. The course includes the development and application of subject area instructional strategies/models, including applied math, writing, communication skills, measurement and evaluation of achievement, and delivery of instruction to at-risk students. PREREQ: Admission MAT program.

HED 556. LINKING RESEARCH, TEACHING, AND PRACTICE (3). This course links research to teaching. Students will work with cooperating teachers and university supervisors to identify and apply research to teaching. PREREQ: Admission to MAT Program.

HED 557. ISSUES AND TRENDS IN CURRICULUM AND INSTRUCTION (3). Emphasizes trends related to subject matter curriculum issues unique to each program area in vocational education. PREREQ: Admission to MAT Program.

NUTRITION AND FOOD MANAGEMENT

Ann M. Wessersmith, Head
Milam Hall 110
Oregon State University
Corvallis, OR 97331-5503
(503) 737-3561

Faculty

Professors Holmes, Leklem, Messersmith, Miller, Raab, Woodburn; *Associate Professors* Cerklewski, Georgiou, Kelsey, Wander; *Assistant Professor* Chambers; *Senior Faculty Research Assistant* Ridlington; *Faculty Research Assistants* Du, Hardin, Ketchum; *Emitus Professor* Woodburn

Undergraduate Major

Nutrition and Food Management (B.S.)

Options

Dietetics
Food Systems Management
Foods in Business
Nutrition Science

Minors

Food Systems Management

Nutrition

Graduate Major

Nutrition and Food Management (M.S., Ph.D.)

Graduate Areas of Concentration

Determinants of Food Behavior
Foodservice Systems Management
Human Nutrition
Human Nutrition & Metabolic Study
Management in Dietetics
Nutrient Requirements and Interrelationships
Nutritional Biochemistry
Nutritional Status Assessment
Physical-Chemical Aspects of Food Quality
Sensory Evaluation of Food Quality

Family Resource Management (M.S., Ph.D.)

Graduate Area of Concentration

Food Systems Management

The Department of Nutrition and Food Management offers an undergraduate major in Nutrition and Food Management and courses for both majors and nonmajors in human nutrition, foods, and food systems management. Four options are available to the student: (1) Dietetics, (2) Food Systems Management, (3) Foods in Business and (4) Nutrition Science.

The Dietetics Option meets the academic requirements for membership in The American Dietetic Association. This degree qualifies the student for preprofessional experience which leads to taking the national registration exam. This option has strong nutrition, food management and science emphases. Graduates find careers as dietitians in health care facilities; in industrial, school, and university foodservices; in private practice; in community nutrition services; as sales representatives for foodservice or health products; as well as many other related fields.

The Food Systems Management Option has a business emphasis and prepares the student for entry level or traineeship positions in foodservice and restaurant management. Career opportunities include foodservices in colleges or universities, public and private schools, hospitals, health care, restaurants and industry; positions in marketing, and consulting; and teaching and research in universities and food industries after graduate study.

The Foods in Business Option is for students interested in food product development and promotion of consumer services in business, industry, and government.

The Nutrition Science Option provides a strong background in basic sciences and human nutrition for students planning further study in health-related professions, such as medicine or dentistry, or graduate school.

Minors in nutrition and food systems management are available. The department's courses are included in curricula of other majors in the College of Home Economics and Education as well as majors in Food Science and Technology; Health Care Administration; Health and Human Performance; and Prenursing.

Graduate programs within the department lead to M.S., M.A.I.S. and Ph.D. degrees. Master's and Doctoral programs may emphasize nutrition, foods, or food systems management or a combination. Graduate programs in food systems management are also offered in the graduate area of Family Resource Management. The Ph.D. program is an approved Western Regional Graduate Program (WICHE) for in-state tuition.

Professional Studies

To be considered for admission to a degree-granting major, a student must complete the Application Form on Professional Program. This form is available from the Undergraduate Advising Office Milam 115, and it includes the required pre-professional course

NUTRITION AND FOOD MANAGEMENT

Baccalaureate Core (48)

Home Economics Core (12)

Nutrition and Food Management Core (23-25)

NFM 104. Orientation (1)
NFM 225. Human Nutrition (4)
NFM 235. Science of Foods (4)
NFM 310. Science & Management of Foods (4)
COMM 114. Argument & Critical Discourse or COMM 111. Public Speaking (3)
MB 230. Introductory Microbiology (4) or MB 302, MB 303. Gen Micro (3,2)
ST 201. Principles of Statistics (3) or ST 351. Intro to Statistical Methods (4)

DIETETICS OPTION

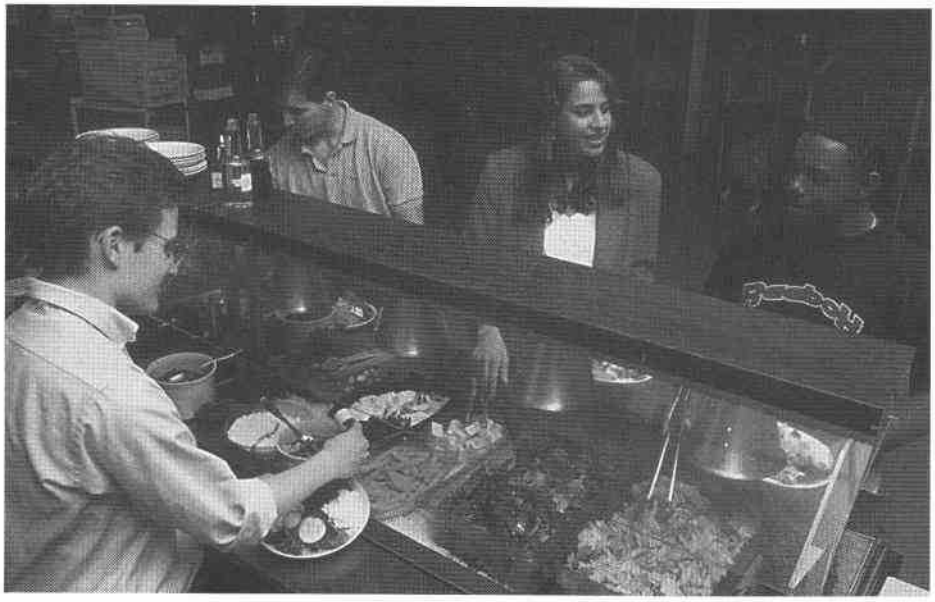
(Meets The American Dietetic Association academic requirements.)
CH 121, CH 122, CH 123, or CH 221, CH 222, CH 223. General Chemistry (15)
CH 331, CH 332 Organic Chemistry (8) or CH 334, CH 335, CH 336. Organic Chem (9)
BB 350 or BB 351. Elementary Biochem (4-5)
Z 332, Z 333. Human Anat & Physiol (6)
HDFS 350. Home Econ Commun Tech or ED 411. Educational Psychology (3)
EC 202. Intro Macroecon (3)
PSY 201, PSY 202. General Psychology (6)
SOC 204. Intro to Sociology (3)
BA 131. Intro Business Computer Systems (3) or CS 101. Computers: Appls & Implications (4) or computer proficiency
BA 215. Fundamentals of Accounting (4)
BA 350. Organization Systems (4)
BA 352. Organizational Behavior (4)
NFM 219. Food Merch & Serv Promo (3)
NFM 311. Quantity Food Production (5)
NFM 325. Nutrition Through the Life Cycle (3)
NFM 417, NFM 418. Human Nutrition (6)
NFM 419. Human Nutrition Laboratory (2)
NFM 407. Seminar-Majors (1)
NFM 420. Nutrition in Disease (3)
NFM 423. Community Nutrition (4)
NFM 441. Foodservice Facility Design (3)
NFM 442. Foodser Procur and Invent Sys (4)
NFM 446. Organiz and Manag of Foodserv (3)
NFM 447. Management of Food Systems Lab (3)
NFM 455. Comp-Assisted Food Sys Mgmt (3)

Electives

Sufficient (together with baccalaureate and home economics cores) to ensure 192 total credits (60 upper division)

FOOD SYSTEMS MANAGEMENT OPTION

A 3-term lab sequence in either physical or biological science, chosen from:
CH 121, CH 122, CH 123. General Chemistry (15) (rec seq) or
PH 201, PH 202, PH 203. Gen Physics (15) or BI 101, BI 102, BI 103. General Biology (12)
EC 201. Intro Microeconomics (3)
EC 202. Intro Macroeconomics (3)
EC 481. Economics of Labor Unions (3) or EC 482. Labor Legislation (3) or BA 455 Management and Union Relations (4)



PSY 201, PSY 202. General Psychology (6)
SOC 204. Intro to Sociology (3)
NFM 219. Food Merch & Service Promotion (3)
NFM 311. Quantity Food Production (5)
NFM 314. Beverage Management (3)
NFM 407. Seminar: Majors (1)
NFM 410. Field Experience (4)
NFM 416. Cultural Aspects of Foods (3)
NFM 441. Foodservice Facility Design (3)
NFM 442. Foodserv Procur & Inventory Sys (4)
NFM 446. Org & Management of Foodserv (3)
NFM 447. Management of Food Systems Lab (3)
NFM 455. Comp Asst Food Sys Mgmt (3)
BA 131. Business Computer Systems (3) or CS 101. Computers: Apps and Impl (4)
BA 215. Accounting Principles (4)
BA 350. Organization Systems (4)
BA 352. Organizational Behavior (4)
BA 390. Marketing (4)
BA 340. Finance (4)

Electives
Sufficient (together with baccalaureate and home economics cores) to ensure 192 total credits (60 upper division)

FOODS IN BUSINESS OPTION
CH 121, CH 122, CH 123 or CH 221, CH 222, CH 223. General Chemistry (15)
CH 331, CH 332 or CH 334, CH 335, CH 336. Organic Chemistry (8-9)
NFM 325. Nutrition Through the Life Cycle (3)
NFM 416. Cultural Aspects of Foods (3)
NFM 425. Advanced Science of Foods (4)
NFM 433. Food Product Dev & Promotion (3)
NFM 435. Experimental Foods (5)
EC 201. Intro to Microeconomics (3)
EC 202. Intro to Macroeconomics (3)
CS 101. Computers: Apps and Implications (4)
BA 390. Marketing (4)
BA 492. Consumer Behavior (4)
FST 420. Sensory Evaluation of Food (3)
SOC 204. Intro to Sociology (3)
Complete at least 12 credits from one of the two emphases below:

Food Product Development Emphasis (12)
NFM 410. Field Experience (3-9)
IE 451. Anal-Dsgn of Quality Assurance Sys (3)
NFM 311. Quantity Food Production (5)
CH 219. Gen Chem Lab (2) (if CH 121 is taken)
CH 324. Quantitative Analysis (4)
MB 440, MB 441. Food Microbiology (5)

Food Product Promotion Emphasis (12)
ART 115. Basic Design (4)
LS 201. News Writing (3)
WR 214. Writing in Business (3)
WR 414. Advertising and Public Relations Writing (3)
NFM 410. Field Experience (3-9)
NFM 415. Global Food Res & Nutrition (3)
HDFS 271. Consumers in Society (3)
HDFS 350. Home Econ Comm Tech (3)
ART 241. Photography (3)

Electives (53-62)
Sufficient (together with baccalaureate and home economics cores) to ensure 192 total credits (60 upper division)

NUTRITION SCIENCE OPTION
CH 121, CH 122, CH 123 or CH 221, CH 222, CH 223. General Chemistry (15)
CH 219. General Chemistry Lab (2) (if CH 121 taken)
CH 331, CH 332 or CH 334, CH 335, CH 336. Organic Chem (8-9)
CH 337. Organic Chemistry Lab (2)
CH 324. Quantitative Analysis (4)
BI 211, BI 212, BI 213. Biology (12)
MTH 111. College Algebra (4)
MTH 112. Elementary Functions (4)
MTH 251. Differental Calculus (4)
PH 201, PH 202, PH 203. General Physics (15)
BB 350 or BB 450, BB 451. Biochemistry (4-7)
Z 331, Z 332, Z 333. Human Anat & Phys (9) or Z 430. Prin. Physiol., Z 431, Z 432. Vertebrate Physiology (12)
PSY 201, PSY 202. General Psychology (6)
NFM 417, NFM 418. Human Nutrition Sci (6)
NFM 419. Human Nutrition Lab (2)
NFM 420. Nutrition in Disease (3)

Electives (27-40)
Sufficient (together with baccalaureate and home economics cores) to ensure 192 total credits (60 upper division)

MINORS
27 credits including 12 upper division

Minor in Nutrition
Students are strongly encouraged to consult an adviser in the Department of Nutrition and Food Management to be sure that prerequisites are taken.
NFM 225. Human Nutrition (4)
NFM 235. Science of Foods (4)
NFM 310. Science and Management of Foods (4)
Z 332, Z 333. Human Anatomy and Physiol (6)
BB 350. Elementary Biochemistry (4) or BB 351. Elementary Biochemistry (5)
NFM 417, NFM 418. Human Nutrition (6)

Minor in Food Systems Management
NFM 104. Orientation: Nutrition & Fd Mgmt (1)
MB 230. Intro Microbiology (4)
NFM 225. Human Nutrition (4)
NFM 235. Science of Foods (4)
NFM 310. Science and Mgmt of Foods (4)
NFM 311. Quantity Food Production (5)
NFM 314. Beverage Management (3)
NFM 442. Fdserv Procuremt & Inventory Sys (4)
NFM 446. Org & Mgmt of Foodservices (3)
NFM 447. Mgmt of Food Systems Laboratory (3)

COURSES

Lower Division

NFM 104. ORIENTATION: NUTRITION AND FOOD MANAGEMENT (1). Identify professional resources, job opportunities, market and trends. Study academic and professional requirements for successful entry to the professional careers in dietetics, food systems management, foods in business, and nutrition science. Graded P/N.

NFM 216. *FOOD IN NON-WESTERN CULTURE (3). Cultural determinants influencing food habits of humans. Interrelation of eating patterns and socio-cultural, ecological, psychological and economic factors in cross-cultural settings. Roles of men and women in food provision. (Bacc Core Course)

NFM 219. FOOD MERCHANDISING AND SERVICE PROMOTION (3). Food systems management responsibilities and consumer interests when promoting menu items and services. The selection, presentation, and marketing of products and services through merchandising and retailing concepts and techniques for profit and not-for-profit organizations.

NFM 225. HUMAN NUTRITION (4). The relationship of food, its nutrients and other components to the promotion of health and fitness with emphasis on the young adult. Current health concerns on a national and international level.

NFM 235. SCIENCE OF FOODS (4). Composition and structure of foods, including modified ingredients. Principles underlying preparation of food products of standard quality. Laboratory. PREREQ: NFM 225 or course in chemistry.

Upper Division

NFM 310. SCIENCE AND MANAGEMENT OF FOODS (4). Interactions of components in food systems, including food quality, safety and regulatory aspects. Management of resources to meet food needs. Laboratory. PREREQ: NFM 235; NFM 225; one year of physical or biological science.

NFM 311. QUANTITY FOOD PRODUCTION (5). Quantity food production methods; standardized formulae and costing; equipment; menu planning; safety and sanitation. Laboratory experience. Computer simulation activity for recipe development. PREREQ: NFM 310.

NFM 312. *ISSUES IN NUTRITION AND HEALTH (3). Impact of nutrition as one component of complex environmental, behavioral, social, and genetic factors significant to health promotion. Apply scientific knowledge to current health issues of changing dietary patterns, technological development in food products and nutrition controversies. Recognize economic and public policy implications. PREREQ; NFM 225; completion of Science in baccalaureate core. (Bacc Core Course)

NFM 314. BEVERAGE MANAGEMENT (3). Principles of food systems management applied to beverage management for profit and nonprofit organizations. Development of standards, procedures, and controls for beverages: dairy products, fruit juices, carbonates, nonalcoholic, alcoholic, decaffeinated, and caffeinated. Laboratory fee.

NFM 325. NUTRITION THROUGH THE LIFE CYCLE (3). Nutritional needs and concerns in pregnancy and lactation, infancy, childhood, adolescence, adult and later years. PREREQ: NFM 225.

NFM 401. RESEARCH (1-16). Graded P/N.

NFM 403. THESIS (1-16). Graded P/N.

NFM 405. READING AND CONFERENCE (1-16). Graded P/N.

NFM 406. SPECIAL PROBLEMS; PROJECTS (1-16). Graded P/N.

NFM 407. SEMINAR (1-16). Graded P/N.

NFM 408. WORKSHOP (1-16). Graded P/N.

NFM 410. FIELD EXPERIENCE (3-12). Supervised work experience with professional-level responsibilities in community agency or business firm. Supplementary conferences, readings, reports. Supervised by agency/firm and instructor. For advanced students. Applications made and approved term preceding enrollment. May be repeated for a maximum of 15 credits. Graded P/N.

NFM 415/NFM 515. *GLOBAL FOOD RESOURCES AND NUTRITION (3). Resources and constraints (natural, political, economic, and social) that impact achievement of adequate food and nutrition for all. Analysis of global interactions that influence the prevention of hunger and malnutrition. PREREQ: Economics, NFM 225. (Bacc Core Course)

NFM 416/NFM 516. ^CULTURAL ASPECTS OF FOODS (3). Regional, ethnic, and religious influences on food patterns; world wide trends in food practices. Laboratory experience with foods from several cultures. PREREQ: NFM 310. Laboratory fee. (Writing Intensive Course)

NFM 417/NFM 517. HUMAN NUTRITION SCIENCE (3). Application of biochemistry and physiology to nutrition of the individual. Must be taken in order. PREREQ: Biochemistry; physiology; one course in nutrition.

NFM 418/NFM 518. HUMAN NUTRITION SCIENCE (3). Application of biochemistry and physiology to nutrition of the individual. Must be taken in order. PREREQ: Biochemistry; physiology; NFM 417.

NFM 419/NFM 519. ^HUMAN NUTRITION LABORATORY (2). Techniques of nutritional assessment; laboratory experiences covering basic nutrition and chemical assays. PREREQ: NFM 417/NFM 517. (Writing Intensive Course)

NFM 420/NFM 520. NUTRITION IN DISEASE (3). Application of nutrition principles to organic, functional and metabolic disorders which may alter nutritional requirements or respond to dietary modification. PREREQ: NFM 418/NFM 518.

NFM 421/NFM 521. CHILD NUTRITION (3). Physiological and biochemical bases for nutritional needs from prenatal life through childhood: applications to nutritional recommendations. PREREQ: NFM 418/NFM 518.

NFM 423/NFM 523. COMMUNITY NUTRITION (4). Meeting nutrition needs in community settings; nutrition status of individuals and groups; programs of public and private agencies and industry; intervention techniques. Roles of community nutritionist. PREREQ: FNM 310, FNM 325.

NFM 425/NFM 525. ADVANCED SCIENCE OF FOODS (4). Polysaccharides, lipids, and proteins; structures and functional properties in foods. Laboratory. PREREQ: NFM 310; CH 332.

NFM 433/NFM 533. FOOD PRODUCT DEVELOPMENT AND PROMOTION (3). Principles of the development and promotion of new food products with current case studies. PREREQ: NFM 310 or FST 412.

NFM 435/NFM 535. EXPERIMENTAL FOOD STUDIES (5). Subjective and objective evaluation techniques applied to individual studies using the experimental approach. PREREQ: NFM 310 or FST 412. Graded P/N.

NFM 440/NFM 550. MEAL SYSTEMS FOR THE ELDERLY (3). Current research topics in the provision of food and meals to the elderly in various home, community and institution settings. Physical, sociological and pyschological factors influencing food intake among the elderly. PREREQ: 3 credits of social science.

NFM 441/NFM 541. FOODSERVICE FACILITY DESIGN (3). Organization and process of designing a foodservice facility. Determining product and consumer flow as related to design. Equipment selection, specifications and arrangement; energy considerations. PREREQ: NFM 311.

NFM 442/NFM 542. FOODSERVICE PROCUREMENT AND INVENTORY SYSTEMS (3). Selecting, packaging, and storing of food items in foodservice. Forecasting and inventory control systems as related to food quality and cost. PREREQ: NFM 311.

NFM 446/NFM 546. ORGANIZATION AND MANAGEMENT OF FOODSERVICES (3). Philosophy and functions of management applied to foodservice organizations; utilization of resources: personnel, space and equipment, time and money; evaluation of food systems. PREREQ: NFM 311; NFM 441/NFM 541; NFM 442/NFM 542.

NFM 447/NFM 547. MANAGEMENT OF FOOD SYSTEMS LABORATORY (2). Application of foodservice management theory by planning, providing, and evaluating meals for the public in the University Food Services. PREREQ: NFM 446/NFM 546 or concurrent registration.

NFM 455/NFM 555. COMPUTER ASSISTED FOOD SYSTEMS MANAGMENT (3). Management of foodservice facilities using computer applications to supplement information needed for decision-making with emphasis on controlling the flow of materials, food quality, and costs. PREREQ: NFM 441/NFM 541; NFM 442/NFM 542.

Graduate

NFM 501. RESEARCH (1-16). Graded P/N.

NFM 502. INDEPENDENT STUDY (1-16). Graded P/N.

NFM 503. THESIS (1-16). Graded P/N.

NFM 505. READING AND CONFERENCE (1-16). Graded P/N.

NFM 506. SPECIAL PROBLEMS; PROJECTS (1-16). Graded P/N.

NFM 507. SEMINAR (1-16). 1 credit graded P/N sections.

NFM 508. WORKSHOP (1-16). Graded P/N.

NFM 509. PRACTICUM (1-16). Graded P/N.

NFM 510. FIELD EXPERIENCE/INTERNSHIP (3-12). Supervised work experience with professional-level responsibilities in community agency or business firm. Supplementary conferences, readings, reports. Supervised by agency/firm and instructor. Limited to students admitted to degree program. Application made and approved term preceding enrollment. No more than 6 credits may be applied to a masters degree program. Graded P/N.

NFM 522. RESEARCH TECHNIQUES (4). Methods and techniques for the analysis of nutrients and metabolites in foods and other biological materials, including blood studies. PREREQ: CH 324; PREREQ/COREQ: NFM 418/NFM 518.

NFM 550. NUTRITIONAL STATUS (4). Research studies with emphasis on estimation of nutrient intake and assessment of nutritional status, including biochemical, clinical, epidemiological and anthropometric measures. Interpretation of status indicators. PREREQ: NFM 418/NFM 518.

NFM 551. SELECTED TOPICS IN NUTRITION (3). Graded P. Topics vary but include protein and amino acid metabolism, lipid metabolism, hormone and vitamin interrelationships, intermediary metabolism, nutrition behavior and education. Emphasis on recent advances in human nutrition. May be repeated for maximum of 6 credits. PREREQ: NFM 418/NFM 518. Not offered every year.

NFM 552. SELECTED TOPICS IN FOODS (3). Graded P. Topics vary but include food safety, sensory qualities of foods, and structural aspects of foods. Emphasis on the research literature. PREREQ: CH 332; NFM 425/NFM 525. Not offered every year.

NFM 556. ADVANCED FOODSERVICE MANAGEMENT (3). Interpretation of management principles and current research in relation to administration of foodservice organizations at the policy- making level. PREREQ: NFM 446/NFM 546; NFM 447/NFM 547. Not offered every year.

NFM 560. LIPID METABOLISM (3). Digestion, absorption, and metabolism of lipids with emphasis on lipoprotein metabolism, regulation of lipid metabolism in various tissues and metabolism of eicosanoids. PREREQ: BB 452 OR BB 492 or equivalent. Offered alternate years. CROSSLISTED as ANS 560.

NFM 590. FOODS AS APPLIED SCIENCE (3). Application of principles from biology and chemistry to the experimental study of foods. Application to secondary education. PREREQ: general chemistry or alternate approved by instructor, NFM 225; NFM 310. Not offered every year.

NFM 591. PRINCIPLES OF NUTRITION FOR TEACHERS (3). Principles and recent developments in nutrition and their applications. For secondary school and Extension personnel. PREREQ: General chemistry; physiology; NFM 325. Not offered every year.

NFM 601. RESEARCH (1-16). Graded P/N.

NFM 602. INDEPDENDENT STUDY (1-16). Graded P/N.

NFM 603. THESIS (1-16). Graded P/N.

NFM 605. READING AND CONFERENCE (1-16). Graded P/N.

NFM 607. SEMINAR (1-16). Graded P/N.

NFM 609. PRACTICUM (1-16).

NFM 610. INTERNSHIP (1-16). Graded P/N.

NFM 617. METABOLIC INTERRELATIONSHIPS IN NUTRITION (3). Interrelationships between nutrients and metabolism at the cellular and human level as influenced by external and internal factors, including age, and environment. PREREQ: NFM 418/518. Offered alternate years.

NFM 618. METABOLIC INTERRELATIONSHIPS IN NUTRITION (3). Interrelationships between nutrients and metabolism at the cellular and human level as influenced by external and internal factors, including age, and environment. PREREQ: NFM 418/518. May be taken out of order. Offered alternate years.

NFM 623. ADVANCED NUTRITION RESEARCH (3). Experimental design and conduct of research related to human nutrition; including both human and animal models. PREREQ: NFM 522. Not offered every year.

SCHOOL OF EDUCATION

Wayne W. Haverson, Director
Education Hall 100
Oregon State University
Corvallis, OR
97331-3502
(503) 737-4661
R. Lance Haddon, *Assistant Director*

Faculty
Professors Carpenter, Dunham, Evans, Haverson, House, Johnson, Kenneke, Parnell, Sredl, Stern, Stiehl; *Associate Professors* Cohen, Collison, Daugherty, Engel, Firth, Gray, Southers, Suzuki; *Assistant Professors* Higgins, Hobbs, Mary-Lou, McEwan, Merickel, Osborne, Stoynoff, Winograd; *Instructors* Baldwin, Brazier, Holmes, Myers, Prickel

Undergraduate Majors
Technology Education (B.S.)
Graduate Majors
Adult Education (Ed.M.)
Counseling (M.S., Ph.D.)
Education (Ed.M., M.S., Ed.D., Ph.D.)
Teaching (M.A.T.)
Graduate Minors
Adult Education
Community College Education
Education

The School of Education, a unit of the College of Home Economics and Education, offers an array of graduate degrees to prepare teachers, counselor educators, and other education professionals for careers in schools, community colleges, business and industry and other post-secondary settings. The undergraduate degree in Technology Education is a component of the Professional Technical Education theme which prepares educators to address the relationships between education and work in schools and the workplace. In addition, there are electives for undergraduate students who wish to explore education as a career choice.

All programs reflect research-based approaches in education and counseling developed by University faculty, K–adult teachers and administrators, counselors and leaders from business and industry. Students gain application skills and administrative experience through extensive internships in public schools, community colleges, business and industry, and other post-secondary settings.

AUTHORIZATION AND ACCREDITATION

The School of Education is authorized by the State Board of Higher Education to offer teacher education and counseling programs and by the Oregon Teacher Standards and Practices Commission (TSPC) to recommend teacher and counselor candidates for basic and standard licensure.

All programs are fully accredited by the National Council for Accreditation of Teacher Education and by the Oregon Teacher Standards and Practices Commission. Counselor Education programs are fully accredited by Council for Accreditation of Counseling and Related Educational Programs (CACREP).

ADVISING

Early and continuous advising is an important aspect of education and counseling in both the undergraduate and graduate programs. Students are urged to declare their interest in education or counseling and/or specialization programs and to seek advice at the earliest possible date. While undergraduates will be advised by their college of choice, those interested in the teaching profession are invited to meet with faculty in the School of Education when questions arise about graduate programs in education and counseling and appropriate undergraduate preparation.

Applicants for licensure must meet TSPC requirements in effect at the time of the licensure application. Because licensure rules are controlled by TSPC, that licensure requirements may change. All persons expecting to be recommended for basic or standard licensure should consult regularly with an adviser.

Undergraduate Electives/Field Experiences

The School of Education has developed educational electives for undergraduate students. These include opportunities for students to participate in field experiences in the public schools. Students who major in one of the undergraduate pre-elementary programs are required to complete a 9-credit sequence in education as part of a pre-professional core.

TEACHER EDUCATION PROGRAM

Teacher education at Oregon State University has the status of graduate professional study such as law, medicine, or pharmacy. The School of Education, in cooperation with other colleges, offers graduate teacher licensure programs for those students wishing to enter the teaching profession as well as for teachers wishing to complete standard licensure requirements. Although the School offers only one undergraduate degree in teacher education (Technology Education), elective courses are offered for undergraduate students who are exploring elementary and/or secondary education as a career goal.

Graduate Degree
Master of Arts in Teaching (M.A.T.)
Areas of Concentration
Biology
Chemistry
Integrated Science
English
Mathematics (Advanced)
Physics
Professional Technical
Health Education
Music Education
Physical Education

The Master of Arts in Teaching degree involves both graduate courses and extensive internship experiences. Students seeking information about the M.A.T. should contact the appropriate College from the following:

- *Agricultural Education:* College of Agricultural Science

- *Elementary Education and the Early Childhood Endorsement:* School of Education, College of Home Economics and Education, College of Liberal Arts, or College of Science
- *Biology, Chemistry, Integrated Science, Mathematics, and Physical Education:* College of Science
- *Health, Physical Education and the Adaptive Physical Education Endorsement:* College of Health and Human Performance
- *Home Economics Education:* College of Home Economics and Education
- *Language Arts and Music:* College of Liberal Arts
- *Technology Education:* School of Education

Degree Requirements
The M.A.T. is a 48-credit program intended for pre-service teacher education students. The program of study includes both course work and extensive internship experience. Emphases are on professional-technical education, school restructuring, and multicultural education, as well as the latest research on schools, learning, and teaching.

Professional education concentration (3)
Course work in the teaching specialization (18-21)
Internship (15-18)
Electives (6-9)

Admission to the Master of Arts Teaching Program
Admission is competitive and selective. The following are the requirements for admission consideration to the M.A.T. Program:

- Completed bachelor's degree,
- 3.0 GPA in the last 90 graded quarter credits, (Some programs may set higher GPA standards. They may also set specific GPA requirements in the teaching specialty.)
- Successful experience working with children or youth (preferably in a public school) verified by a recommendation or evaluation,
- Competence in the basic skills as determined by passing scores on either the California Basic Educational Skills Test (CBEST) or the Core Battery of the National Teachers Examination (NTE),
- Competence in teaching specialty as determined by a passing score on the appropriate Specialty Area Test, e.g., mathematics, agriculture, English,
- Subject competence as determined by the program faculty (see appropriate department or Office of the Assistant Director for advising information), and
- Satisfactory answers to "good conduct" questions as required by the Oregon Teacher Standards and Practices Commission.

Applicants must submit a resume, three letters of recommendation, and a statement of professional goals as part of the application process. Interviews and writing samples are also required for admission consideration.

The application deadline is Dec. 10 for elementary education and Jan. 14 for all other programs.

Preparation for the M.A.T. in Elementary Education
Students intending to apply for the M.A.T. in Elementary Education can choose to complete a bachelor's degree in Human Development and Family Sciences with the Early Childhood Education option, or a degree in General Science in the College of Science, or a degree in Liberal Studies in the College of Liberal Arts. During the undergraduate experience, students should complete a 9-credit sequence in Education as part of the professional core. In addition, preparation in the following areas of study commonly found in the elementary school curriculum is recommended:

Writing (9)
Mathematics (12-15)
Science (18-20)
Social Studies (9)
Art (3)
Music (3-4)
Fitness (3)
Child/Human/Family Development (9)
Literature (9)
Geography (6)

Preparation for the M.A.T. in Secondary and K-12 Education
Students who intend to apply for the M.A.T. in Secondary or K-12 programs choose an undergraduate major(s) in the area they plan to teach.

■ STANDARD LICENSURE

Graduate Major

Education (Ed.M.)

Standard licensure for in-service teachers is offered in the following areas:

Agriculture Education
Biology Education
Business Education
Chemistry Education
Health Education
Home Economics Education
Integrated Science Education
Language Arts Education (English)
Marketing Education
Mathematics Education (advanced)
Music Education
Physical Education
Physics Education
Technology Education

The Master of Education degree may be earned while completing standard licensure requirements if the candidate is eligible for graduate admission.

Admission to Standard Licensure Program
Application dates are open for acceptance to standard programs. Candidates for standard programs must hold or be eligible to hold Basic Teaching License in the State of Oregon.

■ COMMUNITY COLLEGE EDUCATION PROGRAM

Graduate Major

Adult Education (Ed.M.)
Education (Ed.M., Ed.D.)
Areas of Concentration
Community College Education

Graduate Minors

Community College Education
Areas of Concentration
Instruction

Master of Education
The Ed.M. in Adult Education or education can be pursued in the following emphases areas:

- *Adult Basic Education:* Training to provide special-needs adults with the acquisition of skills in basic literacy;
- *Developmental education:* Training to provide special-needs adults with the acquisition of skills in basic learning strategies and other educational needs;
- *English as a second or foreign language:* Preparation to provide instruction to limited English-speaking adults, to function as English as a Foreign Language instructor, or to serve in cross-cultural situations in private or public settings;
- *Leadership and Learning:* Preparation to facilitate change in community college instructional programs through participative management, team learning, systems thinking, learner-centered outcomes and quality commitment;
- *Professional Technical education:* Addressing the relationship between education and work, and education and technology, preparation to design, deliver and manage instruction in community colleges, public agencies, business and industry.

Course work in Adult Education may also be used as a pre-service minor in extension program development, community college instruction, and for other graduate degrees. This minor requires a minimum of 18 credit hours approved course work in the following areas:

The Adult Learner (3)
Instructional Systems (3)
Learning Strategies (3)
Assessment (3)
The Community College (3)
Internship(3)

Degree Requirements
The Ed.M. in Adult Education or education requires a minimum of 45 credits beyond the baccalaureate degree.

Admission
Admission is selective and competitive. Factors considered in making admission decisions include: completion of a bachelor's degree, cumulative grade point average (3.0 in the last 90 graded quarter hours of the bachelor's degree and all post

baccalaureate course work), written and oral communication skills, career objectives and commitment, career experience, and professional references.

Applicants submit a letter of intent, resume, transcripts, three letters of recommendation, writing sample, and application questionnaire. Following an initial screening, applicants will be interviewed by a member of the faculty by telephone or in person.

Course work in Adult Education or Education may also be used as a pre-service minor in community college instruction. This minor requires a minimum of 18 credit hours of approved course work.

DOCTOR OF EDUCATION

Graduates who receive the Ed.D. in Education with a concentration in Community College Education will be prepared to hold a variety of positions in community college or related educational settings.

Field advisers and mentors selected from senior staff of community colleges assure relevance to the community college setting.

Degree Requirements

The Ed.D. degree in Education with a concentration in Community College Education requires a minimum of 108 credits beyond the baccalaureate degree. The residency requirement is met by enrolling in three out of four consecutive quarters and completing a minimum of 36 credits. The following credits must be completed:

Foundational Core (15)
Research Core (9)
Area of Specialization (48)
Internship (12)
Thesis (24)

Admission

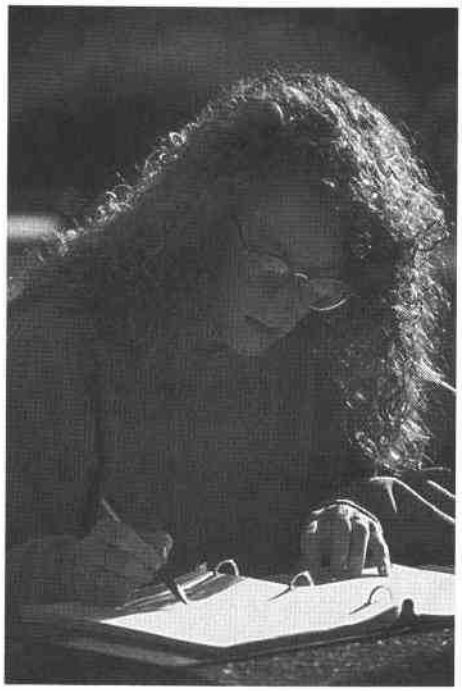
Applicants for the EdD must have an earned master's degree or the equivalent, a 3.0 GPA, and 3-5 years of professional community college experience. Transcripts of previous college work, a resume, three letters of recommendations, a letter of intent and a portfolio of professional experiences, goals and philosophy are required for admission consideration. Final applicants are interviewed by the program admissions committee. The application deadline is June 1.

■ DOCTOR OF PHILOSOPHY PROGRAM

Graduate Major

Education (Ph.D.)

The Ph.D. degree prepares professionals for research and teaching in teacher preparation programs or related programs in higher education or in business and industry.



Degree Requirements

The Ph.D. degree with a major in Education requires a minimum of 122 credits beyond the baccalaureate degree. The residency requirement is met by full-time enrollment for one calendar year after admission. The following credits must be completed:

Foundational Seminars (12)
Research Competence (23)
Area of Specialization (48)
Internship (3)
Thesis (36)

Admission

A master's degree in Education or related field, or equivalent to a master's degree in post baccalaureate course work is required. In addition, applicants to the Ph.D. program must have significant experience in an education or education related setting such as teaching, school administration, curriculum specialist, instructional specialist, child/
youth counselor, supervisor, or in a setting where the primary function is education.

Admission to the Ph.D. program is selective and competitive with only a limited number selected each year.

Applicants must submit transcripts of all previous college or university course work, a letter or statement of professional objectives for doctoral study (including the area of specialization), a portfolio, a current resume or curriculum vita, and three letters of recommendation. International students must submit TOEFL (minimum score of 575) and TWE scores (minimum score of 4). Applicants are reviewed by a faculty committee and candidates are interviewed before a final admission decision is made. The application deadline is February 15.

COURSES

Lower Division

ED 101. DEVELOPMENTAL READING (3). Designed for students who have difficulty with reading for meaning. Self-confidence and a positive attitude toward reading are major focal points. This course is based on research that proves that the more you read the better a reader and writer you become. A celebration of differences is woven throughout the course.

ED 102. COLLEGE READING (3). Developed to provide students with specific strategies for learning through studying. Students will be introduced to strategies to be used before, during, and after textbook reading. Primary focus of the course and text is to prepare students to function successfully in subsequent university course work.

ED 103. METHODS OF STUDY (3). Designed to assist students in developing good study habits, successful note-taking skills, examination expertise, use of the library and other campus resources. General orientation to the university and what is expected of students at the university.

ED 104. SPECIAL STUDIES: MATH EXPLORATION (3). An intensive review of the basic arithmetic operations including sections on percents, geometry and signed numbers. Ways to overcome math anxiety will be discussed. Recommended for the students who has been away from mathematics for several years. PREREQ:Appropriate placement score. **SS/Introduction to Computers:** Basics of word processing, spreadsheets, databases, and electronic mail. Sections on both IBM-compatable and Macintosh computers. **SS/Multicultural Awareness:** Overview of American diversity and the issues with which ethnic and cultural minorities must deal. Emphasis on valuing and managing diversity.

ED 199. SPECIAL STUDIES: TUTORING (1-3). Students in this course receive training and experience in one-on-one and group tutoring in varied couses. They are then assigned tutees.

Upper Division

ED 309. FIELD PRACTICUM (1-6). Placement in either an elementary, middle or secondary school. To assist students to develop competencies in dealing with children or adolescents according to the individual major of the university student.

ED 312. INTRODUCTION TO CURRICULUM AND INSTRUCTION (3). This course will cover an overview of public school curricula K-12 and various instructional approaches, models and strategies that are used in school to facilitate learning.

ED 313. TRENDS AND ISSUES IN EDUCATION (3). This course includes the relationship between school and society in America, the role of the teacher, exploration of curricula trends and issues which affect the structure and directions of education. Designated for undergraduate students who wish to explore education as a professional goal.

ED 341. OTHER WAYS OF KNOWING (3). An introductory course which covers three cenrtal themes: the psychology of learning and brain research, the nature of science as a system of thought, and learning theory and its application.

ED 350. AFRICAN AMERICAN ISSUES (3). Overview of African-American culture, status, role, and influence in the U.S. The course explores issues which shape and impact the African-American experience.

ED 406. PROJECTS/TUTORING (1-3).

ED 407. SEMINAR (1-16).

ED 408. WORKSHOP (1-3).

ED 411. EDUCATIONAL PSYCHOLOGY, LEARNING AND DEVELOPMENT (3). This course is designed as an opportunity to begin the transition from student to teacher. Explores the relationship between human development and learning through the life cycle. to this course.

ED 412/ED 512. PSYCHOLOGY OF THE ADOLESCENT (3). Covers the research and influence of social, physical, psycholmotor, intellectual, cognitive and peer relations as they relate to learning and development of the middle/secondary school student. Investigates the influence of peer groups and the environment as well as identifies at-risk students.

ED 415. STRUCTURE AND DYNAMICS OF PROFESSIONAL TECHNICAL EDUCATION (3). Major forces influencing work force education and training. Professional technical programs examined in the context of a continuously changing world.

ED 416/ED 516. STUDENTS AND TEACHERS, SCHOOLS AND COMMUNITIES (3). This course is designed to reflect the interdependence of students, teachers, schools, and communities and their individual and collective inpact on the educational process and the implications of their impact on curriculum, instruction, and the operation of schools.

ED 417. RESEARCH AND EXPERIMENTATION IN TECHNICAL EDUCATION (3). Application of research procedures to work place systems and technology. This course examines relationships between education, technology, work place, workers, family, and community. Issues such as the changing work place and work force, worker demographics, global systems, higher performance work place standards, management statagies (TQM) , productivity and retraining will be explored.

ED 463. ENVIRONMENTAL EDUCATION (3). Acquaintance with basic concepts with special attention to meaning, scope, value, and philosophical foundations.

ED 464. ENVIRONMENTAL EDUCATION PRACTICUM (3). Planning, conducting, and evaluating field experiences.

ED 465. ADMINISTRATION OF ENVIRONMENTAL EDUCATION (3). Planning, supervision, administration,personnel, financing and evaluation of program.

Graduate

ED 501. RESEARCH (1-16).

ED 502. INDEPENDENT STUDY (1-16).

ED 503. THESIS (1-16).

ED 505. READING AND CONFERENCE (1-16).

ED 506. PROJECTS (1-3).

ED 507. SEMINAR (1-16).

ED 508. WORKSHOP (1-16).

ED 509. PRACTICUM (1-16).

ED 510. INTERNSHIP (1-18). By special permission and arrangement.

ED 511. HUMAN DEVELOPMENT, LEARNING AND EDUCATION (3). Covers the implications in interdependence of human development and learning on educational processes. COREQ: Admission to Professional Teachers Education Program or permission of instructor.

ED 512. PSYCHOLOGY OF THE ADOLESCENT (3). Covers the research and influence of social, physical, psychomotor, intellectual, cognitive and peer relations as they relate to learning and development of the middle/secondary school student. Investigates the influence of peer groups and the environment as well as identifies at-risk youth.

ED 513. SCHOOL ADMINISTRATION AND THE LAW (3). Legal framework of public education, church-state education, relationships, school boards, tort liabilty, contract liability, certification, employment, tenure, discharge of personnel, student civil rights, and rights of students and reachers concerning race, sex, handicap, age, marital status, and national origin.

ED 514. THE EDUCATOR AND THE LAW (3). For teachers and administrators concerned with the law as it relates to public education.

ED 515. ELEMENTARY SCHOOL SUPERVISION AND ADMINISTRATION (3). Roles, duties, needs, problems; evaluation and improvement of teaching and learning. PREREQ: Elemtary certification; one year of elementary teaching experience.

ED 516. STUDENTS AND TEACHERS, SCHOOLS AND COMMUNITIES (3). This course is designed to reflect the interdependence of students, teachers, schools, and comminities and their individual and collective impact on the curriculum, instruction, and the operation of schools. COREQ: Admission to the Professional Teacher Education Program.

ED 517. EDUCATION AND WORK (3). Issues related to work in the U.S. and other countries. The role of public, private, corporate, government, military and other education and training programs in meeting changing individual, corporate, and social work-related needs.

ED 520. CLASSROOM MANAGEMENT AND DISCIPLINE K-12 (3). Knowledge of discipline and classroom management techniques through examination of the litarture and school observations. Explore factors which influence behavior problems, including those associated with social and/or multicultural students populations.

ED 521. SELECTED TOPICS IN EDUCATION (1-3). May be repeated for nine(9) hours.

ED 522. CURRICULUM FOUNDATIONS (3). Anexamination of the development of contemporary frameworks of curricula and instruction; social forces; including the treatment of existential, humanism, behaviorism, social reconstructionism, scientific-technological approaches and curricula anchored on academic subject matter.

ED 523. CURRICULUM AND THE PROCESS OF EDUCATION (3). The global nature of the curriculum, the forces and controversies that shape it; the nature of instruction and the factors that influence it; the obligations of instruction, instructional approaches, models, and strategies that facilitate learning. Oregon's approach to curriculum and instruction.

ED 524. CURICULLUM IMPLEMENTATION AND EVALUATION (3). Review of the research literature on curriculum implementation and evaluation; comparison of research and evaluation procedures which reflect normative and empirical aspects of teaching and learning; exploration of issues, processes, skills and content necessary for implementation and evaluation of curiculum. PREREQ: ED 522

ED 525. ELEMENTARY SCHOOL CURRICULUM (3). Pupil needs in-life situations, objectives, essentials of a goal program, varying curriculum designs, organization of learning experiences, evaluation of learning, and appraisel of new curriculum practices. PREREQ: Elementary school experience.

ED 526. DEVELOPMENTALLY APPROPRIATE CURRICULUM (3). This course covers major theories of child development, developmental patterns in cognitive, social, and emotional development of children and appropriate environment that promotes the growth, development, and learning of children.

ED 527. CURRICULUM DEVELOPMENT IN READING (3). Examines the current research and practices to develop reading curriculum for elementary, middle, secondary, and adult programs. Set goals, objectives, means of evaluation and criteria for curriculum in reading used in the various educational settings.PREREQ: ED 585, ED 591.

ED 528. BASIC AND ESSENTIAL SKILLS IN EDUCATION (3). Course will cover current research findings from educatioal research to better understand and cope with student's difficulties in learning. Students will devise and evaluate a plan for assessing and correcting specific teaching/learning problems K-12. Also covers the Oregon Essential Skills.

ED 529. SPLIT BRAIN RESEARCH AND LEARNING THEORY (3). An examination of split brain research and learning theory and application to teaching and learning.

ED 530. TRAINING AND DEVELOPMENT IN BUSINESS AND INDUSTRY (3). Purpose and function of training and development programs within an organization; philosophy, goals, precursors, and trends.

ED 531. INSTRUCTIONAL SYSTEMS DESIGN (3). Instructional systems theory, conceptual and procedural models. Emphasis on the role of the professional instructional designer in training systems development and instructional project management.

ED 532. EVALUATING TRAINING PROGRAMS (3). Strategies for determining if planned results are being achieved and what inpact results are having on the host organization.

ED 533. ANALYZING PERFORMANCE PROBLEMS (3). Principles of performance technology. Approaches and procedures for analyzing performance discrepancies as preliminary steps in the design and development of training or other performance interventions. PREREQ: ED 530.

ED 534. TRAINING MATERIAL DESIGN (3). Design principles for print and non-print training materials for adult learners. Emphasis on the development of materials for four major training strategies: group presntations, group participation, individual self training and on-the-job performance aids. PREREQ: ED 530.

ED 535. SELF TRAINING SYSTEMS (3). Princples of self training strategies for adult learners; factors that affect the success of self training systems in an organization; design of the self training materials including coputer and video delivery systems. PREREQ: ED 578

ED 536. MANAGING TRAINING PROJECTS (3). This course is intended for the person who will manage training projects. Course work is organized around a five-step approach to project management: activating the project, establishing the project organization, developing impementation plans, obtaining resources, and establishing information and control systems. PREREQ: ED 531.

ED 537. WRITING PROPOSALS FOR TRAINING PROGRAMS (3). Analyzing requests for proposals; specifying project outcomes, tasks, schedules, personnel, budgets, and evaluation.

ED 538. PLANNING AND MANAGING TRAINING (3). Establishing a training system within an organization; strategic planning, budgeting, staffing, evaluation and cost-benefit analysis. PREREQ: ED 530, ED 533.

ED 539. SCRIPTING TRAINING PRODUCTIONS (3). Forms, styles, treatments and technical processes for developing training scripts. Emphasis on training the trainer manuals, documentation video and slide/sound scripts. PREREQ: ED 534.

ED 540. THE AMERICAN COMMUNITY COLLEGE (3). History and philosophy of the comminity and junior college; goals, functions, populations served, faculty and student characteristics, organizations and issues confronting the two-year colleges in America. PREREQ: Graduate standing.

ED 541. COMMUNITY COLLEGE CURRICULUM (3). Corriculum development and management; faculty evaluation; issues within curricular functions; staff development; and techniques for assessing and evaluating the effectiveness of curricular functions.

ED 542. INSTRUCTION DESIGN FOR INTERNATIONAL TRAINING (3). Design and development of instructional materials for use in overseas training setting.

ED 543. TEACHING AND TRAINING OVERSEAS (3). Teaching strategies for customizing training on the local situation.

ED 544. MANAGING INTERNATIONAL TRAINING PROGRAM (3). Planning, organizing, scheduling, monitoring, and controlling international training program.

ED 545. STUDENT DEVELOPMENT IN UNIVERSITIES (3). Theoretical and philosophical foundations of students development; analysis of college student characteristics and the student culture; non-traditional students sub-groups; student attitudes, values, and beliefs; concepts and models which promote student learning; and assessment of student growth.

ED 547. POSTSECONDARY INSTRUCTIONAL STRATEGIES (3). Professional awareness of the competence, concerns, methods, techniques of postsecondary teaching. The college instructors role in relation to the missions of postsecondary institions.

ED 551. COGNITIVE PSYCHOLOGY AND LEARNING (3). Examin current research on human learning from the perspective of both cognitive and behavioral theorists. Emphasis on learning within the content areas such as mathematics, science, writing as well as other content areas of the curriculum.

ED 552. DEVELOPMENT PSYCHOLOGY AND LEARNING (3). In-depth study of the domains of developmental stages; biological, environmental determents, research methods in developmental psychology and various theoretical constructs that are incorporated in the field.

ED 553. LEARNING THEORIES (3). In-depth study of the major families that describe the learning process; Gagne', Bruner, Piaget, Skinner, Bandura; how learning is related to teaching and how learning theory affects the teaching process. Information theories and learning, memory, learning models, transfer and problem solving and motivation and learning are the major concepts covered in this course.

ED 554. THE DYNAMIC CURRICULUM (3). The student will learn to develop, plan and implement curriculum as well as evaluate major curricular reform documents, assessment as the role it plays in curriculum development.

ED 555. INTEGRATION OF THE DISCIPLINE (3). The student will develop an integrated unit of work for an appropriate grade level, understand how the various academic discipline in the elementary school are integrated and can plan and teach an integrated lesson.

ED 556. STRATEGIES: LANGUAGE ARTS (3). Role of language arts in elementary school. Objectives: research findings; the teaching of spelling, writing, and speaking-listening skills; new instructional materials and programs; testing and evaluation. PREREQ: classroom teaching experience or consent of instructor.

ED 557. STRATEGIES: MATHEMATICS (3). For experienced teachers and prinipals interested in designing new or improving existing mathematics curricula; learning theory, research, and instructional programs with classroom organization and modes of learning; emphasis on design curriculum foundations, theory, and construction rather than on content and materials. PREREQ: successful elementary teaching experience or consent of instrucor.

ED 558. STATEGIES: SOCIAL SCIENCES (3). Analyzes structure of several social science disciplines; research literature pertaining to social studies instruction. PREREQ: classroom teaching experience or consent of instrutor.

ED 559. STRATEGIES: SCIENCE (3). Emerging program in elementary science with emphasis on the interdependence of content and process in scientific inquiry; general, diagnostic, and prescriptive techniques in science instruction. PREREQ: classroom teaching experience of consent of instructor.

ED 560. RESEARCH IN LEARNING (3). This course allows the student, though application, to use their research in learning to better structure the classroom as a learning environment; strategies for transfer; essential skills, and cognitive, affective and psycholomotor development. PREREQ: Elementary M.A.T. only.

ED 561. RESEARCH IN INSTRUCTION (3). The student will identify, analyze and implement the research foundations of instruction; the theories of instruction basic strategie for instruction, and the assessment of instruction in the context of multicultural and normal classroom settings.

ED 562. INTRODUCTION TO RESEARCH METHODS IN EDUCATION (3). An introductory course for master's students as well as in-service teachers. Explains quantitative and qualitative research methods in education; classroom action research and understanding of the fundamental statistical procedures used in the interpretation and use of research studies.

ED 563. INTRODUCTION TO EDUCATIONAL MEASUREMENT (3). Scales and scaling techniques, methods of analysis, statistics for understanding standardized and informal testing. Construction and administration of criterion referenced tests, teacher-made tests and standardized tests commonly used in the public schools.

ED 564. INTERMEDIATE EDUCATIONAL MEASUREMENTS (3). Test development and item analysis, test bias, basic definition in reliability, validity and item response theory. PREREQ: ED 563.

ED 565. APPLIED RESEARCH IN EDUCATION (3). The student will identify a statement of classroom research related to teaching, develop a research plan, and monitor the research throughout the academic year in a classroom setting. PREREQ: Elementary M.A.T. only.

ED 566. EVALUTION OF INSTRUCTION AND LEARNING (3). Theory and techniques to help classroom teachers interpret test scores and construction examinations that assess a variety of student outcomes. PREREQ: ED 562.

ED 567. LEADERSHIP DEVELOPMENT AND HUMAN RELATIONS (3). Adult education and basic career expections in community based education. Understanding and development of leadership roles in this area of educational planning. PREREQ: ED 530 or ED 568.

ED 568. EDUCATION AND TRAINING FOR ADULTS (3). Overview of the nature, extent, and significance of adult education and training; historical development in the U.S. and abroad; the nature of adult groups, institutions, agencies, and programs; the literature of adult eduaction and training.

ED 569. COLLEGE AND ADULT READING (3). Prepares students and in-service teachers to teach reading, basic literacy skills and communication skills to community college students, college students and adults; includes goals and objectives, course organization, CAI, management procedures, assessment techniques and develop a physical setting for a fully functional reading, writing and basic literacy program.

ED 570. THEORETICAL FOUNDATIONS OF ESL/EFL (3). An examination of the nature of languages and language acquisition for constructing an integrated theoretical rationale for teaching English to adults in societal contexts where English is the lingua franca (ESL) as well as where English is taught primarily in formal school settings without the support of the society at large (EFL); analysis of the body of literature dealing with a) second language acuisition, b) issues and approaches in the teaching of communicative competence and c) the relevence of basic principles to actual practice in teaching-learning contexts.

ED 571. METHODS AND MATERIALS IN ESL/EFL (3). An analysis of current methods, curricular paradigms and materials in teaching English to adults in English as a second and foreign language contexts; course empasizes the impotantance of establishing congruency between/among the students cultural background and his/her language and academic needs.

ED 572. CURRICULUM AND MATERIALS IN DEVELOPMENTAL EDUCATION (3). Study of current materials, methods, and curricula models in developmental education as used in post secondary education setting.

ED 573. PRINCIPLES AND PRACTICES IN DEVELOPMENTAL EDUCATION (3). Analysis of various philosophical and practical aspects surrounding developmental education; current practices of the field conducted both throunh first hand on site observation and though examination of current literature.

ED 574. SUPERVISION (3). Problems, issues, theories and practices of supervision, especially for teachers, administrators and counselors. Supervisory roles, styles, goals and problems conceptually analyzed relative to changing demands of individuals, schools, and society. Theories of leadership; budgeting; curriculum planning, clinical techniques, group processes, teacher evaluation and related approaches to the improvement of education service and programs.

ED 575. EDUCATIONAL FINANCE (3). Finance, budgeting and accounting sources on revenue; defferal, state and local financing, budgeting and accounting models, practical experience combined with examination of theory, trends and issues. Focus in either public schools, community colleges or higher education through practical experience.

ED 576. EDUCATION FACILITIES (3). Planning, financing, equiping and remodeling public school and higher education facilities, managing and maintaining current facilities; effective use of educational facilities; ecological and aesthetic considerations; enrollment projections and needs assessment.

ED 577. PROGRAM DESIGN AND MANAGMENT (3). Design, coordination and implementation of adult education programs in all settings; situations, objectives, content and instructional resources, promotion and evaluation.

ED 578. ADULT DEVELOPMENT (3). Social scientific literature contrubuting to a better understanding of human development during the adult years. PREREQ:ED 568.

ED 579. HUMAN GROWTH AND DEVELOPMENT (3). Development patterns of growth from childhood though adolescence. Muscular activity, perceptlon, intelligence, cognitive growth, formal and informal language development and cultural context and their implications for the learning environment.

ED 580. EDUCATION AND CONTEMPORARY TRENDS IN THOUGHT (3). May be repeated for nine (9) hours. Six major intellectual movements that have formed the ethos for the contemporary period, their impact upon the nature of the educational system in the United States, and their implications for the future. Social Darwinism and nineteenth-century scientism; pragmatism, pragmaticism, and instrumentalism; Marxism, Freud and psychoanalytic thought; Science in the twentieth century, existentialism.

ED 582. LEGAL ISSUES IN HIGHER EDUCATION (3). A comprehensive presentation and discussion of the law governing administration within community colleges and college/univesities with a special empasis on student services administration.

ED 583. DEVELOPMENTAL READING (3). Devlopmental reading programs to K-9, specific reading skill needs, techniques, organizational strategies, materials and content area reading. Empasis on the developmental nature of the reading process as a life-long activity. PREREQ: Elementary M.A.T. only.

ED 584. READING AND STUDY STRATEGIES FOR DEVELOPMENTAL EDUCATION (3). Strategies and techniqes for middle/secondary and community college teachers; covers reading, listening, writing, and a broad range of study skills for effective and efficient reading and studying in the content areas of the curriculum. PREREQ: ED 573.

ED 585. READING AND THE DISABLED READER (3). Explores causal factors in reading/learning disabilities; strategies for correction; lesson plans, individualized instructional program for correction; role of self-concept and classroom environments that affect the disabled learner.

ED 586. DIAGNOSTIC TECHNIQES IN DEVELOPMENTAL EDUCATION (3). Lecture-discussion and laboratory use of standardized test; construction and use of informal measures for estimating reading achievement. Differential instruction for elementary, secondary and college. PREREQ: ED 573.

ED 588. MATERIALS, MEDIA AND COMPUTER ASSISTED INSTRUCTION IN (3). READING. Explore, examine and use various types of print and nonprint materials and media used to teach reading in grades K-12. Also examine, evaluate and use computer assisted instruction materials to teach reading.

ED 589. CHILDREN'S BOOKS IN ELEMENTARY SCHOOL (3). This course is designed to assist students to recognize the various genres of children's literature and to evaluate examples of each genre. Focus is to enable students to incorporate children's books of all kinds into the curriculum, especially language arts and reading.

ED 590. CORRECTIVE READING (3). Techniques and strategies to identify and ocrrect reading and study skills deficits that impair student learning at all levels of the educational experience. Emphasis is placed on corrective techniques in vocabulary developmen, comprehension and study skills to improve the students' reading ability.

ED 591. LANGUAGE, READING, AND COGNITIVE DEVELOPMENT (3). Covers cognitive theory, language development and its relationship to the reading process; research on metacognition, language and reading; relationship between written and oral language and its effects on cognition and language development.

ED 592. READING ENRICHMENT THROUGH CHILDREN'S LITERATURE (3). An advanced course that will focas on research and effective integration of literature in the secondary curriculum. Students will be able to apply research on issues in literature to plamming appropriate curriculum experiences. Student will also become familier with young adult literature and its effective use in subject matter reading.

ED 593. READING AND WRITING IN THE MIDDLE AND SECONDARY SCHOOL (3). Reading and writing methods which can be used by middle/secondary school teachers to individualize instruction, correct basic reading and writing skills in content area; promote learning and the use of reading materials as supplementary teaching materials.

ED 594. LITERACY AND COMMUNICATIONS (3). Deductive and inductive methods of teaching vocabulary, comprehension and metacognitions skills in the content areas. Study skills for the various content areas will also be stressed. Effective teaching strategies to incorporate communications and literacy skills into secondary content teaching. PREREQ: Admission to the Professional Teacher Education Program.

ED 595. PSYCHOLOGY OF READING (3). Intensive investigation of reading as a cognitive process, as a skill, principles of acquisition, language and language awareness, preception, home, school environments and the exploration of reading as a literacy acquisition. PREREQ: ED 579

ED 596. TECHNOLOGY FOR TEACHERS (3). Examines technology and its application in education and the work place. Instructional tools incuding computers, CD-ROM, laserdisk, satellite communications, telecommunications, video, and multi-media will be examined. Explores technology as a social endeavor and the need to evaluate technology effectively.

ED 597. SOCIO-CULTURAL AND LINGUISTIC FACTORS IN STUDENT SUCCESS (3). Identification of factors such as socioeconomic status, minority/ethnic group identification, language background and learning modalities as they relate to academic and effective development; flexible teaching strategies that are socioculturally and individually appropriate.

ED 598. THE EDUCATIONALLY DIVERSE LEARNER (3). Covers the learning disabled learner, at-risk student, language diverse student; assessment and instructional strategies for instructional implementation.

ED 599. CROSS CULTURAL COMMUNICATIONS (3). An examination of individual and cultural values, preceptions, and assumptions regarding the foreign born, refugees, American minorities, and undocumented persons existing within society and schools; development of communication skills for negotiating at the individual, group, and institutional and cross-cultural level.

ED 601. RESEARCH (1-16).

ED 603. DISSERTATION (1-16).

ED 605. READING AND CONFERENCE (1-16).

ED 606. WORKSHOP (1-16).

ED 607. SEMINAR (1-16).

ED 608. WORKSHOP (1-16).

ED 609. PRACTICUM CLINICAL EXPERIENCE (1-16).

ED 610. INTERNSHIP (1-15).

ED 611. HISTORY OF EDUCATIONAL THOUGHT (3). Intellectual and social history and development of American Education. Common Schools movement; rural/urban, inner city education; curriculum reform; efficiency desegregation, pluralism.

ED 612. RESEARCH DESIGN AND TECHNIQUES IN EDUCATION I, II (3). Qualitative research design for the social sciences; case study research design, and ethnographic research design as well as historical research methods. Data gathering sampling techniques, models and concepts fot research design by application to field and laboratory studies. May be taken for two quarters.

ED 615. CURRICULUM CONSTRUCTION (3). An analysis of curriculum structure, pattern organization used to build teaching and learning environments; covers scope, sequence, continuity and integration of curriculum design in the classroom. PREREQ: ED 522, ED 524.

ED 618. ANTHROPOLOGICAL AND SOCIOLOGICAL APPROACHES (3). Examines research and knowledge for the fields educational anthropology and sociology. Includes such topics as relationship between the schooland home cultures; macro- and micro-enthnographic educational research; culturally compatible classroom practices, conflict vs. functionalist theories views of education; latent function of schooling practices; tracking and desegregation inequality; social mobility; ideology and the curriculum. PREREQ ED 597.

ED 620. SUPERVISION AND ADMINISTRATION OF READING PROGRAMS (3). A course designed for reading supervisors, coordinators, administrators at all education levels. Overview of curriculum development, budget process, in-service fuctions, supervisory roles of reading supervisors/ coordinators/administrators; program evaluation as well as development and training and supervision of tutors, volunteers, and aids for the classroom. PREREQ: ED 522, ED 583 or equivalent.

ED 621. SELECTED TOPICS IN EDUCATION (3). May be repeated for eighteen (18) credits.

ED 640. COMMUNITY COLLEGE ADMINISTRATION (3). Two-year college funding patterns, state and local systems of organization, management and leadership issues, patterns of internal and external governance, institutional planning, and methods for institutional advancements. PREREQ: Community college teaching/administrative experience.

ED 802. INDEPENDENT STUDY (1-3).

ED 805. READING AND CONFERENCE (1-16).

ED 806. PROJECTS (1-3).

ED 807. SEMINAR (1-3).

ED 808. WORKSHOP (1-3).

■ COUNSELOR EDUCATION PROGRAMS

Graduate Major

Counseling (M.S., Ph.D.)

The M.S. degree in Counseling leads to Basic and Standard endorsements for the Oregon Personnel Service license as well as eligibility for Oregon Licensed Professional Counselor application.

School counselor licensing can be obtained in one of two ways: Track-I and Track-II. Track I preparation requires prior public school teaching experience and specific course work in the counselor program. Track-II preparation is available for persons without teacher license or experiences and requires completion of the M.S. degree including specific school-based course work in addition to the state requirements for school counselor preparation. Track-II students must present evidence of a passing score on the CBEST as part of their application materials.

The doctoral program in Counseling is designed to prepare experienced counseling professionals to extend their roles in the counseling profession. The doctoral program is appropriate for those whose career path is that of research and teaching in counselor preparation programs, in student development at a college or university level, or in supervisory positions in schools or agencies.

Counselor Education Programs are accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP).

Admission to the M.S. Program

Admission to the program is by application to the Graduate School and to the Counselor Education Program. The minimal prerequisite is a bachelor's degree. Persons holding a master's degree may apply for non-degree status or a second master's. Admission is not based exclusively on academic success in courses. Screening includes a minimum GPA of 3.00 and a personal interview in which the applicant's educational goals, experience, and employment status are reviewed. Academic background, personal and emotional stability, and educational and professional goals of each candidate are evaluated before admission is granted. Prior counseling-related academic work from an accredited institution may meet, in part, the requirements of the program.

Admission to the Ph.D. Program
It is expected that individuals entering the program will have completed a master's degree in Counseling which covers the nine areas of concentration required by the Council for Accreditation of Counseling and Related Educational programs (CACREP). The nine areas are Human growth and development, social and cultural foundations, helping relationships, groups, career and lifestyle development, Appraisal, research and program evaluation, professional orientation and clinical instruction. In addition, the counselor education faculty expects a background in abnormal psychology, family counseling, and chemical dependency counseling. Areas not covered in the student's master's program or through continuing higher education must be taken in doctoral study.

Applicants are preferred who have a minimum of three years of post-master's experience as a counselor. Preference will be given to National Certified Counselors (NCCs) and /or state Licensed Professional Counselors (LPCs). It is also expected that applicants will have participated in counseling as a client prior to admission to the program. Desirable, but not essential, is work in the field of education such as teaching; school administration; curriculum or instruction; and/or educationally related work in child, youth, or adult development programs.

An application packet may be obtained from the Office of the Assistant Director. Included in the application will be demonstrated evidence of counseling competence through submission on an audio- or videotaped counseling session. A personal interview is also a final step in the application process. Applications received prior to February 15 will be given preference.

Requirements for the Ph.D.
A minimum of 148 credits is required beyond the baccalaureate degree. The program includes thesis (36 credits), internship (13 credits), and 66 credits in specialty areas, including participation in the five core doctoral seminars (see program requirements for Ph.D. with a major in Education). Doctoral students can meet the majority of their residency and course requirements in two years of full-time study.

COURSES

COUN 501. RESEARCH (1-16).

COUN 502. INDEPENDENT STUDY (1-16).

COUN 503. THESIS (1-16).

COUN 505. READING AND CONFERENCE (1-3).

COUN 506. SPECIAL PROJECTS (1-3).

COUN 507. SEMINAR (1-3).

COUN 508. WORKSHOP (1-3).

COUN 509. PRACTICUM IN COUNSELING (3-6). Designed to develop competencies in basic skills, facilitative dimensions, and counseling process. Self critique, peer critique, and supervisor critique of video taped interviews. Written self critique, oral case presentation and charting skills are learned. Practica are graded on a pass/no pass credit basis only. A pass requires at least B level work. PREREQ: Admission to program.

COUN 510. COUNSELING INTERNSHIP (1-15). The internship is the culminating field experience of the M.S. in Counseling program. It is designed to provide the student with an on-site placement in a public or private mental health or school setting that will create the necessary bridge between training and professionalism. Students are expected to function per the expectations of other full-time employees and counseling staff at the internship site. Internships are graded on a pass/no pass credit basis only. A pass requires at least B level work. PREREQ: Six credits of COUN 509 and core program sequence.

COUN 511. STUDY OF SCHOOLS: K-12 (3). Structured observation in selected K-12 school sites. Total of 125 hours of observation, as required by the Oregon Teacher Standards and Practices Commission for persons without prior teaching experience. PREREQ: Admission to Track II program.

COUN 512. CLASSROOM INSTRUCTION FOR COUNSELORS (3). 75 hours of supervised instruction in a public school setting. PREREQ: COUN 511.

COUN 525. FUNDAMENTALS OF COUNSELING (3). A course designed for students planning on working in a human service profession, such as counseling, teaching, nursing, medicine, law. Exploration of basic helping processes appropriate in a variety of settings. Review of ethical standards of conduct. A variety of skills and techniques are demonstrated and practiced through videotape and role play.

COUN 531. DEVELOPMENTAL PERSPECTIVES IN COUNSELING (3). A study of affective, behavioral, cognitive, physical, and moral development for human growth and maturation. Theories of personality and learning which affect normal and non-normal development. Relationship of understanding human development to the counseling profession.

COUN 532. SOCIAL AND CULTURAL PERSPECTIVES IN COUNSELING (3). Social and cultural factors affecting counseling. Includes studies of change, ethnic groups, sub-cultures, changing roles of women, sexism, urban and rural societies, population patterns, cultural mores, use of leisure time, and differing life patterns. PREREQ: Admission to program.

COUN 541. THE COUNSELING PROFESSION (3). This course provides the foundation for becoming a counselor and explores the psychological and philosophical ramifications of the counselor in a changing world. Topics will include: values in counseling, ethical and legal issues in counseling, research in counseling, and maintaining a professional identity. PREREQ: Admission to program.

COUN 542. THE COUNSELING RELATIONSHIP I (1). Focus in this experiential class is on the counselor as a person. The importance of the self and knowing one's personal strengths and weaknesses as a counselor is stressed. The importance of giving the receiving feedback is also emphasized. PREREQ: Admission to program.

COUN 543. THE COUNSELING RELATIONSHIP II (1). Understanding the self as counselor in the work setting is emphasized. Development and identification of one's personal style of management assists the counselor in maintaining effective work relationships. Conflict resolution strategies are presented. Emphasis is also placed on the development of the counselor as a change agent. PREREQ: COUN 542.

COUN 544. THE COUNSELING RELATIONSHIP III (1). This course centers on development and maintenance of the counselor as a professional in the field. The importance of professional organizations, continuing education, skill enhancement, supervision, and maintaining self while working as a counselor are covered. Ways to avoid burn-out through stress reduction techniques are also emphasized. PREREQ: COUN 542.

COUN 551. THEORY AND TECHNIQUES OF COUNSELING I (3). Basic concepts and facilitative skills of helping relationships. Introduction and overview of counseling theories and their related processes and techniques. PREREQ: Admission to program.

COUN 552. THEORY AND TECHNIQUES OF COUNSELING II (3). Continued development of the theories and techniques of counseling including identification of the counseling process. Emphasis on personality development and affective, behavioral and cognitive approaches. PREREQ: COUN 551.

COUN 553. THEORY AND TECHNIQUES OF COUNSELING III (3). Advanced study of counseling theories and techniques. Special emphasis is placed on alternative counseling strategies and counseling special populations. Students develop a personal counseling position paper. PREREQ: COUN 552.

COUN 567. APPRAISAL OF THE INDIVIDUAL (3). Development of framework for understanding the individual; methods for data gathering and assessment; individual and group testing; case study approaches; observational, sociometric, and environmental procedures; study of individual differences. Ethnic, cultural, and sex factors are emphasized. PREREQ: Basic statistics course.

COUN 568. LIFESTYLE AND CAREER DEVELOPMENT (3). Major theoretical approaches to career development; available resources for educational and occupational assessment; procedures to enhance career exploration, planning and placement. Emphasis is on the decision-making process and issues of career counseling with special populations.

COUN 571. GROUP COUNSELING PROCEDURES (3). A conceptual and experiential introduction to group dynamics. Group counseling approaches and models; issues of group leadership; styles of leadership and group facilitation skills. Consideration is given to group counseling goals, composition, phases and research. PREREQ: Admission to the program.

COUN 572. ADVANCED GROUP COUNSELING PROCEDURES (3). Theory and practice of group counseling in a variety of settings. Assessment, intervention, and observation skills are emphasized. The course will include didactic and experiential components pertinent to group facilitation and leadership. PREREQ: COUN 571.

COUN 575. FAMILY COUNSELING (3). An overview of the major theoretical approaches to family counseling will be covered. Through the use of readings, demonstrations, and videos the student will become familiar with systems foundations, the history of family counseling, family roles, interaction patterns, and decision-making processes.

COUN 580. SELECTED TOPICS IN COUNSELING (1-3). Graded P. Current developments in the field of counseling, including such topics as: substance abuse, person abuse, eating disorders, chronic illness. May be repeated with different topics for a maximum of nine credits. PREREQ: Admission to program.

COUN 581. CROSS-CULTURAL COUNSELING (3). Cognitive and experimental study of social and psychological variables influencing the cross-cultural counseling relationship. Social and psychological experiences of selected sub-cultures. Relevant assessment instruments and current literature, methods and outcome studies. PREREQ: Permission of instructor.

COUN 583. DEATH, DYING AND GRIEVING (3). Development of counseling approaches and skills in helping individuals cope with loss. Theoretical, philosophical and practical aspects of death education and counseling are explored. Emphasis is placed on the importance of self-knowledge as a counselor for the grieving. PREREQ: Permission of instructor.

COUN 591. SEXUAL COUNSELING (3). Sexual self-understanding related to the helping professional. Acceptance and comfort in sexual issues in counselor-client relationship. Specific tools will be employed; variety of treatment modalities are presented. This course is not intended to train sexual therapists. PREREQ: Admission to program or permission of instructor.

COUN 601. RESEARCH (1-16).

COUN 602. INDEPENDENT STUDY (1-16).

COUN 603. DISSERTATION (1-16).

COUN 605. READING AND CONFERENCE (1-16).

COUN 606. PROJECTS (1-16).

COUN 607. SEMINAR (1-16).

COUN 608. WORKSHOP (1-16).

COUN 609. PRACTICUM IN COUNSELING (1-12). Specialized counseling experiences supervised by a professional. Emphasis is on development of advanced skills in counseling specific to a population. and supervisor.

COUN 610. INTERNSHIP IN COUNSELING (1-12). Designed to provide experiences in development of teaching and supervision skills in preparation as a counselor educator and supervisor.

COUN 696. COUNSELOR EDUCATION (3). Experience and training to develop effective counselor educators, trainers, and supervisors. Primarily for counselor education and supervision training at the doctoral level, but open to advanced students in related helping professions. Emphasis on investigation of research in the field of counseling, theoretical considerations, planning strategies, programming and evaluation of effectiveness. PREREQ: Documented background in counselor training (or related profession), including equivalent of 30 credits and a minimum of two years of counseling experience.

COUN 697. COUNSELOR SUPERVISION (3). Practical experience for counseling professionals who have responsibility directing personal and professional development of counselors, promoting counselor competency, and developing and implementing counseling services and programs. Theoretical models of supervision are utilized to develop supervisor roles. PREREQ: Admission to doctoral program.

COUN 698. COUNSELOR CONSULTATION (3). Development of consultation skills as a supervisor and counselor educator. Consultation theory and practice are studied. Students practice consultation skills and receive feedback. PREREQ: Admission to doctoral program.

COUN 808. WORKSHOP (1-3).

■ PROFESSIONAL TECHNICAL EDUCATION

Undergraduate Major

Technology Education (B.S.)

The B.S. in Technology Education prepares mid-level and secondary technology education teachers; community college technical instructors, and trainers for business and industry. Lower division course work may be completed at an Oregon community college or the Oregon Institute of Technology. Completion of the program prepares students to apply for entry into either the Master of Education (Ed.M.) or Master of Arts in Teaching (M.A.T.) program.

To graduate with a B.S. degree in Technology Education, a student must complete 192 credits of course work as follows:

Baccalaureate Core (48)

College of Liberal Arts (58)
ANTH 202. Comparative Culture (3)
ANTH 380. Cultures in Conflict (3)
COMM 111. Public Speaking (3)
COMM 114. Argument and Disclosure (3)
EC 213, EC 214. Principles of Economics (3, 3)
PHL 205. Ethics (4)
PSY 201, PSY 202. General Psychology (3,3)
SOC 204. Introduction to Sociology (3)
SOC 205. Institutions and Social Change (3)
WR 121. English Composition (3)
WR 327. Technical Writing (3)
Literature and Arts (3)
Cultural diversity in addition to ANTH 202 (3)
Social science and humanities electives: 12 credits of upper-division course work from:
COMM 322. Small Group Problem Solving (3)
EC 436. Labor Economics (4)
EC 457. Industrial Organization (4)
PS 331. State Government and Politics (3)
PSY 360. Social Psychology (3)
PSY 496. Occupational Psychology (3)
SOC 437. Minority Groups and Issues (3)
SOC 456. Science and Technology in Social Context (3)

College of Science (53)
CS 101. Computers: Applications and Implications (4)
BI 201, BI 202. Introductory Biology (4,4)
PH 201, PH 202. General Physics (5,5)
BI 333. Environmental Problem Solving (3)
HSTS 420. History of Technology (3)
HSTS 421. Technology and Change (3)
MTH 111. College Algebra (4)
MTH 245. Mathematics for Management, Life and Social Science (4)
ST 351. Introduction to Statistical Methods (4)
Science electives: 12 credits of upper division course work from:
MTH 105. Introduction to Contemporary Mathematics (3)
BI 301. Human Impacts on Ecosystems (3)
BI 370. General Ecology (3)
HSTS 413. History of Science (3)
HSTS 416. Science and the Emergence of Modern Society (3)

HSTS 417. History of Medicine (3)
PH 313. Energy Alternatives (3)
ST 352. Introduction to Statistical Methods (4)

College of Health and Human Performance (3)
HHP 231. Lifetime Fitness for Health (3)

School of Education (15)
ED 406. Projects (3)
ED 407. Seminar (6)
ED 415. Structure and Dynamics of Professional Technical Education (3)
ED 416. Research & Exp. in Professional Technical Education (3)
Nine credits of upper division course work in education
ED 435. Education in Technology (3)

FOOTNOTES

*Baccalaureate Core Course

^Writing Intensive Course (WIC)

[1]May be counted only once toward graduation requirements.

[2]May not be repeat of BA courses listed above.

[3]Course opened only to students admitted to professional majors in Apparel, Interiors, Housing and Merchandising, or in other majors requiring this course.

[4]Course may not be counted as a part of the requirement for a graduate major in the department.

[5]Courses in school administration which may be transferred to the administrative certification programs at the University of Oregon, Portland State University and Lewis and Clark College. Other courses may also be accepted by these institutions with the approval of the program adviser.

The College of Oceanic and Atmospheric Sciences has a three-fold mission: to increase the world's store of knowledge about the oceans and atmosphere through research which furthers national atmospheric and oceanic endeavors; to transmit this knowledge to future scientists by educating students for careers in oceanography, atmospheric science, geophysics, and related fields; and to extend this information on the atmosphere, the marine environment and its natural resources to the people of the state and nation to aid in the wise development and management of the oceans and atmosphere.

Since its inception in 1959 as a department, oceanography at Oregon State University has grown to a college with a faculty of 98 scientists, all leaders in their research areas. In 1992, the Department of Atmospheric Sciences was merged with the college to form the present unit. The college is now Oregon's principal source of expert knowledge about the atmosphere and the ocean, especially the northeast Pacific which has long been the focus of major research efforts by OSU oceanographers. It conducts the only comprehensive oceanographic and atmospheric research programs in Oregon. Today, research activities of the college extend throughout the world, and to all oceans. Its advanced degree graduates hold oceanographic positions throughout the United States and many countries of the world. Students from all over this country and from other countries are enrolled in the four graduate programs of the college. By 1994, 771 advanced degrees in oceanography had been awarded at OSU. COAS is a member of the Joint Oceanographic Institutions (JOI Inc.), which represents the ten major oceanography schools in the U.S. In 1993 the college received the third largest amount of support from Ocean Sciences of the U.S. National Science Foundation. In 1991, it was selected by NASA as a data analysis site for its Earth Observation System (EOS) project, part of the U.S. Global Change Research Program.

Faculty

Professors Abbott, Allen, Bennett, Byrne, Caldwell, Chelton, Coakley, Cowles, de Szoeke, Dillon, Duncan, Dymond, Esbensen, Gonor, Hixon, Holman, Horton (Fisheries & Wildlife), Huyer, Keller, Komar, Kulm, Levi, Mahrt, McDougal (Civil Engineering), C. Miller, Nelson, Paulson, Pisias, Schmitt (Chemistry), Shifrin☆, Simoneit, F. Smith (Agricultural & Resource Economics), R. Smith, Unsworth, Wheeler, Zaneveld; *Associate Professors* Barnes, Christie, Collier, Egbert, Fisk, Freilich, Good☆, Gordon, Huh, Klinkhammer, Kosro☆, Levine, Lillie (Geosciences), R. Miller, Mix, Moum, Nabelek, Nielsen☆, Padman☆, Pillsbury☆, Prahl, Richman, B. Sherr, E. Sherr, Strub, Trehu; *Assistant Professors* Barth☆, Beach☆, Chen, Falkner, Graham☆, Hart☆, Levy☆, Matano☆, Smyth☆, Vong; *Research Associates* Boyd, Crawford, Desiderio, Fessenden, Goldfinger, Hazra, Grover, Hogan, Jayakumar, McManus, Newberger, Slinn, Spita, Sun, Wolfe, Yuan

Adjunct Appointments:

de Young (OSU), Frenkel (OSU), Hildreth (UO), Jacobson (UO), Kolbe (OSU), Lannan (OSU), Matzke (OSU), Morrissey (OSU), Sampson, C. Smith (OSU), Sylvia (OSU), Yeats (OSU).

Courtesy Appointments:

Auyong (HMSC), , E. Carey (OSU), Choi (Korea), Cone (OSU), Davis (NMFS), Drake (OSU), Embley (NOAA), Foreman (Canada), Fox (NOAA), Gallardo (Chile), Gieskes (SIO), Hammond (NOAA), Humphreys (U of O), Inomaka (Japan), Jeong (Korea), Kuenvolden (USGS), Lowry (OSU), Lupton (NOAA), Markham (Arch Cape), Olla (NMFS), Peterson (ATS), Rudnicki (UK), Torres (GeoMar), Young (EPA)

Undergraduate Minor

Oceanography

Graduate Majors

Geophysics (M.A., M.S., Ph.D.)

Marine Resource Management (M.A., M.S.)

Oceanography (M.A., M.S., Ph.D.)

Graduate Areas of Concentration

Biological Oceanography
Chemical Oceanography
Geological Oceanography
Physical Oceanography

Atmospheric Sciences (M.S., Ph.D.)

Graduate Areas of Concentration

Air-Sea Interaction
Atmospheric Chemistry and Pollution
Atmospheric Radiation and Remote Sensing
Global Climate Dynamics
Large-Scale Dynamics and Planetary Atmospheres
Turbulence and Convection
Statistical and Applied Meteorology

TEACHING AND RESEARCH

The teaching and research programs within the college are highly interdisciplinary. They emphasize the interdependence of biological, chemical, physical, geological, and geophysical processes within and under the sea, and their interactions with atmospheric processes. The faculty of the college comprises groups of scientists representing each of the basic disciplines involved in the study of the sea and atmosphere. The interdisciplinary character of the college promotes the rapid exchange of ideas often necessary for the solution of research or management problems. Graduate students are essential participants in carrying out the research programs of the college.

UNDERGRADUATE OFFERINGS

Most employment in oceanography, atmospheric sciences and geophysics requires a graduate degree. Students planning on graduate study in the college are advised to complete a baccalaureate degree in a basic natural science, mathematics, or engineering. The college provides undergraduates with the opportunity to become acquainted with the fields offered through undergraduate-level courses in oceanography and atmospheric sciences taught by leading scientists.

Undergraduates interested in the marine sciences can complete a minor in oceanography by following the curriculum below. This minor will add interdisciplinary breadth to undergraduate programs, broadening employment prospects, and

Footnotes for this section on page 277.

Oceanography Administration Building 104
Oregon State University
Corvallis, OR
97331-5503
(503) 737-3504
Fax (503) 737-2064

ADMINISTRATION

G. BRENT DALRYMPLE
Dean Interim

NICKLAS G. PISIAS
Associate Dean

IRMA DELSON
Assistant Director Student Services

JUDITH VERGUN
Director, NAMS Program

ES W. GOOD
ector, MRM Program

FREDERICK JONES
ine Superintendent

enhancing chances for gaining admission to graduate programs. The undergraduate oceanography minor is suggested for students in any of the major programs of the College of Science, in Fisheries or Engineering. The minor also provides a broad environmental science background for students planning to become high school teachers of earth or life sciences. The oceanography minor is administered under the Dean by the Oceanography Student Services office, which provides guidance in completing the minor and having it appear on the student's transcript.

Oceanography Minor (27)

OC 331. Introduction to Oceanography (3)
OC 332. Coastal Oceanography OR
OC 333. Oceanic Research Frontiers (3)
OC 440. Intro to Biological Oceanography (3)
OC 450. Chemical Oceanography (3)
OC 460. Geological Oceanography (3)
OC 430. Principles of Physical Oceanography (4) or OC 433. Coastal and Estuine Oceanography (3) or Coastal and Estuine Sedimentary Processes (3)
OC 401. Research Projects or OC 405. Reading and Conference or OC 495. Special Topics in Oceanography (3)
MRM 414. Ocean Resources Management (3) or MRM 415. Coastal Resources Management (3)
One of the following:
Additional course in Oceanography or Marine Resource Management (3) or ATS 210. Introduction to the Atmospheric Sciences (3)
Z 351. Marine Ecology (3) or FW 431. Dynamics of Marine Biol Res (4)
GPH 463. Intro Solid Earth Geophysics or other approved course (3)

Degree Programs

Although the college provides some undergraduate courses, it offers graduate degrees only. Programs leading to the Master of Science (M.S.), Master of Arts (M.A.), and Doctor of Philosophy (Ph.D.) degrees are available in biological, chemical, geological, and physical oceanography, in geophysics, and in atmospheric sciences. In addition, the college offers a master's degree in marine resource management.

Job Opportunities

Graduate study in the college prepares students for research, teaching, and management positions in academic, industrial, and governmental organizations. Branches of the federal government employing atmospheric scientists, geophysicists, and oceanographers include the Navy, the Coast Guard, the Department of the Interior, the National Oceanic and Atmospheric Administration, the Department of Energy, the Army Corps of Engineers, and the Environmental Protection Agency.

The main U.S. research effort in oceanography, atmospheric science, and geophysics is centered around federal agency programs or federally funded programs. Most of the research in these fields, conducted in universities is supported by federal grants and contracts. There are career opportunities in marine and atmospheric education and research in many colleges and universities, especially at those institutions in the coastal and Great Lakes states. Opportunities for oceanographic and atmospheric research careers are also found in private enterprise, especially in businesses involved with the use of marine and coastal resources and in which climate and weather are important influences.

Admission Requirements

Requirements for admission to the graduate programs in the college:

1. A bachelor's degree with a major (40 quarter credits or more) in a basic natural science (such as physics, mathematics, chemistry, biology, geology, atmospheric science, or computer science) or engineering. Marine resource management applicants must also have a bachelor's degree, but the major may be in the social or political sciences, economics, business administration, the natural sciences, fisheries, or engineering.
2. A minimum cumulative grade-point average of 3.00 on a 4.00 scale for the last 90 quarter credits of undergraduate work.
3. One year each of undergraduate course work in physics, chemistry, and calculus. Qualified applicants deficient in these prerequisites may be admitted conditionally.
4. Graduate Record Examination (GRE) scores (general and advanced).
5. Three letters of recommendation.
6. A score of 550 or higher on the TOEFL for applicants from countries where English is not the official language.

Students may apply for admission any term. Early application is recommended.

Program Recognition

The Western Interstate Commission for Higher Education (WICHE) has selected the biological, chemical, geological, and physical M.S. and Ph.D. programs as well as the marine resource management master's program as unique or specialized graduate programs it coordinates in the Northwest. Residents of Alaska, Arizona, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Utah, Washington, and Wyoming, who major in these programs, pay resident tuition rates at OSU.

Program Requirements

Oceanography and marine resource management students are required to take prescribed core courses in each of the following fields: biological, chemical, geological, and physical oceanography. Geophysics students are normally required to take one or more courses in physical and geological oceanography in addition to their geophysics courses. Atmospheric sciences students are required to take core courses in atmospheric radiation, dynamics and cloud physics.

Students in Oceanography, Atmospheric Sciences, and Geophysics usually minor in some other field of science, mathematics, statistics, or engineering. Marine resource management students have multidisciplinary programs and do not declare a minor.

Master's Programs

All students must satisfy the minimum program requirements (45 credits including 6 credits of thesis) established by the Graduate School. Some graduate credits earned at other institutions may be approved for inclusion in the program. Marine resource management graduate programs have 60 credits of course work and six credits of internship.

A two-hour, final oral examination is required upon completion of the master's program.

Marine Resource Management Program

This master's degree program is designed to prepare students for direct entry into careers in resource management. The program, which is usually completed within two years, consists of courses in oceanography, economics, fisheries, and business administration. Courses may also be taken in the Colleges of Engineering, Agriculture, Science, and Liberal Arts. Each program is adjusted to the needs of the individual. No thesis is required, but students complete an internship or research report. Applicants must meet the general admission requirements of the college.

Doctor of Philosophy Program

In all graduate programs in the college, the content of Ph.D. programs, other than core requirements, is determined by individual students and their committees. Specific University requirements are formulated by the Graduate School. Approximately 80 credits of courses in the graduate major (including the core courses and 30 to 35 credits of thesis) are usually included in the major. A first and second minor or an integrated minor totaling about 40 credits is common. Graduate credits earned at other institutions may be accepted in the major and minor. There are no fixed requirements on the number of course credits to be taken; each program corresponds to the needs of the individual candidate. The dissertation is based on an original investigation in some area of the graduate major.

Courses taken as a part of the master's program at OSU are normally transferable into the Ph.D. program.

Oceanography Graduate Minors

Master's candidates who wish to minor in oceanography must take one course in physical oceanography and from 8 to 15 credits of other oceanography courses.

Ph.D. candidates who wish to minor in oceanography must take the core oceanography courses. If oceanography is the first minor, the program should include a total of approximately 30 credits of oceanography.

RESEARCH VESSEL

The college's major research vessel, the *R/V Wecoma*, is based at the Hatfield Marine Science Center in Newport, 50 miles (90 kilometers) from the Corvallis campus. The ship, which came into service in early 1976, is 185 feet long (56.4 meters) and has space for 18 scientists. It is especially designed for oceanographic research and is used mainly for deep ocean work.

COMPUTING RESOURCES

A new facility, the Environmental Computing Center (ECC) was completed in 1993, to house the College's computing resources. For high performance computing the ECC provides two Thinking Machine supercomputers, and a cluster of IBM RS/6000 workstations. For file/application service, three SUN 690-class file servers are available. A digital media lab contains a variety of computers including a UNIX workstation, an Intel CPU-based PC and a high performance Macintosh. High quality black-and-white and color printers and a CD-ROM mastering and etching device for production of CD-ROMs are also located in the digital media lab. A visualization lab contains state-of-the-art computing and video equipment for producing data visualizations and complete video presentations of research projects.

An extensive installed network, connecting computing equipment within the College, is linked externally for electronic communications and remote computing. In the College's local network domain, twelve buildings are connected together via optical fiber cabling so that sharing of information and utilization of college computing resources can be maximized. There are over 100 UNIX workstations and 150 PCs and Macintoshes connected to this College network, along with laser printers and plotters. From this local network domain, the College is connected to the OSU campus network which in turn is connected to the global network of the Internet, where vast computing resources (e.g., NCSA, NCAAR, UCSD) can be accessed and over which world-wide electronic communication is possible. A separate computer system for Atmospheric Science research, located in Strand Hall, is based on two SUN Sparc 1+ workstations with a color graphics system. Computing facilities for students include three student computing labs, providing over 25 UNIX, PC and Mac platforms where scientific and productivity software applications can be used and where students can log onto the College network and onto the Internet.

COURSES

Many of the courses in the college are offered every other year. Consult the *Schedule of Classes* or the college student services office for current offerings.

■ OCEANOGRAPHY

Lower Division Courses

OC 199. SPECIAL TOPICS IN OCEANOGRAPHY (1-3). Introduction to topics of current interest in oceanography for lower division undergraduates. May be repeated on different topics for credit.

Upper Division Courses

OC 331. INTRODUCTION TO OCEANOGRAPHY (3). A comprehensive survey of oceanography as interdisciplinary marine science. Plate tectonics and the origin of ocean basin geological features, geochemistry and the origin of sea water. Marine sediments and minerals. Chemical and physical properties of sea water. Climate and air-sea interactions; El Niño events. Oceanic circulation, waves and tides; processes and causes. Oceanography from space. Coastal and estuarine processes. Biotic communities and adaptations in open ocean, deep sea, and bottom environments. Biological processes in the sea: marine production and oceanic food webs; controlling factors. Oceanic fisheries and their limits. Offered every quarter.

OC 332. COASTAL OCEANOGRAPHY (3). Physics, geology, biology and hydrology of coastal oceans. How coastal waters respond to forcing by heating, cooling, winds, tides, waves, rain, evaporation, river runoff and freezing. Geography and geology of coastlines: erosion and deposition processes, beach dynamics. Coastal equilibrium cells as sources and sinks of sediment. Rocky shore, beach, mudflat, estuarine, and coastal biotic communities; animal migrations. Law of the Sea rights and responsibilities of coastal states. Fisheries and mariculture in coastal seas. Pollution and coastal ocean resources. Using a matrix to define environment problems; pathways that pollutants take through the coastal ecosystem. Offered annually.

OC 333. OCEANIC RESEARCH FRONTIERS (3). An introduction to oceanographic research today. Current and developing concepts, techniques, and questions in geological, physical, chemical, and biological oceanography, presented by College of Oceanography researchers. Topics include formation of the planet, the ocean, and the ocean basins; sea floor geologic and geochemical processes; oceanic interaction with global climate; satellite observations; microbial and large scale biological processes. Brief overview introduces each lecture. Video format, with classroom, live broadcast, and tape-delayed viewing options. PREREQ: OC 331 recommended. Offered annually.

OC 401. RESEARCH PROJECTS (1-4). Field and laboratory research in oceanography for undergraduates, resulting in a written report. Consent and approval of research problem by supervising faculty required before registration.

OC 405. READING AND CONFERENCE (1-4). Independent library research and reading in specialized topics in oceanography for undergraduates, guided by discussions in conferences with faculty. A written report may be required. Consent and topic approval by supervising faculty required before registration.

OC 407. SEMINAR (1-3). Undergraduate seminar on current developments in the oceanographic research literature, with student presentations and group discussions. A written report may be required.

OC 495. SPECIAL TOPICS IN OCEANOGRAPHY (1-4). Subjects of current interest in oceanography, not covered in depth in other courses. For upper-division undergraduates. May be repeated on different topics for credit. PREREQ: Varies with current topic.

Graduate Courses

OC 501. RESEARCH (TBA). Original research work that will not be part of the data used in a thesis. Consent of supervising faculty required. Graded P/N.

OC 503. THESIS (TBA). Thesis research and writing.

OC 505. READING AND CONFERENCE (TBA). Independent reading and library research on specialized topics in oceanography, guided by discussions with supervising faculty. A written report may be required. Consent and topic approval required before registration.

OC 506. PROJECTS (TBA).

OC 507. SEMINAR (1-3). Section 1: Student presentations and discussions of current research literature or personal research results. OC 507B: Original research presentations by visiting scientists, OSU faculty and graduate students presenting final thesis results. Other sections and specific topics by arrangement.

OC 508. WORKSHOP (TBA). Section 3: Computer Applications Workshop (1). Introduction to the computing systems, networks, and software applications available to students in the College of Oceanic and Atmospheric Sciences. Emphasis is placed on basic computing skills, specific hardware and applications required by students for COAS courses and research.

OC 601. RESEARCH (TBA). Original research work that will not be part of the data used in a thesis. Consent of supervising faculty required. Graded P/N.

OC 603. THESIS (TBA). Thesis research and writing.

OC 605. READING AND CONFERENCE (TBA). Independent reading and library research on specialized topics in Oceanography, guided by discussions with supervising faculty. A written report may be required. Consent and topic approval required before registration.

OC 606. PROJECTS (TBA).

OC 607. SEMINAR (1-3). Section 1: Student presentations and discussions of current research literature or personal research results. OC 607B: Original research presentations by visiting scientists, OSU faculty and graduate students presenting final thesis results. Other sections and specific topics by arrangement.

OC 608. WORKSHOP (TBA). Section 3: Computer Applications Workshop (1). Introduction to the computing systems, networks, and software applications available to students in the College of Oceanic and Atmospheric Sciences. Emphasis is placed on basic computing skills, specific hardware and applications required by students for COAS courses and research.

■ BIOLOGICAL OCEANOGRAPHY

OC 440/OC 540. INTRODUCTION TO BIOLOGICAL OCEANOGRAPHY (3). Introduction to the ocean as an ecosystem, with emphasis on the processes affecting productivity and structure of oceanic communities. Interactions of biological processes with chemical, physical and geological processes in the ocean. Effects of light and nutrients on phytoplankton, grazing by zooplankton, microbial activity and recycling, distributional patterns of zooplankton and nekton, ecology of benthic animals, marine fisheries and pollution problems. Offered annually.

OC 441/OC 541. MARINE ZOOPLANKTON (4). Small animal life in the sea: Population biology, biogeography, migrations, life cycles, physiology. Role of zooplankton in pelagic ecosystem dynamics is examined through modeling. PREREQ: An ecology course, invertebrate zoology, or OC 440/OC 540. Offered alternate years.

OC 446/OC 546. ECOLOGY OF COASTAL MARINE FISHES (2). Behavioral, population, and community ecology of fishes inhabiting subtidal marine systems, especially temperate and tropical reefs. Distributional patterns, foraging and predation, competitive interactions, reproduction, and recruitment. PREREQ: Two years of biology; OC 440/OC 540 is recommended. Offered alternate years.

OC 641. BIOLOGICAL OCEANOGRAPHY LABORATORY. (3) Laboratory and field experience with techniques for the determination of standing stocks of planktonic organisms, rate measurements and analyses of physiological adaptations to oceanic environmental variables. PREREQ: OC 440/OC 540 or consent of instructor. Offered alternate years.

OC 642. MARINE NEKTON (3). Biology of oceanic and deep sea fishes, squids, and shrimp, including sampling methods, vertical distribution and migration, bioluminescence, buoyancy, locomotion, migration, special adaptations, and relationships with oceanographic processes. PREREQ: OC 440/OC 540 or equivalent. Offered alternate years.

OC 643. MARINE NEKTON LABORATORY (1). To be taken concurrently with OC 642. Offered alternate years.

OC 644. MARINE PHYTOPLANKTON ECOLOGY (3). Floating plant life in the sea and estuaries; systematics and distribution; physiology; population dynamics; environmental factors; artificial cultivation, effect upon environment and position in food webs. PREREQ: OC 331 or OC 440/OC 540 or two years of biology. Offered alternate years.

OC 645. MARINE PHYTOPLANKTON PHYSIOLOGY (4). Life processes of plankton algae: energy-capturing processes, mineral nutrition, flotation mechanisms, cell division. Evaluation of experimental procedures; problems of existence in the open ocean; artificial production of maximum yields. PREREQ; OC 644. Offered alternate years.

OC 646. PHYSICAL/BIOLOGICAL INTERACTIONS IN THE UPPER OCEAN (4). Variability in physical oceanic processes in the upper ocean and relationship to spatial and temporal variations in biomass, growth rates, and other biological patterns in the organisms of ocean surface waters. The relationship between variability in ocean physical phenomena and ecosystem dynamics, including the requirements of sampling design for upper ocean ecological studies. Time and space scales of physical and biological phenomena in the upper ocean PREREQ: OC 430/OC 530 and OC 440/OC 540 or permission. Offered alternate years.

OC 647. MARINE MICROBIAL PROCESSES (4). Roles of procaryotic and eukaryotic microbes in the biological and chemical processes of the sea, with emphasis on pelagic ecosystems. Functional and taxonomic types and distribution of marine microorganisms. Biochemical and physiological processes of major groups of microbes as these relate to geochemical cycles of biologically active elements in the sea. Heterotrophic and mixotrophic protists in pelagic foodwebs. Discussion of current experimental approaches to determining aspects of microbial activity and production. PREREQ: Two years of biology, OC 440/OC 550, or consent of instructor. Offered alternate years.

OC 648. MARINE BENTHIC ECOLOGY (3). Ecology of marine benthic organisms. Interactions of benthos with chemical, physical and geological properties of sediments and with boundary layer flows. Feeding, energetics and production of individuals; interactions at the level of populations and communities. Remineralization and benthic-pelagic coupling. Ecology of hydrothermal vent fauna. PREREQ: Z 451 or equivalent. Offered alternate years.

OC 649. SPECIAL TOPICS IN BIOLOGICAL OCEANOGRAPHY (1-4). Special topics of current interest in biological oceanography not covered in detail in other courses. May be repeated on different topics for credit.

■ CHEMICAL OCEANOGRAPHY

OC 450/OC 550. CHEMICAL OCEANOGRAPHY (3). Chemical properties and processes in the oceans. Composition, origin and evolution of sea water; thermodynamic and kinetic predictions for reactions in sea water; homogeneous and heterogeneous equilibria; major and minor element reservoirs and fluxes; vertical and horizontal transport of materials; isotopic clocks and tracers; nutrients; chemical properties and processes in sediments. PREREQ: One year of college-level general chemistry. Offered annually.

OC 651. ADVANCED CHEMICAL OCEANOGRAPHY (3). Advanced topics in chemical oceanography, including those of timely interest. Descriptive and theoretical models of chemical properties and processes in sea water; geochemical and biochemical cycles; sea water chemistry at high pressures and temperatures and in specialized environments; sea water-sediment interactions; analytical and theoretical advances. PREREQ: OC 450/OC 550. Offered alternate years.

OC 652. CHEMICAL OCEANOGRAPHY LABORATORY (3). Chemical analytical techniques for seawater and marine sediments. Topics include: salinity; dissolved oxygen; nutrients; the CO2 system; dissolved and particulate organic materials; trace metals; radionuclides; analytical barriers and recent advances. PREREQ: OC 450/OC 550 or consent of instructor. Offered alternate years.

OC 653. MARINE RADIOCHEMISTRY (3). Basic principles of radioactive decay and growth; marine biogeochemistry of uranium and thorium series radionuclides; release of artificial radionuclides into marine environments; applications of radioisotopic techniques to oceanic circulation and mixing, paleoceanography, sediment geochronology, archeometry, and marine pollution. PREREQ: One year of college-level general chemistry. OC 450/OC 550 desirable. Offered alternate years.

OC 654. MARINE POLLUTION (3). Identification of sources for organic and inorganic pollutants in estuarine, coastal and oceanic environments; mechanisms of introduction and dispersal; chemical and biological behavior and removal processes; regional and global scale effects; case studies and future research strategies; monitoring programs for pollution assessment. PREREQ: OC 450/OC 550. Offered alternate years.

OC 656. MARINE ORGANIC GEOCHEMISTRY (3). Models for the formation and decomposition of simple and macromolecular organic matter in waters and sediments of the marine environment. Chemotaxonomic methods to distinguish sources of sedimentary organic matter and to identify the processes that influence the transfer and preservation of organic matter in the geological record. PREREQ: CH 332 or CH 336 and OC 450/OC 550. Offered alternate years.

OC 657. MARINE ECOLOGICAL BIOCHEMISTRY (3). A detailed exploration of chemical communication in the oceans, considering the chemistry of dissolved biochemicals in sea water and the ecological consequences of their production and reception. Topics include release and uptake of dissolved organic materials in sea water, chemical competition for essential trace elements, chemical cues to location, feeding, development, and reproduction, and pollutant interference in chemical communication. Assigned readings, discussion format. PREREQ: College-level biochemistry and/or college-level ecology. REC: OC 450/OC 550. Offered alternate years.

OC 658. PETROLEUM GEOCHEMISTRY (3). Introduction to the nature of organic carbon in the geological record. The composition, formation and migration of petroleum and its maturation in terms of diagenesis, catagenesis and metamorphism by geothermal and hydrothermal processes. Source rocks, reservoirs, and alteration. Oil-to-oil, oil-to-source rock and other correlations, prospect evaluation and basin modeling. A brief overview of production and refining of oil and other fossil fuels. PREREQ: One year college-level organic chemistry. Offered alternate years.

OC 659. SPECIAL TOPICS IN CHEMICAL OCEANOGRAPHY (1-4). Special topics of current interest in chemical oceanography not covered in detail by other courses. May be repeated on different topics for credit.

■ GEOLOGICAL OCEANOGRAPHY

OC 460/OC 560. GEOLOGICAL OCEANOGRAPHY (3). Structure of ocean basins, plate tectonics and sea floor spreading, marine sedimentation, history of ocean basins, and analysis of geological and geophysical data. PREREQ: One year each of physics and chemistry or science background. Offered annually.

OC 461/OC 561. MARINE GEOLOGY CASE STUDIES (1-3). Modular course providing laboratory experience in current marine geological research areas. Modules are self contained projects, based on current faculty research or recently published literature. Modules include field trips to examine marine sedimentary and submarine volcanic rocks and to observe coastal processes, including beach morphology and sedimentary processes. Examination of deep sea sediment cores including chemical and paleontologic analysis to extract paleoclimate or paleoenvironmental information. Experimental igneous petrology. Relationships of submarine basalt chemistry to topographic and tectonic features. Plate tectonic reconstructions. PREREQ: OC 460/OC 560 or equivalent, one year each physics, calculus and geology, and consent on modules. Offered annually.

OC 464/OC 564. COASTAL AND ESTUARINE SEDIMENTARY PROCESSES (3). Nearshore ocean processes including tides, sea-level variations, waves, currents, sediment transport, and the resulting beach morphology; coastal erosion problems and management issues; dynamics of estuarine sedimentation. PREREQ: PH 212 and MTH 252, or equivalents. Offered alternate years.

OC 528. MICROPROBE ANALYSIS (3). Theory and application of electron microprobe analysis to problems in geology, engineering, chemistry, physics and biology. CROSSLISTED as G 528.

OC 660. PALEOCEANOGRAPHY (3). Large-scale changes in the oceanic and atmospheric system, as recorded in marine sediments, and their implications for understanding global environmental changes. Chemical, physical, and biological proxies for oceanic and atmospheric processes in the geologic record period. Evidence for changing global climate at time scales longer than the historical record; the oceanic history of the Late-Cenozoic ice ages, long-term evolution of climate change patterns, catastrophic global environmental events, and application of quantitative models to the past. Current research topics in paleoceanography. PREREQ: OC 560 or OC 662, or consent of instructor. Offered alternate years.

OC 661. PLATE TECTONICS AND STRUCTURE OF OCEAN BASINS (3). Evidence and predictions of plate tectonic model; structure and evolution of divergent and convergent plate margins; petrology of oceanic crust and upper mantle; lithosphere-mantle interaction; evolution of oceanic lithosphere; models for development of continental margins. PREREQ: One year each of physics, calculus, and geology. Offered annually.

OC 662. PHYSICAL, CHEMICAL AND BIOLOGICAL SEDIMENTATION IN THE OCEANS (3). Fundamentals of transport, chemical reactions and biological processes in sediment formation; including fluid flow and drag, threshold and sedimentary bed forms, sources, facies and budgets of sediments, early diagenetic reactions, marine microfossil stratigraphy and paleoceanographic interpretations. Offered annually.

OC 663. DEEP-SEA SEDIMENT RECORD (3). Nature and distribution of deep-sea deposits; factors controlling the distribution of terrigenous, volcanic, biogenic, and authigenic components; diagenesis and redistribution at the ocean floor; ancient deep-sea sediments. Offered alternate years.

OC 664. LITTORAL PROCESSES AND SEDIMENTATION (3). Nearshore environmental processes including an examination of real waves (wave theories and their application, refraction, diffraction, reflection, and breaking); generation of longshore and rip currents, mechanics of sediment transport on beaches, and features of recent sediments. PREREQ: General physics; integral and differential calculus. Offered alternate years.

OC 665. ANALYSIS OF GEOLOGIC DATA BASES (4). Spatial and stratigraphic characteristics of geologic data; geologic data bases; application of matrix theory to the solution of geologic problems; descriptive models, predictive models, spatial models, and stratigraphic and time-series models. PREREQ: One year of statistics and one year of computer science. Offered alternate years.

OC 666. ISOTOPIC MARINE GEOCHEMISTRY (3). Radiogenic and light stable isotopes and application to composition and evolution of the suboceanic mantle, petrogenesis of the oceanic crust, sediment provenance and sedimentary processes, geochronology, seawater chemical dynamics and paleoclimatology. Offered alternate years.

OC 667. IGNEOUS PROCESSES IN THE OCEAN BASINS (3). Origin and evolution of oceanic crust including the origin and nature of chemical heterogeneity and igneous rocks in the ocean basins; interaction of mantle and lithosphere as reflected in the topography of ocean basins; hydrothermal processes and the alteration of oceanic crust; geothermometry and geobarometry of oceanic magmas; elementary fractionation patterns and modeling of partial melting; fractional crystallization in oceanic magmas. Offered alternate years.

OC 668. THERMODYNAMICS IN MARINE GEOLOGY (3). Quantitative application of thermodynamics to problems of igneous and metamorphic geology and hydrothermal solutions. The principles of energy, enthalpy, entropy, and activity in solids, liquids, and gases. Equilibrium processes related to melting, crystallization, mineral chemistry, distribution of trace elements between phases, geothermometers, and geobarometers. PREREQ: Physical chemistry or theoretical petrology. Offered alternate years.

OC 669. SPECIAL TOPICS IN GEOLOGICAL OCEANOGRAPHY (1-4). Subjects of current interest in geological oceanography, not covered in depth in other courses. May be repeated on different topics for credit.

■ PHYSICAL OCEANOGRAPHY

OC 430/OC 530. PRINCIPLES OF PHYSICAL OCEANOGRAPHY (4). Fundamental principles of physical oceanography—conservation of mass, heat, momentum and vorticity; equations governing motion in the ocean; geostrophy; planetary boundary layers; wind-driven and thermohaline circulation. Descriptive oceanography—application of the fundamental principles to the ocean; examination of the major current systems; water mass analysis. PREREQ: One year of college physics and college calculus. Offered annually.

OC 433/OC 533. COASTAL AND ESTUARINE OCEANOGRAPHY (3). Circulation of the coastal ocean including continental shelf circulation, upwelling, coastal jets, undercurrents, coastal-trapped waves. Fundamentals of surface waves and tides; tsunamis, wind generation, breaking waves. Estuary classification and circulation patterns; shallow-water processes and beach morphology. PREREQ: One year college physics, one year calculus. Offered alternate years.

OC 670. FLUID DYNAMICS (4). Fundamentals of fluid dynamics; conservation of laws of mass, momentum, and energy; inviscid and viscous flows; boundary layers; vorticity dynamics; irrotational and potential flow. PREREQ: One year of college physics; mathematics through differential equations and vector calculus. Offered annually.

OC 671. GEOPHYSICAL FLUID DYNAMICS (4). Dynamics of rotating and stratified fluids, potential vorticity, geostrophic motion; inviscid shallow-water theory, Poincare, Kelvin, and Rossby waves; geostrophic adjustment, quasigeostrophic approximation, Ekman layers, two-layer and continuously stratified models. PREREQ: OC 670. Offered annually.

OC 672. THEORY OF OCEAN CIRCULATION (4). Theory of steady and time-dependent large-scale circulation in ocean basins. Effects of earth's curvature: the beta-plane approximation. The wind-driven Sverdrup circulation, western boundary currents, eastern boundary upwelling; the effects of friction. Linear theory and nonlinear theory; inertial gyres. Effects of buoyancy forcing; heating, cooling, evaporation, precipitation; density stratification. Wind- and buoyancy-forced circulation in the thermocline; ventilation. Potential vorticity conservation and homogenization. PREREQ: OC 670 and OC 671. Offered annually.

OC 673. DESCRIPTIVE PHYSICAL OCEANOGRAPHY (4). Fundamental mass, force and energy balances of the ocean—geostrophy; planetary boundary layers; wind-driven and thermohaline circulation; vorticity; air-sea fluxes of heat, salt, moisture and momentum. Application of these balances through descriptive examination of the ocean—global heat budget; surface current systems; abyssal circulation. Study of variability on a variety of time and space scales. Instrumentation and platforms used for observing the ocean. PREREQ: OC 430/OC 530 or OC 670, or ATS 415/ATS 515. Offered annually.

OC 674. TURBULENCE (4). Governing equations, turbulent kinetic energy, vorticity dynamics; turbulent transports of mass and momentum; statistical description of turbulent flows, spectral dynamics; turbulent boundary layers, planetary boundary layers in the atmosphere and ocean, convective mixed layers, stable boundary layers; deep ocean turbulence. PREREQ: OC 670.

OC 675. NUMERICAL MODELING IN OCEAN CIRCULATION (4). Review of theoretical models of ocean circulation, including shallow water, barotropic, quasigeostrophic, and primitive equation models; adjustment times, internal length and time scales; the role of advection, bathymetry and coastlines; global models, basin models, regional models and models of jets, eddies and boundary currents. Review of numerical techniques and problems specific to ocean modeling. Local facilities are used to develop models on remote supercomputers. PREREQ: OC 670, MTH 625, MTH 626 or equivalent, and a working knowledge of FORTRAN. Offered alternate years.

OC 676. INVERSE MODELING AND DATA ASSIMILATION (4). Survey of methods for combining oceanographic observations and observing systems with numerical models of ocean circulation. Topics include: finite-dimensional least squares theory with inequality constraints, optimal interpolation, the representation theory of smoothing; the Kalman smoother and filter; gradient descent methods for minimization; spatial and temporal regularity of filters and smoothers; linear theory of array design; nonlinear optimization, practical assimilation methods. PREREQ: Strong background in linear algebra and advanced calculus, geophysical fluid dynamics, numerical modeling of ocean circulation. Offered alternate years.

OC 678. SATELLITE OCEANOGRAPHY (3). Theory and applications of satellite remote sensing observations of the ocean with emphasis on strengths and limitations in the measurements. Topics include review of electricity and magnetism, absorption and scattering in the atmosphere (radiative transfer), satellite orbital mechanics, measurements of ocean color, infrared remote sensing, microwave radiometry, scatterometry, and satellite altimetry. PREREQ: MTH 252, PH 212 or equivalent. Offered alternate years.

OC 679. SPECIAL TOPICS IN PHYSICAL OCEANOGRAPHY (1-4). Subjects of current interest in Physical Oceanography, not covered in depth in other courses. May be repeated on different topics for credit.

OC 680. STABILITY OF GEOPHYSICAL FLUID FLOWS (4). Baroclinic instability—linear and nonlinear stability problems; models of Eady and Charney. Instability of parallel shear flow—linear inviscid theory; Rayleigh's theorem; nonlinear contour dynamics; effects of stratification; Taylor-Goldstein equation. Thermal instability—the linear Rayleigh-Bernard problem; nonlinear models; the Lorenz equations, chaos and strange attractors. Geostrophic turbulence—resonant Rossby wave interactions; energy and enstrophy. Instability of nonparallel flow—Arnold's criteria. PREREQ: OC 670. Offered alternate years.

OC 681. GEOPHYSICAL WAVES. (4). Fundamentals of wave dynamics applied to geophysical fluids. Hyperbolic waves—linear and nonlinear; characteristics; shock waves. Dispersive waves—linear waves, dispersion relations, group velocity; isotropic and anisotropic dispersion; nonlinear solitary waves. Application to geophysical waves—surface gravity, capillary, internal gravity, Kelvin, planetary, coastal. PREREQ: OC 670. Offered alternate years.

OC 682. OCEANOGRAPHIC AND ATMOSPHERIC DATA ANALYSIS I: BASIC TECHNIQUES (4). Theory of classical and modern time series analysis techniques with application to real oceanographic and atmospheric data. Topics include sampling errors, confidence tests, least squares analysis, Fourier analysis, sampling theory, autospectral analysis, cross spectral analysis and empirical orthogonal function analysis. PREREQ: MTH 252, MTH 341, ST 623 or equivalent, OC 508C or OC 608C and working knowledge of Fortran. Offered alternate years.

OC 683. OCEANOGRAPHIC AND ATMOSPHERIC DATA ANALYSIS II: ADVANCED TECHNIQUES (3). Theory and application of advanced data analysis techniques. Topics include advanced least squares, data filtering, advanced empirical orthogonal function analysis, objective analysis, and advanced spectral analysis. PREREQ: OC 682. Offered alternate years.

■ GEOPHYSICS

GPH 463/GPH 563. INTRODUCTORY SOLID EARTH GEOPHYSICS (4). Principles of geophysics including seismology, gravity, magnetism, heat flow and applications to plate tectonic theory. Laboratory exercises include computer modeling and interpretation of observed data. Designed for students with backgrounds in geology. PREREQ: MTH 251 and PH 211, PH 212. Offered annually. CROSSLISTED as GEO 463/GEO 563.

GPH 464/GPH 564. SEISMIC REFLECTION INTERPRETATION (4). Use of seismic reflection data to interpret subsurface geology. For students with backgrounds in either geology or geophysics. Emphasis on the integration of reflection data with other types of geophysical and geological data to interpret the structure and stratigraphy of sedimentary basins and the gross structure of the earth's crust. Brief overview of wave propagation theory and acquisition and processing procedures. Laboratory exercises include computer modeling of reflection data and interpretation of profiles from a wide variety of tectonic settings. PREREQ: GEO 463/GEO 563, GPH 463/GPH 563. Offered annually. CROSSLISTED as GEO 464/GEO 564.

GPH 501. RESEARCH (TBA). Original research work that will not be part of the data used in a thesis. Graded P/N.

GPH 503. THESIS (TBA). Thesis research and writing.

GPH 505. READING AND CONFERENCE (TBA). Independent reading and library research on specialized topics in geophysics, guided by discussions with supervising faculty. A written report may be required. Consent and topic approval required before registration.

GPH 507. SEMINAR (TBA).

GPH 601. RESEARCH (TBA). Original research work that will not be part of the data used in a thesis. Graded P/N.

GPH 603. THESIS (TBA). Thesis research and writing.

GPH 605. READING AND CONFERENCE (TBA). Independent reading and library research on specialized topics in geophysics, guided by discussions with supervising faculty. A written report may be required. Consent and topic approval required before registration.

GPH 607. SEMINAR (TBA).

GPH 620. PHYSICS OF THE EARTH (3). Effects of confining pressure, temperature, time, and solutions on properties of rocks; earth and moon in solar system; source materials and their reliabilities for determining nature and composition of the earth; composition of core, crust, and mantle; geodynamics; processes within the earth with special reference to their effect on earthquakes, isostasy, crustal structure, island arcs. Offered alternate years.

GPH 630. ELEMENTS OF SEISMOLOGY (4). Survey of basic concepts in global seismology: world seismicity; elastic structure of the earth; seismic wave paths in the earth; locating earthquakes; earthquake focal mechanisms, magnitudes, stress drop, energy; stress and strain, elasticity, wave equation, plane waves in homogeneous and layered media, surface waves, free oscillations; ray theory; seismometry; earthquake prediction. Laboratory exercises include interpretation and analysis of seismograms from global seismographic networks. PREREQ: Differential equations. Offered alternate years.

GPH 631. THEORETICAL SEISMOLOGY (3). Representation of seismic sources, moment tensors, wave radiation from point and finite sources; wave propagation in attenuating medium; reflection and refraction of spherical waves, Lamb's problem, Cagniard-De Hoop methods; surface waves in a vertically heterogeneous medium; free oscillations of the earth. PREREQ: GPH 630, differential equations, complex analysis. Offered alternate years.

GPH 632. CRUSTAL SEISMOLOGY (3). Structure of the earth's crust and upper mantle from seismic reflection and large offset (refraction, wide-angle reflection) data. Methods of data collection, data processing theory and practice, modeling and interpretation techniques, correlation of seismic results with laboratory measurements of rock properties, and regional case studies. PREREQ: GPH 630. Offered alternate years.

GPH 640. THE EARTH'S GRAVITY FIELD (4). Gravity field and gravity potential, earth ellipsoid; gravity measurements (sea, land, and space), reduction of gravity measurements; gravity anomalies, isostasy, deviations from isostatic equilibrium; internal constitution of the earth. PREREQ: Differential equations, two years of physics, one year of geology. Offered alternate years.

GPH 641. ELECTROMAGNETIC METHODS IN GEOPHYSICS (3). Survey of electromagnetic (EM) methods in geophysics. Review of electromagnetic theory, Maxwell's equations in the quasi-static limit, the diffusion of EM fields in a layered conductor, qualitative discussion of EM fields in 2- and 3-d conductors. EM techniques, including DC resistivity, magnetotellurics, controlled source EM, induced polarization, and long period magnetometer array methods. Applications to exploration, to basic research on crustal structure and to studies of upper mantel conductivity. PREREQ: Upper division EM course. Offered alternate years.

GPH 642. EARTH MAGNETISM (3). Geomagnetism and magnetic potential: general morphology and secular change; internal and external sources; principles of paleomagnetism, including field and laboratory procedures; origin of remanent magnetism in rocks and the controlling physical and chemical processes; the origin of the Earth's magnetic field. PREREQ: Consent of instructor. Offered alternate years.

GPH 650. GEOPHYSICAL INVERSE THEORY (4). Survey of the theory and applications of inverse methods currently used in the geophysical sciences for the interpretation of inaccurate and inadequate data. Backus-Gilbert inverse theory, resolution, regularization methods (such as damped least squares) for linear and non-linear problems, stochastic inversion, and extremal models. Applications to seismic, gravity, magnetic and electromagnetic data. PREREQ: Linear algebra. Consent of instructor. Offered alternate years.

GPH 651. GEODYNAMICS I (3). Application of the techniques of continuum mechanics to geological problems. Thermal and subsidence history of the lithosphere; stress and strain in the earth; elasticity and flexure of the lithosphere; gravitational compensation. PREREQ: Consent of instructor. Offered alternate years.

GPH 652. GEODYNAMICS II (3). Application of the techniques of continuum mechanics to geological problems. Rheology of earth materials; fluid mechanics applied to the earth's mantle and to magma chambers; fluid flow in porous media. PREREQ: Consent of instructor. Offered alternate years.

GPH 665. GEOPHYSICAL FIELD TECHNIQUES (3). Instrumentation, field methods and interpretation of gravimetric, magnetic, electrical and seismic prospecting techniques. Students will be required to collect, reduce, analyze, and interpret data. Offered alternate years.

GPH 689. SPECIAL TOPICS IN GEOPHYSICS (1-4). Special topics of current interest in geophysics, not covered in detail in other courses. May be repeated on different topics for credit.

■ MARINE RESOURCE MANAGEMENT

MRM 414/MRM 514. OCEAN RESOURCES MANAGEMENT (3). Science, technology, economics, and management of specific resources and uses of the oceans. Domestic and international laws, regulations, programs, and management regimes related to living and nonliving marine resource utilization and protection. Offshore petroleum; energy; metals; minerals; freshwater; waste disposal; marine mammals and fisheries; medicines; recreation; transportation; and international law of the sea. Relevant resource management concepts, strategies and tools. Offered alternate years.

MRM 415/MRM 515. COASTAL RESOURCES MANAGEMENT (3). Laws, policies and programs governing the use and protection of ocean and coastal renewable and nonrenewable resources. Issues covered include: coastal wetlands management, shoreline development and erosion control, coastal effects of offshore energy and mineral development, innovative management and planning approaches, emerging institutional and resource conflicts and coastal management programs in other countries. Offered alternate years.

MRM 501. RESEARCH (TBA). Graded P/N.

MRM 503. THESIS (TBA).

MRM 505. READING AND CONFERENCE (TBA).

MRM 506. PROJECTS (TBA).

MRM 507. SEMINAR (TBA).

MRM 508. WORKSHOP (TBA).

MRM 510. INTERNSHIP (1-9). Planned and supervised resource management experience with selected cooperating governmental agencies, private organizations, or business firms. Supplementary conferences, reports and evaluations. For marine resource management majors only.

MRM 525. SPECIAL TOPICS IN MARINE RESOURCE MANAGEMENT (1-4). Subjects of current interest in Marine Resource Management, not covered in depth in other courses. May be repeated on different topics for credit.

■ ATMOSPHERIC SCIENCES

Lower Division Courses

ATS 210. INTRODUCTION TO THE ATMOSPHERIC SCIENCES (3). Physical basis of atmospheric phenomena on small, medium and large scales; introduction to atmospheric dynamics and thermodynamics; examination of atmospheric circulation systems; introduction to atmospheric physics and chemistry.

Upper Division Courses

Courses numbered 500 and above may be taken for graduate credit.

ATS 401. RESEARCH (TBA).

ATS 403. THESIS (TBA).

ATS 405. READING AND CONFERENCE (TBA).

ATS 406. PROJECTS (TBA).

ATS 407. SEMINAR (1). One-credit sections, graded P/N.

ATS 411/ATS 511. ATMOSPHERIC PHYSICS (4). Thermodynamic processes in the atmosphere, and an introduction to cloud microphysics. PREREQ: PH 213.

ATS 412/ATS 512 ATMOSPHERIC RADIATION (3). Radiative transfer in the earth and planetary atmospheres, absorption and scattering of sunlight, absorption and emission of terrestrial radiation, absorption and scattering cross sections for molecules, cloud droplets and aerosols. Applications include enhancement of photochemical reaction rates in clouds, remote sensing, the earth's radiation budget, radiative-convective equilibrium, radiative forcing due to changes in atmospheric composition and climate change. PREREQ: PH 213, MTH 254. Offered annually.

ATS 413/ATS 513. ATMOSPHERIC CHEMISTRY (3). Principles of atmospheric chemistry; chemical fundamentals, sampling principles, sources, reactions, scavenging, and deposition of sulfur, nitrogen, ozone, and carbon compounds. Atmospheric aerosol size distribution, mechanics, optics, and scavenging. PREREQ: PH 213 and CH 221.

ATS 415/ATS 515. ATMOSPHERIC DYNAMICS I (4). Derivation of equations governing atmospheric motions; shallow atmosphere approximation and the primitive equations. Simple balanced flows; vertical motion; circulation, vorticity and potential vorticity; Ekman layer dynamics; prototypical atmospheric waves; geostrophic adjustment; quasi-geostrophic motions; analysis of structure of synoptic-scale systems; baroclinic instability. PREREQ: PH 213.

***ATS 416/516 ATMOSPHERIC DYNAMICS II (4).** Review of basic equations; scale analysis and approximations. Turbulence and boundary layers. Dry and moist convection; covective storms. Frontogenesis; symmetic instability; internal gravity waves and mountain waves; differentially heated circulations including sea breezes, slope flows and urban circulations. PREREQ: ATS 415/ATS 515 or equivalent.

ATS 446/ATS 546. GEOPHYSICAL BOUNDARY LAYERS (3). Descriptive introduction to atmospheric and oceanic boundary layers, Reynolds averaging, approximate equations of motion, tensor budget equations for higher moments, turbulence energy equation, similarity theory of the surface layer and boundary layer, closure schemes, convective mixed layer, stable boundary layer; air-sea interaction and land surface processes. PREREQ: ATS 416/ATS 516 or equivalent. Offered alternate years.

ATS 475/ATS 575. PLANETARY ATMOSPHERES (3). Origin and evolution of planetary atmospheres; vertical structure of atmospheres; hazes and clouds; atmospheric motions and general circulation. Presentation of recent observations and current research issues, focusing on Venus, Earth, Mars, Jupiter, Saturn, and Titan. Emphasis on comparative aspects and simple models. PREREQ: MTH 254, PH 213. Offered alternate years.

ATS 564. INTERACTIONS OF VEGETATION AND ATMOSPHERE (3). Quantitative treatment of radiation, heat, mass and momentum exchange between vetgetation and atmosphere; forest, natural and agricultural ecosystem examples. Physical and biological controls of carbon dioxide and water vapor exchange; remote sensing of canopy processes; models of stand-scale evaporation, photosynthesis and respiration; landscape and regional scale exchanges; vegetation and planetray boundary layer coupling; vegetation in global climate models. PREREQ: PH 201, MTH 251, BI 201. Offered annually.

ATS 590. SELECTED TOPICS (1-4). Maximum of 12 credits may be used in graduate program.

Graduate Courses

ATS 501. RESEARCH (TBA).

ATS 503. THESIS (TBA).

ATS 505. READING AND CONFERENCE (TBA).

ATS 506. PROJECTS (TBA).

ATS 507. SEMINAR (1). One-credit sections, graded P/N.

ATS 601. RESEARCH (TBA).

ATS 603. THESIS (TBA).

ATS 605. READING AND CONFERENCE (TBA).

ATS 606. PROJECTS (TBA).

ATS 607. SEMINAR (1). One-credit sections, graded P/N.

ATS 613. AEROSOL AND CLOUD PHYSICS (3). Formation, composition and brownian coagulation of atmospheric aerosol. Nucleation, composition, growth and evaporation of cloud droplets and ice crystals; precipitation processes. Scavenging of aerosol by cloud droplets. PREREQ: ATS 511, 513. Offered alternate years.

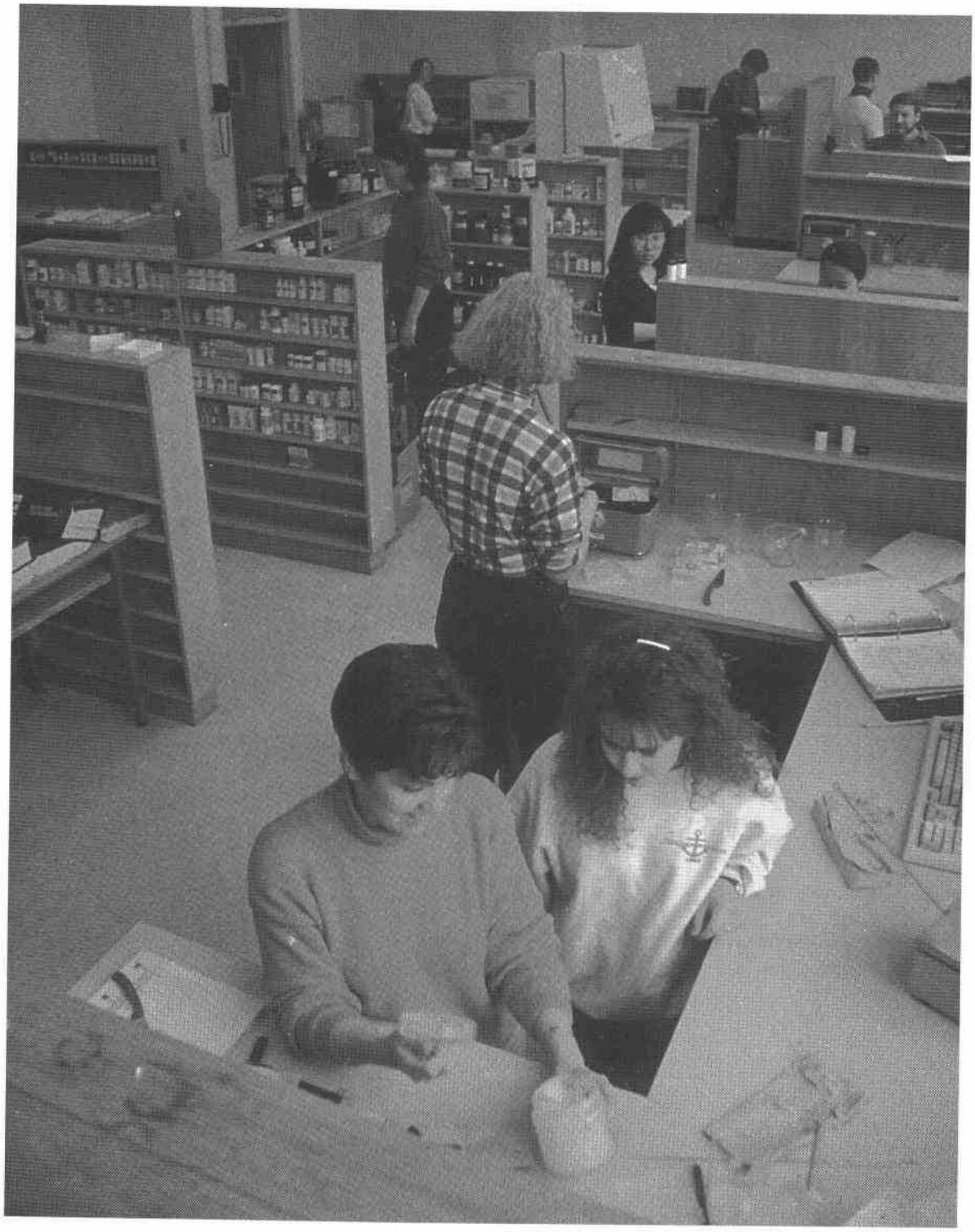
ATS 615. GENERAL CIRCULATION DYNAMICS (3). Zonally symmetric circulations: viscous and nearly inviscid circulations. Wave-mean flow interactions: mean meridional circulations in the Eulerian framework, the transformed Eulerian mean framework, the residual circulation and Eliassen-Palm flux, and the non-interaction theorem. Forced planetary waves, transient baroclinic eddies, and breaking gravity waves. PREREQ: ATS 515 or OC 671. Offered alternate years.

ATS 630. CLIMATE DYNAMICS (3). Physical basis of climate and climatic change; application of general circulation models to climate simulation and climatic change experiments; climate predictability; theory of simplified climate models and their application. PREREQ: MTH 254 and PH 213. Offered alternate years.

ATS 690. SELECTED TOPICS (TBA). Maximum of 12 credits may be used in a graduate program.

FOOTNOTE

☆Senior research faculty



The Oregon State University College of Pharmacy is a member of the American Association of Colleges of Pharmacy and is fully accredited by the American Council on Pharmaceutical Education. Its objective is to contribute to the improvement of public health and welfare through dissemination, expansion, and application of knowledge. In so doing, the college provides an instructional program assuring academic and technical proficiency in the basic sciences and their pharmaceutical application.

A petition from the pharmacists of Oregon led to the establishment of the Department of Pharmacy at Oregon State College in 1898. The department grew steadily and in 1917 became the School of Pharmacy. In 1983 it became the College of Pharmacy.

There are many career options available to individuals having a B.S. in pharmacy degree. Some graduates are employed in privately-owned or chain pharmacies and practice in a community setting, while others practice in hospitals or nursing homes. The pharmaceutical industry offers careers in many areas including sales, marketing, public and government relations, manufacturing, and basic research. Pharmacy graduates are also employed in various local, state and federal health agencies, including the U.S. Public Health Service and the Veterans Administration. Individuals who decide to acquire advanced professional or graduate training may follow a career in research and academics.

College of Pharmacy graduates are eligible for licensure as pharmacists throughout the United States.

Undergraduate Major

Pharmacy (B.S.)
Doctor of Pharmacy (Pharm.D.)

Graduate Major

Pharmacy (M.S., Ph.D.)
Graduate Areas of Concentration
Biopharmaceutics
Medicinal Chemistry
Natural Products Chemistry
Pharmaceutics
Pharmacokinetics
Pharmacology
Pharmacy Socio-Economics
Toxicology

Faculty:
Professors Ayres, Block, Constantine, Gerwick, Mpitsos, Murray, Ohvall, Stennett, Weber; *Associate Professors* Campbell, Christensen, DeLander, Munar, Parrott, Simonson, Strandberg, Vanderveen; *Assistant Professors* Baldwin, Bianco, Farnett, Farthing, Franklin, Haxby, Leid, McGuinness, Raber, Zabriskie; *Instructors* Conroy, Kwong, Samuels, Stadsvold

Courtesy Faculty:
Professors Magee, Poulsen, Stewart; *Associate Professors* Gatlin, Henry; *Assistant Professors* J. Anderson, Boyce, R. Brown, Collell, D. Colley, Comer, Ditmer, Eldredge, Frear, Hibbard, LaFrance, Louie-Lee, Millar, Millard, Noonan, Regner, Sahli, Schnabel, Taniguchi, Thonstad, Williams ,Yeh; *Senior Instructors* Alexander, Chung, Collet, Culp, Egging, Heisel, Johnson, Maples, Miller, Myers, Nishimura, N. Robertson, R. Robertson; *Instructors* Babal, K. Barton, T. Barton, D. Brown, Brownlee, Caldwell, Chrusoskie, C. Colley, Comer, Conrad, Cunningham, Curry, J. Edwards, R. Edwards, Estoup, Gauen, Gerding, Gordon, Gustafson, Hanley, Hubert, Huckestein, Huey, Hyatt, Kalman, Ketchum, Kinard, Larson, S.D. Logan, S.G. Logan, Mason, Matsuda, McCann, McGinley, McLeod, Monsen, Mosier, Muilenburg, Natwick, Nye, Ober, Schlabs, Sharples, Sheeley, Tabor, Tanigawa, Thompson, Tipton, Van Valkenberg, Walker-Medlin, Watkins, Webb, West, Whitaker, White, Williamson, Wojciechowski, Woodson, Yancey

Adjunct Faculty:
The College of Pharmacy utilizes practicing pharmacists and physicians as lecturers in the pharmacy practice teaching program, the institutional pharmacy program, pharmacy management, and graduate education. Current adjunct faculty: Adams, Andrus, Armstad, Amichi, T. Anderson, Balin, Barry Decker, K. Barton, T. Barton, Blair, Bock, Bowman, Breen, Brown, Bubalo, Butcher, Canton, Clark, Cole, Cooper, Day, Denison, Dulwick, Edmondson, D. Edwards, Farley, Flaming, Freis, Galvin, Gardiner, Gerke, Giffin, Gilson, Goe, Gress, Griffin, Grimes, Haas, Halvorsen, K. Hatch, W. Hatch, Henderson, Ho, Inscore, Jackimiec, Jenck, Kelso, Kendrick, Kenyon, C. Kovach, S. Kovach, Krupicka, Larson, Lassfolk, Lemar, Logan, Lubisher, Marcus, Marshall, Mayo, McMann, Megy, Merrigan, Miner, Neill, Neukamm, Nissl, Olyaei, Owens, Parish, Perry, Pierce, Polk, Prince, Rask, Reasoner, Ring, Ripley, J. Robbins, K. Robbins, Roberts, Rosenblatt, Ryan, Saegart, Schnedly, Schoenbrun, Scott, Shannon, Siemsen, Stanley, Stauffer, Stewart, Stockberger, K. Stoner, S. Stoner, Stout, Sturgeon, Tanigawa, Tate, Taylor, Tefft, Thompson, Tipton, Tsukamaki, Wick, Wilborn, Wilson, Wolfer, Wright, Yamaguchi, Yok, Zwicker

PHARMACY INFORMATION

A student beginning a career in pharmacy needs a combination of natural attributes, education, training, and experience. A pharmacist has a position of considerable responsibility in the health professions. Carelessness can endanger lives; thus, a student going into pharmacy must be precise, orderly, and accurate.

Pharmacy education consists of two years of prepharmacy study followed by three years in the professional pharmacy program.

After completion of this five-year program the graduate is eligible to take a licensing exam administered by state boards of pharmacy. After passing the licensing exam and completing required internship training, the graduate is licensed to practice as a registered pharmacist. While time requirements may vary from state to state, many graduates become licensed as pharmacists approximately three months after graduation from Oregon State University.

Footnotes for this section on page 285.

Pharmacy Bldg. 203
Oregon State University
Corvallis, OR
97331-3507
(503) 737-3424
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ADMINISTRATION

RICHARD A. OHVALL
Dean

RANDALL L. VANDERVEEN
Assistant Dean for Pharmacy Practice, OHSU

KEITH PARROTT
Head Adviser

The Prepharmacy Program

Required courses in the prepharmacy program may be taken at Oregon State University or any other accredited college or university. The prepharmacy program must be completed for the student to be considered for admission to the professional program.

Required courses must be taken for a letter grade; however, an exception may be made if a course is only offered pass/no pass. The student should make a specific request for waiver of grade requirement directly to the College of Pharmacy Admissions Committee prior to taking the course.

If a high school graduate fulfills the requirements for admission to OSU, the graduate may be admitted to the prepharmacy program in the College of Pharmacy as a freshman. Four years of high school mathematics, English, history/social studies, and sciences, including chemistry, physics, and biology, and at least two years of a foreign language, as well as speech communication are recommended.

Students from community colleges, other colleges and universities, or other colleges at OSU may transfer into the prepharmacy program at any time.

The Professional Pharmacy Program

Enrollment in the three-year professional program is limited. **A student who has completed the prepharmacy requirements must apply directly to the College of Pharmacy for admission to the professional pharmacy program (contact OSU College of Pharmacy for application forms and other information). Students are admitted to the professional program for fall quarter only. Students who have completed the prepharmacy program at other institutions must also apply for admission to OSU (contact OSU Office of Admissions).**

Once admitted to the professional program, each student reviews his or her career objectives with an assigned faculty adviser and determines a program of study. The adviser must approve the student's proposed schedule before preregistration each term. Students may register for only those courses for which they have completed the stated prerequisite courses. Students are advised that part of their course work may require living away from the Corvallis campus for more than one academic term in their third professional year.

Students in the College of Pharmacy are required to complete 240 quarter credits to satisfy graduation requirements.

The three year professional pharmacy program provides a broad scientifically-based education. Through appropriate selection of professional elective courses, a student may concentrate in such areas as community, clinical, geriatric, administrative, nuclear or industrial pharmacy, or prepare for graduate study. Eighteen quarter credits of professional electives are required.

Doctor of Pharmacy (Pharm. D.) Program

Oregon State University College of Pharmacy and the Oregon Health Sciences University School of Medicine jointly offer a two-year post-baccalaureate Doctor of Pharmacy (Pharm. D.) program. The curriculum for this post-baccalaureate professional program is divided into two components: nine months of didatic course work and 12 months of clinical clerkships will provide eight months of training in generalist areas followed by four months of tailored training in areas designed to meet specific career goals. During the clerkship experience, students will contribute to optimal patient care by applying the knowledge and skills learned in the didactic portion of the program.

Academic Requirements

Pharmacy students must meet the current academic requirements of the university. In addition, the faculty of the college has adopted the rules listed below to assure that all pharmacy students graduating from the OSU College of Pharmacy have the best possible educational backgrounds.

- To be eligible for graduation, students must complete all required core courses (pharmacy designators) with a grade-point average of 2.00 or higher, and they may have no more than a total of two D grades in required, core pharmacy courses, including anatomy and physiology; in addition only one D is allowed in the following sequence courses: Z 441, Z 442, Z 443, Z 430, Z 431, Z 432; PHAR 317, 318, 319, 470; PHAR 323, 324, 325; PHAR 345, 351, 449; PHAR 450, 451, 452; PHAR 491, 492, 493; PHAR 454, 455, 456.
- Students must have completed all required core courses (pharmacy designators) with a cumulative GPA of 2.00 or above to enroll in the Externship (PHAR 410).
- Any student achieving a grade-point average below 2.00 in the required core courses of the professional pharmacy program, either term or cumulative, will be placed or continued on probation (unless subject to suspension) in the College of Pharmacy. Any student on probation may be removed from probation by earning a 2.00, both term and cumulative, in the required core courses of the professional pharmacy program.
- Any student who is on probation for two consecutive terms or is deficient 12 or more grade points in the required core courses may be placed on deferred suspension or be suspended from the College of Pharmacy.
- Students placed on deferred suspension must meet with the head adviser to develop a program of study to improve their academic standing. Students on deferred suspension may not be allowed to take any pharmacy courses. Students may be removed from deferred suspension by improving their academic deficiencies in pharmacy core courses in a timely fashion (within two quarters) and by making progress toward graduation. Failure to do so may result in suspension from the college. Students who have been suspended may not take any pharmacy courses.
- A course in which a D or F was earned may be repeated only once. A pharmacy course in which a B or C grade was earned may not be repeated for the purpose of raising the pharmacy grade-point average.
- E and I grades in required core pharmacy courses which serve as prerequisites for other core courses must be removed within three weeks after the next term begins.
- A student on probation or deferred suspension will not be allowed to serve on any College of Pharmacy committee or as an officer or any College of Pharmacy sponsored organization.
- Students on probation or deferred suspension may not enroll in any pharmacy professional option courses or special topic courses.
- Credits received in pharmacy professional option courses or special topic courses in which a grade of D+ or less is received will NOT apply to completion of the 18 hour professional option requirement. Only courses in which a grade of C- or above is achieved will apply to the option requirement.
- Only students enrolled in the College of Pharmacy are allowed to enroll in professional option courses accumulating credits toward a degree in pharmacy.

The faculty reaffirms the policy that any student may petition the College of Pharmacy Academic Requirements Committee for deviation from the college's academic requirements.

Withdrawal

A student who leaves the college via withdrawal must contact the head adviser at least two weeks prior to the term for which the student wishes to re-enroll. Transcripts of all class work attempted after withdrawal must be provided.

Field Trips

Students may take field trips including visits to pharmaceutical companies. As guests of a pharmaceutical firm, they are provided with lodging and meals.

WICHE Program

The College of Pharmacy accepts students supported through the Western Interstate Commission for Higher Education (WICHE) Professional Student Exchange Program.

This interstate program provides the opportunity for students from the 13 cooperating states to obtain professional training not available in their home states.

Further information regarding the WICHE program may be obtained by writing to the state certifying officer or to the WICHE Professional Student Exchange Program, P.O. Drawer P, Boulder, Colorado 80302.

Program on Gerontology

Administered through the College of Home Economics, the Program on Gerontology involves students and faculty from seven colleges and fourteen departments throughout the University, including the College of Pharmacy. Through course work in these departments, the program offers a multidisciplinary perspective on aging and prepares students for careers in programs on aging, or for work with the elderly as a specialty within another professional area.

Undergraduate students may earn a certificate in gerontology, graduate students an integrated minor. For further information, contact the director in the College of Home Economics.

Licensure

State law requires that a pharmacist be licensed to practice pharmacy in the State of Oregon. To become licensed in Oregon, a person must be at least 18 years of age; of good moral character; a graduate of an accredited school or college of pharmacy recognized by the Oregon Board of Pharmacy; complete internship requirements; and pass a national licensing examination administered by the Oregon Board of Pharmacy.

Internship requirements include approximately one year of pharmacist-supervised pharmacy practice experience. Specific information regarding internship rules and regulations should be obtained from the Oregon Board of Pharmacy.

Baccalaureate Degree Programs

The Bachelor of Science (B.S.) degree is awarded after completion of the five-year undergraduate program in pharmacy. A degree candidate must satisfy University requirements and have completed a total of 240 quarter credits. A grade point average of 2.00 (C) or higher in all professional pharmacy course work is required for graduation.

Academic performance is not the sole criterion for admission to and/or continuation in certain courses in the College of Pharmacy, such as externships and clerkships. In addition, the College may find it necessary to evaluate a person's background to determine his or her likelihood of maintaining standards of professional conduct and performance that are necessary in the pharmacy profession. An evaluation may take into consideration current performance as well as past experience and actions. A valid Oregon Intern license is required for enrollment in the externship and clerkships.

Professional Doctorate

The State Board of Higher Education has approved a two-year post-baccalaureate Pharm.D. program. This program will begin Fall 1995.

Graduate Study

The College of Pharmacy offers Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in pharmacy, with dissertation fields in biopharmaceutics, medicinal chemistry, natural products chemistry, pharmaceutics, pharmacokinetics, pharmacology, pharmacy socio-economics, and toxicology. The college participates in the M.A.I.S. program (see Graduate Catalog for more information). All advanced degrees are granted through the Graduate School. The College of Pharmacy can provide additional information about graduate study in pharmacy.

Candidates for admission to graduate study must hold a bachelor's degree. Acceptance is determined by the Graduate Studies and Research Committee of the College of Pharmacy. Advanced degree programs can be designed with faculty advice to meet the interests and objectives of the individual candidate.

Professional Associations

Students are encouraged to join various professional organizations. At OSU they may choose the following:

Academy of Students of Pharmacy—Open to all students in pharmacy; includes affiliation with the American Pharmaceutical Association and the Oregon State Pharmacists Association.

Oregon Society of Hospital Pharmacists—Open to all students in pharmacy; includes membership in the American Society of Hospital Pharmacists and the Oregon Society of Hospital Pharmacists.

Rho Chi—Membership in Beta chapter of Rho Chi, national pharmaceutical honor society, is based on high scholastic achievement.

Lambda Kappa Sigma—Membership in Rho chapter of this international pharmacy sorority is limited to qualified individuals who meet the scholastic requirements.

Phi Delta Chi—Membership in the Beta Iota chapter of this 100-year old national pharmacy fraternity is limited to qualified individuals who meet the scholastic requirements.

Scholarships and Loans

Information about scholarships and loans is available from the College of Pharmacy Awards Committee and/or the University Financial Aid office.

Study Resource Fee

A Study Resource Fee, in addition to tuition, is charged to professional pharmacy students.

Curriculum

Because pharmacy is a rapidly changing discipline, it is likely that curricular modifications will occur from time to time. Thus, the College of Pharmacy reserves the right to alter its curriculum in accordance with professional and institutional standards during the tenure of any given student.

Prepharmacy Curriculum

May be taken at any accredited college or university.

First Year

CH 221, CH 222, CH 223. General Chemistry or equivalent one-year sequence in freshman chemistry with laboratory for chemistry or science majors. Survey courses are unacceptable (15)
Writing I or equivalent (3)
BI 211, BI 212, BI 213. Biological Science or equivalent one-year biology sequence for Life Science majors and pre-professional students (12)

Second Year

CH 334, CH 335, CH 336. Organic Chemistry or equivalent one-year sequence in basic organic chemistry for chemistry majors; must include one term of lab (CH 337). Survey course which includes biochemistry unacceptable (11)
MB 302, MB 303. Microbiology (Bacteriology) or equivalent microbiology/bacteriology lecture/lab course (5)
BI 214. Cell and Molecular Biology (3)

First and/or Second Year

(distribution at student's discretion)
MTH 241 or MTH 251 Calculus or equivalent, introductory calculus course (4)
Writing II (3)
Writing III or Speech (3)
EC 201. Principles of Economics (3)
PSY 201. Psychology (3)
Social science (6) (must be selected from sociology, psychology or economics offerings)
Electives: selected according to the student's interests. Students are encouraged to consider courses to meet the remaining university mandated baccalaureate core requirements (12-13)
(It is advisable to have earned at least 96 credits to avoid need to register for more than 16 credits per term during professional curriculum.)

Professional Curriculum

Junior Year

Z 441, Z 442, Z 443. Anatomy (6)
Z 430, Z 431, Z 432. Physiology (12)
PHAR 323, PHAR 324, PHAR 325. Med Chem (13)
PHAR 317. Pharmacy Practice (3)
PHAR 318. Pharmaceutics (3)
PHAR 319. Pharmaceutics (5)
PHAR 345. Pharmacy Socioeconomics (4)
PHAR 351. Pharmacy Law (3)
Total (48)

Senior I Year
PHAR 491, PHAR 492, PHAR 493. Pharmacology (15)
PHAR 470. Pharmacokinetics (4)
PHAR 450, PHAR 451, PHAR 452. Biopharmaceut Chem (11)
PHAR 454, PHAR 455. Therapeutics (12)
PHAR 456. Ambulatory & Self Care Therapeutics (3)
PHAR 449. Management (3)
Upper div baccalaureate core requirement (3)
Total (51)

Senior II Year
PHAR 410. Externship (18)
Clerkships (12)
Electives (13)
Upper div baccalaureate core requirement (3)
Total (46)

Total 240 in five years

COURSES

Lower Division

PHAR 201. PHARMACY ORIENTATION (2). Career opportunities in pharmacy including community and institutional practice, government, and industry. Discussion of available educational pathways. Open to nonpharmacy students.

PHAR 210. TERMINOLOGY OF THE HEALTH SCIENCES (2). Provides the student in any of the health science disciplines or pre- professional studies with a working knowledge of the terminology used in the health sciences. Open to nonpharmacy students.

PHAR 215. CONSUMER DRUGS AND RELATED HEALTH ISSUES (2). Provides the student with basic knowledge of the proper use of medications and other health products. Discussion of current health topics of interest and their treatment. For nonpharmacy majors.

PHAR 317. INTRODUCTION TO PHARMACY PRACTICE (3). Introduction to dispensing practices, responsibilities of pharmacists, practice options, drug information, calculations, drug products and devices. PREREQ: CH 336, CH 337; BI 214; MTH 241 or MTH 251.

PHAR 318. PHARMACEUTICS (3). Physical pharmacy with emphasis on formulation requirements for liquid dosage forms. PREREQ: PHAR 317.

PHAR 319. PHARMACEUTICS (5). Physical pharmacy with emphasis on formulation requirements for solid and semi-solid drug dosage forms. PREREQ: PHAR 318.

PHAR 320. HEALTH CENTER PHARMACY EXPERIENCE (2). A general introduction to the specialized practice of pharmacy at the Student Health Center. PREREQ: PHAR 319.

PHAR 321. COSMETICS (3). Application of physiology of the skin, hair and body to the development, production, and use of cosmetics. PREREQ: Pharmacy majors - PHAR 319; non-pharmacy majors - one year organic chemistry and one year biology.

PHAR 323. MEDICINAL CHEMISTRY I (4). Drugs used in the practice of pharmacy; correlation between chemical and physical properties and their use. PREREQ: BI 214; CH 336, CH 337; MB 302, MB 303; concurrent with Z 430.

PHAR 324. MEDICINAL CHEMISTRY II (4). Drugs used in the practice of pharmacy; correlation between chemical and physical properties and their use. PREREQ: PHAR 323; concurrent with Z 431.

PHAR 325. MEDICINAL CHEMISTRY III (5). Drugs used in the practice of pharmacy; correlation between chemical and physical properties and their use. PREREQ: PHAR 324; Concurrent with Z 432.

PHAR 330. PHARMACEUTICAL NATURAL PRODUCTS (2). Medicinal agents derived from terrestrial and marine plants and animals, their identification, use, and abuse potential. PREREQ: Organic chemistry, biology.

PHAR 345. PHARMACY IN THE HEALTH CARE SYSTEM (4). Organization, delivery, and financing of health services, and public health policy. PREREQ: WR 121.

PHAR 346. ISSUES IN CONTEMPORARY PHARMACY PRACTICE (2). Introduction to contemporary issues facing practicing pharmacists. PREREQ: PHAR 345.

PHAR 351. PHARMACY LAW (3). Federal, State, and local laws regulating pharmacy practice. PREREQ: WR 121.

PHAR 387. ESSENTIALS OF PHARMACOLOGY (4). Basic concepts in pharmacology. Mechanisms of action and therapeutic indications of major drug classes. For nonpharmacy students. PREREQ: One year of chemistry, and one year of biology.

PHAR 388. PSYCHOACTIVE DRUGS IN OUR SOCIETY (3). Current information concerning the pharmacological properties, use and misuse of psychoactive drugs. For nonpharmacy majors. Offered summer.

PHAR 401/PHAR 501. RESEARCH (1-16). Department approval required.

PHAR 403/PHAR 503. THESIS (1-16). Department approval required.

PHAR 405/PHAR 505. READING AND CONFERENCE (1-16). Department approval required.

PHAR 407/PHAR 507. SEMINARS (1-16).

PHAR 410. INTERNSHIP (18). Graded P/N. Clinical Clerkship (6). Supervised clinical education in inpatient care emphasizing application of pharmaceutical and biomedical science to the collection of patient data, planning and monitoring of drug therapy, and patient education. PREREQ: PHAR 454, PHAR 455, PHAR 456. Ambulatory Care Externship (6). Supervised education in appropriate outpatient practice environments emphasizing the application of biomedical and pharmaceutical sciences in the patient care area. PREREQ: PHAR 454, PHAR 455, PHAR 456. Institution Externship (6). Supervised education in hospital pharmacy environments emphasizing the application of biomedical and pharmaceutical sciences in the patient care area. PREREQ: PHAR 454, PHAR 455, PHAR 456. Department approval required.

PHAR 411. DRUG INFORMATION CLERKSHIP (6). Drug information for health professionals. Taught in a four-week block. PREREQ: PHAR 493. Department approval required.

PHAR 412. POISON CONTROL CLERKSHIP (6). Application of pharmacology, toxicology, and communication principles to management and prevention of poisoning incidents. Taught in a four-week block. PREREQ: PHAR 493. Department approval required.

PHAR 413. INVESTIGATIONAL DRUG SERVICES CLERKSHIP (6). Application of basic pharmacy and communications knowledge and skills to the drug development process through participation in investigational drug studies. Taught in a four-week block. PREREQ: PHAR 455, PHAR 456. Department approval required.

PHAR 414. PHARMACY ADMINISTRATION CLERKSHIP (12). Supervised professional training in the administration of a multifaceted pharmacy practice in facilities provided by Kaiser Permanente, Oregon Region, or The Oregon Health Sciences University. Emphasis on the application of basic knowledge regarding the provision of drugs and their distribution within the organization; management of physical, economic, and human resources; and maintenance of quality patient care. Taught in an eight-week block. PREREQ: PHAR 345; PHAR 449. Department approval required.

PHAR 415. STERILE PRODUCTS CLERKSHIP (12). Supervised professional education in appropriate inpatient practice environments, emphasizing the development and management of a sterile products service. Taught in an eight-week block. PREREQ: PHAR 410, PHAR 458. Department approval required.

PHAR 416. NUTRITIONAL SUPPORT CLERKSHIP (12). Supervised professional education in appropriate practice environments emphasizing the application of biomedical and pharmaceutical sciences in the use of parenteral and enteral nutrition in patients. Taught in an eight-week block. PREREQ: PHAR 410, PHAR 458. Department approval required.

PHAR 418. CLINICAL EXPERIENCE (6). Continuing clinical experience in inpatient and ambulatory pharmacy practice. Practice in data gathering, problem solving, therapy monitoring, and patient education, with emphasis on developing in-depth understanding of a specific area of practice. Taught in a four-week block. May be repeated for credit at various sites. PREREQ: PHAR 410. Department approval required.

PHAR 419. ADVANCED THERAPEUTICS CLERKSHIP (12). Expanded clinical experience and problem solving in appropriate practice environments. Practice in data gathering, problem solving, therapy monitoring, and patient education, with emphasis on developing in-depth understanding of a specific area of practice. Taught in an eight-week block. PREREQ: PHAR 410. Department approval required.

PHAR 424. *THE U.S. PHARMACEUTICAL INDUSTRY (2). Information on the pharmaceutical industry and its role in the U.S. health care system. PREREQ: PHAR 345. (Bacc Core Course)

PHAR 425. THE HISTORY AND ETHICS OF PHARMACY (2). Reviews and historical development of pharmacy and the ethical codes and behaviors which have governed pharmacy practice. Open to non-pharmacy majors. PREREQ: PHAR 351 for pharmacy majors.

PHAR 432. ^WRITING IN THE PHARMACEUTICAL SCIENCES (2). A writing intensive course emphasizing writing used in pharmacy. PREREQ: Admission to the professional program in pharmacy. (Writing Intensive Course)

PHAR 443/PHAR 543. SELECTED TOPICS IN MEDICINAL CHEMISTRY (3).

PHAR 444/PHAR 544. SELECTED TOPICS IN MEDICINAL CHEMISTRY (3). Graded P/N.

PHAR 449. PHARMACY MANAGEMENT (3). Management principles and factors affecting short- and long-term operation of institutional and community pharmacies. PREREQ: PHAR 345.

PHAR 450. BIOPHARMACEUTICAL CHEMISTRY I (4). Pharmaceutical and medical applications of the metabolic processes. PREREQ: BI 214; CH 336, CH 337; MB 302, MB 303; Z 432.

PHAR 451. BIOPHARMACEUTICAL CHEMISTRY II (4). Pharmaceutical and medical applications of the metabolic processes. PREREQ: PHAR 450.

PHAR 452. BIOPHARMACEUTICAL CHEMISTRY III (3). Pharmaceutical and medical applications of the metabolic processes. PREREQ: PHAR 451.

PHAR 454. THERAPEUTICS I (6). Pathophysiology and drug therapy of common diseases. PREREQ: PHAR 470, PHAR 323, PHAR 450; Z 432. COREQ: PHAR 492.

PHAR 455. THERAPEUTICS II (6). Pathophysiology and drug therapy of common diseases. PREREQ: PHAR 454; concurrent with PHAR 493.

PHAR 456. AMBULATORY AND SELF CARE THERAPEUTICS (3). Patient counseling, non-prescription drug therapy, prescription management. PREREQ: PHAR 454; concurrent with PHAR 455.

PHAR 457/PHAR 557. HEALTH CARE SYSTEMS (3). The planning for pharmacy services coupled with an advanced analysis of the organization, delivery and financing of health care. PREREQ: PHAR 345.

PHAR 458. INTRAVENOUS ADDITIVE SYSTEMS (2). Design, development, and maintenance of intravenous additive programs. PREREQ: PHAR 319. COREQ: PHAR 450.

PHAR 460. HOSPITAL PHARMACY (3). Introduction to the practice of pharmacy in a hospital setting. PREREQ: PHAR 317.

PHAR 461. CONSULTANT PHARMACIST PRACTICE (1-2). Role of the pharmacist in long-term facilities; monitoring drug therapy; case presentations; discussion of medications, diseases, and conditions. PREREQ: PHAR 450, PHAR 491. Department approval required.

PHAR 470/PHAR 570. PHARMACDKINETICS (4). Influence of pharmaceutical frmulations on bioavailab ility of drugs.

PHAR 471/PHAR 571. EXPERIMENTAL APPROACH TO BIOPHARMACEUTICS (3). AND PHARMACOKINET-ICS Experimental protocol, rationale, and procedures in clinical pharmacokinetic, pharmacokinetic, and biopharmaceutical experiments. PREREQ: PHAR 470.

PHAR 472/PHAR 572. APPLIED BIOPHARMACEUTICS AND PHARMACOKINETICS (3). Application of biopharmaceutic and pharmacokinetic theory as seen in patient care environments. PREREQ: PHAR 470.

PHAR 473/PHAR 573. CURRENT TOPICS IN PHARMACEUTICAL SCIENCES (1-3). Graded P. Critical evaluation of contemporary pharmaceutics and pharmacokinetics research articles.

PHAR 491/PHAR 591. PHARMACOLOGY I (5). Principles of pharmacology; pharmacodynamics, toxicity, therapeutic uses of drugs. PREREQ: Z 432, Z 343; PHAR 452, concurrent with PHAR 323; or graduate standing.

PHAR 492/PHAR 592. PHARMACOLOGY II (5). Principles of pharmacology; pharmacodynamics, toxicity, therapeutic uses of drugs. PREREQ: PHAR 491/PHAR 591. COREQ: PHAR 324.

PHAR 493/PHAR 593. PHARMACOLOGY III (5). Principles of pharmacology; pharmacodynamics, toxicity, therapeutic uses of drugs. PREREQ: PHAR 492/PHAR 592. COREQ: PHAR 325.

PHAR 494. PHARMACOLOGY LABORATORY (1-3). May be repeated for credit. PREREQ: PHAR 491. Department approval required.

PHAR 495/PHAR 595. TARGET ORGAN TOXICOLOGY (4). Principles of toxicology; tissue and organ responses to toxicant effect; acute and chronic toxicities of agents found in the home, industry, and the environment. PREREQ: PHAR 491 or equivalent.

PHAR 501. RESEARCH (1-16). Graded P/N.

PHAR 503. THESIS (1-16). Graded P/N.

PHAR 505. READING AND CONFERENCE (1-16). Graded P/N. Departmental consent required.

PHAR 524. MEDICINAL CHEMISTRY (3). Theoretical bases of biological responses to applied agents; correlation of molecular structure with biological activity; natural and synthetic sources of medicinal agents. PREREQ: One year of organic chemistry and consent of instructor.

PHAR 525. MEDICINAL CHEMISTRY (3). Theoretical bases of biological responses to applied agents; correlation of molecular structure with biological activity; natural and synthetic sources of medicinal agents. PREREQ: One year of organic chemistry and consent of instructor.

PHAR 536. PRODUCT DEVELOPMENT (3). Current and novel dosage forms; product stability; therapeutic design. PREREQ: PHAR 319, PHAR 470.

PHAR 540. NATURAL PRODUCTS I: MARINE (3). Description of the natural products and their biological properties from the major phyla of marine life forms. PREREQ: Graduate or senior standing with CH 332, BB 452, or PHAR 451.

PHAR 545. SELECTED TOPICS IN MEDICINAL CHEMISTRY (3).

PHAR 557. HEALTH CARE SYSTEMS (3). The planning for pharmacy services coupled with an advanced analysis of the organization, delivery and financing of health care. PREREQ: PHAR 345.

PHAR 564. BIOCHEMICAL PHARMACOLOGY (3). Advanced concepts and recent developments in biochemical pharmacology. Topics include receptor theory, receptor regulation, signal transduction, second messenger systems, and neurotransmitter pathways and functions. PREREQ: Consent of instructor. Offered alternate years.

PHAR 571. EXPERIMENTAL APPROACH TO BIOPHARMACEUTICS AND PHARMACOKINETICS (3). Experimental protocal, rationale, and procedures in clinical pharmacokinetics, pharmacokinetics, and biophamaceutic experiments. PREREQ: PHARM 470.

PHAR 572. APPLIED BIOPHARMACEUTICS AND PHARMACOKINETICS (3). Application of biophamaceutic and phamacokinetic theory as seen in patient care environments. PREREQ: PHAR 470.

PHAR 573. CURRENT TOPICS IN PHARMACEUTICAL SCIENCES (1-3). Critical evaluation of contemporary phamaceutics and phamacokinetics research articles.

PHAR 577. PHARMACOGNOSTICAL TECHNIQUES (3). Laboratory course on current methodology employed in natural products chemistry. PREREQ: PHAR 323.

PHAR 580. PHARMACODYNAMIC AND PHARMACO-KINETIC MODELING (3). Evaluation of strengths and weaknesses of mathematical models relative to pharmacodynamic and pharmacokinetic data. PREREQ: PHAR 470.

PHAR 585. DRUG DESIGN (3). Chemical and biochemical concepts and their application in the national design of drugs and other biologically active molecules. PREREQ: PHAR 325 and senior standing in pharmacy, or senior standing in chemistry or a biological science.

PHAR 591. PHARMACOLOGY (5). Principles of phamacology; phamacodynamics, toxicity, therapeutic uses of drugs. PREREQ: Z 432, Z 343; PHAR 325, concurrent with PHAR 450; or graduate standing.

PHAR 592. PHARMACOLOGY II (5). Principles of pharmacology; pharmacodynamics, toxicity, therapeutic uses of drugs. PREREQ: PAHR 491/PHAR 591. COREQ: 451.

PHAR 593. PHARMACOLOGY III (5). Principles of pharmacology; pharmacodynamics, taxicity, therapeutic uses of drugs. PREREQ: PHAT 492/PHAR 592. COREQ: 452.

PHAR 595. TARGET ORGAN TOXICOLOGY (4). Principles of toxicology; tissue and organ responses to toxicant effect; acute and chronic toxicities of agents found in the home, industry, and the environment. PREREQ: PHAR 491 or equivalent.

PHAR 597. MECHANISMS OF TOXICITY (3). Lectures, conferences, and laboratories on advanced concepts of the mechanisms of toxicity of drugs and other chemicals. Offered alternate years. PHAR 495.

PHAR 601. RESEARCH (1-16).

PHAR 603. THESIS (1-16).

PHAR 605. READING AND CONFERENCE (1-16).

PHAR 606. PROJECTS (1-16).

PHAR 707. CLINICAL PHARMACY SEMINAR (1). PREREQ: Admission to the Pharm.D. program.

PHAR 711. PROFESSIONAL ISSUES I, II, III (1, 1, 1). Career opportunities in clinical pharmacy practice, contemporary issues facing pharmacy and the health care system, and formats for pharmacy practice oral presentation. PREREQ: First year standing in the Pharm.D program.

PHAR 721. PRINCIPLES OF CLINICAL PHARMACY I: PATIENT-PROVIDER COMMUNICATIONS, HEALTH PROMOTION, DISEASE PREVENTION (3). Development and application of communication skills appropriate for health professionals, including pharmacist-patient interactions, patient counseling, disease prevention and wellness strategies.

PHAR 722. PRINCIPLES OF CLINICAL PHARMACY II: PATIENT ASSESSMENT (2). Basic physical assessment, history taking, evaluation of clinical laboratory values and selected diagnostic procedures, basics of clinical data collection, principles of triage. PREREQ: PHAR 721.

PHAR 723. PRINCIPLES OF CLINICAL PHARMACY III: DRUG THERAPY MANAGEMENT (2). Development and application of skills in therapeutic plan development, drug regimen review, patient monitoring, and documentation of clinical activities. PREREQ: PHAR 722.

PHAR 734, PHAR 735, PHAR 736. PATHOPHYSIOLOGY AND THERAPEUTICS I,II,III (10, 8, 8). The pathophysiologic basis of disease and drug therapy management. PREREQ: First-year standing in the Pharm.D. program.

PHAR 737. CLINICAL PHARMACOKINETICS (4). Application of pharmacokinetics concepts to optimize drug therapy in actual patients. PREREQ: Admission to the Pharm.D. program.

PHAR 739. INFORMATION SCIENCE (4). Students will learn to identify appropriate information resources and will systematically collect, arrange, and analyze pertinent information related to a particular patient or drug product problem. PREREQ: First-year standing in the Pharm.D. program.

PHAR 741. DRUG POLICY-OUTCOMES. (4). The purpose, principles, and techniques of drug use review and medical audits. Emphasis will be placed on criteria development, data collection and analysis, and appropriate interventions in a variety of practice settings. PREREQ: Admission to the Pharm.D. program and PHAR 740.

PHAR 751. LONGITUDINAL AMBULATORY CARE (1). Supervised advanced professional education in an ambulatory setting. Emphasis will be on providing advanced clinical pharmacy services to a select group of patients and health car providers over a period of one year. PREREQ: Second-year standing in the Pharm.D. program. May be repeated for credit.

PHAR 760. ADULT GENERAL INTERNAL MEDICINE REQUIRED CLERKSHIP (5). Supervised advanced professional education in appropriate internal medicine practice environments emphasizing the application of biomedical and pharmaceutical sciences to patient care. PREREQ: Second-year standing in the Pharm.D. program.

PHAR 770. REQUIRED CLERKSHIP: INTERNAL MEDICINE SPECIALTY ROTATIONS. (5). Supervised clinical pharmacy experience in various patient care settings within internal medicine. Specialties include geriatrics, pediatrics, infectious disease, and drug information. PREREQ: Second-year standing in the Pharm.D. program. May be repeated for credit.

PHAR 775. DRUG INFORMATION CLERKSHIP (5). Students will learn to identify appropriate information resources and will systematically collect, arrange, and analyze pertinent information related to a particular patient or drug problem. Written and oral communication skills will be emphasized. PREREQ: Second-year standing in the Pharm.D. program.

PHAR 780. AMBULATORY PRIMARY CARE CLERKSHIP (5). Supervised advanced professional education in appropriate ambulatory primary care practice environments emphasizing the application of biomedical and pharmaceutical sciences to patient care. PREREQ: Second-year standing in the Pharm.D. program.

PHAR 790. ELECTIVE CLERKSHIP: INTERNAL MEDICINE SPECIALTY ROTATIONS (5). Supervised clinical pharmacy experience in various patient care settings within internal medicine. Specialties include neonatology, psychiatry, cardiology, oncology, transplant, critical care, nutrition, neurology, nephrology, surgery, and managed care. PREREQ: Second-year standing in the Pharm.D. program. May be repeated for credit.

FOOTNOTES

^Writing Intensive Course (WIC)

[1]PHAR 432 (Writing Intensive course) must be taken during last three years.

The College of Veterinary Medicine at Oregon State University was established in 1975 with three major areas of responsibility—teaching, research, and public service.

Graduate Majors

Comparative Veterinary Medicine (Ph.D.)
Graduate Areas of Concentration
Laboratory Animal Medicine
Microbiology
Parasitology
Pathology
Toxicology

Veterinary Medicine (D.V.M.)
Veterinary Science (M.S.)
Graduate Areas of Concentration
Clinical Sciences
Laboratory Animal Medicine
Microbiology
Parasitology
Pathology
Toxicology

Faculty
Professors Blythe, Craig, Engel, Hutton, Koller, Matsumoto, Patton, Pearson, Riebold, Scott, A. Smith, Snyder, Watrous; *Associate Professors* Crisman, Hansen, Hedstrom, Mattson, B. Smith, Timm; *Assistant Professors* Adams, C. Andreason, J. Andreasen, Gerros, Hall, Heidel, Huber, McDonald, Mattoon, Parker, Van Saun; *Instructors* Bates, Newell, Whitler

TEACHING

The college's professional education program began in 1979. Each year, 28 residents of Oregon and eight residents from the Western Regional Compact states are selected to enter the OSU College of Veterinary Medicine. The 36 Oregon-sponsored students take their first year of professional study at OSU, then transfer to Washington State University for their second and part of their third year of study. At the end of March in their third year, they transfer back to OSU to finish the third year of instruction and to take their final year of study. Completion of the professional program leads to the Doctor of Veterinary Medicine (D.V.M.) degree.

This unique approach to veterinary education has been accomplished through a formal arrangement with the College of Veterinary Medicine at Washington State University, Pullman, and the University of Idaho, Moscow.

OSU's College of Veterinary Medicine is accredited by the Council on Education of the American Veterinary Medical Association.

Comprehensive research training is provided through graduate programs leading to the M.S. degree or the Ph.D. degree in comparative veterinary medicine.

RESEARCH

Biomedical research and research training are conducted by the college in cooperation with the OSU Agricultural Experiment Station, Environmental Health Sciences Center, and the Sea Grant College Program. This research is of economic and public health significance, as it aims to develop new information to improve the health of animals and people.

The college emphasizes research on diseases of food and fiber animals and on problems of present and potential concern to Oregon's valuable livestock and poultry industries. The college also shares a regional and national responsibility for providing information to assist in the control of animal diseases. Diseases of terrestrial wildlife, aquatic, and companion animals are also studied because of their importance in food production, recreation, and companionship.

The research program is a multidisciplinary effort, bringing together faculty expertise in pathology, parasitology, bacteriology, virology, biophysics, biochemistry, immunology, physiology, anatomy, neurosciences, toxicology, clinical veterinary medicine, and other disciplines.

Advice from livestock and poultry producers, practicing veterinarians, producer and commodity groups, the Oregon Department of Agriculture, and others helps establish research priorities.

Faculty research and service activities are described in this catalog under the Extension Service, Agricultural Experiment Station, Environmental Health Sciences Center, and Sea Grant College Program.

PUBLIC SERVICE

The service programs focus on the prevention, treatment, and control of animal diseases. The college assists veterinary practitioners, animal owners, and the general public through the Veterinary Diagnostic Laboratory, the Veterinary Teaching Hospital, and the Veterinary Extension programs.

The diagnostic laboratory accepts animals and specimens for examination and analysis. It is equipped with diagnostic and analytical facilities for microbiological, chemical, toxicological, and pathological examinations. Clinical pathology services are available for both referring veterinarians and clinicians in the Veterinary Teaching Hospital.

The Veterinary Teaching Hospital is designed and equipped for diagnosis and medical and surgical treatment of equine, food animal, and camelid patients. Patients are admitted directly from animal owners and through referral from practicing veterinarians in Oregon and the Pacific Northwest. Radiology, anesthesiology, pharmacy, intensive care, and other services are available to support the hospital functions.

The diagnostic laboratory and the teaching hospital serve as laboratories where students examine all aspects of disease, including history, symptoms, diagnosis, treatments, and prognosis.

Magruder Hall 200
Oregon State University
Corvallis, OR
97331-4801
(503) 737-2098

ADMINISTRATION

NORMAN E. HUTTON
Interim Dean

LINDA L. BLYTHE
Interim Assistant Dean

Footnotes for this section on page 291.

The Veterinary Extension program carries the results of research to animal owners and Oregon's practicing veterinarians through meetings, conferences, publications, and personal consultations with Extension veterinarians and research scientists, teachers, clinicians, and diagnosticians within the school.

Providing continuing education for veterinarians is also considered a major responsibility of the college. One- to three-day intensive courses of instruction on specific topics are offered periodically.

Career Opportunities In Veterinary Medicine

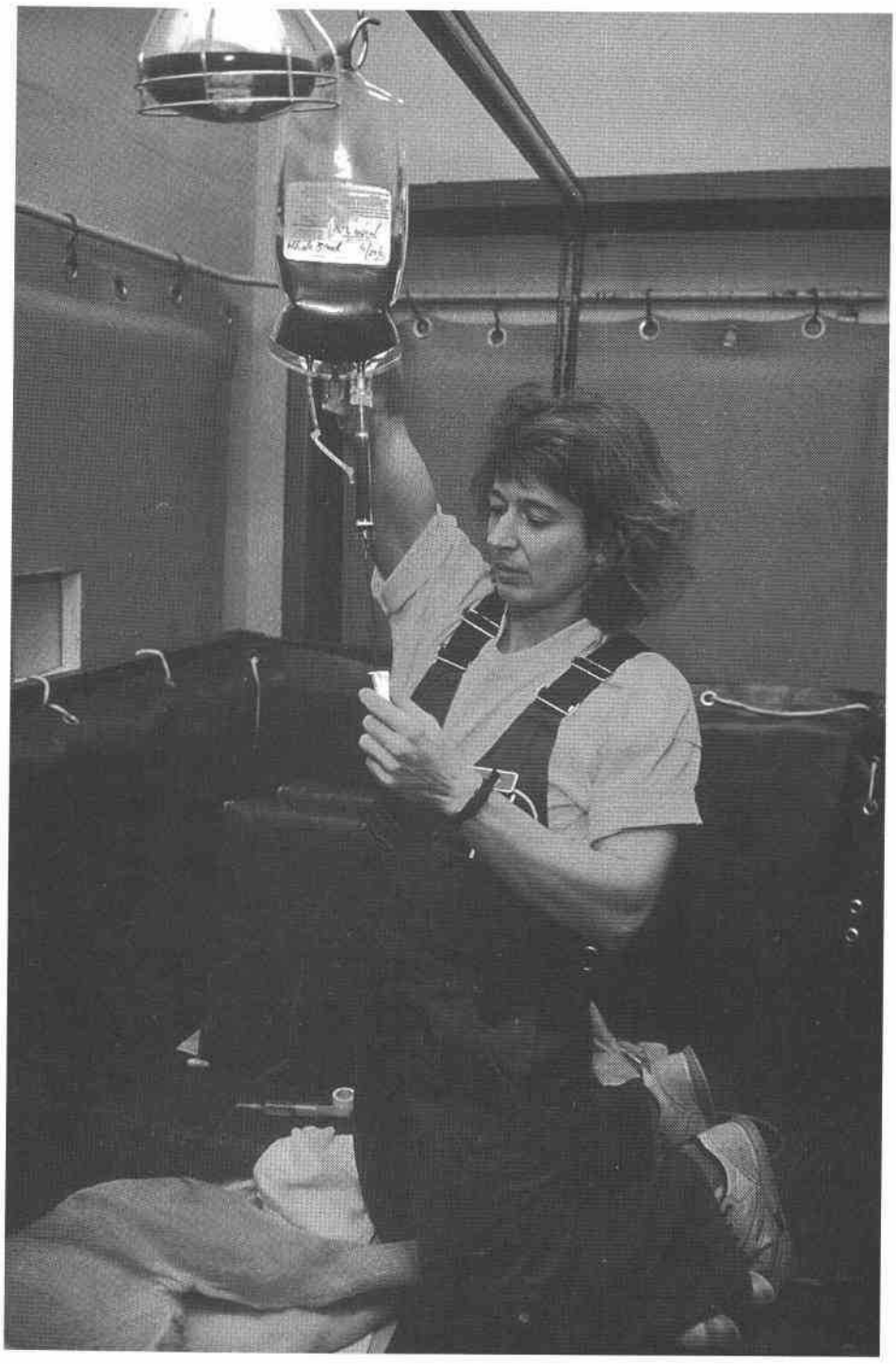
Opportunities for employment in veterinary medicine are good. Nearly 70 percent of the professionally active veterinarians in the United States are engaged in private practice. Some practices are limited to particular groups of animals, such as food animal, equine, or companion animal practices. Others involve specialties such as surgery, ophthalmology, cardiology, or radiology. In addition to private practice, there are numerous teaching and research opportunities in academic, governmental, and industrial situations. A relatively new and expanding area is laboratory animal medicine in which veterinarians are often employed by medical schools, large health-related research organizations, or universities.

Admission to the Professional Program

Applicants for admission to the College of Veterinary Medicine should have at least 90 acceptable quarter credits from an accredited college or university. The credits must include courses that will meet the requirements for a bachelor's degree at the student's undergraduate institution as well as electives in the student's areas of interest. Included in the 90 credits are courses in written communication, the arts and humanities, and the social sciences. Also included are 54 credits of physical and biological sciences, with courses in chemistry, including organic and biochemistry; mathematics, through college-level algebra; genetics; physics; and zoology or general biology. Completion of the Graduate Record Examination is also required. In addition to the academic requirements, it is desirable that the applicant has experience working with animals and an understanding of the veterinary profession.

Applications

Students seeking to enter the four-year professional veterinary medical education program must complete both an Oregon State University application for admission in veterinary medicine and an application for admission to the WOI Program of Veterinary Medical Education. Both applications, plus a $50 application fee and officially sealed transcripts of all college credits, must be sent to the Office of the Dean, College of Veterinary Medicine, Oregon State University, Magruder Hall 200, between September 1 and November 1 preceding the fall term in which the applicant wishes to enroll.



All preveterinary requirements must be fulfilled or scheduled for completion by the end of the spring term of the year in which the applicant seeks to be admitted. A list of courses in progress at the time of filing the application or scheduled for completion by the end of the spring term must accompany the applications and transcripts.

Admission to the College of Veterinary Medicine is on a competitive and selective basis. Scholastic performance, aptitude, and personal development are given consideration in the selection of candidates. Consideration of admission to the College of Veterinary Medicine is administered equally without regard to race, color, creed, sex, national origin, disability, or age. Admission is granted annually at the beginning of the fall quarter only.

In considering applicants for admission to the College of Veterinary Medicine, preference is given to qualified Oregon residents and to qualified residents certified and financed by the Western Interstate Commission for Higher Education (WICHE) compact states (see below). To be considered an Oregon applicant, the student must be an Oregon resident by November 1 preceding the fall term in which the applicant wishes to enroll.

All candidates are given written notification of acceptance or denial as soon as possible after the admissions committee has reached its final decision. Such notification is generally given by April 15. Sometimes, however, decisions on applications are delayed until grades in the more advanced courses are made available to the committee. Acknowledgment of notification of acceptance should be made promptly in writing by the successful applicant. Unsuccessful applicants who wish to be considered for the following year must resubmit an application.

When an applicant is offered and accepts admission to the College of Veterinary Medicine, the admitted student must pay a deposit of $75 not later than two weeks following notice of acceptance to reserve a place in the entering class.

Applications from WICHE Students

The College of Veterinary Medicine at Oregon State University, the College of Veterinary Medicine at Washington State University, and the Faculty of Veterinary Medicine at the University of Idaho have entered into a regional educational program with Alaska, Arizona, Hawaii, Montana, Nevada, 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 his or her home state and is subject to the same fees as the Oregon, Washington, and Idaho resident students.

Students from these compact states must apply to their home state for certification in addition to making application to the Office of the Dean, College of Veterinary Medicine, Oregon State University, Magruder Hall 200, Corvallis, OR 97331-4801. Additional information regarding regional veterinary education may be obtained from: The Executive Director, Western Interstate Commission for Higher Education, P.O. Drawer P, Boulder, Colorado 80302.

Readmission

Any student who voluntarily withdraws from the College of Veterinary Medicine or who is dropped for cause must make written application for reinstatement to the school.

Veterinary Student Expenses

Oregon resident students registered in the College of Veterinary Medicine will pay tuition and fees of approximately $2,201 per term. Students from the compact states will pay the same fees as Oregon resident students.

Veterinary students must provide their own special clothing, as well as the dissection, surgical, and diagnostic instruments stipulated by the faculty.

Occasional field trips are scheduled in the veterinary curriculum. Transportation is provided by the University for required trips, but students must provide their own food and lodging. For optional trips, the student is usually expected to provide transportation as well as lodging and food. All other expenses such as residence hall and living expenses are the same as for students in other schools of the University, except for the expenses of the moves students must make to Washington State University for their second and the first half of their third year of study and back to Oregon State University for the final portion of the curriculum.

Oregon residents desiring additional information about veterinary medicine should write to the Office of the Dean, College of Veterinary Medicine, Oregon State University, Magruder Hall 200, Corvallis, Oregon 97331-4801.

Policy on Laboratory and Duty Hours

During the professional curriculum several laboratory exercises in the preclinical years require the use of live animals. The exercises are designed to complement didactic lectures and demonstrations through "hands-on" experience with various species of animals. In all instances, the animals are humanely treated and anesthetized if the procedures are deemed painful; animals are humanely euthanized at the termination of most of the laboratory exercises.

During the clinical years, animals are used in laboratory exercises in the teaching of basic surgical skills and medical procedures. In all instances, the animals are anesthetized. Strict protocol is enforced regarding the animals' well-being in exercises requiring post-operative recovery. Participation in these clinical exercises is mandatory for all students.

During the fourth year of the veterinary curriculum, students are assigned on a rotational basis to the various divisions and services engaged in the operation of the veterinary hospital. Emergency services are offered to the public on a 24-hour basis seven days a week.

Student assignments in the clinical blocks are time-demanding and students are required to spend time at night, weekends, and holidays in the delivery of health care to patients. Hospital operations continue seven days per week and students are responsible for their assigned tasks regardless of time and day of week.

Graduation Requirements

A total of 220 quarter credits is required for graduation. To be awarded the degree of Doctor of Veterinary Medicine, candidates must have passed all required courses in the veterinary curriculum, have a 2.00 grade-point average in the veterinary curriculum, and have a bachelor's degree.

Curricula

Typical Preveterinary Curriculum at Oregon State University (see baccalaureate core requirements for details on skills, perspectives, and synthesis). Oregon State University courses that will meet the preveterinary academic requirements:

Skills (15)
Perspectives (30)
Synthesis (6)
Physical and Biological Sciences
CH 121, CH 122, CH 123, CH 219. General Chemistry or CH 221, CH 222, CH 223 (15-17)
CH 331, CH 332, CH 337. Organic Chem (10)
MTH 111 and MTH 112. Mathematics (8)
PH 201. General Physics (5)
BI 211, BI 212, BI 213. Biology (12-15)
BB 350 or BB 450 and BB 451. Biochem (4-8)
GEN 311 or ANS 378. Genetics (4-5)
Electives (directed toward major)

PROFESSIONAL CURRICULUM D.V.M. DEGREE

First Year
Fall (20)

(at Oregon State University)
VM 709. Veterinary Medicine Orientation (1)
VM 711. Veterinary Gross Anatomy (4)
VM 714. Veterinary Microscopic Anatomy (5)
VM 717. Physiology (7)
VM 723. Applied Nutrition (3)

Winter (19)

(at Oregon State University)
VM 712. Veterinary Gross Anatomy (4)
VM 715. Veterinary Microscopic Anatomy (3)
VM 716. Veterinary Neurosciences (5)
VM 718. Veterinary Physiology (7)

Spring (17)

(at Oregon State University)
VM 713. Veterinary Gross Anatomy (4)
VM 720. Immunology (5)
VM 721. Veterinary Pathology (6)
VM 738. Intro to Animal Care (2)

Second Year
Semester I (20 semester credits)

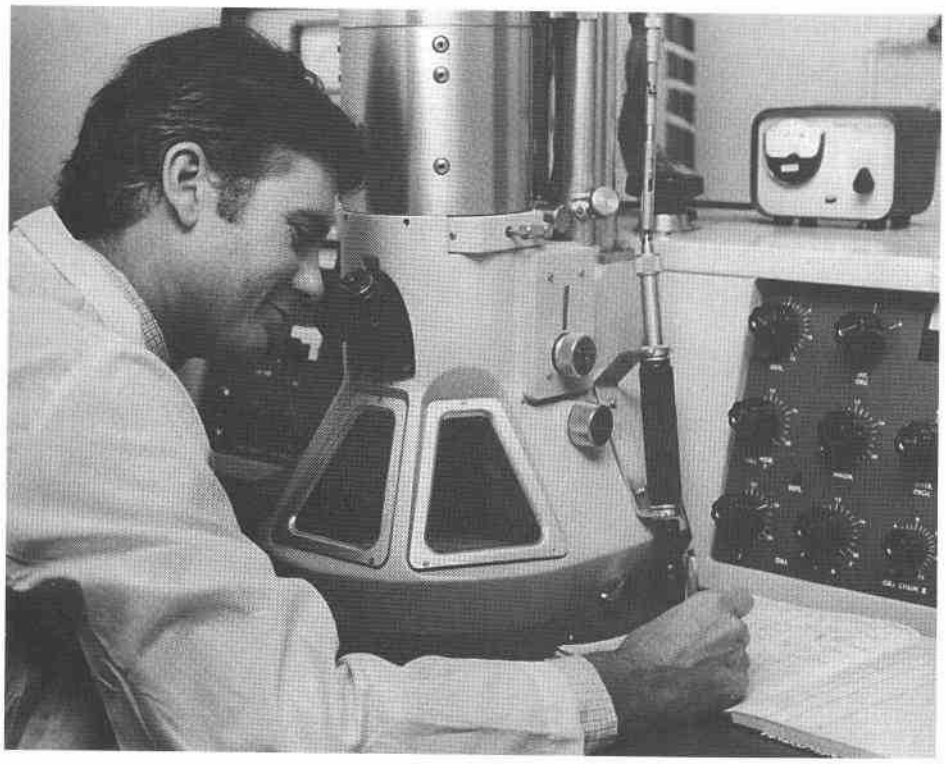
(at Washington State University)
VM 446. Pathology II (6)
VM 432. Bacteriology (4)
VM 409. Epidemiology (2)
VM 531. Pharm/Tox I (5)
VM 460. Laboratory Diagnosis (3)

Semester II (21 semester credits)

(at Washington State University)
VM 431. Virology (3)
VM 451. Parasitology (4)
VM 533. Pharm/Tox II (4)
VM 481. Radiology (3)
VM 463. Small Animal Medicine I (4)
VM 471. Intro to Surgery (1)
VM 457. Clin Anesthes (2)

Third Year
Term I (17 semester credits)

(at Washington State University)
VM 433. Public Health (2)
VM 464. Small Animal Medicine II (5)
VM 472. Small Animal Surgery (3)
VM 474. Small Animal Surgery Lab I (1) or
VM 475. Small Animal Surgery Lab II (1)
VM 461. Large Animal Medicine I (6)



Term II (8 semester credits)
Block system (4 weeks/block)
(at Washington State University)
VM 562. Small Animal Medicine (4)
VM 567. Small Animal Surgery (4)

Term III (25 quarter credits)
(at Oregon State University)
VM 722. Large Animal Medicine II (8)
VM 724. Large Animal Surgery (3)
VM 726. Theriogenology (6)
VM 728. Special Animal Medicine (4)
VM 733. Special Veterinary Surgery (3)
VM 775. Practice Management (1)

Fourth Year
Block system (4 weeks/block)
(at Oregon State University)
Required blocks (6)
VM 732. Clinical Medicine I (6)
VM 734. Clinical Surgery I (6)
VM 736. Clinical Service I (6)
VM 735. Rural Veterinary Practice I (6)
VM 780. Preceptorship I (1)
VM 780. Preceptorship II (1)

Elective blocks (12 weeks required)
VM 757. Topics: Small Animal Surg & Med (6)
VM 773. Avian Medicine (6)
VM 774. Laboratory Animal Medicine (6)
VM 752. Clinical Medicine II (6)
VM 754. Clinical Surgery II (6)
VM 756. Clinical Service II (6)
VM 755. Rural Veterinary Practice II (6)
VM 781. Llama Medicine & Surgery (1) - Section 5
VM 781. Clinical & Diag. Toxicology (3) - Section 11
VM 781. Sheep/Goat Medicine & Surgery (3) - Section 20
VM 790. Food Animal Medicine/Caldwell (6) - Section 5
VM 790 Small Animal Private Practice (6) - Section 10
VM 790. Radiology (3) - Section 12
VM 790. Anesthesiology (3) - Section 13
VM 790. Special Studies (6) - Section 20
VM 790. Clin/Lab Diagnosis (3) - Section 21
VM 790. Dairy Herd Health (3) - Section 23

Vacation blocks (12 weeks)

COURSES

Lower Division Courses

VM 110. PREVETERINARY MEDICINE (1). Introduction to the profession's role in society. Graded P/N.

Upper Division Courses

Courses numbered 500 and above may be taken for graduate credit.

VM 451/VM 551. AVIAN DISEASES (3). The pathology of avian diseases; programs for control. PREREQ: VM 431/VM 531 or P 431/P 531. Offered alternate years. Offered 1994-95 and 96-97.

Graduate Courses

VM 501. RESEARCH (TBA). Graded P/N.

VM 503. THESIS (TBA). Graded P/N.

VM 505. READING AND CONFERENCE (TBA). Graded P/N.

VM 506. PROJECTS (TBA). Graded P/N.

VM 507. SEMINAR (TBA). Graded P/N.

VM 601. RESEARCH (TBA). Graded P/N.

VM 603. THESIS (TBA).

VM 605. READING AND CONFERENCE (TBA).

VM 606. PROJECTS (TBA). Graded P/N.

VM 607. SEMINAR (TBA). One-credit section; VM 607 sec 1. Graded P/N.

VM 611, VM 612, VM 613. VETERINARY GROSS ANATOMY (4,4,4). Systematic and topographic study and dissection of the dog, cat, horse, ruminant, pig, and chicken. PREREQ: One year of inorganic chemistry, including a lab; one upper-division course in biochemistry; one term of physics; one year sequence in general biologic sciences or equivalent. Must be taken in sequence.

VM 614, VM 615. VETERINARY MICROSCOPIC ANATOMY (5, 3). Structure and development of cells, tissues, organs, and organ systems of animals. PREREQ: One year of inorganic chemistry, including a lab; one upper-division course in biochemistry; one term of physics; one-year sequence in general biological sciences or equivalent; must be taken in sequence.

VM 616. VETERINARY NEUROSCIENCES (5). Structural and functional relationships of the nervous system and organs of special sense with emphasis on general clinical application. PREREQ: One year of inorganic chemistry, including a lab; one upper-division course in biochemistry; one term of physics; one-year sequence in general biologic sciences or equivalent

VM 620. VETERINARY IMMUNOLOGY (5). Clinical and diagnostic aspects of immunological mechanisms, serological reactions, hypersensitivity, allergy, and disorders of the immune system. PREREQ: One year of inorganic chemistry, including a lab; one upper-division course in biochemistry; one year of physics; one-year sequence in general biologic sciences or equivalent.

VM 621. GENERAL PATHOLOGY (4). General principles of pathology: cell injury and death, inflammation and tissue repair, abnormalities of cell growth, and structures and mechanisms of disease. PREREQ: One year of inorganic chemistry, including a lab; one upper-division course in biochemistry; one term of physics; one-year sequence in general biological sciences or equivalent; must be taken in sequence.

VM 622. PATHOLOGY LABORATORY (2). Laboratory instruction to complement VM 511. PREREQ: VM 611 or concurrent enrollment; one quarter of microscopic anatomy.

VM 651. SELECTED TOPICS IN VETERINARY MEDICINE (3). Topics vary; check Schedule of Classes for particular topics. PREREQ: Graduate standing; consent of instructor.

VM 657. VETERINARY PHYSIOLOGY (6). Physiology of body fluids, respiration, muscle, acid-base balance, blood, cardiovascular and renal systems. PREREQ: One year of inorganic chemistry, including a lab; one upper-division course in biochemistry; one term of physics; one-year sequence in general biologic sciences or equivalent.

VM 658. VETERINARY PHYSIOLOGY (4). Physiology of digestion, metabolism, endocrine system, and renal function. PREREQ: VM 657.

VM 659. VETERINARY REPRODUCTIVE PHYSIOLOGY (2). Physiology of reproduction and lactation. PREREQ: VM 657.

Professional Courses

VM 701. RESEARCH (TBA).

VM 705. READING AND CONFERENCE (TBA).

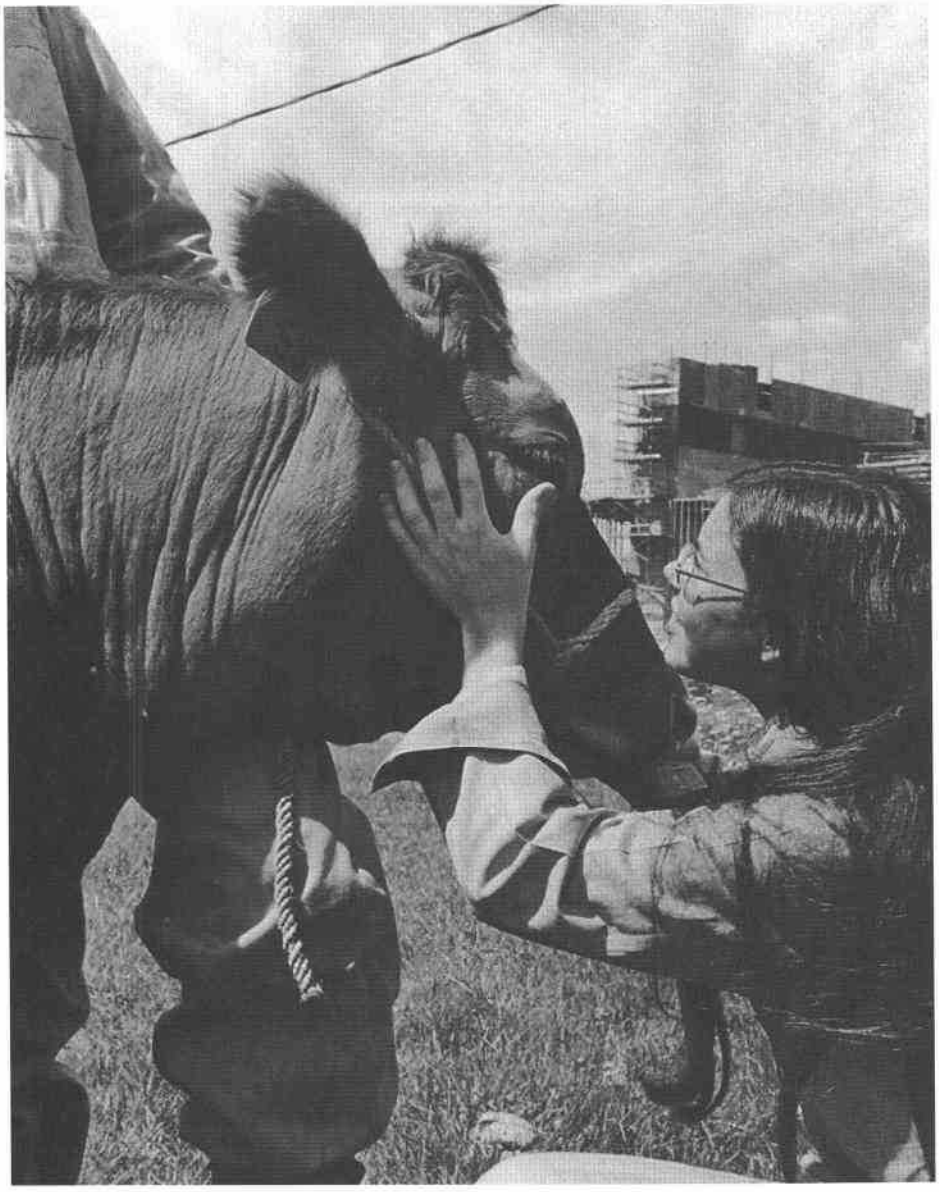
VM 706. PROJECTS (TBA).

VM 709. VETERINARY MEDICINE ORIENTATION (1). An overview of veterinary medicine with emphasis on historical development, current veterinary medical issues, employment opportunities, and professionalism. PREREQ: First-year standing in veterinary medicine. Graded P/N.

VM 711, VM 712, VM 713. VETERINARY GROSS ANATOMY (4, 4, 4). Systematic and topographic study and dissection of the dog, cat, horse, ruminant, pig, and chicken. PREREQ: First-year standing in veterinary medicine. Must be taken in sequence.

VM 714, VM 715. VETERINARY MICROSCOPIC ANATOMY (5,3). Structure and development of cells, tissues, organs, and organ systems of animals. PREREQ: First-year standing in veterinary medicine.

VM 716. VETERINARY NEUROSCIENCES (5). Structural and functional relationships of the nervous system and organs of special sense with emphasis on general clinical application. PREREQ: First-year standing in veterinary medicine.



VM 717, VM 718. VETERINARY PHYSIOLOGY (7, 7). Physiology of body fluids, excretion, respiration, acid-base balance, blood, muscle, bone, cardiovascular system, digestion, metabolism, endocrine system, reproduction, and lactation. PREREQ: First-year standing in veterinary medicine. Must be taken in sequence.

VM 720. VETERINARY IMMUNOLOGY (5). Clinical and diagnostic aspects of immunological mechanisms, serological reactions, hypersensitivity, allergy, and disorders of the immune system. PREREQ: First-year standing in veterinary medicine.

VM 721. VETERINARY PATHOLOGY (6). Basic mechanisms and concepts relating to reaction of cells and tissues to disease, with emphasis on cellular and tissue degeneration, inflammatory reaction, circulatory disturbance, and neoplasia. PREREQ: First-year standing in veterinary medicine.

VM 722. LARGE ANIMAL MEDICINE II (8). Diagnosis and treatment of large animal diseases. PREREQ: Third-year standing in veterinary medicine.

VM 723. APPLIED NUTRITION (3). Nutritional concepts related to animal medicine. PREREQ: First-year standing in veterinary medicine.

VM 724. LARGE ANIMAL SURGERY (3). Large animal surgical techniques and procedures. PREREQ: Third-year standing in veterinary medicine.

VM 726. THERIOGENOLOGY (6). Diagnosis, symptomatology, and treatment of reproductive disorders. PREREQ: Third-year standing in veterinary medicine.

VM 728. SPECIAL ANIMAL MEDICINE (4). Diagnosis, treatment, and management of special animals, including the common laboratory animals. PREREQ: Third-year standing in veterinary medicine.

VM 729. CLINICAL PRACTICE (2). General clinical assignments and orientation to veterinary hospital activities. PREREQ: Fourth-year standing in veterinary medicine.

VM 732. CLINICAL MEDICINE I (6).[1] Clinical medicine training in diseases of food animals and horses; clinic rounds and diagnostic procedures. PREREQ: Fourth-year standing in veterinary medicine.

VM 733. SPECIAL VETERINARY SURGERY (3). Selected surgical techniques and procedures as related to food animals and horses. PREREQ: Third-year standing in veterinary medicine.

VM 734. CLINICAL SURGERY I (6).[1] Clinical surgery, treatment, and care of food animals and horses; clinic rounds; training in surgery, lameness, and diagnostic procedures. PREREQ: Fourth-year standing in veterinary medicine.

VM 735. RURAL VETERINARY PRACTICE I (6).[1] Rural practice training in diseases of food animals and horses. PREREQ: Fourth-year standing in veterinary medicine.

VM 736. CLINICAL SERVICE I (6).[1] Clinical experience in radiology, clinical pathology, microbiology, and necropsy. PREREQ: Fourth-year standing in veterinary medicine.

VM 738. INTRODUCTION TO ANIMAL CARE (2). Feeding, housing, breeding and marketing systems related to animal care. PREREQ: First-year standing in veterinary medicine. Graded P/N.

VM 752. CLINICAL MEDICINE II (6).[1] Additional clinical medicine training. PREREQ: VM 732. Graded P/N.

VM 754. CLINICAL SURGERY II (6).[1] Additional clinical surgery training. PREREQ: VM 734. Graded P/N.

VM 755. RURAL VETERINARY PRACTICE II (6).[1] Additional rural practice training. PREREQ: VM 735. Graded P/N.

VM 756. CLINICAL SERVICE II (6).[1] Advanced clinical experience in radiology, clinical pathology, microbiology, or necropsy. PREREQ: VM 736. Graded P/N.

VM 757. SMALL ANIMAL SURGERY AND MEDICINE TOPICS (6).[1] Small animal medicine and surgical techniques and procedures. PREREQ: Fourth-year standing in veterinary medicine. Graded P/N.

VM 770. CLINICAL THERIOGENOLOGY (6).[1] Clinical experience related to reproduction in animals. PREREQ: Fourth-year standing in veterinary medicine.

VM 771. HERD HEALTH AND PREVENTIVE MEDICINE (6).[1] Preventive medicine; environmental, housing, nutrition, management, and agribusiness practices related to farm animals. PREREQ: Fourth-year standing in veterinary medicine. Graded P/N.

VM 772. SHEEP AND GOAT MEDICINE AND SURGERY (1-6). Clinical experience related to diseases of sheep and goats. PREREQ: Fourth-year standing in veterinary medicine. Graded P/N.

VM 773. AVIAN MEDICINE (6).[1] Clinical experience related to diseases of poultry. PREREQ: Fourth-year standing in veterinary medicine. Graded P/N.

VM 774. LABORATORY ANIMAL MEDICINE (6).[1] Clinical experience related to diagnosis, treatment, and management of laboratory animals. PREREQ: Fourth-year standing in veterinary medicine. Graded P/N.

VM 775. PRACTICE MANAGEMENT (1). Ethical, legal, regulatory, and economic aspects of veterinary practice. PREREQ: Third-year standing in veterinary medicine. Graded P/N.

VM 776. EXOTIC ANIMAL MEDICINE (6).[1] Veterinary, surgical, and medical experiences related to diagnosis, treatment, and management of fish, wildlife, aquatic, and zoo animals. PREREQ: Fourth-year standing in veterinary medicine.

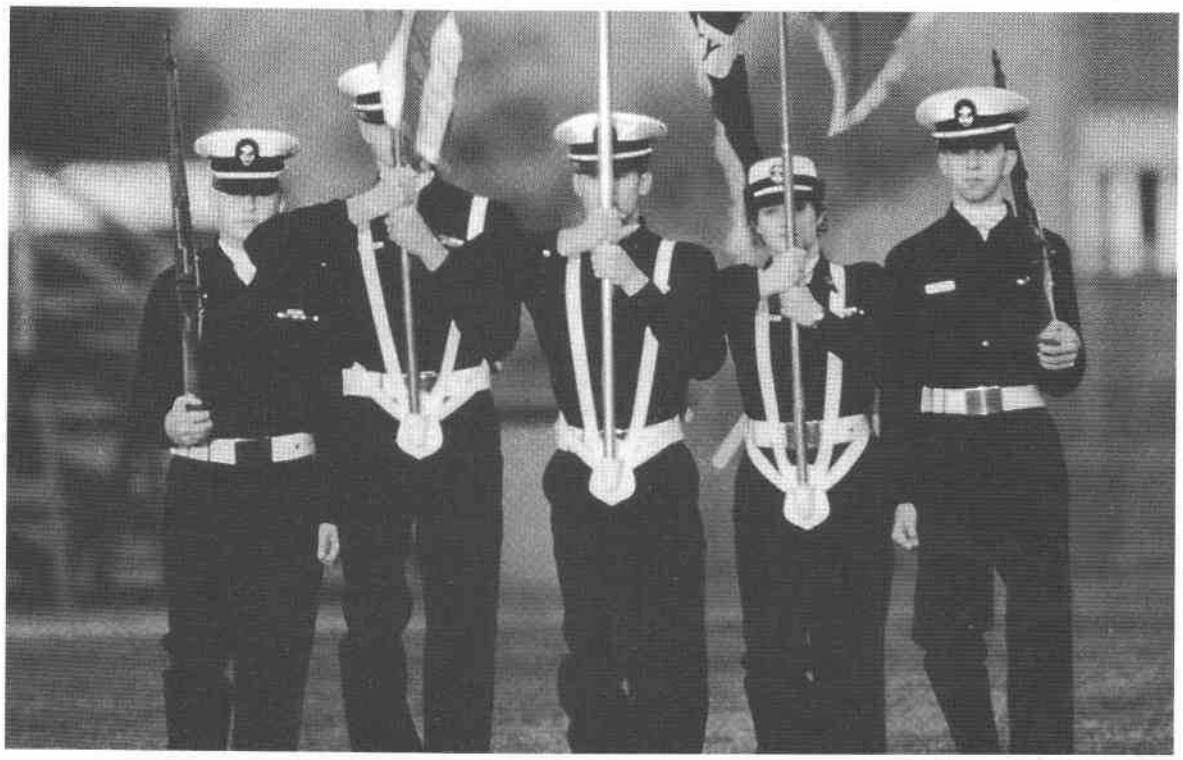
VM 780. VETERINARY MEDICAL PRECEPTORSHIP (1-16).[1] Theory of practice of veterinary medicine in a non-university situation. PREREQ: Fourth-year standing in veterinary medicine. Graded P/N.

VM 781. SEMINAR IN VETERINARY MEDICINE (TBA). Seminars and case discussions on selected topics by students, staff, and others. Graded P/N.

VM 790. CLINICAL EXPERIENCE (TBA). One- to-four week periods. Graded P/N. **Section 1:** Large Animal Clinical Experience/Topics (1-16). PREREQ: Fourth-year standing in veterinary medicine. Graded P/N. **Section 2:** Small Animal Clinical Experience/Topics (1-16). PREREQ: Fourth-year standing in veterinary medicine. Graded P/N. **Section 3:** Mixed Animal Clinical Experience/Topics (1-16). PREREQ: Fourth-year standing in veterinary medicine. Graded P/N. **Section 4:** Small Animal Private Practice (1-6). PREREQ: Fourth-year standing in veterinary medicine. Graded P/N. **Section 5.** Special Studies (1-16). PREREQ: Fourth-year standing in veterinary medicine. Graded P/N.

FOOTNOTE

[1]Four week period.



For more than a century, military training has been offered at Oregon State University. Fulfilling a provision of the Morrill Act of 1862, which gave Corvallis College its first public support, an Army Cadet Corps was organized in 1873.

At the end of World War II the Secretary of the Navy commissioned the Department of Naval Science (NROTC) on this campus to provide the training of both Navy and Marine Corps officers. On July 1, 1949, the U.S. Air Force activated an AFROTC unit that is called the Department of Air Force Studies. OSU is now one of 33 colleges and universities that offer education for all three military departments.

Originally, two years of military science and tactics were required of all able-bodied male students, but since 1962, ROTC has been voluntary. Since 1965, two-year programs have been available for students who have finished two years of college but have not taken ROTC previously.

As opportunities for women to serve as officers in the armed forces grow, opportunities for women to participate in ROTC programs expand. Women have long been eligible to take ROTC course work for credit. Since 1970, they have been enrolled as cadets in Air Force ROTC and, since 1973, have also been enrolled as cadets in military and naval science.

Mission and Objectives

The ROTC selects and prepares young men and women, through a program of instruction coordinated with the students' normal academic curriculum, for commissioning and service as officers in the regular and reserve components of the Army, Navy, Air Force, and Marine Corps.

Uniforms and Allowances

Students in each of the units receive uniforms to be worn at drill periods and on special occasions. During the final two years, students receive $150 a month subsistence pay for up to 20 months. Travel to and from any summer camps or cruises is paid. While at camp or on cruise, the members receive food and quarters at government expense in addition to basic pay. (See the individual sections for further information on the various camps and cruises.) Those selected for the scholarship programs receive tuition, books, and fees plus $150 a month subsistence pay for up to 40 months.

Flight Training

Eligible Army, Navy, and Air Force ROTC students may be selected for flight training upon their successful completion of the program and commissioning. Selected Air Force ROTC students may participate in a flight instruction program between their junior and senior years at government expense as a prerequisite to pilot training after commissioning.

How to Enroll

See the Army, Navy, or Air Force sections of this catalog for enrollment details for the various ROTC programs. All three departments have staff available throughout the year during normal school hours to answer any inquiries regarding the ROTC programs.

AIR FORCE SCIENCE

Col. Duncan Koller, Commander
McAlexander Fieldhouse 308
Oregon State University
Corvallis, OR 97331-4902
(503) 737-3291

Faculty

Professor Col. Koller; Associate Professor Maj. Zautner; *Assistant Professors* Capt. Hebing, Capt. Harris; *Instructors;* TSgt. Danner, SSgt. Urban

Minor

Air Force Studies

The mission of Air Force ROTC is to provide professional preparation for future Air Force officers. The Department of Air Force Studies offers students, in virtually all academic areas, the opportunity to qualify for a commission in the United States Air Force while simultaneously completing University undergraduate or graduate degree requirements.

Today's Air Force is a highly technologically advanced branch of the military forces. Whether a student's interest lies in flying the most advanced aircraft in the world or in the development of state-of-the-art technology, the Air Force can offer exciting and challenging opportunities to those who qualify. Graduates go on active duty in career fields where they can apply their education.

Additionally, they assume advanced leadership and management responsibilities not normally found in civilian entry level positions. The Air Force ROTC approach to education encourages inquiry, analysis, critical thinking, imagination, judgment, and individual participation, on the part of each student. Air Force studies courses are open to all University students.

Minor (27)

The Department of Air Force Studies offers a minor which is open to any OSU student. The minor is designed to give students a broad exposure to the concepts of aerospace power, leadership and management, and general military studies.

Required Courses

AS 311, AS 312, AS 313. Air Force Leadership and Management (9)
AS 411, AS 412, AS 413. National Security Forces in Contemporary American Society (9)

Elective Courses

At least 9 credits from the following:
AS 211, AS 212, AS 213. The Development of Air Power (2 each) OR AS 306. Field Training (6)
AS 320. Leadership Lab (1) (maximum of 3 credits)

AS 420. Leadership Lab (1) (maximum of 3 credits)
COMM 322. Small Group Problem Solving (3)
COMM 440. Theories of Conflict and Conflict Management (3)
COMM 446. Communication in International Conflict and Disputes (3)
HST 316. The American Military (4)
HST 317. Why War? A Historical Perspective (4)
HST 440, HST 441. History of Russia (4 each)
HST 464, HST 465. American Diplomatic History (4 each)
HST 466. United States-Latin American Relations (4)
MS 211. Effective Team Building (2)
MS 212. American Military History (2)
MS 213. Fundamentals of Military Operations (2)
NS 321. Evolution of the Art of War, Modern Basic Strategy and Tactics (3)
NS 322. Art of War from Alexander to the Present (3)
PAX 201. Study of Peace and the Causes of Conflict (3)
PHL 205. Ethics (4)
PHL 445. World Views, Values, and Contemporary Global Issues (3)
PS 204. Intro to Comparative Politics (4)
PS 205. Intro to International Relations (4)
PS 340. Eastern & Central European Politics (4)
PS 342, PS 343. Soviet and Post Soviet Political System (4 each)
PS 344. Latin American Politics (4)
PS 345. Politics of Developing Nations (4)
PS 456. Asian Government and Politics (4)
PS 451. American Foreign Policy (4)
PS 452. Alternative International Futures (4)
PS 453. Soviet and Post Soviet Foreign Policy (4)
PS 454. International Law and Organizations (4)
PSY 462. Interpersonal Relations and Small Group Processes (3)
SOC 324. Groups and Organizations (3)

PROGRAMS

Two Air Force ROTC programs are available. Students who qualify may elect to pursue either of these programs.

Four-Year Program

The four-year program consists of the General Military Course: six quarters of lower division Air Force Studies classes, including a laboratory each quarter, and the Professional Officer Course: six quarters of upper division aerospace studies classes, including a laboratory each quarter.

Previous military experience (ROTC, academy, or military service) may allow the professor of Air Force Studies to waive all or part of the General Military Course (freshman and sophomore years) for students enrolled in the four-year AFROTC program.

Students may enter the freshman class at the start of fall, winter or spring quarter. Sophomore students may enter at the start of fall quarter and take the freshman and sophomore level courses concurrently.

Prior to enrolling in the last two years of the program, the Professional Officer Course, the student must meet AFROTC qualification standards and requirements.

Two-Year Program

This program provides an opportunity for students who did not elect the four-year ROTC program. Entry is on a competitive basis. Application should be made early during fall term of the student's sophomore year. Selectees attend mandatory six-week summer field training (AS 306) prior to their junior year of college. Applicants must have two years remaining in college after the six-week field training. This may be undergraduate or graduate work or a combination. The curriculum includes AS 306 (six-week field training); AS 300-series and AS 400-series, including a laboratory each quarter.

COMMITMENTS

Cadets in the four-year program incur no obligation during their first two years in AFROTC unless on scholarship. The student agrees to accept commission, if offered, only after enrolling in AS 311. Scholarship students incur a commitment at the beginning of their sophomore year. Upon accepting their commission, pilots incur an obligation of eight years after completion of pilot training; navigators incur a six-year obligation after initial training; and all others agree to serve for four years following commissioning.

SCHOLARSHIPS

Scholarships are available for qualified students. High school seniors interested in applying should consult their high school counselors in their junior year or early in their senior year. University students in the four-year AFROTC program compete for scholarships twice a year on the basis of grade-point average, Air Force Officer Qualifying Test scores, Scholastic Aptitude Test scores, and a personal interview. Special scholarship programs are available for students majoring in pharmacy, computer engineering, math, or computer science (majors subject to change). Special scholarship programs are also available to minorities in all majors. Students receiving scholarships must be able to complete the Air Force ROTC program, receive degree, and be commissioned by age 25 (29 for veterans). Each scholarship covers the cost of tuition, laboratory fees, incidental expenses, textbooks, and an allowance of $150 a month.

For students who are not selected for any other scholarship program, the Air Force is offering $2,000 per year for tuition and books plus $150 a month for expenses to students *in any academic major* during their junior & senior years. To qualify for this scholarship, the student must:

- be a full-time student at OSU.
- not be older than 25 upon graduation (waiverable for students with prior military service).
- have a 2.35 term GPA.

As in the other scholarship programs, students must enroll in the AFROTC program and agree to accept an Air Force officer commission and service commitment upon graduation.

For details on both programs, contact the AFROTC Detachment, McAlexander Fieldhouse Room 308, (503) 737-3291. For more information, see the Scholarship section in the front of this catalog.

ALLOWANCES, UNIFORMS, TEXTBOOKS

Students enrolled in the Professional Officer Course are paid a $150 monthly stipend. Uniforms and textbooks for both the General Military Course and Professional Officer Course are provided by the Air Force.

STANDARDS

Cadets must be U.S. citizens of sound physical condition and high moral character. Before graduation, nonscholarship cadets must complete a 3-credit course in mathematical reasoning.

Nonscholarship cadets must complete ROTC and receive a degree prior to age 26½ (27½ for veterans) if designated for flight training, or otherwise prior to age 30, to be commissioned as Air Force officers. Veterans may request an age waiver up to age 35.

FURTHER EDUCATIONAL OPPORTUNITIES

After completion of AFROTC requirements, advanced degrees may be sought by delaying active duty commitments. Some commissioned officers continue advanced studies through the fully-funded Air Force Institute of Technology programs.

Special provisions are available for medical, law, and meteorology students. For further information, contact the AFROTC detachment, 308 McAlexander Fieldhouse, OSU or call (503) 737-3291.

FIELD TRAINING

Under either Air Force ROTC program, the student takes only one summer field training session. The two-year program requires six weeks of field training; the four-year program requires four weeks. Students are paid varying amounts for each of these training periods. This pay is in addition to travel pay to and from the field training location.

COURSES

Lower Division

AS 111, AS 112, AS 113. THE AIR FORCE TODAY (1). This course deals with the Air Force in the contemporary world through a study of the total force structure, strategic offensive and defensive forces, general purpose forces, and aerospace support forces.

AS 120. LEADERSHIP LABORATORY (1). Graded P. Cadets learn officership, leadership, drill and ceremony, and customs and courtesies. Taken concurrently with AS 111, AS 112 and AS 113.

AS 211, AS 212, AS 213. THE DEVELOPMENT OF AIR POWER (2). This course is a study of air power from balloons and dirigibles through the jet age; a historical review of air power employment in military and non-military operations in support of national objectives; a study of changes in the nature of military conflict; and a look at the evolution of air power concepts and doctrine.

AS 220. LEADERSHIP LABORATORY (1). Graded P. Cadets are placed in element leadership positions in order to know and comprehend the air force concepts of command, discipline, tradition, and courtesies. Taken concurrently with AS 211, AS 212 and AS 213.

AS 280. PREPROFESSIONAL OFFICER COURSE (1). Graded P. Air Force ROTC Leadership Laboratory participation for students who have completed the Air Force General Military Course sequence that are not eligible for immediate entry into the Air Force Professional Officer Course. Instruction is conducted within the framework of an organized cadet corps. Leadership laboratory is a study of Air Force customs and courtesies; drill and ceremonies; career opportunities in the Air Force; and the life and work of an Air Force junior officer. Students develop their leadership potential in a practical and supervised laboratory. PREREQ: Completion of AS 100 and AS 200 series.

Upper Division

AS 304. FIELD TRAINING (6). Graded P. Four-week field training (for four-year program students); supplements campus courses in developing leadership and discipline. Mission, organization, and functions of an Air Force base; marksmanship, survival, and physical training; aircrew and aircraft indoctrination; orientation on specific opportunities in career fields. Conducted at an Air Force base. Permission of department head required.

AS 306. FIELD TRAINING (6). Graded P. Six-week field training (for two-year program applicants); education and training comparable to that received by the four-year program cadet during the freshman and sophomore years on campus and the four-week field training period (AS 304). Conducted at an Air Force base. Permission of department head required.

AS 311, AS 312, AS 313. AIR FORCE LEADERSHIP AND MANAGEMENT (3). An integrated management course emphasizing the concepts and skills required by the successful manager and leader. The curriculum includes individual motivational and behavioral processes, leadership, communication, and group dynamics, providing the foundation for the development of the junior officers professional skills (officership). Course material on the fundamentals of management emphasizes decision making, the use of analytic aids in planning, organizing, and controlling in a changing environment, as necessary professional concepts. Organizational and personal values (ethics), management of change, organizational power, politics, and managerial strategy and tactics are discussed within the context of the military organization courses must be taken in order.

AS 320. LEADERSHIP LABORATORY (1). Graded P. Cadets are placed in line and staff leadership positions as a preparation for Air Force active duty. Cadet responsibilities include planning, organizing, directing, and controlling the activities of the cadet corps. Taken concurrently with AS 311, AS 312 and AS 313. PREREQ: AS 304, AS 306.

AS 351. AEROSPACE STUDIES (1). Graded P. Principles of flight, weather and navigation; flight computers; flight planning; aviation physiology, and Federal Aviation Regulations. Preparation for Air Force flight training and flying careers. PREREQ: AS 304 or AS 306.

AS 405. READING AND CONFERENCE (1-16). Graded P. Supervised individual work.

AS 411, AS 412, AS 413. NATIONAL SECURITY FORCES IN CONTEMPORARY AMERICAN SOCIETY (3). This course is a study of US National Security Policy which examines the formulation, organization, and implementation of national security; context of national security; evolution of strategy; management of conflict; and civil-military interaction. It also includes blocks of instruction on the military profession, officership, and the military justice system. The course is designed to provide future Air Force officers with a background of United States National Security Policy so they can effectively function in todays Air Force. Must be taken in order.

AS 420. LEADERSHIP LABORATORY (1). Graded P. The senior-level Leadership Laboratory program places cadets in command, line, and staff positions as a preparation for commissioned Air Force service. Cadet responsibilities include planning, organizing, directing, coordinating, and controlling leadership laboratory and the activities of the cadet corps. Taken concurrently with AS 411, AS 412 and AS 413. PREREQ: AS 304, AS 306.

MILITARY SCIENCE

Lt. Col. Lawrence D. Clement, Commander
McAlexander Fieldhouse 200
Oregon State University
Corvallis, OR 97331-4901
(503) 737-3511

Faculty

Professor Lt. Col. Clement (Infantry); *Assistant Professors* McKeffer (Infantry) Maj. Kashchy (Field Artillery), Cpt Cunningham (Military Intelligence), Capt. Hendrickson (Infantry), Capt. Loeffler (Infantry); *Instructors* Master Sergeant Cox, Sgt. First Class Casteneda

Minor

Military Science

The Military Science program is specifically designed to give college men and women on-campus instruction and experience in the art of organizing, motivating, and leading others. It includes instruction in leadership to develop self-discipline, physical stamina, and professional bearing.

All courses offered by the Department of Military Science are fully accredited and applicable towards fulfilling academic requirements for graduation. The University offers each eligible man and woman the opportunity to compete for a commission as an officer in the United States Army while earning a college degree. There are both basic and advanced programs with multiple entry points which can be tailored to a student's needs. Those interested in aviation careers have the opportunity to become officer pilots in fixed or rotary wing aircraft. Merit scholarship opportunities exist for students in any approved academic discipline, particularly in business, engineering, science, and social science. Uniforms and books are provided free of charge.

Basic Program

The basic program is voluntary, comprising the 1- and 2-credit, lower-division courses listed below, and is normally completed during the freshman and sophomore years. Students may also satisfy the basic program requirements or accelerate their progress by previous military experience or by completing Summer Camp (MS 214), or Fundamentals of Military Science (MS 215).

No military obligation is incurred for participation in Basic Program classes, and students can decide whether they want to apply for the advanced program.

Advanced Program

Students who desire to enroll in the two-year advanced program, comprising the 3-credit, upper-division courses listed below, must apply and be accepted. Only those students who have satisfied the basic program requirements described above are eligible.

Students in the advanced program receive $150 per month subsistence allowance during the school year. During the six-week summer portion of the program, they receive room and board, travel expenses to and from the program location, and approximately $700 for the period involved. Veteran students enrolled in the ROTC program receive these amounts in addition to any other educational benefits.

The advanced summer program is normally attended between the cadet's junior and senior years. The University awards 6 credits for successful completion.

Simultaneous Membership Program

Advanced Program ROTC students may also elect to join reserve or national guard units. As officer candidates, they receive pay and allowances from both ROTC and their assigned unit while, at the same time, gaining essential military knowledge prior to their commissioning. Students participating in this program can earn over $6,500 in two years.

Service Obligation and Academic Delay

Current laws and regulations require each advanced program graduate to accept a commission upon graduation and to fulfill an eight-year military commitment. This may be satisfied by eight years of reserve forces duty in the USAR or ARNG or by a combination of active duty and reserve forces duty, usually three years active duty and five years reserve forces duty. ROTC scholarship students may be required to serve on active duty for four years, depending on the needs of the army at the time.

Delays in reporting to active duty may also be granted for up to four years to selected students who are enrolled in a full time program of instruction leading to an acceptable advanced degree. No additional service obligation is incurred by this academic delay.

COMMISSIONING

United States Army Reserve and the Regular Army

Students who complete the Advanced Program are eligible for appointment and commission by the President of the United States as officers in the U.S. Army Reserve. Reserve commissions are tendered in all 16 basic branches of the army. The branch in which a student is commissioned is determined by personal preference, leadership potential, academic background, recommendations of the faculty, and needs of the service. A newly commissioned officer normally attends officer branch school shortly after graduation, unless granted delayed entry to pursue a graduate degree.

A student who has been designated a Distinguished Military Graduate by the president of the University and the Professor of Military Science may, upon graduation and approval of the Department of the Army, be commissioned into the regular army.

SCHOLARSHIPS

Army ROTC offers two types of National Competition Merit Scholarships. There are now three tiers of scholarship that will pay either $12,000, $8,000 or $5,000 annually for tuition, a book allowance of $150 per term, laboratory and incidental fees, and $150 subsistence allowance each school month for the term of the scholarship. The four-year scholarships are awarded to selected high school seniors or to recent high school graduates. High school students interested in applying should consult their school counselors during the junior year or early in the senior year.

Three-year and two-year on-campus scholarships are available to selected University freshmen and sophomores, whether or not they are enrolled in ROTC. Full information on Army scholarships may be obtained by contacting the Department of Military Science. Off-campus students can call (503) 737-3511 collect. For more information, see the scholarship section in the front of this catalog.

MINOR (27)

MS 111. Military Science I: Leadership Development (1)
MS 112. Military Science I: Military Skills (1)
MS 113. Military Science I: Land Navigation (1)
MS 211. Military Science II: Effective Team Building (2)
MS 212. Military Science II: American Military History (2)
MS 213: Military Science II: Fundamentals of Military Operations (2)
MS 311. Military Science III: Advanced Military Operations (3)
MS 312. Military Science III: Theory and Dynamics of the Military Team (3)
MS 313. Military Science III: Applications of Military Leadership (3)
MS 411. Military Science IV: Military History (3)
MS 412. Military Science IV: Military Justice (3)
MS 413. Military Science IV: Professionalism and Ethics (3)

The following classes may be substituted for one or more of the Military Science I or II classes. (Total of 27 credits must still be met.)

MS 214. Basic Summer Camp: Camp Chal (6)
MS 216. Basic Military Science (1-6)

MILITARY EDUCATION REQUIREMENTS

In order to receive a commission as an Army officer each cadet must meet professional military education requirements. These include study in human behavior, written communication, and mathematics or numerical analysis. Scholarship students also must take a course in an Indo-European foreign language.

COURSES

Lower Division

MS 111. MILITARY SCIENCE I: LEADERSHIP DEVELOPMENT (1). Introduction to ROTC, its relationship to the U.S. Army. Role of the army officer, including leadership and management fundamentals. Types of jobs available to army officers.

MS 112. MILITARY SCIENCE I: MILITARY SKILLS (1). Basic rifle marksmanship; military first aid; customs and traditions of the U.S. Army; unit organization and missions.

MS 113. MILITARY SCIENCE I: LAND NAVIGATION (1). How to read a topographic map and use a magnetic compass; includes practical exercises.

MS 211. MILITARY SCIENCE II: EFFECTIVE TEAM BUILDING (2). An examination of effective leadership. Development of interpersonal skills using practical exercises and case studies.

MS 212. MILITARY SCIENCE II: AMERICAN MILITARY HISTORY (2). History of the American soldier from 1775 to 1919; weaponry and tactics of the American Army. Use of battle analysis and wargaming included.

MS 213. MILITARY SCIENCE II: FUNDAMENTALS OF MILITARY OPERATIONS (2). Basic U.S. Army tactics at the individual, team, and squad levels. Integration of military skills in offensive and defensive operations.

MS 214. BASIC SUMMER CAMP: CAMP CHALLENGE (6). Six weeks of leadership training at Fort Knox, Kentucky. Substitute for the first two years of the ROTC program. PREREQ: Meet minimum enrollment standards for the advanced ROTC program.

MS 215. FUNDAMENTALS OF MILITARY SCIENCE (3). Leadership and management fundamentals; role of the Army ROTC and the Army officer. Individual military skills and their incorporation into tactical operations at the squad level. Land navigation using map and compass.

MS 216. BASIC MILITARY SCIENCE (1-6). Introduction to leadership and management. Organization of the Army and ROTC. The army as a profession. Map reading and land navigation. Military tactics. Role of the Army officer.

Upper Division

MS 311, MS 312, MS 313. MILITARY SCIENCE III: LEADERSHIP AND MANAGEMENT (3). OF MILITARY ORGANIZATION Study of military leadership, management, and theory and dynamics of the military team. Applies principles to advanced military operations. Includes leadership, management, and organizational theory; group dynamics; funcitons of staff organizations; developent of the commander's estimate; combat orders and plans; troop leading procedures; applications of leadership concepts in offensive and defensive operations at the squad, platoon, and company level; and fundamentals of small-unit tactics/patrolling.

MS 314. ADVANCED SUMMER CAMP: CAMP ADVENTURE (6). Practical and theoretical instruction for six weeks at Fort Lewis, Washington. Practical leadership application and experience in a military environment. PREREQ: MS 311, MS 312, MS 313.

MS 405. READING AND CONFERENCE (1-16). Graded P.

MS 411, MS 412, MS 413. MILITARY SCIENCE IV: PREPARATION FOR (3). OFFICERSHIP Recent military history, national defense policy and its application in current world events. Includes military law; law of land warfare; small-unit administration; and ethics and professionalism with emphasis on applied leadership, management techniques, and ethical decision making. Designed to assist the future army officer with the transition from student to junior officer leader.

NAVAL SCIENCE

Capt. Marvin R. Rice (USN)
Commanding Officer
Naval Science
Oregon State University
Corvallis, OR 97331-5401
(503) 737-6289

Faculty

Professor Capt. Rice; *Associate Professor* Cdr. Ward, Executive Officer; *Assistant Professors* Maj. Hough (USMC), LTs. Gremmels (USN), Thomas (USN), Sowa (USN), Fuller (USN); *Instructors* Chief Storekeeper Sadac (USN), Staff Sgt. Luebke (USMC), Chief Quartermaster Dawley (USN), Chief Yeoman Harold (USN).

Minor

Naval Science

MINOR (27)

The Department of Naval Science offers a minor in which the student may choose between a Navy sequence and a Marine Corps sequence. A minimum of 27 credits is required for the minor with 20 credits of upper division courses required for the Navy sequence and 18 credits of upper division courses required for the Marine Corps sequence. Students may elect to have their minor designated on their transcript. Specific requirements are listed below:

NAVAL SCIENCE MINOR CORE REQUIREMENTS (9)

NS 111. Introduction to Naval Science (3)
NS 112. U.S. Naval History (3)
NS 112. Seapower and Maritime Affairs (3)

NAVY SEQUENCE (29)

Naval Science Minor Core (9)

NS 211. Introduction to Naval Engineering (3)
NS 212. Introduction to Auxiliary Naval Engineering (3)
NS 213. Leadership and Management I (3)
NS 311. Rules of the Road and Basic Piloting (4)
NS 312. Celestial and Electronic Navigation (4)
NS 313. Maneuvering Board and Naval Operations (3)
NS 411. Principles of Naval Weapons Systems (3)
NS 412. Leadership and Management II (3)
NS 413. Leadership and Management III(3)
NS 450. At Sea Training (6)

MARINE CORPS SEQUENCE (27)

Naval Science Minor Core (9)

NS 321: Evolution of Warfare I (3)
NS 322. Evolution of Warfare II (3)
NS 323. Marine Corps Option Summer Prep I (3)
NS 421. Amphibious Warfare (3)
NS 422. Doctrinal Principles (3)
NS 423. Marine Corps Option Summer Prep II(3)
NS 450. At Sea Training (6)

NROTC Scholarships

The Navy offer, two-, three- and four-year scholarships leading to baccalaureate degrees. Students are selected through national competition, and recipients are appointed midshipman USNR by the Secretary of the Navy. Scholarship Midshipmen receive the financial benefits described below and attend summer cruises during the summers at the end of their freshman, sophomore, and junior years.

Two- and three-year scholarship applicants must be enrolled in the NROTC college program (described below) before applying, and in good academic standing with not less than a B (3.0) grade point average. Students additionally must have completed one term of college calculus with a grade of C or better, and receive a favorable recommendation from the Professor of Naval Science.

For all scholarship students, the Navy pays tuition, cost of textbooks, other fees of an instructional nature, and a subsistence allowance of $150 a month for each nine-month school year. Graduates will be commissioned as Ensign, U. S. Naval Reserve, or Second Lieutenant, U. S. Marine Corps Reserve, and are required to serve on active duty for four years. Applications for the scholarship program may be obtained from any NROTC unit or Navy-Marine Corps recruiting office.

College Program

Students may apply to participate in the NROTC program. Applicants are selected by the Department of Naval Science at OSU and are then eligible to compete for two and three year scholarships. Additionally, after their sophomore year, College Program Midshipmen must apply and be selected for "advance standing" status. If selected for "advance standing" for their junior and senior years, selectees receive subsistence pay of $150 a month, uniforms, and pay during summer cruises. Graduates are offered commissions as Ensign, U. S. Naval Reserve, or Second Lieutenant, U. S. Marine Corps Reserve, and are required to serve on active duty for three years. College program students have the same professional opportunities after graduation as scholarship students to select careers in naval aviation, surface or submarine duty with a nuclear power option, or specialties within the Marine Corps.

Any university student may take Naval Science courses for credit. However, such students are classified as Naval Science students, and are not enrolled in the NROTC program.

Requirements

Every acceptable NROTC candidate applying for any of the NROTC programs must: a) be a citizen of the United States or become a citizen before entering the advanced course; b) be accepted for admission or enrolled in the university; c) be at least 17 years of age upon enrollment and under 25 years (27 for College Program) on June 30 of the calendar year in which eligible for commissioning; d) be physically qualified in accordance with the standards established by the Department of the Navy; e) possess a satisfactory record of moral integrity and have potential officer characteristics; f) have no moral obligations or personal convictions preventing him or her from conscientiously bearing arms and supporting and defending the Constitution of the United States against all enemies foreign and domestic.

Status and Curriculum

Students enrolled in the NROTC program are not on active duty. They wear the uniform only for drills, on special occasions, and during the summer training periods.

The program of study fits into curricula leading to baccalaureate degrees. All midshipmen are required to take credits of Naval Science per term. Additionally, Navy option scholarship students must complete three terms of calculus by the end of their sophomore year and three terms of calculus-based physics by the end of their junior year.

Courses

Lower Division

NS 111, NS 112, NS 113. NAVAL SCIENCE I (3). NS 111: Naval Organization and Administration; Organization of the Navy; the Navy as a career; responsibilities and commitments as an officer in the Navy or Marine Corps. NS 112: U. S. NAVAL HISTORY; U. S. Navy development from the birth of the naval service in 1775 to the present. NS 113: SEA POWER AND MARITIME AFFAIRS; A comprehensive look at the broad principles, concepts, and elements of sea power with historical and modern applications to the United States and other world powers. PREREQ: NS 112.

NS 211, NS 212, NS 213. NAVAL SCIENCE II (3). NS 211: INTRODUCTION NAVAL ENGINEERING:Basic engineering systems theory and concepts, application in todays fleet; fleet hardware. NS 212: INTRODUCTION TO AUXILIARY ENGINEERING.

NS 213. LEADERSHIP & MANAGEMENT I. (3).

Upper Division

NS 311, NS 312, NS 313. NAVAL SCIENCE III (4). NS 311: NAVIGATION: Piloting, dead reckoning, and rules of the nautical road. NS 312: NAVIGATION: celestial and electronic navigation. NS 313: NAVAL OPERATIONS: Theory of shiphandling, communications, weather, fleet maneuvers, and relative movement problem solution. REC: To be taken in order.

NS 321, NS 322. NAVAL SCIENCE III: MARINE CORPS OPTION (3). Evolution of Art of War and Modern Basic Strategy and Tactics: Art of war from Alexander to present; principles of modern strategy and small unit tactics. For U.S. Marine Corps candidates. REC: To be taken in order.

NS 323. NAVAL SCIENCE III: MARINE CORPS OPTION (3). Evolution of Art of War and Modern Basic Strategy and Tactics: Art of war from Alexander to present; principles of modern strategy and small unit tactics. For U.S. Marine Corps candidates. REC: To be taken in order.

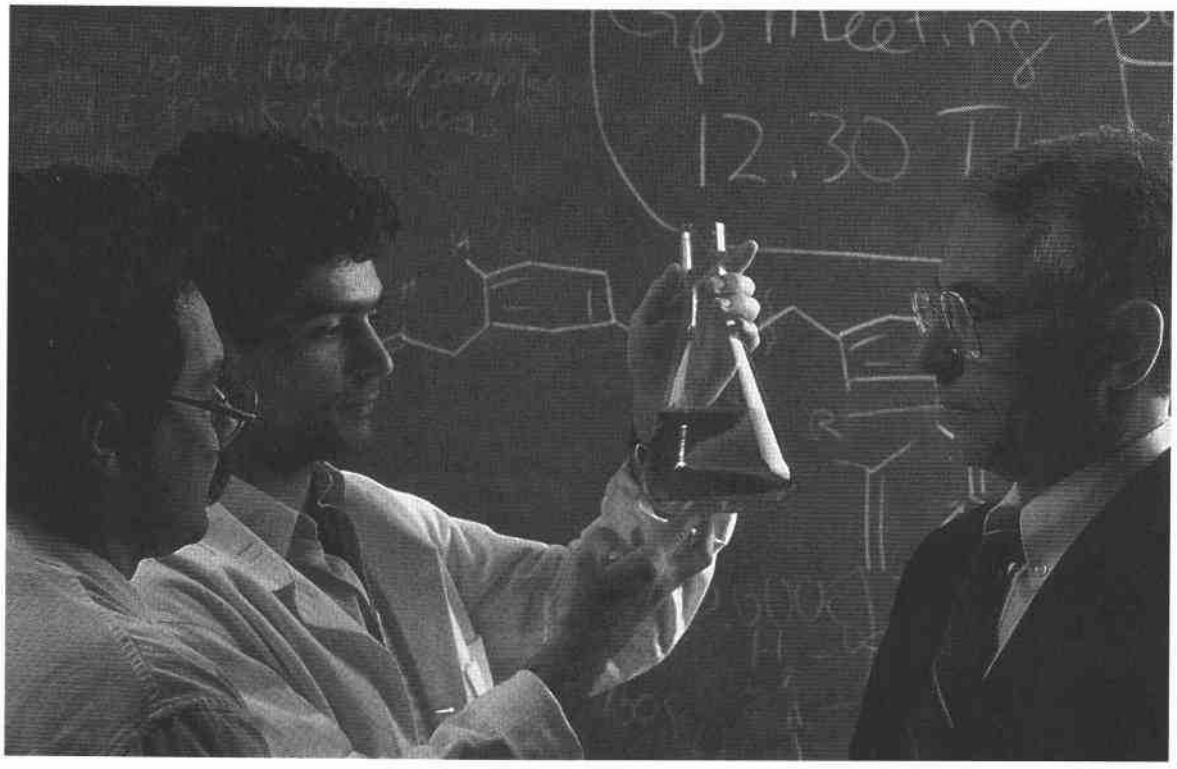
NS 405. READING AND CONFERENCE (1-16). Graded P. To prepare midshipmen returning from a leave of absence from the naval ROTC program for commissioning and entrance into the fleet.

NS 411, NS 412, NS 413. NAVAL SCIENCE IV (3, 3, 3). NS 411: PRINCIPLES OF NAVAL WEAPONS SYSTEMS: Development and employment of Navy and Maritime Corps weapons systems. NS 412: LEADERSHIP AND MANAGEMENT II: Methods of effective leadership. NS 413: LEADERSHIP AND MANAGEMENT III: Junior officer administrative responsibilities. REC: To be taken in order.

NS 421, NS 422. NAVAL SCIENCE IV: MARINE CORPS OPTION (3). Amphibious Warfare and Administration: Theory of amphibious operations in World War II and Korean War; administration; leadership; and military justice. For U.S. Marine Corps candidates. REC: To be taken in order. Offered alternate years.

NS 423. NAVAL SCIENCE IV: MARINE CORPS OPTION (3). Amphibious Warfare and Administration: Theory of amphibious operations in World War II and Korean War; administration; leadership; and military justice. For U.S. Marine Corps candidates. REC: To be taken in order. Offered alternate years.

NS 450. AT-SEA TRAINING (6). Four-to six-week training cruise taken aboard naval ships or submarines as arranged by professor of naval science.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Exciting and diverse educational opportunities are offered through the graduate programs of Oregon State University's 11 colleges which encompass over 70 major disciplines. A Land, Sea, and Space Grant University, OSU enrolls almost 3,000 graduate students, representing more than 90 countries and every state in the nation.

At OSU, maximum opportunity is provided for the integration of graduate instruction and research. The graduate faculty (1,600 members) is selected on the basis of training, experience, research, and evidence of the ability to successfully direct and supervise graduate students.

All study beyond the bachelor's degree at Oregon State University is conducted through the Graduate School. The establishment of departmental graduate programs and the formulation and direction of individual student programs are responsibilities of the departments, under the general rules and requirements of the Graduate School.

The information presented in this catalog concerning graduate programs, degree requirements, Graduate School rules and regulations, and specific department requirements has been condensed. Complete information is available in the *OSU Graduate Catalog* which is available from the Graduate School.

Advanced Degrees

The major academic fields in which advanced degrees are offered by Oregon State University and the types of degrees granted in these fields are listed below.

Adult Education—Ed.M.
Agricultural and Resource Economics—M.S., Ph.D.
Agricultural Education—M.S.
Agriculture—M.Agr.
Animal Science—M.S., Ph.D.
Apparel, Interiors, Housing, and Merchandising—M.A., M.S., Ph.D.
Applied Anthropology—M.A.
Atmospheric Sciences—M.A., M.S., Ph.D.
Biochemistry/Biophysics—M.A., M.S., Ph.D.
Bioresource Engineering—M.S., Ph.D.
Botany and Plant Pathology—M.A., M.S., Ph.D.
Business Administration—M.B.A.
Chemical Engineering—M.S., Ph.D.
Chemistry—M.A., M.S., Ph.D.
Civil Engineering—M.S., Ph.D.
College Student Services Administration—Ed.M., M.S.
Comparative Veterinary Medicine—Ph.D.
Computer Science—M.A., M.S., Ph.D.
Counseling—M.S., Ph.D.
Crop Science—M.S., Ph.D.
Economics—M.A., M.S., Ph.D.
Education—Ed.M., M.S., Ed.D., Ph.D.
Electrical and Computer Engineering—M.S., Ph.D.
English—M.A.
Entomology—M.A., M.S., Ph.D.
Environmental Health Management—M.S.
Family Resource Management—M.S., Ph.D.
Fisheries Science—M.S., Ph.D.
Food Science and Technology—M.S., Ph.D.
Forest Engineering—M.F., M.S., Ph.D.
Forest Products—M.F., M.S., Ph.D.
Forest Resources—M.F., M.S., Ph.D.
Forest Science—M.F., M.S., Ph.D.
General Science—M.A., M.S., Ph.D.
Genetics—M.A., M.S., Ph.D.
Geography—M.A., M.S., Ph.D.
Geology—M.A., M.S., Ph.D.
Geophysics—M.A., M.S., Ph.D.
Health and Safety Administration—M.S.
Health Education—M.S.
Home Economics—M.S.
Horticulture—M.S., Ph.D.
Human Development and Family Studies—M.S., Ph.D.
Human Performance—M.S., Ph.D.
Industrial Engineering—M.S., Ph.D.
Interdisciplinary Studies—M.A.I.S.
Manufacturing Engineering—M.Eng.
Marine Resource Management—M.A., M.S.
Materials Science—M.S.
Mathematics—M.A., M.S., Ph.D.
Mathematics Education—M.A., M.S., Ph.D.
Mechanical Engineering—M.S., Ph.D.
Microbiology—M.A., M.S., Ph.D.
Molecular and Cellular Biology—Ph.D.
Movement Studies for the Disabled—M.S.
Nuclear Engineering—M.S., Ph.D.
Nutrition and Food Management—M.S., Ph.D.
Ocean Engineering—M.Oc.E.
Oceanography—M.A., M.S., Ph.D.
Operations Research—M.A., M.S.
Pharmacy—M.S., Ph.D.
Physics—M.A., M.S., Ph.D.
Plant Physiology—M.S., Ph.D.
Poultry Science—M.S., Ph.D.
Public Health—M.P.H., M.S., Ph.D.
Radiation Health—M.A., M.S.
Rangeland Resources—M.S., Ph.D.
Science Education—M.A., M.S., Ph.D.
Scientific and Technical Communication—M.A., M.S.
Soil Science—M.S., Ph.D.
Statistics—M.A., M.S., Ph.D.
Teaching—M.A.T.
Toxicology—M.S., Ph.D.
Veterinary Science—M.S.
Wildlife Science—M.S., Ph.D.
Zoology—M.A., M.S., Ph.D.

Minors

Any of the majors listed above also may be taken as minor fields of study as part of a student's graduate study program. In addition, the following graduate minors are offered:

Agricultural Chemistry
Anthropology
Art
Community College Education
Community Health
Earth Information Science and Technology
Economic Geography
Foreign Languages and Literatures
Gerontology
History
International Agricultural Development
Music
Philosophy

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ADMINISTRATION

Thomas J. Maresh
Dean

John C. Ringle
Associate Dean

Mary S. Prucha
Coordinator of Graduate Services

Virginia R. Logan
Assistant to the Dean

Physical Education
Political Science
Psychology
Sociology
Speech Communication
Water Resources
Women Studies

GENERAL REGULATIONS

ADMISSION

A student desiring to enter the Graduate School at Oregon State University will provide the Office of Admissions: (a) admission forms; (b) photocopies of transcripts of all previous college or university work, undergraduate and graduate. (If admitted, official transcripts from these institutions must be received by the Office of Admissions prior to the start of the first term of enrollment.); (c) a letter indicating the student's objectives and the special fields of interest, and (d) a nonrefundable $50 application fee. A third copy of the application form must be sent directly to the major department, along with copies of transcripts, a copy of the letter of interest, and three letters of reference. The applicant should contact the major department for any special requirements such as GRE scores. To be considered for admission to the Graduate School, an applicant must have a 4-year baccalaureate degree from an accredited college or university, as well as a scholastic record, background, and other evidence that indicate the ability to do satisfactory graduate work. Normally, this is a combined GPA of 3.00 on the last 90 credits of graded undergraduate work plus all work completed thereafter. The Office of Admissions will determine whether the general conditions for admission have been met. The major department indicated by the student will examine the material submitted to determine adequacy of scholastic background and to decide whether departmental facilities are adequate for the student's expressed aims.

Test of English Proficiency

The Test of English as a Foreign Language (TOEFL) is required of all international applicants whose native language is not English. The minimum acceptable TOEFL score is 550. If all other admission requirements are met, conditional admission may be granted if an applicant has a TOEFL score of at least 500. Refer to International Student Admissions in the *Graduate Catalog* for complete details.

ADMISSION STATUS

Students may be admitted to the Graduate School under the following categories:

Advanced Degree Students (Regular Graduate Students)

These students have been accepted by the University and by a major department to work toward an advanced degree.

Conditionally Admitted Graduate Students

Students who have not met the formal University admission requirements but whose accomplishments have convinced the University's Graduate Admissions Committee and their major departments they have potential for success as advanced degree candidates may be admitted conditionally.

Provisionally Admitted Graduate Students

Students who have met all of the University standards for formal admission, but whose academic program or major department may have placed additional restrictions upon their admission, may be admitted provisionally.

Tentatively Admitted Graduate Students

Students who have met all of the University and departmental standards for formal admission, but have not yet provided official transcripts and/or TOEFL scores, may be admitted tentatively.

Credit will be allowed for graduate courses students have completed acceptably while registered as conditional, provisional, or tentative students.

If they fail to complete satisfactorily these terms of admission, they will be dismissed from the Graduate School.

Non-degree Students

The non-degree student category may be used by those holding a baccalaureate degree who do not wish to pursue an advanced degree.

Reclassification of Postbaccalaureate and Non-degree Students

A postbaccalaureate or non-degree student (graduate) may be considered for status as a regular graduate student under one of the following provisions, depending upon prior academic records:

a. If the student would have been eligible for graduate admission at the time of entering as a postbaccalaureate or a non-degree student, he or she is eligible for admission consideration at any time.

b. If the student, prior to entering as a postbaccalaureate or non-degree student, had been denied graduate admission, or would have been ineligible for graduate admission as determined *a posteriori* by the Graduate Admissions committee. The postbaccalaureate or non-degree student must: 1) complete 24 credits each with a grade of B (3.00) or better, or 2) bring the cumulative grade point average (that for the last 90 credits of undergraduate work plus that for courses taken as part of the 24-hour rule) to 3.00 or better before the student is *eligible to apply* for graduate admission.

These courses will normally be regular graduate courses relevant to the specific field, except that seminars and other blanket number graduate courses may not be used. Upper division undergraduate courses are acceptable, provided that they eliminate specific deficiencies. Lower division undergraduate courses may not be used. All courses should be carefully selected in consultation with an academic adviser from the graduate field into which the student desires admission.

The completion of 24 credits with a grade of B (3.00) or better in each course does *not* guarantee graduate admission.

Reclassification decisions employ the same procedures and requirements as those for admission. All requests for reclassification are initiated in the Office of Admissions.

DISMISSAL FROM GRADUATE SCHOOL

Advanced degree (including conditional and provisional) students are expected to make satisfactory progress toward a specific academic objective including maintaining a satisfactory GPA (3.00 or greater), meeting departmental requirements, and participating in a creative activity such as a thesis.

If the major department requests that the student be terminated from its program, he or she may be dismissed from the Graduate School. Any student who fails a final oral examination may be dismissed from the Graduate School.

Academic dishonesty and other violations of the Student Conduct Regulations may serve as grounds for dismissal from the Graduate School.

GRIEVANCE PROCEDURES

Students desiring to appeal matters relating to their graduate education should request a copy of *Grievance Procedures for Graduate Students at Oregon State University* from the Graduate School.

REENROLLMENT

Graduate students who withdraw from the Graduate School must apply for readmission if they wish to re-enter after an absence of two or more terms. Students who re-enter prior to that time need not apply for readmission. Readmittance back into a graduate program is not guaranteed.

REQUIREMENTS AND OPTIONS

Reserving Credits

Credit for graduate courses taken in excess of the requirements for a baccalaureate degree may be granted to undergraduate and postbaccalaureate students by reserving credits for possible use in a graduate program. A maximum of 15 credits may be reserved for graduate credit. Baccalaureate degree holders who are admitted to postbaccalaureate status may reserve not more than 6 graduate credits per term to apply in a graduate program. A request for reservation of credit *must* be made prior to the end of the term in which the student completes baccalaureate requirements.

Registration Requirements

The maximum load for a full-time graduate student is 16 credits. A student may exceed this limit only with the approval of the Graduate School. For teaching and research assistants, the maximum load is 15 credits if appointed on a .15 to .29 FTE assistantship and 12 credits if the appointment is .30 to

.50 FTE. The minimum load is 9 term credits; fellows may carry the maximum load. A minimum load of 9 term credits may be necessary to qualify for purposes of veterans' benefits, visa requirements, financial aid, etc.

Degree-seeking students must enroll for a minimum of three credits in any quarter in which they are using University space, facilities, or faculty time. This includes such activities as holding program meetings, taking departmental written examinations, and having preliminary oral examinations. Registration solely for the purpose of taking the final oral exam for the master's or doctoral degree is not required.

Grade Requirement
A grade-point average of 3.00 (a B average) is required for all courses taken as a graduate student and for courses included in the graduate program. Grades below C (2.00) are not accepted on a graduate program.

Graduate students may elect to take courses on the S-U basis only if those courses are not in their degree program or are not required for the removal of deficiencies.

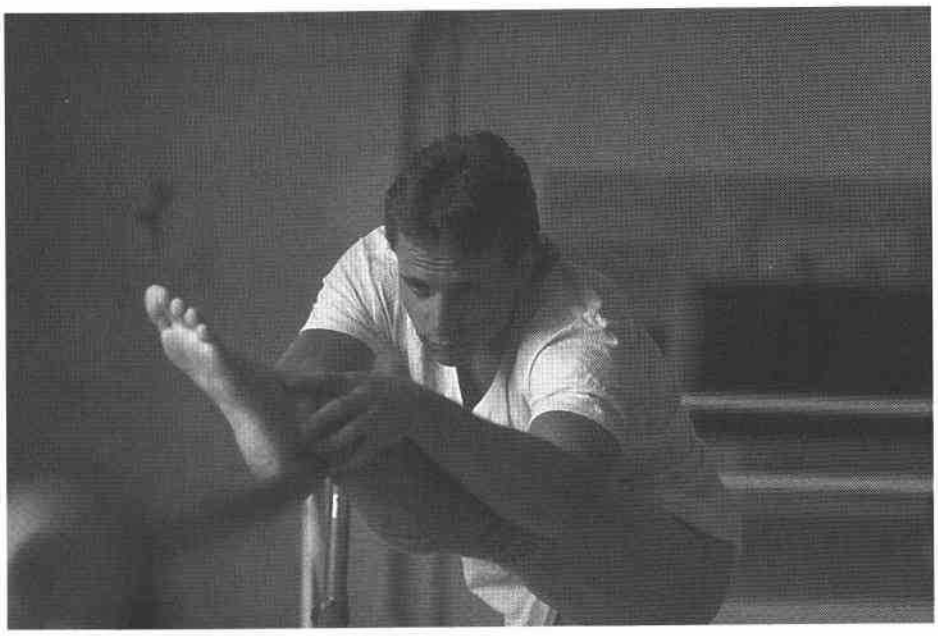
Graduate Major
A graduate major is the area of academic specialization, approved by the State Board of Higher Education, in which the student chooses to qualify for the award of a graduate degree. Upon completion of a graduate degree, the degree awarded and the graduate major are listed on the student's transcript.

Graduate Minor
A graduate minor is an academic area that clearly supports the major. On a master's or doctoral program, a minor may be (a) an academic area available only as a minor, (b) a different major, (c) the same major with a different area of concentration (d) an approved major at another institution in the Oregon State System of Higher Education, or (e) an integrated minor. An integrated minor consists of a series of cognate courses from outside the major area of concentration, with most of the courses being outside the major department.

Graduate Areas of Concentration
A graduate area of concentration is a subdivision of a major or minor in which a strong graduate program is available.

Dual Majors
For the M.A., M.S., Ed.M., M.F., or Ph.D. degree, a student may select two graduate major areas to pursue instead of the traditional single major.

Graduate Courses
Only courses numbered in the 500s and 600s carry graduate credit. No 800-level courses may be applied toward advanced degrees. 500-level course work offered in a 4xx/5xx format must satisfy *all* of the following conditions: 1) The course must include a research component or creative activity appropriate to graduate training in



the given field. 2) When research and/or projects are required in both the 4xx and 5xx levels of the course, instructors must require students enrolled for 5xx credit to present work that is significantly more rigorous in both scope and methodology. 3) When making qualitative evaluations of students, the instructor must hold students in the 5xx course to a standard higher than those enrolled for 4xx credit.

Blanket-numbered courses (courses whose middle digit is zero) carrying graduate credit may be repeated to the maximum as indicated below.

A maximum of 6 credits of blanket numbers other than thesis, or research in lieu of thesis for nonthesis degrees, may be used on the master's degree program; 15 such credits may be used toward the doctorate. Blanket-numbered transferred courses will be considered as part of this maximum.

Meetings and Exam Schedules
Program meetings and preliminary and final examinations may be held during any period when school is in session.

Petitions
A student who wishes to deviate from the normal Graduate School regulations and procedures may present his or her problem in a letter to the Graduate School, signed by the student and his or her major professor.

Diploma Application
Graduate students wishing a diploma must complete an application supplied by the Graduate School. This form should be submitted to the Graduate School for the intended term of graduation prior to taking the final examination.

GRADUATE FEES

Graduate students registered for 9 term credits of work or more pay tuition and fees in accordance with the schedule printed in the Fees and Deposits section of this catalog. Students holding teaching or research assistantships of .15 FTE or greater receive tuition remission but must pay fees. Graduate students registering for 3 to 8 credits of work pay the graduate part-time fee.

GRADUATE WORK BY STAFF MEMBERS

Staff members of Oregon State University holding academic rank cannot receive advanced degrees from OSU. Full-time staff members normally may not register for more than 7 credits per term at staff fee rates. Further information may be obtained from the Department of Human Resources.

GRADUATE APPOINTMENTS

Graduate Teaching Assistantships and *Graduate Research Assistantships* are awarded by academic departments to graduate students who have superior records in their undergraduate work. In order to hold an assistantship appointment, the person must be admitted as a regular or provisionally-admitted graduate student, be enrolled as a full-time student in the Graduate School concurrently with the assistantship appointment, and be making satisfactory progress on an advanced degree. Graduate assistants must complete a minimum of 9 credits during each term of appointment. Persons interested in assistantships should write directly to the department concerned.

Fellowships, sponsored by the university, industry, foundations, and government agencies, are available to superior graduate students for graduate study in various departments at Oregon State University. These fellowships are awarded through the departments concerned, and application should be made by writing to the department. Fellows render no service to the

institution, may carry 16 term credits, and pay full tuition, except as noted. See the *Graduate Catalog* for a list of fellowships.

Degree Programs

Master of Arts and Master of Science

Credit Requirement

All master's degrees require a minimum of 45 graduate credits including the thesis (6 to 12 credits) or paper (3 to 6 credits) when required. Credits used in one master's program may not be used in an additional master's program. Approximately two thirds of the work (30 credits) must be in the major and one third (15 credits) in the minor.

Residence Requirements

The residence requirement for the master's degree is 30 credits on this campus after admission as a graduate student. These 30 credits must appear on the master's degree program. (This does not include credits reserved as an undergraduate or postbaccalaureate student nor credits taken as a postbaccalaureate or non-degree student.)

Transferred Credit

A maximum of 15 quarter credits of graduate work accomplished at another accredited institution may be transferred, provided that: (a) the work fits into a logical program for the degree; (b) the transfer is approved by the student's committee, by the department, and by the Graduate School, and (c) a grade of B (3.00) or better has been earned.

Language Requirements

For the Master of Arts degree, the student must show proficiency in a foreign language equivalent to the level attained by the end of the second-year university course in the language with a grade of C (2.00) or better.

There is no foreign language requirement for the Master of Arts in Interdisciplinary Studies degree. For all other master's degrees there is no foreign language requirement, unless a language is needed in the individual student's program.

Graduate Study Program

A regular master's degree student must file a study program with the Graduate School before the completion of 18 credits of graduate course work.

The program is developed under the guidance of the major and minor professors and signed by the major and minor professors and the chair of the academic unit before filing in the Graduate School office.

Time Limit

Students must complete all work for a master's degree within seven years, including transferred credits, course work, thesis (if required), and all examinations.

Thesis

An examination copy of the master's thesis must be presented to the Graduate School office at least one week prior to the final oral examination. Additional examination copies of the thesis are distributed by the student at this time to other members of the examining committee, including the Graduate Council Representative.

Within six weeks after the final oral, two unbound copies of the thesis for the library, including copies of the abstract, must be deposited in the Graduate School office. If these copies are submitted after the initial six-week period, the student may be subject to re-examination.

Full information concerning the prescribed style for thesis is given in the booklet, "Preparing a Thesis or Dissertation at Oregon State University: A Graduate Student's Guide," available in hard copy at the OSU Book Store and electronically on Gopher.

Final Examinations

Successful completion of a final oral examination is required for all Master of Science and Master of Arts degrees. The examination should be scheduled for two hours.

When a thesis is involved, about half the time should be devoted to the thesis and related areas. The examining committee consists of at least four members of the graduate faculty—two in the major field, one in the minor field, and a Graduate Council Representative. It is the student's responsibility to obtain his or her own Graduate Council Representative from a list provided by the Graduate School.

When no thesis is involved, the examining committee consists of three members of the graduate faculty—two in the major field and one in the minor field.

One dissenting vote is permitted for both thesis and non-thesis degrees. No more than two re-examinations are permitted by the Graduate School, although academic units may permit fewer re-examinations. The final oral examination must be scheduled in the Graduate School office at least one week prior to the date of the examination.

At the time of the final examination, the student must have completed or be registered concurrently in all courses required by the student's program. In addition, the student must have earned a 3.00 GPA in courses required by his or her graduate program and also must have maintained a 3.00 GPA for all courses taken at OSU as a graduate student.

Other Master's Degrees

Master of Agriculture

The program for the Master of Agriculture degree provides a broader and more flexible training in the field of agriculture than the program for the Master of Science degree.

Forty-five credits are required in at least three agricultural or agriculturally related fields, with a maximum of 21 credits in any one field. These three fields must be identified on the program. A thesis is not usually prepared, but a paper demanding 3 to 6 credits of work is required.

A student's committee consists of a minimum of three graduate faculty members—at least one from each field. If a thesis is involved, the committee must also include a Graduate Council Representative. A final oral examination is required.

Areas may be agricultural economics, agricultural education, animal science, botany and plant pathology, crop science, fisheries, food science and technology, horticulture, rangeland resources, soil science, wildlife science, or other areas approved by the College of Agricultural Sciences.

Master of Arts in Interdisciplinary Studies

This degree is granted for attainment of broad, advanced knowledge and achievement integrated from three fields of study. Any graduate major or minor may serve as a field for this degree. Two of the three fields may be identical if the areas of concentration within these two fields are different. At least one field must be selected from among the departments in the College of Liberal Arts. A minimum of 9 credits in each of the three fields of study is required; at least 12 credits must be taken in the College of Liberal Arts. No more than 21 credits (excluding thesis or research paper credits) will be taken in any field unless the total program exceeds 45 credits. There is no foreign language requirement. No more than 3 credits of blanket-numbered courses in each field of study may be used in the program; thesis credits or research paper credits are exempt from this limitation. The

student's committee consists of four members of the graduate faculty—one from each of the three fields and a Graduate Council Representative. A final oral examination is required.

There are two options under the program:

Thesis option: The thesis must coordinate work in the three fields. The requirement is 6 to 9 credits of thesis. The thesis adviser must be a member of the graduate faculty authorized to direct theses.

Research Paper option: The research paper does not necessarily integrate work from the three fields, but typically investigates a subject in depth from one or possibly two of the three fields. The requirement is 4 to 7 credits, registered as research, reading and conference, or projects.

MASTER OF ARTS IN TEACHING

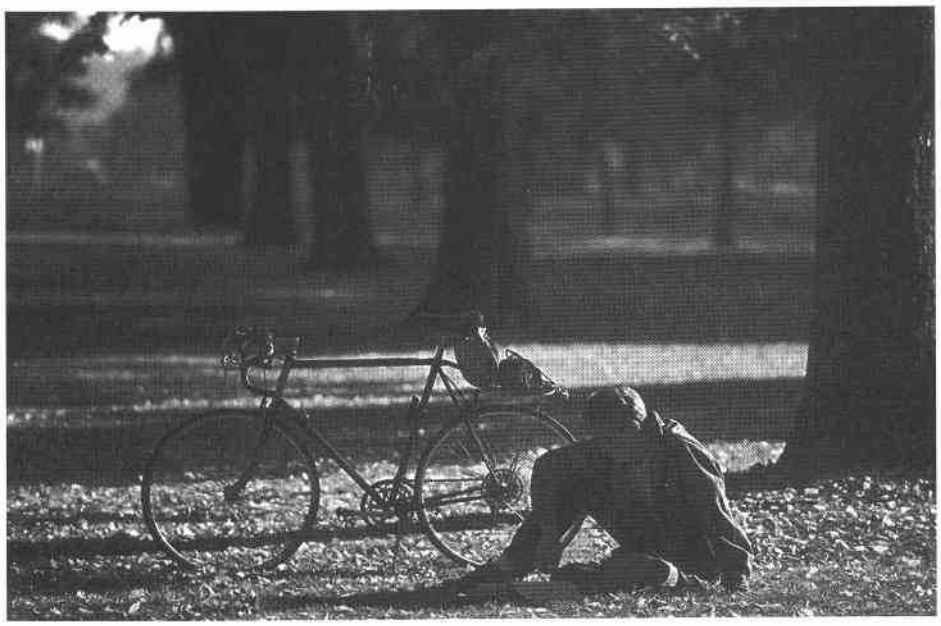
The Master of Arts in Teaching (M.A.T.) is an intensive professional degree program intended to prepare teachers for careers in public school education. Students who successfully complete the M.A.T. are recommended for the Oregon basic teaching certificate upon the positive evaluations of the University and public school supervisors.

The professional program in teacher education is full-time and one calendar year in length. Students will enroll each year with their subject area cohort group and complete the program in one year. Teacher licensure is offered in the following areas: advanced mathematics education, biology education, chemistry education, elementary education, health education, integrated science education, language arts education (English), music education, physical education, physics education, and professional technical education.

PROFESSIONAL TEACHER EDUCATION PROGRAM

The professional teacher education program has two major components: a 15-credit professional education core that is foundational to and a prerequisite for the 48-credit Master of Arts in Teaching degree. The 48-credit M.A.T. includes a professional education concentration (three credits), professional course work in the teaching specialty (18 to 21 credits), a public school professional internship (15 to 18 credits), and a minimum of nine graduate electives in the subject matter specialization (mathematics, business, literature, etc.). Because the professional teacher education program is a two-part program, including the professional core and the M.A.T., future students may plan their programs as either five-year (with a nine-month M.A.T.) or as fifth year programs (with 12 months of graduate study including both the professional core and the M.A.T.).

The M.A.T. degree requires successful completion of a final oral examination.



MASTER OF BUSINESS ADMINISTRATION

The Master of Business Administration degree is designed for the individual holding an undergraduate or graduate degree in nonbusiness areas as well as someone with an undergraduate degree in business administration who seeks professional education which will aid him or her to develop into a competent and responsible executive. The program involves a broad study of business administration, rather than intensive work in any one specialized area.

All newly-admitted M.B.A. students are required to attend an intensive four-credit orientation session prior to the start of their first term in the program. The orientation eliminates the need for many of the typical undergraduate prerequisites.

Students with an undergraduate degree or minor in business can complete the M.B.A. program in four terms; five terms are required for students with a degree in a nonbusiness area.

The M.B.A. program is "lock-step"—students are admitted during fall term only. Students are required to attend a summer session to complete the program. The M.B.A. degree requires a minimum of 45 credits and requires no thesis. A final written examination is required.

MASTER OF EDUCATION

The Master of Education is a professional degree. For the degree, a minimum of 45 term credits in graduate courses must be completed; additional credits may be required. A minimum of 9 additional term credits in graduate courses is required for the master's degree in college student services administration (CSSA).

The Master of Education degree requires successful completion of a final written examination.

Options available under the Master of Education degree are outlined in the *Graduate Catalog*.

MASTER OF ENGINEERING

The Master of Engineering degree in manufacturing engineering is a collaborative program administered jointly by Oregon State University and Portland State University. It is designed to provide engineering professionals the opportunity to pursue advanced-level study in a field of engineering that involves subject matter normally not covered in basic engineering undergraduate programs. The program is concerned with application of specialized engineering and managerial knowledge applied to the development of productive systems of people and machines. Primary emphasis is on the design, operation, and controls of integrated systems for the production of high quality, economically competitive goods utilizing efficient product design, computer networks, machine tools, robotics, and materials-handling equipment.

The M.Eng. is a 45-credit program that requires a technical specialty of 9 to 15 credits. The examining committee consists of a minimum of three members, including an approved joint graduate faculty member in manufacturing engineering from each institution plus the academic program director.

Once admitted as a graduate student to the manufacturing engineering program, any course taught by a joint graduate faculty member qualifies for resident credit. Courses taught by nonjoint faculty members, or other transfer courses, are considered transfer credit.

A final oral examination is required. The degree will be jointly awarded by Oregon State University and Portland State University.

MASTER OF FORESTRY

The Master of Forestry degree is intended for potential administrators and professional forestry specialists in public and private organizations where persons of broad ability and broad technical education are demanded. At least 21 credits are to be selected from a series of designated courses within the College of Forestry. As many as 24 credits may be elected from other courses offered by the collere or University according to guidelines set forth in the program descriptions prepared by each department. The electives must contribute to a unified program that will meet the objectives of the student. A thesis is not required, but a technical report, on an approved topic, correlated with courses in the major fields or assigned or approved topics, must be submitted. A final oral examination is required.

MASTER OF OCEAN ENGINEERING

The Civil Engineering Department offers a Master of Ocean Engineering degree to those students who complete a specially designed, rigorous core course of designated ocean engineering subjects. Other courses outside the core area are permitted. A thesis and final oral examination are required.

MASTER OF PUBLIC HEALTH

The Master of Public Health (M.P.H.) degree program combines broad training in public health with specific training in one of the specialty tracks offered by the three participating universities: Oregon Health Sciences University, Oregon State University, and Portland State University.

The M.P.H. program is designed for persons who already have a bachelor's degree and who wish to obtain further formal education in the field of public health. Persons with experience in the health field or who have training in a specialized area of health will be able to increase their knowledge regarding population-based health to prepare them for expanded administrative and service careers. Persons who do not have prior experience in health fields will be able to prepare themselves for a broad variety of careers depending upon their choice of specialty track.

Eight tracks are offered by Oregon State University in the following areas: epidemiology/biostatistics; health behaviors; health policy and management; occupational health and safety; public health promotion and education; maternal and child health; international health; and gerontology.

Students who are admitted to a track will be able to take core courses at any one of the participating universities and these courses will be considered residency credit. Other courses taken at participating universities are counted as transfer courses.

The M.P.H. program will consist of 15 credits of core courses serving as the minor, plus additional units of required and elective courses, an internship, and a thesis or non-thesis project depending upon the specific track. Programs will average 45 to 60 credits in length. A final oral examination is required.

DOCTOR OF PHILOSOPHY

General Requirements

The degree of Doctor of Philosophy is granted primarily for creative attainments. There is no rigid credit requirement; however, the equivalent of at least three years of full-time graduate work beyond the bachelor's degree is required. A minimum of one full-time academic year (at least 36 credits) should be devoted to the preparation of the thesis.

Graduate Study Program

The student's doctoral study program is formulated and approved subject to departmental policies at a formal meeting of his or her doctoral committee, which consists of a minimum of five members of the graduate faculty, including two from the major department and a representative of the Graduate Council. If a minor is declared, it must consist of at least 18 credits (15 credits for an integrated minor) and the committee must include a member from the minor department. All committee members must be on the graduate faculty with appropriate authorization to serve on the student's committee. The equivalent of one full-time academic year of regular non-blanket course work (defined at 36 credits) must be included on a doctoral program. The program meeting is scheduled in the Graduate School one week in advance. No more than 15 credits of blanket-numbered courses, other than thesis, may be included in the doctoral program.

A regular graduate student who holds a master's degree must file a study program with the Graduate School by the end of one calendar year of enrollment as a doctoral student.

A regular graduate student who does not hold a master's degree must file a study program with the Graduate School by the end of the fifth quarter of enrollment as a doctoral student.

Residence

For the doctoral degree, the residence requirement consists of two parts: (1) a minimum of 36 graduate Oregon State University credits must be completed; and (2) the student must spend at least three terms of full-time graduate academic work (at least 9 credits/term) on site at the Corvallis campus or at an off-campus site approved by the Graduate School. Adequate fulfillment of the residence requirement is determined by the Graduate School.

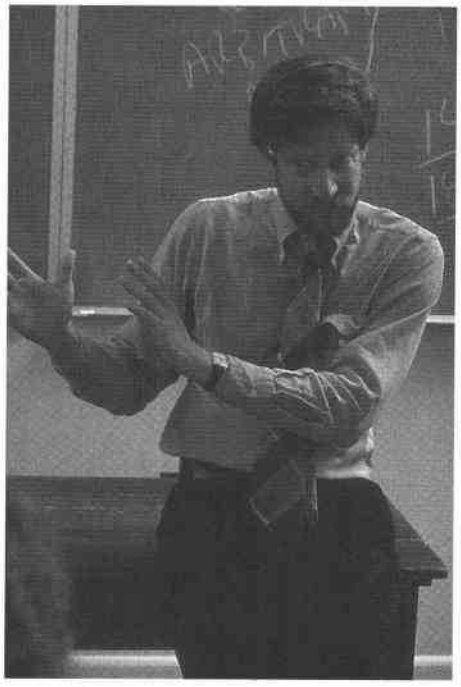
Language Requirements

The foreign language requirement is determined by the student's doctoral committee. Foreign language requirements must be completed before the oral preliminary examination.

Preliminary Examinations

The student working toward the doctorate must pass a comprehensive preliminary examination (at least partly oral) in his or her major and minor subjects.

Most programs require a written comprehensive examination to be taken before the oral preliminary examination. If a written examination is required, it must be completed prior to the oral preliminary examination. The content, length, timing, passing standard, and repeatability of this examination are at the discretion of the major department.



The purpose of the oral preliminary examination is to determine the student's understanding of his or her major and minor fields and to assess the student's capability for research. Advancement to candidacy is contingent on passing this preliminary examination. If more than one negative vote is recorded by the examination committee, the candidate will have failed the examination. Oral preliminary examinations must be scheduled in the Graduate School one week in advance.

At least one complete academic term must elapse between the time of the oral preliminary examination and final oral examination. The final oral examination must be taken within five years after the oral preliminary examination. If more than five years elapse, the candidate will be required to take another oral preliminary examination.

For additional details concerning the preliminary examination, consult the *Graduate Catalog*.

Thesis

Every candidate for the degree of Doctor of Philosophy must submit a thesis embodying the results of research and giving evidence of originality and ability in independent investigation. The preparation of an acceptable dissertation will require at least one full-time academic year. The booklet "Preparing a Thesis or Dissertation at Oregon State University: a Graduate Student's Guide" is available in hard copy at the bookstore and electronically on Gopher.

Regulations concerning the doctoral dissertation are the same as those for the master's degree with the following exceptions: An examination copy of the thesis must be presented to the Graduate School office at least two weeks prior to the final oral examination; within six weeks, two final copies of the thesis for the library and one extra copy of the abstract must be deposited unbound in the Graduate School office.

An abstract of the doctoral thesis of not more than 350 words will be published by University Microfilms in *Dissertation Abstracts*.

Final Examination

After completion or while concurrently registered for all work required by the program, the student must pass a final doctoral examination which may be written in part but must include an oral examination.

The examining committee consists of the student's doctoral committee and any additional members, including professors from other institutions, whom the major department may recommend. In the oral examination, the candidate is expected to defend his or her thesis and to show a satisfactory knowledge of his or her field. If more than one negative vote is recorded by the examining committee, the candidate will have failed the examination. No more than two re-examinations are permitted by the Graduate School, although academic units may permit fewer re-examinations.

Doctor of Education

The Ed.D. program is a degree program with a major in education. It is intended for the educational professional whose career path is that of educational or teaching specialist, administrator, or other practitioner in the public schools, post secondary institutions of higher education, or in business and industry. Its focus is on the application of knowledge to learning and teaching environments in public and private settings. The Ed.D. program is designed to prepare educational leaders in community college education, college student services administration, teacher education, and training and development.

A master's degree in Education or a related field, or equivalent to a master's degree in postbaccalaureate course work is required for admission. In addition, the School of Education requires the following: 1) minimum professional experience as defined by each program, 2) letter or statement of professional objectives for doctoral study and area of specialization within education, 3) three letters of recommendation, and 4) either the Graduate Record Examination or the Miller Analogies Test.

Applicants to the Ed.D. program must have significant experience in an education or education-related setting such as teaching, school administration, curriculum specialist, instructional specialist, child/youth counselor, supervisor; or in a setting where the primary function is education.

In general, the following requirements are in effect for the Ed.D.: 1) a minimum of 108 credits beyond the baccalaureate degree, 2) completion of the same residence requirements as listed for the Ph.D. degree, 3) a dissertation of no less than 24 credits, 4) a mentored internship in an appropriate work setting for a minimum of 12 credits, 5) a minimum of 48 graduate credits in an area of specialty in Education, 6) completion of 24 credits of core seminars, and 7) completion of the core courses in research.

Procedures and requirements for preliminary and final examinations and thesis are similar to those of the Doctor of Philosophy degree.

Interdisciplinary Programs

There are several interdisciplinary programs with the Graduate School as their academic unit. These are college students services administration (ED.M., M.S.), interdisciplinary studies (M.A.I.S.), plant physiology (M.S., Ph.D.), and toxicology (M.S., Ph.D.).

■ College Student Services Administration

The College Student Services Administration program offers preparation in the organization and administration of programs, services, and facilities in Postsecondary Education, including college union/centers, recreational sports, student government and activities, residence life programs, student housing, financial aid, career planning and placement, and general student advising and academic support.

The M.S. and Ed.M. degrees are offered with a major in CSSA. Two academic years on campus are required toward the completion of the minimum of 54 credits of academic work. One year of full time work experience is required for admission, and the application deadline is March 1 for admission the following fall.

Paid assistantships are an important part of the curriculum and the total learning experience. They are generally required for master's students.

Courses

CSSA 550. INTRODUCTION TO PROFESSIONAL COMPETENCIES IN STUDENT SERVICES ADMINISTRATION (1). College student services administration as a field of study, introduction to and review of basic competencies, identification of professional development goals.

CSSA 551. PROGRAMS AND FUNCTIONS IN COLLEGE STUDENT SERVICES (3). Historical, philosophical, and organizational foundations; operational components and functional areas; overview and analysis of college student services in post-secondary educational institutions; leadership development.

CSSA 552. PRINCIPLES AND THEORIES OF STUDENT DEVELOPMENT IN UNIVERSITIES AND COMMUNITY COLLEGES (3). Theoretical and philosophical foundations of student development; analysis of college student characteristics and the student culture; non-traditional student sub-groups; student attitudes, values, and beliefs; concepts and models which promote student learning; and assessment of student growth.

CSSA 553. ORGANIZATION AND ADMINISTRATION OF COLLEGE STUDENT SERVICES (3). Legal foundations, governance models, planning and goal setting, resource acquisition and allocation,personnel and financial management and administrative leadership.

CSSA 554. LEGAL ISSUES IN HIGHER EDUCATION (3). A comprehensive presentation and discussion of the law governing administration within community colleges and colleges/universities with a special emphasis on student services administration.

CSSA 555. PRACTICUM IN COLLEGE STUDENT SERVICES (3). In-depth experience in student services administration and student advising in a variety of offices and departments on campus and at other colleges and universities.

CSSA 556. CURRENT PRACTICES IN STUDENT SERVICES ADMINISTRATION (1). Orientation to and review of current practices and specialized functions in college student services administration.

CSSA 557. PROFESSIONAL DEVELOPMENT IN COLLEGE STUDENT SERVICES ADMINISTRATION (1). Self-assessment, goal setting, professional growth, and professional ethics as a practitioner in college student services administration.

CSSA 680. STUDENT ACTIVITIES AND COLLEGE UNION ADMINISTRATION (3). Advanced study of the historical and philosophical foundations of student activities and college union administration with a special emphasis on current principles and practices; cocurricular student involvement; student organization and leadership development; and student government, student media, student organization advising.

CSSA 681. RECREATIONAL SPORTS ADMINISTRATION IN HIGHER EDUCATION (3). Advanced study of the theory as well as historical growth and development of recreational sports administration on college and university campuses with an emphasis on program development, coordination, and administration.

CSSA 682. STUDENT HOUSING AND RESIDENCE LIFE ADMINISTRATION (3). Advanced study of various aspects of providing educational living environments for students with a special emphasis on varied philosophical approaches, organizational style and structure, fiscal planning and management, food service, residence programs, and daily operations.

CSSA 683. STUDENT FINANCIAL AID ADMINISTRATION (3). Advanced study of the history, philosophy, development, and growth of student financial aid in the United States with a special emphasis on the types of financial aid, student financial aid advising and counseling, and general administration in a financial aid office.

CSSA 684. NEW STUDENT PROGRAMS AND ENROLLMENT MANAGEMENT IN COLLEGES AND UNIVERSITIES (3). Advanced study of current principles, practices, and trends in the management of student enrollment in colleges and universities with a special emphasis on prospective student relations, admissions, orientation, registration, and retention.

CSSA 685. CAREER PLANNING AND PLACEMENT ADMINISTRATION IN COLLEGES AND UNIVERSITIES (3). Advanced study of vocational decision making and career planning in colleges and universities as well as the organization and administration of career planning and placement centers.

CSSA 686. ADVANCED STUDIES IN HIGHER EDUCATION ADMINISTRATION (1). Current issues and trends in higher education with a special emphasis on the relationship between student affairs, academic. affairs, administrative affairs, and institutional leadership.

■ MASTER OF ARTS IN INTERDISCIPLINARY STUDIES (M.A.I.S.)

Programs participating in this degree are adult education (not as a primary area of concentration); agricultural and resource economics; agricultural education; animal science; anthropology; apparel, interiors, housing, and merchandising; art; biochemistry and biophysics; botany and plant pathology; business administration (not as a primary area of concentration); chemical engineering; chemistry; civil engineering; community college education; computer science; crop science; economics; education; electrical and computer engineering; English; entomology; environmental health management; family resource management; fisheries science; food science and technology; foreign languages and literatures (French, German, or Spanish); forest engineering; forest products; forest resources; forest science; genetics; geography (not as a primary area of concentration); geology; gerontology; health and safety administration; health education; history; home economics; horticulture; human development and family studies; human performance; industrial engineering; international agricultural development; materials science; mathematics; mechanical engineering; microbiology; movement studies for the disabled; music; nutrition and food management; operations research; pharmacy; philosophy; physical education; physics; political science; poultry science; psychology; rangeland resources; scientific and technical communication; sociology; soil science; speech communication; statistics; toxicology; water resources; wildlife science; women studies; and zoology.

Courses

IST 501. RESEARCH (TBA).

IST 503. THESIS (TBA).

IST 505. READING AND CONFERENCE (TBA).

IST 506. PROJECTS (TBA).

■ TOXICOLOGY

Toxicology is an interdisciplinary graduate program administered by the Graduate School. The Toxicology Program offers courses leading to the M.S. or Ph.D. degree in Toxicology and prepares students for careers in toxicology in industry, government, and academic institutions. Biochemical, chemical, and pathological research approaches are emphasized, focusing on the following areas: analyical, aquatic, biochemical, comparative, environmental, food, immuno- and neurotoxicology. The close interactions between the faculty and the National Institute of Environmental Health Sciences (NIEHS) supported Environmental Health Sciences Center and Marine/Freshwater Biomedical Sciences Center at OSU contribute additional research and training opportunities for students. Three scientists from the Oregon Health Sciences University are also faculty members and provide students with new opportunities directly related to issues in human health. Most students in the program receive financial support through graduate research assistantships or from an NIEHS environmental health predoctoral training program.

The Toxicology Program has an interdisciplinary focus with faculty from the Colleges of Science, Agricultural Sciences, Pharmacy, Veterinary Medicine, Engineering, the staff of OSU's Hatfield Marine Sciences Center, and from the Center for Research on Occupational and Environmental Toxicology, and the Department of Pharmacology at the Oregon Health Sciences University in Portland.

Students who wish to enter the program should have a B.S. degree (or equivalent) in a science related field and are expected to develop a M.S. or Ph.D. curriculum related to their own area of specialization. Students will take a core set of courses and they will attend and participate in the Toxicology Seminar class. Courses in toxicology also may be taken by students in engineering or the basic sciences.

Courses

TOX 430/TOX 530. CHEMICAL BEHAVIOR IN THE ENVIRONMENT (3). Applications of chemical concepts in the definition and solution of pollution problems; analytical considerations, thermodynamic factors influencing movement of chemicals, physical and metabolic transformations occurring in the environment. PREREQ: CH 106, CH 331; senior standing. CROSSLISTED as AC 430/AC 530.

TOX 445/TOX 545. ON-LINE TOXICOLOGY DATA SYSTEMS (3). Use of on-line systems (Toxline; CASOnline, etc.) to obtain bibliographic and other data relating to toxicology and application of PROPHET system for toxicological data analysis. PREREQ: BB 450, BB 451/ CROSSLISTED as AC 445/AC 545, TOX 445/TOX 545.

TOX 501. RESEARCH (TBA).

TOX 503. THESIS (TBA).

TOX 505. READING AND CONFERENCE (TBA).

TOX 507. SEMINAR (TBA).

TOX 520. COMPARATIVE METABOLISM OF FOREIGN COMPOUNDS (3). Metabolism of exogenous chemicals by plants and animals and relation to environmental problems; comparative aspects of metabolic processes; interacting effects of other chemicals, nutritional and environmental variables; metabolic aspects of selective toxicity. PREREQ: BB 450, BB 451. Offered alternate years. CROSSLISTED as AC 520.

TOX 528. CHEMICAL ANALYSIS OF ENVIRONMENTAL RESIDUES (3). Separation and analysis of chemical pollutants in the environment; considerations in sampling, separation techniques, methods of chemical analysis used for analysis and confirmation of trace levels of organic chemicals and heavy metals. PREREQ: CH 428. CROSSLISTED as AC 528.

TOX 545. ON-LINE TOXICOLOGY DATA SYSTEMS (3). Use of on-line systems (Toxline, CAS-Online, etc.) to obtain bibliographic and other data relating to toxicology and application of PROPHET system for toxicological data analysis. PREREQ: BB 450 or BB 451 and graduate standing. CROSSLISTED as AC 545.

TOX 601. RESEARCH (TBA).

TOX 603. THESIS (TBA).

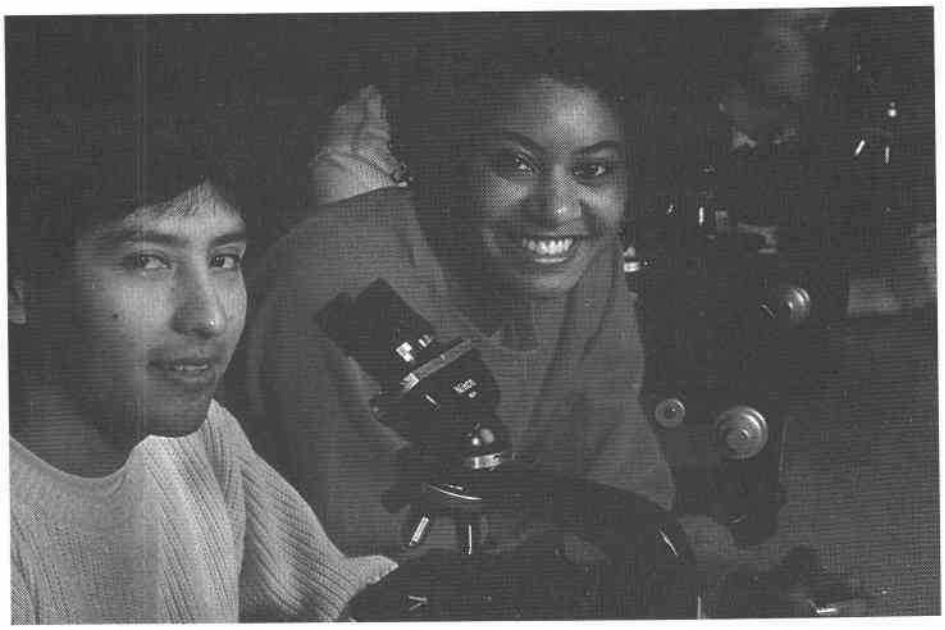
TOX 605. READING AND CONFERENCE (TBA).

TOX 607. SEMINAR (TBA).

Terms and credits to be arranged for the courses listed above.

■ PLANT PHYSIOLOGY

Plant physiology is a complex interdisciplinary field which requires broad training in the plant sciences and in such varied disciplines as physics, chemistry, biochemistry, genetics, and statistics. Courses relevant to plant physiology, and active research programs in plant physiology are found in many departments and in several colleges of the University. The curriculum reflects the need for breadth of training and draws upon courses from a number of departments of the University.



The core curricula for programs leading to the Ph.D. and M.S. degrees in plant physiology are listed below.

Ph.D. Program
Plant Physiology
One course required in each of the following four areas (11-12)
Plant Metabolism
BB 653. Plant Biochemistry (3)
Water, Nutrition, and Transport
CSS 655. Plant Water Relations (3)
HORT 516. Plant Nutrition (3)
HORT 623. Phloem Transport (3)
Plant Growth and Development
BOT 533. Hormonal Regulation of Plant Growth & Development (3)
BOT 593. Selected Topics: Plant Cell and Molecular Biology (3)
HORT 541. Plant Tissue Culture (4)
Environmental Physiology
BOT 588. Environmental Physiology of Plants (4)
HORT 629. Plant Dormancy and Stress Physiology (3)
RNG 643. Arid Land Plant Physiology (4)

Biochemistry
BB 590, BB 591, BB 592. Biochemistry (9)

Genetics/Cellular Biology
A graduate-level course in genetics or molecular biology (3).

Advanced Laboratory Methods
BB 593. Biochemistry Laboratory (2)
Other laboratory course(s) consistent with the goals of the student (2).

Seminars
Two seminar presentations, including one on a different topic than the thesis.
Total Credits (Minimal Requirements)

Required core courses (27-32)
Seminars (2)
Research, thesis and supportive electives (68-75)
Total Program (108)

M.S. Program
Plant Physiology

One course from at least two of the areas listed in the Ph.D. curriculum.

Biochemistry
BB 550, BB 551. General Biochemistry (7)

Advanced Laboratory Methods
BB 593. Biochemistry Laboratory (2)

Other
At least two other courses from the Ph.D. core curriculum (5-6)

Seminars
Two seminar presentations, including one on the thesis research.

Total Credits
Core Courses (19-22)
Seminars (2)
Research, thesis, and supportive electives (21-24)
Total Program (45)

Courses

PP 501. RESEARCH (TBA).
PP 503. THESIS (TBA).
PP 505. READING AND CONFERENCE (TBA).
PP 507. SEMINAR (TBA).
PP 601. RESEARCH (TBA).
PP 603. THESIS (TBA).
PP 605. READING AND CONFERENCE (TBA).
PP 607. SEMINAR (TBA).

Concurrent Enrollment

Oregon State University students paying full tuition may enroll for courses through other colleges and universities of the Oregon State System of Higher Education at no additional cost in the concurrent enrollment program. Complete details of policies and procedures are available in the Registrar's Office.

Joint Campus Program

Joint-campus programs offer the OSU graduate student access to specialized instructional and research sources of other universities within the Oregon State System of Higher Education through a single matriculation and registration. Students participating in a joint-campus program are considered students of their home university. OSU students follow the standard advising and registration procedures, registering for all courses at OSU irrespective of the campus on which the course is offered. The OSU Registrar's Office will record all credit earned on any campus by OSU students in a joint-campus program. Tuition and fees will be the same as if all courses were taken at Oregon State University.

At present, most campuses of the OSSHE participate with OSU in joint-campus registration. Consult the Registrar's Office for complete details and procedures.

Any admitted graduate student at OSU may enroll in graduate courses on most OSSHE campuses when the courses are a part of his or her approved study plan. Credits earned at other campuses are considered transfer credits, except for authorized joint campus degree programs.

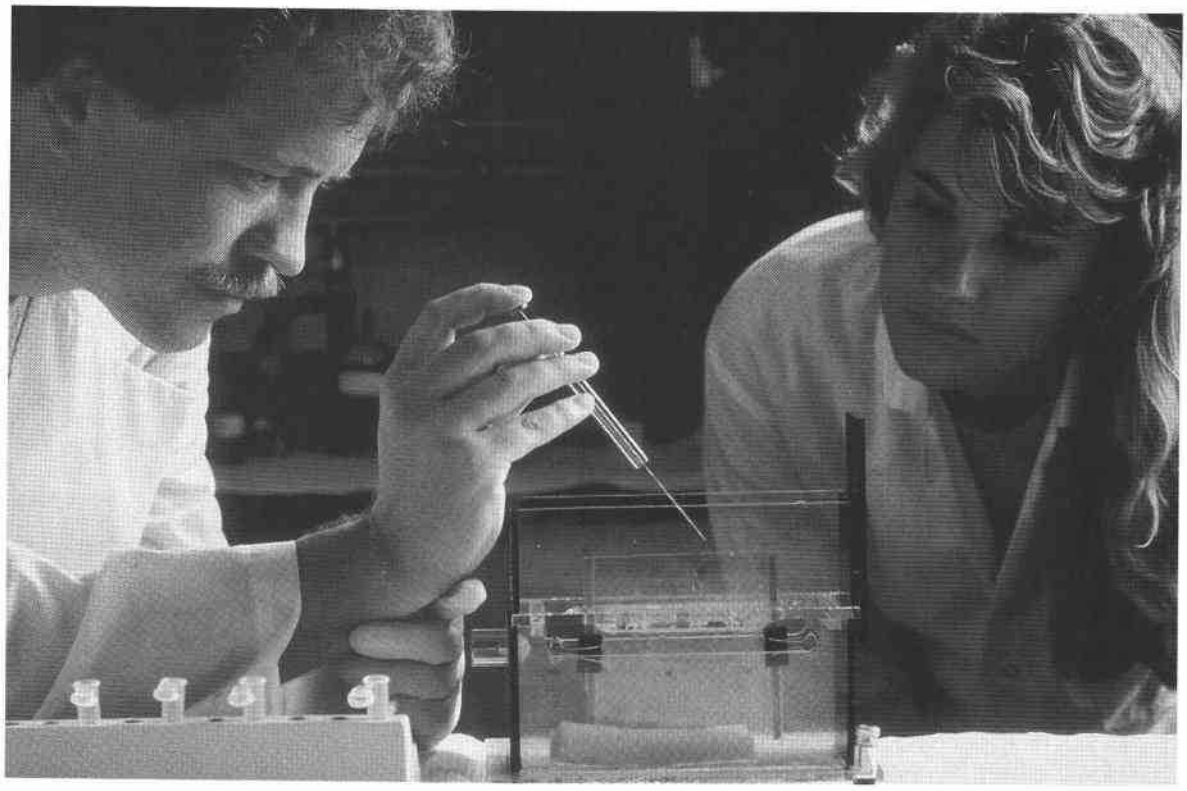
Off-Campus Programs

Off-campus degree programs are offered at a number of localities throughout Oregon. Further information regarding these programs may be obtained from the Graduate School.

WICHE Regional Graduate Programs

The following degrees are offered under WICHE (Western Interstate Commission for Higher Education) regional graduate programs at OSU: Ph.D. in family resource management (Department of Human Development and Family Sciences); Ph.D. in nutrition and food management (Department of Nutrition and Food Management); Ph.D. in human development and family studies (Department of Human Development and Family Sciences); M.A., M.S. in marine resource management (College of Oceanic and Atmospheric Sciences); M.A., M.S., Ph.D. in oceanography (College of Oceanic and Atmospheric Sciences); M.A., M.S. in operations research (Department of Statistics); M.Agr., M.S., Ph.D. in poultry science (Department of Animal Sciences); and M.S., Ph.D. in toxicology (Toxicology Program).

Students from Alaska, Arizona, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, South Dakota, Utah, Washington, and Wyoming who are accepted into these programs will be treated as resident students for tuition purposes. Information about the above programs may be obtained from the college, program, or department indicated.



Advancement of human knowledge and provision of technical and technological services to the commonwealth are recognized functions of institutions of higher education. Research to advance human knowledge is encouraged and assisted at Oregon State University by general and directed research funds and is conducted within departments, colleges, centers, and institutes as a part of normal academic activity.

Research is supported by appropriations to experiment stations, institutes, and centers, as well as by grants from private and public agencies for institutional and individual projects.

The General Research Fund (seed funding) is administered with the advice of the Research Council.

Separately organized research units include the following:

- Agricultural Experiment Station
- Engineering Experiment Station
- Environmental Remote Sensing Applications Laboratory
- Forest Research Laboratory
- Sea Grant College Program

Research Centers

- Center for Advanced Materials Research
- Center for Analysis of Environmental Change
- Center for Gene Research and Biotechnology
- Center for the Humanities
- Center for Salmon Disease Research
- Center for Study of the First Americans
- Environmental Health Sciences Center
- Integrated Plant Protection Center
- Laboratory Animal Resources
- Marine/Freshwater Biomedical Sciences Center
- Mark O. Hatfield Marine Science Center
- Oregon Productivity and Technology Center
- Radiation Center
- Survey Research Center
- Western Rural Development Center

Research Institutes

- Cooperative Institute for Marine Resources Studies
- Nuclear Science and Engineering Institute
- Nutrition Research Institute
- Transportation Research Institute
- Water Resources Research Institute

Research Consortia

- Advanced Science and Technology Institute (ASTI)
- Consortium for International Development (CID)
- Consortium for International Fisheries and Aquaculture Development (CIFAD)
- Inter-University Consortium for Political and Social Research
- University Corporation for Atmospheric Research (UCAR)

The Vice Provost for research coordinates efforts of the various research organizations of the University. The vice provost encourages and assists faculty members in the development of research programs and in handling grant and contract applications; advises the president of the University regarding general progress of the institution's research programs; works to ensure maximum opportunity for the integration of graduate instruction and research; and maintains a technology transfer program for researchers who identify new devices and/or processes useful to the public. Special evaluations are made of patent ownership provisions to assure that the interests of the inventor, the University, and the state are best served. The vice provost also coordinates administration of grant and contract operations with the directors of business affairs and business services to aid the work of faculty and to ensure compliance with University, state, and federal regulations.

GRANTS FROM RESEARCH OFFICE

The General Research Fund is primarily intended to provide "seed money" for developing new concepts and to support faculty research that is not supported by organized or directed programs of other research organizations on or off campus. Funds are allocated by the Dean of Research with the advice of the Research Council. Faculty members with the rank of instructor and above are eligible to apply for support from the fund. Application forms are available from the Research Office. Funds may be used for supplies, travel, equipment, and wages. Support will not be given to provide data for theses leading to advanced degrees, subject matter for a specific course, or information for use with administrative functions. Faculty summer and sabbatical leave salaries are not supported.

ADVANCED SCIENCE & TECHNOLOGY INSTITUTE

Robert S. McQuate, *Executive Director*

The Advanced Science and Technology Institute (ASTI) is a cooperative organization between Oregon State University, the University of Oregon, Oregon Health Sciences University, and Portland State University. The program objective is facilitated access by the private sector to university-based research and technology development capabilities. Technology licensing, research sponsorship, and faculty consultation are specific elements of involvement with companies.

Effective communication between the universities and businesses is a key component of ASTI's success. Access to university research is gained through the publication of a quarterly newsletter, cooperative research projects with industry, conferences and seminars, and the Industrial Associates Program. ASTI participates in technology transfer activities and promotes statewide economic development through involvement with researchers at the participating universities.

AGRICULTURAL EXPERIMENT STATION

Thayne R. Dutson, *Director*
Michael J. Burke, *Associate Director;* L.J. Koong, *Associate Director;* V. Van Volk, *Program Coordinator;* Robert & Witters, *Program Coordinator;* Bruce Sorte, *Assistant Director*

ADMINISTRATION

GEORGE H. KELLER
Vice Provost for Research and International Programs

RICHARD A. SCANLAN
Dean of Research

MARY E. NUNN
Sponsored Programs Officer

WILLIAM H. HOSTETLER
Director, Technology and Transfer and Trademark Licensing Program

The Oregon Agricultural Experiment Station was organized July 1, 1888, in accordance with the Hatch Act of 1887. It now includes a central station at Corvallis and ten branch stations in the major crop and climate areas of Oregon, assuring that its research program is close to the people and the needs of Oregon agriculture.

The station is the principal agricultural research agency in the state. Its mission is to conduct research and demonstrations in the agricultural, biological, social, and environmental sciences that contribute to the economic and social welfare of Oregon. The products of its research help to:

1) ensure a stable and productive agriculture through wise management and use of the soil, water, wildlife, and other natural resources of the state;
2) protect crops and animals from insects, diseases, and other hazards;
3) improve the efficiency of agricultural production by developing integrated system approaches to management;
4) develop new agricultural products and processes and enhance quality of the state's food products;
5) improve the marketing of Oregon's agricultural products;
6) promote community development and develop the ability of both rural and urban people to provide better housing, jobs, and services to people of the state;
7) improve the nutritional value and quality of food and protect the consumers of Oregon's food products;
8) protect and improve the environment and quality of living for residents of the state;
9) assist developing countries in agriculture to promote trade with the United States and alleviate world hunger.

The station conducts research in the following departments and colleges: agricultural and resource economics, agricultural chemistry, animal sciences, bioresource engineering, botany and plant pathology, crop and soil science, entomology, fisheries and wildlife, food science and technology, home economics, horticulture, microbiology, rangeland resources, statistics, and veterinary medicine. Research is supported in other units such as the Center for Gene Research and Biotechnology, the Environmental Health Sciences Center, and the Western Rural Development Center. The Central Oregon Agricultural Research Center (Madras and Powell Butte), Eastern Oregon Agricultural Research Center (Burns and Union), Klamath Experiment Station (Klamath Falls), Malheur Experiment Station (Ontario), Hermiston Agricultural Research & Extension Center (Hermiston), Mid-Columbia Agricultural Research & Extension Center (Hood River), North Willamette Research & Extension Center (Aurora), Columbia Basin Agricultural Research Center (Pendleton and Moro), Southern Oregon Experiment Station (Medford), and the Coastal Oregon Marine Experiment Station (Newport and Astoria) branch stations provide opportunity for basic and applied field research programs in important agricultural areas of Oregon.

The station collaborates with the OSU Extension Service, the College of Agricultural Sciences' instructional and international agriculture programs, the U.S. Department of Agriculture, the U.S. Department of Interior, the U.S. Department of Commerce, and other federal and state agencies on research programs of interest to the state, the Pacific Northwest, the nation, and other countries.

Center for Advanced Materials Research

John R. Arthur, *Director*

The Center for Advanced Materials Research has been established to strengthen research and education in the properties, synthesis, and understanding of new materials, with special emphasis on materials of importance to Oregon's economy. It is an interdisciplinary program spanning nine departments in the Colleges of Engineering, Forestry, and Science. These are Chemical Engineering, Civil Engineering, Electrical and Computer Engineering, Mechanical Engineering, Nuclear Engineering, Forest Products, Chemistry, Mathematics, and Physics.

A degree of Master of Science in Materials Science provides for graduate training in materials science. Typically, this degree is pursued in parallel with studies in one of the departments that participate in the center.

Areas of research interest in the center are ceramics, composite materials (both natural and engineered), electronic materials, magnetic materials and superconductivity, metallurgy, optical materials, transportation materials, nuclear materials, polymers, surface science, analysis of materials, and theory. These efforts are interdisciplinary, and activity in one of these research areas may involve collaborative research between scientists in different departments.

Center for Gene Research and Biotechnology

Russel H. Meints, *Director*

The Center for Gene Research and Biotechnology was established in 1983 to strengthen University research and teaching programs that are concerned with the structure, organization, and expression of genetic material, and to promote multidisciplinary basic research projects which will apply this basic information to problems of practical importance.

The Center consists of active research scientists who use the techniques of molecular biology, tissue culture and monoclonal antibodies as well as protein and nucleic acid biochemistry in pursuit of their varied interests. Included are all the basic biological disciplines and the applied sciences of agriculture, forestry, veterinary medicine, food science, pharmacy, and marine science. Examples of specific research areas include cell, tissue, and embryo culture; isolation and characterization of genes; molecular mechanisms of bacterial and viral disease of plants and animals; nitrogen fixation, hormonal control of growth and development; molecular control of gene expression; micropropagation and regeneration of plants; development of vaccines; tissue culture, molecular and genetic techniques applied to plant and animal breeding programs. A Central Service Laboratory which now includes equipment and technical expertise for peptide sequencing, peptide synthesis, oligonucleotide synthesis, DNA sequencing, and computer-assisted analysis of protein and nucleic acid sequences, is available for faculty and students with active research programs in these areas.

Approximately 80 faculty members are associated with the center and represent academic departments and colleges from throughout the campus. The center is an organizational unit under the vice provost for research and international studies. Various activities are coordinated by the director in consultation with two advisory groups; one composed of scientists actively engaged in research, the other of administrators from the main academic units and the Agricultural Experiment Station.

The Center for the Humanities

Peter J. Copek, *Director*

The Center for the Humanities, established in 1984, is primarily concerned with the advancement of interdisciplinary humanities research. The center consists of visiting scholars as well as OSU resident fellows engaged in collaborative and individual research, and coordinates much of its activity around an annual theme. Themes are recommended by an Advisory Board composed of faculty from throughout the campus. The center also hosts or co-sponsors research conferences, seminars, film and lecture series, and numerous public programs. In addition, it maintains an undergradute certificate program in Twentieth Century Studies which was developed during the early years of activity. The center's fundamental concern is the improvement of the quality of humanities research and teaching at OSU. It is located just off campus at 811 S.W. Jefferson Avenue.

Center for Analysis of Environmental Change

W. E. Winner, Ph.D., *Director*

The Center for Analysis of Environmental Change was established in 1991 to serve as a focal point for the development of long-term, multidisciplinary environmental studies. Analysis of the processes and impact of environmental change lead to the view that such changes result from human activity and other causes. The purpose of this analytical effort is to both contribute to the development of basic knowledge needed to understand the causes and consequences of environmental change and to foster the wise use and management of natural resources.

The center involves participation of scientists from OSU; the Pacific Northwest Experiment Station, USDA Forest Service; the Environmental Research Laboratory—Corvallis, U.S. Environmental Protection Agency, and the Battelle Northwest Research Laboratory. The Center helps these institutions meet key ecological, environmental, and natural resource research needs. Work includes organizing and coordinating interagency efforts in environmental and ecological sciences, and participation in networks on regional and global scale environmental research.

The initial Center scope includes such issues as the effects of global and regional environmental change; the analysis of ecosystem structure and function; ecological restoration; biological, genetic, and ecological diversity; ecosystem process related to natural disaster reduction; the impact of the release of genetically engineered organisms; and political, social, and economic aspects of environmental issues. Thus the Center's broad scope invites the participation of scientists and students from many academic disciplines.

Through its publications, seminars, and conferences, as well as through active participation in national and international research activities, the Center seeks to promote greater interest in and understanding of the environmental sciences.

Center for Salmon Disease Research

The faculty of Oregon State University have been in the forefront of salmon disease research for over 30 years, beginning with the pioneering efforts of Dr. John L. Fryer, OSU Distinguished Professor and Chair of the Department of Microbiology. During this time, the group of faculty members engaged in salmonid disease research has steadily increased and currently numbers twelve faculty in four colleges. Investigators have trained many of the nation's professional fish pathologists and fish health researchers, have developed vaccines and diagnostic tests that are routinely used for cultured and wild stocks of fish, and have provided a wealth of knowledge on the pathogenic mechanisms and epidemiology of most of the serious salmonid diseases of the U.S. and the world. The Center for Salmon Disease Research (CSDR) was established in 1994 as a multidisciplinary unit organized to recognize this group as a Research and Educational Center within Oregon State University and the Oregon State System of Higher Education. Center investigators consist of faculty selected primarily from the College of Agricultural Sciences and the College of Science, with the involvement of several faculty from the College of Pharmacy, the College of Veterinary Medicine, and other units or institutions as appropriate.

The CSDR seeks to resolve disease problems which present a threat to the salmonid species of the Pacific Northwest, the nation, and the world. A central function of the Center is to promote and assist the salmonid disease research of the Center's investigators and those who desire collaborative ties.

Center for Study of the First Americans

Rob Bonnichsen, *Director*
Patty Good, *Manager*
Charlie Bolen, *Lab Director*

The mission of the Center for Study of the First Americans is the promotion of interdisciplinary scholarly dialogue and research, and the stimulation of public interest on the subject of the peopling of the Americas. Toward these goals, the Center provides leadership and coordination to scholars worldwide; creates and implements programs of study and research involving the physical, biological, and cultural sciences; and disseminates the product of the synergism through public education programs reaching a broad range of groups, from local school children to international scholars.

The Center is working toward establishing a program in First American Studies. For more information, write to the Center for Study of the First Americans, Weniger Hall 106, or call (503) 737-4595.

Consortium for International Development (CID)

George H. Keller, Thayne Dutson, *Trustees*

The Consortium for International Development (CID) is a nonprofit corporation of 11 publicly supported universities located in the western region of the United States. CID's member institutions are the University of Arizona; California State Polytechnic University, Pomona; Colorado State University; the University of Hawaii, Manoa; the University of Idaho; Montana State University; New Mexico State University; Oregon State University; Texas Tech University; Utah State University; Washington State University; and the University of Wyoming.

CID's objectives are to encourage and facilitate the involvement of member universities and their faculties in international activities; to provide support for international project planning, implementation, and evaluation; and to assist the member universities' efforts to share their expertise with developing countries. The CID system provides a network through which interested faculty and staff at the member universities can interact with international donor agencies and host countries. It provides a means for each university to enhance its effectiveness in teaching, research, and public service through participation in international development activities.

Consortium for International Fisheries and Aquaculture Development (CIFAD)

CIFAD is a group of five U.S. universities that have strong programs in fisheries and aquaculture and that are committed to assisting other countries with fisheries-sector development problems. The consortium was established in 1979 to provide a more effective, coordinated program of research, training, and outreach to the developing nations of the world.

Oregon State University is the lead institution for the consortium. It coordinates various programs and serves as the consortium's contracting and fiscal agent. Other CIFAD members are the University of Arkansas at Pine Bluff, the University of Hawaii, Michigan State University, and the University of Michigan.

Funding for the CIFAD program activities is provided by various international donor agencies such as the Agency for International Development and the World Bank, as well as by host-country governments and by private sector benefactors.

Pond Dynamics/Aquaculture Collaborative Research Support Program (CRSP)

Hillary S. Egna, *Director*

The Pond Dynamics/Aquaculture CRSP is one of a family of international agricultural research programs that are headquartered at US Land Grant Universities. CRSPs were initiated under Title XII legislation enacted by the US Congress. They are partially supported by the US Agency for International Development and through the participating US and host country institutions. Research conducted by these programs helps farmers improve their incomes and alleviate hunger without depleting the natural resource base on which they depend for food, fuel, fibre, and shelter. CRSPs work with international agricultural research centers, private industry, and non-governmental organizations in the U.S. and abroad.

Oregon State University is the lead institution for the Pond Dynamics/ Aquaculture CRSP, which administers research and development activities for six institutions overseas and eight U.S. universities (five of which formerly participated in CIFAD, the Consortium for International Fisheries and Aquaculture Development). Present research locations include Thailand, the Philippines, Honduras, Egypt, and the United States; former sites included Panama, Indonesia, and Rwanda. Since 1982, the Pond Dynamics/ Aquaculture CRSP has focused on improving the efficiency of aquaculture systems through a unique collaborative process that brings together researchers from the U.S. and host countries to solve constraints in the generation and adoption of aquaculture technologies.

The two main areas currently pursued by Oregon State University researchers in the CRSP are aquaculture systems modelling—in the Bioresource Engineering Department—and aquatic ecology—in the Department of Fisheries and Wildlife. Other research has been conducted in fish physiology, women in development, and soils.

Cooperative Institute for Marine Resources Studies

Lavern Weber, *Director*

The Cooperative Institute for Marine Resources Studies was established in 1982 to foster collaborative research between the National Oceanic and Atmospheric Administration (NOAA) and Oregon State University in fisheries and aquaculture, oceanography, and related fields. It also encourages education and training of scientists in disciplines related to marine resources.

Administered through the vice president for research, the institute has members from the Pacific Marine Environmental Laboratory in Seattle and a number of departments at OSU. Headquarters are at the Hatfield Marine Science Center in Newport.

Projects currently funded through the institute include research on the effects of hydrothermal venting on global ocean heat and chemical budgets.

The Institute sponsors interdepartmental seminars and workshops and promotes multidisciplinary research in areas of geology, geophysics, and chemical and physical oceanography.

Engineering Experiment Station

R. Gary Hicks, *Director*

By act of the Board of Regents of Oregon State College on May 4, 1927, the Engineering Experiment Station was established at Corvallis to serve the state in a manner broadly outlined by the following policy:

a. To serve the industries, utilities, professional engineers, public departments, and engineering teachers by making investigations of significance and interest to them.
b. To stimulate and elevate engineering education by developing the research spirit in faculty and students.
c. To publish and distribute through bulletins, circulars, and technical articles in periodicals the results of such studies, surveys, tests, investigations, and research as will be of greatest benefit to the people of Oregon, and particularly to the state's industries, utilities, and professional engineers.

The Engineering Experiment Station is an integral part of the College of Engineering. All staff members and laboratory facilities are available for the investigative work of the station. The associate dean of engineering is the director of the Engineering Experiment Station and guides the operation of the station to conform with state and institutional policies.

All research work is carried out by regular departmental engineering faculty and their graduate students. On-going projects are financed by grants and contracts from outside sponsors. It is, therefore, not possible to respond to requests which require research or investigations for which funding is not provided. General areas of research emphasis are listed below, by department.

Chemical Engineering—Biotechnology control, chemical reactor engineering, environmental engineering, heat transfer, high temperature materials, mass transfer, polymers, thermodynamics.

Civil Engineering—Environmental engineering, geotechnical engineering, ocean engineering, structural engineering, transportation engineering, water resources.

Computer Science—Parallel computing, software engineering and systems, artificial intelligence, programming languages.

Electrical and Computer Engineering—Solid state electronics, materials engineering, computer engineering, systems engineering, energy systems.

Industrial Engineering—Productivity, simulation modeling, expert systems, computer integrated manufacturing systems and robotics, artificial intelligence, human factors.

Mechanical Engineering—Design and manufacturing, concurrent engineering, computer aided design, expert systems, robotics, wind power generation, materials science, heat transfer, energy systems, combustion, fluid mechanics.

Nuclear Engineering—Nuclear reactor thermal hydraulics, space reactor system design, fusion, nuclear waste management, radioactive material, transportation of radioactive materials, reactor operations, management and safety, radiation instrumentation.

Environmental Health Sciences Center

Donald J. Reed, *Director*

The Environmental Health Sciences Center was established in 1967 as an organizational unit under the vice president for research. It provides coordination and stimulation of vigorous interdisciplinary, environmental health research and training as related to human health.

Problems of environmental quality and the resultant effects continue to challenge both the health of man and the ability of man to understand and manage the evolving impact of environmental agents. Solutions to environmental problems require interdisciplinary efforts of professionals in many fields, both to generate new knowledge and to develop a qualified cadre of researchers who can provide the basis for risk assessment.

The EHS Center currently brings together and utilizes the variety of professional capabilities of research and teaching faculty, staff, and students from numerous departments, schools, and colleges within OSU. Academic areas include agricultural chemistry, chemistry, biochemistry and biophysics, toxicology, biology, food science and technology, fisheries and wildlife, veterinary medicine, pharmacology, statistics, zoology, and engineering.

The broad mission of the center encompasses research and encourages research by training and supporting qualified predoctoral candidates and postdoctoral research associates; sponsors conferences, symposia, and meetings for both student training and public communication; and serves as an interdisciplinary resource on human health as related to the environment.

Examples of specific research areas of interest include toxicology of environmental chemicals, cellular and biochemical toxicology, immunotoxicology, naturally occurring toxins, carcinogenesis of environmental chemicals, genetic toxicology, movement of chemicals in the environment, geochemistry, mass spectrometric ionization processes and methodologies, hetero nuclear NMR studies, solid waste and chemical waste disposal, environmental engineering, and statistical studies, e.g., temporal aspects of cancer risks.

New research approaches to investigate effects of toxicants on human health are encouraged through an active, competitive pilot project program. Selected proposals receive funding for preliminary studies, many of which have led to agency funding as major projects.

In addition to coordinating the ongoing pre- and postdoctoral program supported by the National Institute of Environmental Health Sciences in environmental toxicology that emphasizes the determination of mode of action of environmental chemicals, the center administers a visiting scientists program and the M.S./Ph.D. interdisciplinary graduate program in toxicology. Federal environmental health legislation, particularly the Toxic Substances Control Act, has created a greater need for qualified toxicologists. The training of this professional group is designed to meet that need. Biochemical, pathological, and pharmacological approaches are emphasized in the areas of aquatic, biochemical, comparative, environmental, food, and general toxicology.

The administrative office of the EHS Center is located in the Agricultural and Life Sciences Building; research and teaching facilities are located in the cooperating departments on campus.

Environmental Remote Sensing Applications Laboratory

William J. Ripple, *Director*

Coincident with the launch of the first Landsat satellite in 1972, the National Aeronautics and Space Administration provided funding to Oregon State University for the establishment of the Environmental Remote Sensing Applications Laboratory. NASA and OSU jointly agreed that this campus would be one of a select group of universities to conduct research in the rapidly developing field of remote sensing. Since that beginning, ERSAL scientists, graduate students, colleagues at Oregon State University, and colleagues in state and federal agencies have conducted a variety of programs that integrate remote sensing and related technologies in geographic information systems (GIS). ERSAL is located in the Department of Forest Resources within the College of Forestry at Oregon State University.

"Remote sensing" refers to the acquisition, processing, analysis, and interpretation of reflected and emitted radiation from targets of interest, usually features on the surface of the earth: plants, soil, minerals, water, etc. At ERSAL, data acquired from detectors mounted in satellites, aircraft, and field instruments are used to study the spectral properties of vegetation-soil systems. Information regarding these properties is then used to develop techniques for detecting, classifying, mapping, and quantifying vegetation cover and the condition of vegetation. Examples of research topics include landscape ecology, remote sensing of forest fires, forest structure, forest landscape patterns, and wildlife habitat, and ecosystem analysis.

With combined funding from federal, state agencies and private sources, the ERSAL research program develops and applies remote sensing and GIS technology for the study of forest lands and related natural resource problems.

Forest Research Laboratory

George W. Brown, *Dean, Director*

The Forest Research Laboratory is Oregon's forestry research agency; its director is the dean of Oregon State University's College of Forestry. Established by the Oregon Legislature in 1941, the program is supported by state and federal appropriations and by research grants from public and private sources. In addition to research in campus laboratories and University forests, studies are conducted cooperatively in public and private forests throughout Oregon.

Activities are organized within five program areas which draw upon faculty expertise in the College of Forestry's Departments of Forest Engineering, Forest Products, Forest Science, and Forest Resources; and, to a lesser extent, from the Departments of Botany and Plant Pathology, Entomology, Fisheries and Wildlife, and Soil Science. Research program areas are forest regeneration; forest ecology, culture, and productivity; protecting forests and watersheds; evaluating forest uses and practices; and wood processing and products performance. Interdisciplinary teamwork is characteristic of many of the research projects. The program supports research of graduate students in forest genetics, economics, physiology, biometrics, hydrology, entomology, pathology, forest soils, forest engineering, recreation, forest policy, silviculture, ecology, and wood science.

This laboratory's program is designed to provide information enabling wiser public and private decisions concerning the management and use of Oregon's forest resources and the operation of the state's wood-using industries. As a result of this research, Oregon's forests produce more forest products, water, forage, fish, wildlife, and recreation; wood is harvested and used more efficiently; forests are used more intensively and effectively; employment, production, and profitability in dependent industries are strengthened; and assistance is provided in maintaining a quality environment for Oregonians.

The Forest Research Laboratory, the Corvallis Forestry Sciences Laboratory of the U.S. Forest Service, and related research conducted elsewhere on campus combine to form the largest concentration of forest science research in North America.

Integrated Plant Protection Center

Marcas Kogan, *Director*

The Integrated Plant Protection Center (IPPC) was established in 1991 to expand the programmatic scope and geographic range of activities of the former International Plant Protection Center that was chartered by Oregon State University in 1969. The new IPPC focuses primarily on the development and implementation of integrated pest management programs and in promoting modern pesticide management activities in the state of Oregon. While stressing domestic activities, IPPC will continue to develop, foster, and support effective pest and pesticide management programs in developing countries. IPPC is supported by the Oregon State University Extension Service, the Agricultural Experiment Station, and operates in cooperation with the Office of International Research and Development.

The Center is recognized as one of the leading information clearinghouses for weed research and control technology and for small pesticide application equipment. IPPC serves as an extensive specialized source of information on plant protection. IPPC maintains a document collection that is particularly strong in weed science. The collection has been recently expanded to include entomological and general IPM literature with the incorporation of over 10,000 documents that were part of the library of the Consortium for International Crop Protection, formerly at the University of Maryland. The combined collections represent one of the most complete informational resource banks on integrated pest management in the USA. IPPC supports the activities of IPMNet, a computerized system for IPM information discemination through the Internet. IPMNet News, a monthly electronic newsletter, is produced at IPPC.

IPPC has assumed the role of coordinating unit for pesticide related issues within the Cooperative Extension Service. An office of pesticide coordinator was established, and the Pesticide Applicator Certification training program is under the umbrella of IPPC. In addition, the Center promotes interdisciplinary research and training in

integrated pest management on a worldwide basis with emphasis on alternative, non-chemical control methods, including biological control, host plant resistance, and cultural methods. The Center coordinates its activities with several departments in the Colleges of Agricultural Sciences, Forestry, and Science; and it links with other state and federal government agencies, international agencies under the aegis of the United Nations, private foundations, the family of international agricultural research centers and several foreign national research and education institutions. The Center's internationally experienced staff, drawn from several departments at OSU, is supported by an independent administrative infrastructure.

Inter-University Consortium for Political and Social Research (ICPSR) Data Project

Melvin R. George, *Director*

As the world's largest data archive, ICPSR acquires, processes, and distributes data. Holdings are housed at the University of Michigan and contain over 30,000 machine-readable files.

Oregon State University is among the 350 colleges and universities worldwide that are members of ICPSR. Membership entitles the OSU community to all data sets in the archive at no charge, access to variable searches through electronic mail, and reduced fees to attend the Summer Program in Quantitative Methods.

Funding for the ICPSR Data Project is provided by the Library, the Research Office, and the Colleges of Liberal Arts, Agricultural Sciences, Home Economics, and Health and Human Performance. The Project supports the annual membership fee and the part-time services of the ICPSR Research Consultant who provides assistance in conducting variable searches, ordering data sets, and downloading data.

Laboratory Animal Resources

Nephi M. Patton, *Director*

Laboratory Animal Resources, is a University-wide service organization. The office is housed in the Laboratory Animal Resources Center. This organization has been charged with the care and humane treatment of all warm- blooded laboratory animals used in research and teaching. Technicians at the center service facilities in eight different buildings on campus. In addition, the following services are provided: procurement and quarantine of all warm-blooded laboratory animals; constant health monitoring of animals and personnel; and consultation with investigators on experimental design, special procedures, and beneficial animal models.

Mark O. Hatfield Marine Science Center

(Newport, Oregon)

Lavern J. Weber, *Director*

The Marine Science Center is located on a 49-acre site in Newport adjacent to Yaquina Bay and one mile from the Pacific Ocean. The facility is operated by the University to serve the general public, the staff of OSU, sister institutions, and cooperating state and federal agencies. The University encourages all workers in the marine sciences whose research, instruction, or extension activities require a coastal site to use the center facilities.

Main buildings provide 200,000 square feet of office, library, classroom, and fresh and salt water laboratory space and include a public auditorium and aquarium. Buildings include the Marine Science Center, Oregon Department of Fish and Wildlife Marine Region Headquarters, the Newport Aquaculture Laboratory and Research Support Facility of the National Marine Fisheries Service, Environmental Protection Agency, U.S. Fish and Wildlife Service, Guin Library, and ship support facilities of the College of Oceanography. Dock areas serve the OSU ship Wecoma. There are housing and self-service kitchen facilities for up to 82 students and visiting staff members.

Research projects currently involve more than 280 staff members from the Colleges of Agricultural Sciences, Oceanography, Pharmacy, and Science; the Extension Service; the U.S. Environmental Protection Agency; the National Marine Fisheries Service; the Ocean Environment Research Division of NOAA; the Cooperative Institute for Marine Resource Studies; the Oregon Department of Fish and Wildlife, and the Coastal Oregon Productivity Enhancement (COPE) program. The instruction program focuses on aquaculture and marine biological aspects of tidal, estuarine, and nearshore marine environments, subjects for which the center's location provides a natural laboratory. Extension work concentrates on programs of interest to the general public and to the coastal fishing industry. Much of the research and extension work of the OSU Sea Grant College Program is conducted at the center.

The public area has more than 280,000 visitors annually, including about 8,000 elementary and high school students. Potential users of center facilities are invited to write to the director, outlining their needs.

Marine/Freshwater Biomedical Center

George S. Bailey, *Director*

The Marine/Freshwater Biomedical Sciences Center has as its mission the development and use of aquatic models, principally the rainbow trout, to investigate environmental problems of human health concern. As recognized by the National Institutes of Health, fish are sensitive, low-cost, comparative vertebrate models that reduce dependence on mammalian species for health-related research. The Center was established initially in 1985 through core support from the National Institute of Environmental Health Sciences, and was formally established as a research Center of Excellence through the State Board of Higher Education in 1989.

Center research has primarily focused on cancer and its modulation by dietary environmental factors. Attention has been given to the basic mechanisms and causes of cancer, and to naturally occurring dietary factors capable of preventing or inhiabiting the cancer process. Although the main focus of center research has been on cancer, center investigators are also using fish models for the study of aging, immune function, environmental pollution, and stress response. A multidisciplinary team of senior investigators and students from three colleges at OSU provides expertise in pharmacology, biochemistry, molecular genetics, analytical chemistry, and pathology in a collaborative environment. The center's work on the interactions between environmental agents, diet, and cancer, including the possibility of dietary chemoprevention, supports the research, teaching, and extension mission of OSU as a Land Grant university.

To support these functions, the Center provides research funds for pilot studies leading to research grant applications, supports a schedule of seminars and visiting consultants, provides guidance in program development through annual external program review by invited experts, and supports a trout hatchery/histopathology research core facility that is unique worldwide.

Nuclear Science and Engineering Institute

Brian Dodd, *Director*

Established in 1966, this institute coordinates curricular matters in nuclear science and engineering at the graduate and undergraduate levels. It also implements fellowship programs, graduate training programs, short-course programs, research programs, and seminar programs that are not managed by individual departments and are interdisciplinary in nature.

Nutrition Research Institute

P. D. Whanger, *Chairperson*

Established in 1965, this institute recognizes that provision of an adequate food supply is a major continuing problem for humanity, and that various disciplines at Oregon State University are uniquely positioned to deal with it. The institute is dedicated to the advancement of knowledge of nutrition and its effective application in the improvement

of human health and welfare. The institute has been designed to be complementary to and not competitive with existing administrative units. As such, its broad objectives are the encouragement, stimulation, facilitation, and coordination of research in various areas practiced in relevant departments and colleges of the University.

The institute welcomes applications for membership from campus scientists having a major interest in nutrition. Associate membership is available to graduate students and post-doctorals having similar interests. It operates through a chairperson and nutrition advisory group.

Activities include sponsorship of visiting lectureships, organization of seminars, symposia and workshops, and assistance with preparation of grant proposals and manuscripts for publication. The institute holds an annual meeting near the end of each academic year at which it recognizes outstanding research contributions in nutrition through the Gary E. Costley Award.

Radiation Center

Brian Dodd, *Director*

The Radiation Center is a campus-wide instructional and research facility especially designed to accommodate programs involving the use of radiation and radioactive materials. Located in the Center are major items of specialized equipment and unique teaching and research facilities, including a TRIGA-II research nuclear reactor (licensed to operate at 1,100 kilowatts when running at a steady power level and at 3,000 megawatts in the pulsing mode); two cobalt-60 gamma irradiators; a 300 kVp X-ray generator; a number of gamma radiation spectrometers and associated germanium detectors; neutron diffraction equipment; a neutron radiography facility capable of taking still or very high speed radiographs; and a variety of instruments for radiation measurements and monitoring. Facilities for radiation work include teaching and research laboratories with up-to-date instrumentation and related equipment for performing neutron activation analysis and radiotracer studies; laboratories for animal and plant experiments involving radioactivity; an instrument calibration facility for radiation protection instrumentation; and facilities for packaging radioactive materials for shipment to national and international destinations.

Staff members at the Radiation Center normally receive joint appointments to the Center and to their appropriate academic department. The staff is available to provide a wide variety of services including instruction and/or consultation associated with the feasibility, design, and execution of experiments using radiation and radioactive materials, and with safety evaluations relating to experiments or devices involving the use of radioisotopes or other radiation sources. In addition, the Center provides direct support and assistance to teaching and research programs involving nuclear engineering, nuclear and radiation chemistry, radiation health physics, neutron activation analysis, neutron radiography, neutron diffraction, radiation effects on biological systems, radiation dosimetry, production of short- lived radioisotopes, radiation shielding, nuclear instrumentation, emergency response, transportation of radioactive materials, instrument calibration, and radioactive waste disposal.

The Center's laboratories and instruments are available to all campus instructional and research programs requiring such support. The Center also accommodates instructional and nuclear research and development programs requested by other universities, by federal and state agencies, and by industrial organizations. In addition, a special neutron activation analysis service for forensic studies is available to all law enforcement agencies.

Sea Grant College Program

Robert E. Malouf, *Director*

The Oregon State University Sea Grant College Program takes an integrated approach to addressing the problems and opportunities of Oregon's marine resources. Oregon Sea Grant's three related primary activities—research, education, and extension services—respond to the needs of ocean users and act to stimulate the Oregon economy. Funding for Sea Grant comes from federal and state appropriations as well as contributions from local governments and industry. The major support is a grant from the National Oceanic and Atmospheric Administration.

Program activities are conducted in several interdependent fields. They include coastal management and engineering; ocean productivity and fisheries; marine product development and biotechnology; seafood and health; aquaculture, including disease control and prevention; and law and public policy analysis. Oregon Sea Grant has been an innovator in promoting cooperative Pacific regional and international research and development. The program also provides professional, technical, and public education, as well as Extension services through the Extension Sea Grant program. In addition, Sea Grant administration provides support for OSU graduate students to study important marine and coastal problems and to participate in research administration.

Oregon Sea Grant Communications offers publication and other media support for program participants. The communications specialists operate from within Sea Grant administration and draw upon the resources of the information community at Oregon State University. Sea Grant Communications also prepares news releases and radio programming as part of a broader effort to inform the public about marine resource issues.

Multidisciplinary and interdisciplinary in operation, the Oregon Sea Grant program involves faculty and students in the Colleges of Liberal Arts, Science, Agricultural Sciences, Engineering, Oceanic and Atmospheric Sciences, and Pharmacy. Participants in the program also include the University of Oregon and the Oregon Graduate Institute of Science and Technology.

Oregon Sea Grant also maintains close relationships with several research facilities on the Oregon coast. They include the OSU Mark O. Hatfield Marine Science Center in Newport and the Seafood Laboratory in Astoria.

The users of Oregon's marine resources are key contributors to the program. An advisory council of marine industry leaders provides external review of program emphasis and progress.

Survey Research Center

Virginia Lesser, *Director*

The Survey Research Center, established in 1973, operates as a center for research in survey methodology, and to provide research support with regard to survey design, sample selection, questionnaire construction, data collection and reduction, statistical analysis, and the reporting of results.

The center is available to departments of the Oregon State System of Higher Education and to other organizations serving the public interest. Charges are made for all work in the center except preliminary consulting. Estimates for project proposals can be obtained upon request. For proposals to be submitted to funding agencies, the center can either submit a joint proposal or act as a subcontractor.

The center's interests include surveys of human populations, and other populations such as plants, animals, land areas, and other populations for which surveys can provide useful information.

Transportation Research Institute

Chris A. Bell, *Director*

The Transportation Research Institute (TRI) was established in 1962 to enhance research and interaction within the University and to serve as a link with other universities, industry, and government on transportation-related issues. The institute conducts a variety of research efforts, including traditional single-disciplinary and multidisciplinary research, and also serves as a clearinghouse and central source of transportation-related information.

The institute encourages faculty interation from the Colleges of Engineering, Forestry, Agricultural Sciences, Oceanography, Business, Science, and Liberal Arts. The major areas of activity include transportation system economics, policy, and regulation; geotechnical engineering and highway materials testing; transportation systems planning, traffic operations, and safety; low-volume road design, construction, and maintenance; transportation for resource development; rural transportation; sociopolitical and behavioral factors; transportation for persons with disabilities; and environmental and energy factors. An advisory committee of professionals familiar with the transportation issues and problems in the Northwest provides policy guidance as well as suggestions to the TRI staff.

Extensive facilities are available to institute members and students. These include computerized literature search capabilities, an electronic computing center, and a complete soils and materials testing laboratory. The laboratory houses closed-loop servo-controlled test systems, as well as a walk-in cold room for testing frozen soils. Also available are complete hydrology and hydraulic labs for drainage and hydraulic studies and 14,000 acres of timberland reserved for teaching and research, available through the College of Forestry.

University Corporation for Atmospheric Research (UCAR)

Richard A. Scanlan, Jeffry R. Barnes, *OSU Member Representatives*

Through its membership in this national research consortium, Oregon State University has access to extensive facilities and services in support of its research in atmospheric, oceanic, and related sciences. Chief among these is the National Center for Atmospheric Research (NCAR) in Boulder, Colorado. Under the support of the National Science Foundation, this national laboratory conducts significant programs of atmospheric, oceanographic, and solar research in cooperation with member universities, and operates a state-of-the-art super computer facility which is accessible to member institutions. UCAR also operates facilities for scientific ballooning, and through NCAR, maintains instrumented research aircraft and an extensive research and data library.

In addition to using these facilities, OSU faculty and graduate students participate in numerous seminars, workshops, and scientific meetings and conferences which are held at NCAR throughout the year. Through the corporation, Oregon State also cooperates in various national and international initiatives for research, service, and training in the atmospheric and related sciences.

Water Resources Research Institute

Benno P. Warkentin, *Director*

The Water Resources Research Institute was established in 1960 to foster, encourage, and facilitate research and education related to quantity and quality of water available for beneficial uses. The institute is administered under the Vice President for Research, Graduate Studies, and International Programs, with an executive committee of the deans of the Colleges of Agricultural Sciences, Engineering, and Forestry. Membership includes all faculty members in higher education in Oregon who are engaged in water resources research and teaching, currently about 200 persons in more than 40 departments in 12 universities and colleges in Oregon. The institute assists in organizing multidisciplinary groups of University personnel for research and technology transfer on water management concerns in Oregon.

Extensive facilities available to institute members and students include forested watershed lands, streams with a wide range of characteristics, branch agricultural equipment stations, field measuring equipment, soils laboratories, experimental water and waste treatment facilities, freshwater science laboratories, experimental streams, a hydraulics laboratory, and a radiation center. Research projects are conducted in the areas of water supply and quality, planning and management, systems analysis, legal and institutional complexities, and water uses and use impacts. Research assistantships and fellowships are available through many of the member departments. The institute provides "seed money" for selected research and training programs in water resources.

The institute works closely with state and federal agencies in its research and information transfer programs. Seminars are sponsored during fall and spring terms to address water issues. Research reports are given wide distribution through the institute's information dissemination program. Workshops are organized on topics of current interest.

Western Rural Development Center

Russell C. Youmans, *Director*

The Center is funded from federal and grant sources. The mission of the WRDC is to strengthen rural families, communities, and businesses by facilitating collaborative socio-economic research and extension through higher education institutions in the western region. It is one of four in the nation focusing on applied social science research and education programs with impact on quality of rural life. Proposals for funding are submitted by states in the region for support to extend research or education programs into a regional context.

Summary of Enrollment and Degrees

Enrollment by Curriculum and Class, Fall Term 1994

Curriculum	Fresh	Soph	Junior	Senior	Undergrad Postbac	Undergrad Special	Undergrad Total	Grad/Prof	Total
Liberal Arts and Sciences									
College of Liberal Arts	370	399	525	737	48	36	2,135	84	2,219
College of Science	477	344	337	490	60	35	1,743	563	2,306
TOTAL Liberal Arts and Sciences *(excluding duplicates)*	**847**	**743**	**862**	**1,227**	**108**	**71**	**3,878**	**647**	**4,525**
Professional Curricula									
College of Agricultural Sciences	144	127	215	218	58	14	776	329	1,105
College of Business	389	290	362	390	35	30	1,496	128	1,624
College of Engineering	616	380	444	695	58	14	2,207	516	2,723
College of Forestry	71	59	62	97	6	2	297	165	462
College of Health and Human Performance	151	143	180	223	11	9	717	117	834
College of Home Economics and Education	122	148	215	296	25	8	814	386	1,200
College of Oceanic and Atmospheric Sciences	—	—	—	—	—	—	—	94	94
College of Pharmacy	75	63	75	178	64	2	457	27	484
College of Veterinary Medicine	—	—	—	—	—	—	—	74	74
Graduate School	—	—	—	—	—	—	—	619	619
University Exploratory Studies Program	320	102	73	30	2	52	579	—	579
TOTAL Professional Colleges	**1,888**	**1,312**	**1,626**	**2,127**	**259**	**151**	**7,343**	**2,455**	**9,798**
TOTAL Students *(excluding duplicates)*	**2,735**	**2,055**	**2,488**	**3,354**	**367**	**222**	**11,221**	**3,102**	**14,323**

Summary of Degrees Conferred 1993-94

Doctor of Philosophy	194
Doctor of Veterinary Medicine	28
TOTAL Doctorate Degrees	**227**
Master of Agriculture	16
Master of Arts	6
Master of Arts in Interdisciplinary Studies	55
Master of Arts in Teaching	89
Master of Business Administration	77
Master of Education	72
Master of Forestry	3
Master of Ocean Engineering	1
Master of Public Health	3
Master of Science	362
TOTAL Master's Degrees	**684**
Bachelor of Arts	
College of Business	45
College of Engineering	3
College of Home Economics and Education	2
College of Liberal Arts	224
College of Science	10
Bachelor of Science	
College of Agricultural Sciences	182
College of Business	354
College of Engineering	376
College of Forestry	65
College of Health and Human Performance	169
College of Home Economics and Educaton	199
College of Liberal Arts	499
College of Pharmacy	87
College of Science	317
Bachelor of Fine Arts	
College of Liberal Arts	32
TOTAL Bachelor's Degrees	**2,248**

TOTAL DEGREES CONFERRED 1993-94: 3,475

Students receiving: 1 degree	3344
2 degrees	64
3 degrees	1

Source: OSU Office of Budgets and Planning

Enrollment by Gender and Term, 1993-94

Term	Men	Women	Total
Summer Session, 1993	2,327	2,199	4,526
Fall Term, 1993	8,238	6,026	14,264
Winter Term, 1994	7,815	5,712	13,530
Spring Term, 1994	7,278	5,452	12,733
Summer Session, 1994*	2,123	2,085	4,222
Fall Term, 1994	8,081	6,242	14,323
Percentage (Fall Term 1994)	*56.4*	*43.6*	

*Incudes 14 no response

Source of Student, Fall Term	1992	1993	1994*
New Freshmen	1,722	1,618	1,922
Transfer Students	2,041	2,075	2,054
Special Students	251	425	706
Returning Students	715	631	617
Continuing Students	9,607	9,515	9,024

*Estimated

Full-Time/Part-Time, Fall Term, 1994

	Full-time	Part-time	Total
Undergraduate	10,294	927	11,221
Graduate	2,280	822	3,102
TOTAL	12,574	1,749	14,323
Percentage	*87.8*	*12.2*	

Graduation Rates (Entering Freshmen)

Class	% 4 Years	% 5 Years	% 6 Years	% 7 Years
1983-84	17.4	42.4	49.0	51.4
1984-85	17.2	42.8	50.0	52.0
1985-86	16.0	43.8	50.4	53.7
1986-87	17.3	39.0	51.6	—
1987-88	17.9	44.9	—	—
1988-89	17.2	—	—	—

Geographic Origin (Residency) Fall Term, 1994

	Number	Percent
Oregon	10,759	75.1
U.S. (plus Territories and Possessions)	2,218	15.5
International	1,346	9.4
TOTAL	14,323	100.0

EMERITUS FACULTY

Emeritus status is given to eligible tenured Oregon State University faculty members upon their retirement, in recognition for their years of effective service. As leaders in their fields, many Emeritus faculty members continue to serve the University throughout their retirement. The year listed after each name is the year the faculty member began service at Oregon State.

PRESIDENTS EMERITUS

MacVicar, Robert William 1970 President Emeritus & Prof Emeritus Chemistry

VICE PRESIDENTS EMERITUS

Chick, Robert William 1962 Vice President Emeritus for Student Services, Prof Emeritus Education

Parsons, Theran Duane 1955 Vice President Emeritus for Finance & Administration, Prof Emeritus Chemistry

Popovich, Milosh 1947 Vice President Emeritus for Administration, Prof Emeritus Mechanical Engineering

DEANS EMERITUS

Burgess, Fredrick J. 1953 Dean Emeritus Engineering, Prof Emeritus Civil Engineering

Calvin, Lyle David 1953 Dean Emeritus Graduate School, Prof Emeritus Statistics

Cooney, Wilbur Tarlton 1937 Dean Emeritus Agriculture, Prof Emeritus Poultry Science

Gilkey, Gordon Waverly 1947 Dean Emeritus Liberal 1968 Prof Emeritus Russian

Long, James Waldo 1966 Dean Emeritus Health & Physical Education, Prof Emeritus Physical Education

Nicodemus, David Bowman 1950 Dean of Faculty Emeritus, Prof Emeritus Physics

Poling, Dan Williams 1937 Dean Emeritus of Men & Prof Emeritus

Stoltenberg, Carl Henry 1966 Dean Emeritus Forestry, Prof Emeritus Forest Resources

Tucker, Sylvia B. 1975 Dean Emeritus Education, Prof Emeritus Education

Wedman, E. Edward 1971 Dean Emeritus Veterinary Medicine, Prof Emeritus Veterinary Medicine

Wilkins, B. H. 1961 Dean Emeritus College of Liberal Arts, Prof Emeritus Economics

Williamson, Stanley E. 1946 Dean Emeritus Education, Prof Emeritus Science Education

Wilson, Charles O. 1959 Dean Emeritus Pharmacy, Prof Emeritus Pharm Chem

LIBERAL ARTS

Adolf, Leonard Allen 1955 Prof Emeritus History

Andrick, Virginia 1970 Asst Prof Emeritus Architecture

Anton, Peter 1956 Prof Emeritus Philosophy

Bennett, Cleon Vernon 1958 Prof Emeritus Speech Communication

Borgir, Tharald 1967 Prof Emeritus Music

Bowman, Marian Y. 1964 Prof Emeritus Art

Brye, Joseph Chester 1947 Prof Emeritus Music

Burt, George Sherwin 1966 Assoc Prof Emeritus Psychology

Butts, Irene 1947 Instr Emeritus English

Cadart-Ricard, Odette 1965 Prof Emeritus French

Campbell, William Alexander 1966 Prof Emeritus Music

Carlson, Roy Werner 1958 Assoc Prof Emeritus English

Carlson, Theodore Harold 1962 Assoc Prof Emeritus Journalism

Castle, Emery N. 1954 Prof Emeritus Economics

Clarke, Ronald Orville 1963 Prof Emeritus Philosophy

Conkey, Harlan D. 1969 Prof Emeritus Speech Comm

Cormack, Charles William 1963 Prof Emeritus Anthropology

Crooks, William Ramsden 1947 Prof Emeritus Psychology

Crozier, William Kenneth, Jr. 1966 Prof Emeritus Art

Dale, Robert D. 1965 Assoc Prof Emeritus Philosophy

Dankleff, Richard Elden 1963 Assoc Prof Emeritus English

Davis, Wilbur Arthur 1966 Prof Emeritus Anthropology

DeDeurwaerder, Charles A. 1967 Prof Emeritus Landscape Architecture

Doler, Thurston Ermon 1949 Prof Emeritus Speech Comm

Dorn, Harold Clarence 1965 Prof Emeritus Journalism

Dost, Jeanne 1973 Prof Emeritus & Dir Emeritus of Women Studies

Doudoroff, Eve-Mary 1960-61 1963 Asst Prof Emeritus French & German

Ellis, Russell Eugene 1949 Prof Emeritus Architecture

Farness, Donald H. K. 1963 Assoc Prof Emeritus Economics

Ferran, Francisco Rene 1965 Asst Prof Emeritus Spanish

Finnigan, David Francis 1957 Assoc Prof Emeritus English

Foreman, Walter Cyril 1948 Prof Emeritus English

Fox, Dorothy B. 1928 Assoc Prof Emeritus Art

Fuquay, Robert Frank 1953 Prof Emeritus Political Science

Garrison, Chester Arthur 1954 Prof Emeritus English

Gilkey, Gordon W. 1947 Prof Emeritus Art

Groshong, James Willard 1946, 1950 Prof Emeritus English

Gunn, Paul 1948 Prof Emeritus Art

Harris, Charles N. 1946 Prof Emeritus Speech Comm

Harris, Frederick Philip 1967 Prof Emeritus Philosophy

Harris, Irwin Cecil 1945 Director Emeritus Student Publications, Prof Emeritus Journalism

Harter, Lafayette George Jr. 1960 Prof Emeritus Economics

Hewitt, Ray Storla 1953 Prof Emeritus English

Hovland, Clarence Warren 1949 Prof Emeritus Religious Studies

Jameson, Demetrios G. 1950 Prof Emeritus Art

Jeffress, Dean Paget 1963 Asst Prof Emeritus English

Jones, Robert 1962 Asst Prof Emeritus English

King, Roger Edward 1954 Professor Emeritus English

Knapp, James Gilbert 1960 Assoc Prof Emeritus Music

Kraft, Walter Carl 1950 Prof Emeritus German

Lawrence, Margaret Lucille 1945 Asst Prof Emeritus English

Leman, Nancy Farwell 1971 Instr Emeritus English

Levine, Gloria A. 1960 Assoc Prof Emeritus Spanish

Levine, Shepard 1954 Prof Emeritus Art

Ludwig, Martin James 1949 Asst Prof Emeritus English

Maclean, Doris G. 1963 Asst Prof Emeritus Foreign Lang & Lit

Madden, Theodore Martin 1959 Assoc Prof Emeritus Psychology

Maddox, Russell W., Jr. 1950 Prof Emeritus Political Science

Malueg, Sara Ellen 1966 Assoc Dean Emeritus Liberal Arts & Prof Emeritus French

Martel, Donald Joseph 1947 Prof Emeritus Landscape Architecture

Mason, Robert George 1961 Prof Emeritus Sociology

McClenaghan, William Andrew 1949 Prof Emeritus Political Science

McClintock, Thomas Coshow 1959 Assoc Dean Emeritus Liberal Arts & Prof Emeritus History

McFarland, Floyd Brant 1964 Prof Emeritus Economics

McGrath, Edward G. 1965 Prof Emeritus Political Science

McIlvenna, Don Edward 1965 Assoc Prof Emeritus History

Meehan, Margaret Elizabeth 1970 Senior Instr Emeritus History

Meehan, Thomas Richard 1962 Prof Emeritus History

Metzer, Stuart Miles 1962 Assoc Director Emeritus Facilities Planning & Assoc Prof Emeritus Architecture

Mills, William Willis 1954 Prof Emeritus Psychology

Murphy, Thomas A. 1963-66, 1968 Assoc Prof Emeritus Psychology

Norris, Faith Grigsby 1947 Prof Emeritus English

O'Connor, John Alan 1949 Prof Emeritus Music

Orzech, Ze'ev B. 1957 Prof Emeritus Economics

Padfield, Harland Irving 1972 Prof Emeritus Anthropology

Patterson, Kenneth Denton 1958 Prof Emeritus Economics

Philipp, Kurt David 1963 Assoc Prof Emeritus History

Plambeck, Hans Heinrich 1946 Prof Emeritus Sociology

Phillips, Robert L. 1957 Prof Emeritus Journalism

Rock, John H. 1958 Prof Emeritus Art

Ross, Richard Everett 1970 Prof Emeritus Anthropology

Rossbacher, Peter Georg 1968 Prof Emeritus Russian

Rudinsky, Norma Leigh 1965 Sr Instr Emeritus English

Sandgren, Nelson E. 1948 Prof Emeritus Art

Shaw, Francis Harding 1955 Prof Emeritus History

Shively, Stanley Edward 1968 Assoc Prof Emeritus Sociology

Simmons, Dale David 1959-1963, 1966 Prof Emeritus Psychology

Sinnard, Herbert Reeves 1929-32, 1934 Prof Emeritus Architecture & Landscape Arch

Sjogren, Christine Oertel 1960 Prof Emeritus German

Solberg, Ingvald Ben 1947 Assoc Prof Emeritus Landscape Arch

Sorenson, Gary W. 1970 Assoc Prof Emeritus Economics

Sponenburgh, Mark R. 1961 Prof Emeritus Art

Stadsvold, Cyril V. 1963 Assoc Prof Emeritus Art

Staver, Frederick Lee 1957 Assoc Prof Emeritus English

Taubman, Lisa Waite 1956 Asst Prof Emeritus Psychology

Taysom, Wayne P. 1953 Prof Emeritus Art

Tentchoff, Dorice M. 1977 Asst Prof Emeritus Anthropology

Towey, Richard Edward 1962 Prof Emeritus Economics

Wallace, Allice L. 1961 Asst Prof Emeritus Speech Comm

Walls, Robert Boen 1947 Prof Emeritus Music

Walter, Austin Frederic 1950 Prof Emeritus Political Science

Warnath, Charles Frederick 1961 Prof Emeritus Psychology

Wilkins, B. H. 1961 Prof Emeritus Economics

Willey, Dale Herbert 1959 Asst Prof Emeritus English

Wilson, Norman William 1947 Assoc Prof Emeritus English

Winger, Carlyn R. 1938 Prof Emeritus Speech Comm

Wolfson, Murray 1964 Prof Emeritus Economics

Wong, Allen Quan 1967 Prof Emeritus Art

Wubben, Hubert Hollensteiner 1963 Prof Emeritus History

Yonker, Nicholas J. 1962 Prof Emeritus Religious Studies

Zwahlen, Fred Casper Jr. 1950 Prof Emeritus Journalism

SCIENCE

Allen, Thomas C. 1962 Prof Emeritus Botany & Plant Pathology

Anderson, Arthur W. 1953 Prof Emeritus Microbiology

Anselone, Philip Marshall 1964 Prof Emeritus Mathematics

Arnold, Bradford Henry 1947 Prof Emeritus Mathematics

Baisted, Derek John 1964 Prof Emeritus Biochemistry & Biophysics

Ballantine, Charles S. 1960 Prof Emeritus Mathematics

Becker, Robert Richard 1962 Prof Emeritus Biochemistry & Biophysics

Bishop, Norman Ivan 1963 Professor Emeritus Botnay and Plant Pathology

Boedtker, Olaf Alexander 1963 Assoc Prof Emeritus Physics & Head Adviser Emeritus, Science

Brady, James Joseph 1937 Prof Emeritus Physics

Brandt, William Henry 1956 Assoc Prof Emeritus Botany

Brunk, H. Daniel 1969 Prof Emeritus Statistics

Burch, David Stewart 1958 Prof Emeritus Physics

Calvin, Lyle David 1953 Prof Emeritus Statistics

Carter, David S. 1961 Prof Emeritus Mathematics

Chambers, Kenton L. 1968 Prof Emeritus Botany

Chilcote, William Wesley 1950 Prof Emeritus Botany

Christensen, Bert Einar 1931 Prof Emeritus Chemistry

Conte, Frank Philip 1961 Prof Emeritus Zoology

Corden, Malcolm Ernest 1958 Prof Emeritus Botany & Plant Pathology

Cutler, Melvin 1963 Prof Emeritus Physics

Davis, Joel 1963 Assoc Prof Emeritus Mathematics

Dawson, Peter Sanford 1969 Prof Emeritus Zoology

Deardorff, James W. 1978 Prof Emeritus Atmospheric Sciences

Decker, Fred W. 1946 Assoc Prof Emeritus Atmospheric Sciences

Denison, William Clark 1966 Assoc Prof Emeritus Botany & Plant Pathology

Drake, Charles Whitney 1966 Prof Emeritus Physics

Easterday, Harry Tyson 1960 Prof Emeritus Physics

Elliker, Paul Reuben 1947 Prof Emeritus Microbiology

Evans, Harold J. 1961 Distinguished Professor Emeritus Plant Physiology & Director Emeritus Nitrogen Fixation Laboratory

Faulkenberry, G. David 1967 Prof Emeritus Statistics

Field, Cyrus West 1963 Prof Emeritus Geosciences

Firey, William James 1961 Prof Emeritus Mathematics

Fontana, Peter Robert 1967 Prof Emeritus Physics

Fredericks, William J. 1962 Prof Emeritus Chemistry

Frenkel, Robert Edgar 1965 Prof Emeritus Geography

Freund, Harry 1947 Prof Emeritus Chemistry

Fryer, John L. 1963 Distinguished Professor Emeritus & Dept Chair Microbiology

Gates, W. Lawrence 1976 Prof Emeritus Atmospheric Sciences

Godard, Russell Holcomb 1950 Asst Prof Emeritus Mathematics

Hawkes, Stephen James 1968 Prof Emeritus Chemistry

Hedberg, Kenneth Wayne 1956 Prof Emeritus Chemistry

Hewson, Wendell 1968 Prof Emeritus Atmospheric Sciences

Highsmith, Richard Morgan Jr. 1947 Prof Emeritus Geography

Hisaw, Frederick Lee Jr. 1958 Assoc Prof Emeritus Zoology

Jensen, Harold James 1950 Prof Emeritus Botany & Plant Pathology

Jensen, James Herbert 1961 Prof Emeritus Botany & Plant Pathology

Jensen, John Granville 1946 Prof Emeritus Geography

Johnston, La Rea Dennis 1959 Sr Instr Emeritus Botany & Plant Pathology

Kaplan, Edward Lynn 1961 Prof Emeritus Mathematics

Krueger, Hugo Martin 1948 Prof Emeritus Zoology

Lonseth, Arvid T. 1948 Prof Emeritus Mathematics

Loomis, Walter David 1953 Prof Emeritus Biochemistry & Biophysics

Lyford, John Higgins, Jr. 1966 Assoc Prof Emeritus Biology

MacDonald, Donald Laurie 1962 Prof Emeritus Biochemistry & Biophysics

MacVicar, Robert William 1970 Prof Emeritus Chemistry

McIntire, Charles David 1964 Prof Emeritus Botany & Plant Pathology

Marvell, Elliot N. 1958 Prof Emeritus Chemistry

Moore, Thomas Carrol 1963 Prof Emeritus Botany & Plant Pathology

Morita, Richard Y. 1962 Prof Emeritus Microbiology

Narasimhan, Mysore N.L. 1966 Prof Emeritus Mathematics

Newburgh, Robert Warren 1953 Prof Emeritus Biochemistry

Nicodemus, David Bowman 1950 Prof Emeritus Physics

Norris, Thomas H. 1947 Prof Emeritus Chemistry

Northam, Ray 1966 Prof Emeritus Geography

Oles, Keith Floyd 1961 Prof Emeritus Geosciences

Overholser, Donald L. 1965 Sr Instr Emeritus Microbiology

Overton, Walter Scott 1965 Prof Emeritus Statistics

Owczarzak, Alfred 1955 Assoc Prof Emeritus Zoology

Van Holde, Kensal Edward 1967 Distinguished Prof Emeritus Biochemistry & Biophysics

Parsons, Theran Duane 1955 Prof Emeritus Chemistry

Peterson, Roger C. 1965 Prof Emeritus Statistics

Poole, Albert Roberts 1946 Prof Emeritus Mathematics

Powelson, Robert Loran 1956 Prof Emeritus Botany & Plant Pathology

Pritchard, Austin Wyatt 1953 Prof Emeritus Zoology

Roland, Jean Overholser 1957 Asst Prof Emeritus Mathematics

Roth, Lewis Franklin 1940 Prof Emeritus Botany

Saunders, Roy Bly 1946 Assoc Prof Emeritus Mathematics

Schecter, Larry 1955 Prof Emeritus Physics

Schmitt, Roman A. 1966 Prof Emeritus Chemistry

Scott, Allen B. 1941 Prof Emeritus Chemistry

Shoemaker, Clara Brink 1970 Prof Emeritus Chemistry

Shoemaker, David Powell 1970 Prof Emeritus Chemistry

Simons, William Haddock 1966 Prof Emeritus Mathematics

Smith, John Wolfgang 1964 Prof Emeritus Mathematics

Smith, Kennan Tayler 1968 Prof Emeritus Mathematics

Spencer, James Brookes 1963 Assoc Prof Emeritus General Science

Stalley, Robert Delmer 1956 Prof Emeritus Mathematics

Storm, Robert Macleod 1948 Prof Emeritus Zoology

Swenson, Leonard Wayne 1968 Prof Emeritus Physics

Taubeneck, William H. 1955 Prof Emeritus Geology

Terriere, Leone C. 1950 Prof Emeritus Entomology

VanDyke, Henry 1963 Prof Emeritus General Science

Wang, Chih H. 1950 Prof Emeritus Chemistry, Nuclear Engineering, Director Emeritus Radiation Center

Williams, Max Bullock 1941 Prof Emeritus Chemistry

Willis, David Lee 1962 Prof Emeritus Radiation Biology & General Science

Yoke, John Thomas 1964 Prof Emeritus Chemistry

Young, Roy A. 1948 Prof Emeritus Plant Pathology

AGRICULTURAL SCIENCES

Adair, John 1953 Sr Instr Emeritus Animal Sciences

Adams, Frank William 1953 Asst Prof Emeritus Agricultural Chemistry

Adams, Holyoke P. 1971 Prof Emeritus Animal Sciences

Allyn, Margaret Marie 1954 Asst Prof Emeritus Extension

Andersen, Wilbert Lowell 1956 Assoc Prof Emeritus Extension Ed

Anderson, Nelson Christian 1946 Prof Emeritus Extension

Anderson, Roberta Frasier 1959 Prof Emeritus Extension

Anglemier, Allen F. 1956 Prof Emeritus Food Science & Technology

Apple, Spencer Butler Jr. 1950 Prof Emeritus Horticulture

Appleby, Arnold Pierce 1959 Prof Emeritus Crop & Soil Science

Arscott, George H. 1953 Prof Emeritus Poultry Science

Bailey, Leeds Crim 1941 Assoc Prof Extension

Baron, Lloyd Carol 1945-46 1957 Prof Emeritus Extension

Becker, Manning Henry 1948 Prof Emeritus Ag & Res Economics

Bedell, Thomas 1966-70, 1973 Prof Emeritus Extension

Bernier, Paul E. 1947 Prof Emeritus Poultry Science

Berry, Donald Wilson 1954 Prof Emeritus Extension

Besse, Ralph Stephen Jr. 1963 Prof Emeritus Int'l Agriculture

Binder, Julius Floyd 1952 Assoc Prof Emeritus Extension

Black, Harold Mayfield 1949 Prof Emeritus Extension

Blanch, Grant Etherington 1945 Prof Emeritus Ag & Res Economics

Bluhm, Wilbur L. 1957 Prof Emeritus Extension

Bogart, Ralph 1947 Prof Emeritus Animal Sciences

Bolton, Floyd E. 1967 Assoc Prof Emeritus Crop Science

Bond, Carl Eldon 1949 Prof Emeritus Fisheries & Wildlife

Bonham, Earl Edward 1955 Assoc Prof Emeritus Extension

Booster, Dean Emerson 1956 Prof Emeritus Ag Engineering

Breese, Wilbur Paul 1953 Prof Emeritus Fisheries & Wildlife

Brewer, Donald Haden 1957 Prof Emeritus Crop Science

Brooks, Royal Harvard 1967 Prof Emeritus Ag Engineering

Brown, Dorothy Furtick 1955 Prof Emeritus Extension Home Economics

Brown, Joy Brougher 1962 Asst Prof Emeritus Extension

Brown, Kenneth Neil 1963 Prof Emeritus Extension

Brown, William Galen 1955 Prof Emeritus Ag & Res Economics

Burkhart, Betty Jane 1963 Assoc Prof Emeritus Extension

Burkhart, David James 1961 Prof Emeritus Extension

Burkhart, Harry Ray 1972 Asst Prof Emeritus Animal Sciences

Burr, James Almon 1951-52 1960 Prof Emeritus Extension

Burrill, Larry Clyde 1962 Assoc Prof Emeritus Extension

Bussard, Marie Harris 1957 Prof Emeritus Extension

Cain, Robert F. 1956 Prof Emeritus Food Science & Technology

Calhoun, Wheeler Jr. 1948 Assoc Prof Emeritus Agronomy

Cameron, H. Ronald 1955 Prof Emeritus Plant Pathology

Cannon, Lynn Elton 1963 Prof Emeritus Extension

Capizzi, Joseph 1955-63 1965 Prof Emeritus Extension Entomology

Carter, George Edward 1960 Assoc Prof Emeritus Agronomy

Cate, Rufus 1945 Prof Emeritus Extension

Cheney, Horace Bellatti 1952 Prof Emeritus Soil Science

Chilcote, David O. 1961 Prof Emeritus Crop Science

Chilcote, William Wesley 1953 Prof Emeritus Crop Physiology

Ching, Te May T. 1956 Prof Emeritus Crop Science

Christensen, Dorothy Jean 1967 Assoc Prof Emeritus Extension

Christensen, Leno Virgil 1957 Assoc Prof Emeritus Ag Education

Church, D.C. 1956 Prof Emeritus Animal Sciences

Clark, Elsie K. 1960 Assoc Prof Emeritus Extension

Clark, Harry Edwin 1951 Prof Emeritus Extension

Claypool, Donald W. 1964 Asst Prof Emeritus Animal Sciences

Compton, Oliver Cecil 1948 Prof Emeritus Horticulture

Conklin, Frank Sidney 1968 Prof Emeritus Ag & Resource Economics

Conner, Helen Dwelle 1963 Prof & Malheur Co Extn Agent. BS Montana 1963

Cook, Clive Winston 1944 Asst Prof Emeritus Extension

Cooney, Wilbur Tarlton 1937 Prof Emeritus Poultry Science

Coolican, Patricia 1978 Prof Emeritus Extension Home Economics

Cox, Joseph Rew 1945-50 1957 Director Emeritus Extension & Prof Emeritus Extension

Crabtree, Garvin Dudley 1958 Prof Emeritus Horticulture

Craig, Richard P. 1974 Assoc Prof Emeritus Extension

Crawford, David 1958 Prof Emeritus Food Science & Technology

Cropsey, Myron George 1946 Prof Emeritus Ag Engineering

Crowell, Hamblin Howes 1946 Prof Emeritus Entomology

Davidson, Tom P. 1950 Asst Prof Emeritus Hermiston Ag Res & Ext Ctr

Davis, John Rowland 1971 Prof Emeritus Ag Engineering

Dawson, Murray 1958 Prof Emeritus Soil Sci

Day, Paul Edward 1972 Assoc Prof Emeritus Extension

Dost, Frank N. 1975 Prof Emeritus Extension

Doudoroff, Peter 1953 Prof Emeritus Fisheries & Wildlife

Duncan, Andrew Adrian 1958 Prof Emeritus Horticulture

Ebert, Arnold Christian 1936 Assoc Prof Emeritus Extension

Edwards, John Allan 1961 Prof Emeritus Ag & Res Economics

England, David C. 1955 Prof Emeritus Animal Sciences

Fang, Sheng Chung 1948 Prof Emeritus Chemistry, Ag Chemistry

Farrell, William King 1942 Prof Emeritus Extension

Fendall, Roger K. 1968 Prof Emeritus Crop & Soil Science

Fischer, C.M. 1947 Prof Emeritus Extension

Fisher, Ermina Jane 1952 Prof Emeritus Extension

Fitch, Luther Aaron 1960 Prof Emeritus Extension

Foster, Lee Russell 1947 Prof Emeritus Extension

Frakes, Rodney 1960 Prof Emeritus Agronomy

Frazier, William Allen 1949 Prof Emeritus Horticulture

Freed, Virgil Haven 1943 Prof Emeritus Ag Chemistry

Friedemann, Dale Herbert 1966 Prof Emeritus Extension

Frischknecht, Wilford Dean 1956 Prof Emeritus Extension

Frizzell, John Kitchner 1955 Prof Emeritus Extension

Funk, Evelyn 1958 Assoc Prof Emeritus Extension Home Economics

Gardner, Ernest Hugh 1966 Prof Emeritus Soil Science

Garren, Ralph Jr. 1950 Prof Emeritus Horticulture

Gates, W. Lawrence 1976 Prof Emeritus Atmospheric Sciences

Gavin, Charles Gerald 1955 Assoc Prof Emeritus Extension

Giles, Donald Edward 1968 Assoc Prof Extension

Goetz, Norman 1959 Prof Emeritus Agronomy Ext Program

Grabe, Don Frederick 1968 Prof Emeritus Crop & Soil Science

Grimes, John Keith 1942-44, 1953 Asst Prof Emeritus Extension

Groder, Roland 1950 Prof Emeritus Extension & Ag Res Economics

Gross, Alvin Eugene 1935 Prof Emeritus Agronomy

Gross, Louis Henry 1943 Prof Emeritus Extension

Gurton, John Reginald 1948 Assoc Prof Emeritus Extension

Hagelstein, Fred 1958 Prof Emeritus Extension

Hagen, Ivan John 1969 Sr Instr Emeritus Extension

Hall, Frances Ann 1930-58, 1961 Assoc Prof Emeritus Extension

Hall, James Dane 1963 Prof Emeritus Fisheries & Wildlife

Hall, Paige LeRoy 1954 Assoc Prof Emeritus Extension

Hamilton, Margaret Elizabeth 1957 Professor Emeritus Extension

Hansen, Elmer 1935 Prof Emeritus Horticulture

Hansen, Herbert E. 1974 Assoc Prof Emeritus Bioresource Engineering

Hansen, Hugh J. 1974 Prof Emeritus Extension

Hansen, Neils John 1943 Prof Emeritus Extension

Hardin, Edward E. 1957 Assoc Prof Emeritus Crop Science

Harper, James A. 1942 Prof Emeritus Poultry Science

Hart, Ralph Daniel 1969 Prof Emeritus Extension

Harward, Moyle E. 1955 Prof Emeritus Soil Science

Helfer, Donald 1963 Prof Emeritus Poultry Science

Henderson, Robert Wesley 1938-41, 1946 Prof Emeritus Crop Science

Hickerson, Hugh 1959 Prof Emeritus Extension

Hilty, Ivy Elizabeth 1959 Asst Prof Emeritus Extension

Hoecker, F. Dale 1946-58 1963 Asst Prof Emeritus Extension

Hoffman, Elbert Neil 1942 Assoc Prof Emeritus Agronomy

Hollands, Harold Fuller 1948 Prof Emeritus Ag & Res Economics

Holthouse, Mary 1965 Asst Prof Emeritus Extension

Horrell, Elvera Charlotte 1942 Asst Prof Emeritus Extension

Huber, James Russell 1947 Prof Emeritus Extension

Isley, Arleigh Gentry 1969 Assoc Prof Emeritus Extension

Jendrezejewski, Walter John 1938 Assoc Prof Emeritus Extension

Jensen, Louisa A. 1938 Prof Emeritus Agronomy

Johnston, Alberta B. 1963 Prof Emeritus Extension

Kennick, Walter H. 1956 Prof Emeritus Animal Science

Kerr, Harold Edward 1960 Prof Emeritus Extension

Kifer, Paul E. 1973 Prof Emeritus Food Science, Int'l Research & Development

Kiigemagi, Ulo 1954 Sr Instr Emeritus Ag Chemistry

Killingsworth, Kenneth 1969 Prof Emeritus Extension

Kirk, Dale Earl 1942 Prof Emeritus Ag Engineering

Klein, Glenn Arthur 1952 Prof Emeritus Extension Education

Koepsell, Paul Arthur 1969 Prof Emeritus Extension

Krantz, Gerald W. 1955 Prof Emeritus Entomology

Kuhn, Lee Wallace 1946 Prof Emeritus Fisheries & Wildlife

Landers, John Herbert Jr. 1950 Prof Emeritus Extension

Langmo, Reuben Donald 1948 Assoc Prof Emeritus Ag & Res Economics

Lannan, James E., Jr. 1969 Prof Emeritus Fisheries & Wildlife

Law, Duncan 1944 Prof Emeritus Food Science & Technology

Leach, Charles Morley 1950 Prof Emeritus Plant Pathology

Lear, Gene Maurice 1939 Prof Emeritus Extension

Lee, Sylvia C. 1952 Prof Emeritus Extension

Lee, William O. 1956 Prof Emeritus Crop Science

Leffel, John A. 1962 Prof Emeritus Extension

Lesuer, Mary L. 1965 Prof Emeritus Extension

Libbey, Leonard Morton 1961 Prof Emeritus Food Science & Technology

Likens, Sam T. 1951 Prof Emeritus Ag Chemistry

Lombard, Porter Bronson 1963 Prof Emeritus Horticulture

Long, Jay Bass 1940 Prof Emeritus Wildlife Ecology

Lund, Steve 1975 Prof Emeritus Agronomy

Lundbom, Dorthy B. 1966 Asst Prof Extension

Lunner, Marilyn Jeanne 1968 Assoc Prof Extension

Mack, Harry John 1955 Prof Emeritus Horticulture

Marks, Stephen 1956 Assoc Prof Emeritus Extension, Ag & Res Economics

Marsh, Robert Kendall 1956 Asst Prof Emeritus Extension

Martin, Lloyd W. 1967 Prof Emeritus Horticulture

Massie, John William 1956 Assoc Prof Emeritus Extension

Matson, Walter Edward 1965 Prof Emeritus Ag Engineering Extension

Maxwell, Darrell Clifford 1952-60 1963 Prof Emeritus Extension

McCarty, Raymond Gerald 1953 Assoc Prof Emeritus Extension

McGuire, William Saxon 1956 Prof Emeritus Crop Science

McGill, Lois 1952 Prof Emeritus Food Science & Technology

Mellenthin, Walter M. 1950 Prof Emeritus Horticulture

Mikesell, O. E. 1934 Prof Emeritus Extension

Milleville, Howard 1969 Prof Emeritus Food Science & Technology

Minnick, Kenneth Clayton 1944 Assoc Prof Emeritus Extension

Mitchell, Velma Roberta 1958 Assoc Prof Emeritus Extension

Montgomery, Marvin Leonard 1954 Senior Instr Emeritus Ag Chemistry

Moore, Bernard Jerry 1970 Sr Instr Emeritus Plant Pathology

Morgan, Max 1970 Prof Emeritus Food Science & Technology

Morrison, Betty J. 1983 Assoc Prof Emeritus Extension

Mosher, Wayne Delbert 1948 Prof Emeritus Extension

Myers, H. Joe 1948 Prof Emeritus Extension

Nelson, E. M. 1946 Assoc Prof Emeritus Extension

Neugart, Zelma R. 1955-63, 1977 Assoc Prof Emeritus Extension

Newell, Ben Allen 1944 Prof Emeritus Extension

Novotny, Raymond E. 1952 Prof Emeritus Extension

Oester, Louis Milton 1955 Prof Emeritus Extension

Oldfield, James Edmund 1949 Prof Emeritus Animal Nutrition

Oman, Paul Wilson 1967 Prof Emeritus Entomology

Ottaway, George Hollis 1941 Assoc Prof Emeritus Extension

Parker, J. Roland 1930 Assoc Prof Emeritus Extension

Parsons, Jacque E. 1965 Prof Emeritus Extension

Passon, David Edward 1960 Prof Emeritus Extension

Paulsen, Lenore Maxine 1969 Asst Prof Emeritus Extension

Phipps, Wanda 1971 Assoc Prof Emeritus Extension

Pumphrey, Floyd Vance 1957 Prof Emeritus Agronomy

Raleigh, Robert J. 1960 Prof Emeritus Eastern Oregon Ag Res Ctr

Ralston, Allen T. 1960 Prof Emeritus Animal Science

Rasmussen, Donald Lewis 1946 Prof Emeritus Extension

Rauen, Paul 1959 Prof Emeritus Extension

Reynolds, Guy Elmer 1966 Prof Emeritus Extension

Riggert, Craig Edwin 1976 Assoc Prof Extension

Roberts, Alfred Nathan 1940 Prof Emeritus Horticulture

Roberts, Warren Wayne 1950-52. 1954 Prof Emeritus Extension

Rodgers, Jefferson Belton 1946 Prof Emeritus Ag Engineering

Rohde, Charles R. 1952 Prof Emeritus Columbia Basin Ag Res Ctr

Rosenstiel, Robert George 1946 Assoc Prof Emeritus Entomology

Ross, Charles Robert 1946 Assoc Prof Emeritus Extension

Ross, Jackson W. 1961 Prof Emeritus Extension

Rowe, Kenneth Eugene 1964 Prof Emeritus Statistics

Roy, Doris Mary 1952 Assoc Prof Emeritus Extension

Rudd, Oris Clark 1955 Prof Emeritus Extension

Rydrych, Donald J. 1965 Prof Emeritus Crop & Soil Science

Salisbury, Ralph William 1949 Prof Emeritus Extension

Sander, Gary 1955 Asst Prof Emeritus Extension Forestry

Saul, Molly Sylvester 1962 Prof Emeritus Extension

Scales, Murle 1947 Prof Emeritus Extension

Scheel, Jean Willard 1946 Prof Emeritus Extension

Schmall, Vicki Louise 1975 Prof Emeritus Extension

Schneider, Gary Lee 1964 Prof Emeritus Extension

Schneiter, George R. 1955 Asst Prof Emeritus Extension

Schroeder, Jane 1952 Assoc Prof Emeritus Extension

Schroeder, Walter Greiff 1949 Prof Emeritus Extension

Schultz, Harold William 1953 Prof Emeritus Food Science & Technology

Seat, Velma Maxwell 1959 Prof Emeritus Ag & Res Economics

Shannon, Elfred 1945 Assoc Prof Emeritus Extension

Shearer, Marvin Nobel 1950 Prof Emeritus Ag Engineering

Sheets, Willis Arden 1959 Prof Emeritus Extension

Shibley, Gloria Olson 1965 Prof Emeritus Extension

Simonson, Gerald H. 1961 Prof Emeritus Agronomy

Sinnard, Herbert Reeves 1929-32, 1934 Prof Emeritus Ag Engineering

Sinnhuber, Russell Otto 1939 Prof Emeritus Food Science & Technology

Sitton, Gordon Russell 1955 Prof Emeritus Ag & Res Economics

Skinner, Francis Asbury 1946 Assoc Prof Emeritus Extension

Smith, Robert L. 1982 Prof Emeritus Extension

Smith, William Charles 1951 Prof Emeritus Extension

Stearling, Robert Howard 1940-42, 1956 Prof Emeritus Extension

Stebbins, Robert Lloyd 1962 Prof Emeritus Extension

Stevely, Robert Hugh 1954 Asst Prof Emeritus Extension

Stevenson, Elmer Clark 1967 Assoc Dean Emeritus, Director Emeritus Resident Instruction, Prof Emeritus Horticulture

Taskerud, Esther Adelia 1947 Prof Emeritus Extension

Thienes, John Ralph 1952 Prof Emeritus Extension

Thomas, Marion D. 1937-45, 1947 Prof Emeritus Extension, Ag & Res Economics

Thompson, John Gray 1948 Prof Emeritus Extension

Thompson, Maxine M. 1964 Prof Emeritus Horticulture

Thompson, Thomas W. 1949 Prof Emeritus Extension

Ticknor, Robert Lewis 1959 Prof Emeritus Horticulture

Torbeck, Frances Watts 1958 Assoc Prof Emeritus Extension

Torvend, Palmer Stanley 1939 Prof Emeritus Extension

Tubb, Richard Arnold 1975 Prof Emeritus Fisheries & Wildlife

Vandehey, Norbert Joseph 1959 Prof Emeritus Extension

Varseveld, George W. 1962 Assoc Prof Emeritus Food Science & Technology

Vomocil, James Arthur 1967 Prof Emeritus Crop & Soil Science

Von Borstel, Frank Jr. 1948 Prof Emeritus Extension

Wales, Joseph 1959 Assoc Prof Emeritus Food Science & Technology

Walrod, Dan Coin 1948 Assoc Prof Emeritus Extension

Warren, Charles E. 1953 Prof Emeritus Fisheris & Wildlife

Watkinson, Lois A. 1962 Prof Emeritus Extension

Weiser, Conrad John 1973 Prof Emeritus Horticulture

Werth, Harold Eldon 1949-51, 1956 Assoc Prof Emeritus Extension

Westigard, Peter Hughes 1962 Prof Emeritus Extention Entomology

Weswig, Paul Henry 1941 Prof Emeritus Ag Chemistry, Chemistry

Weswood, Melvin Niel 1960 Prof Emeritus Horticulture

Walls, Adolf

Wilcox, Bert Guy 1962 Prof Emeritus Extension

Wills, Clayton Stanley 1959 Prof Emeritus Extension

Winters, Eugene Philip 1954 Prof Emeritus Extension

Witt, James McAuley 1966 Prof Emeritus Ag Chemistry

Wolfe, John William 1947 Prof Emeritus Ag Engineering

Woodard, Ernest Steve 1974 Prof Emeritus Extension

Wright, Leroy C. 1929 Assoc Prof Emeritus Extension

Yang, Hoya Y. 1943 Prof Emeritus Food Science & Technology

Young, Marvin M. 1958 Prof Emeritus Extension

Youngberg, Chester Theodore 1952 Prof Emeritus Soil Science

Youngberg, Harold Wayne 1960 Prof Emeritus Crop Science

Yu, T. C. 1956 Assoc Prof Emeritus Food Science & Technology

Yungen, John Alfred 1950 Prof Emeritus Agric Expt Station

Zimmerman, Martin Joseph 1950 Prof Emeritus Extension

Zinn, Thomas G. 1962 Prof Emeritus Extension

Zundel, Afton 1934-44, 1957 Prof Emeritus Extension

Zwick, Robert W. 1964 Assoc Prof Emeritus Entomology

BUSINESS

Amano, Matthew M. 1967 Prof Emeritus Mgmt & Marketing

Beran, Kurt 1975 Asst Prof Emeritus Business

Dane, Charles Wesley 1957 Prof Emeritus Mgmt & Marketing

Easton, Edison Ellsworth 1951 Prof Emeritus Business Admin

Edwards, Louis Laird 1955 Director Emeritus Careers Planning Placement, Assoc Prof Business Admin

Gray, Clifford Frederick 1961-2, 1965 Prof Emeritus Mgmt & Marketing

Gudger, Charles M. 1970 Assoc Prof Emeritus Business Admin

Jones, Hilda Meius 1947 Assoc Prof Emeritus Admin Mgmt

Kemp, Patrick S. 1974 Prof Emeritus Accounting

Larse, Lloyd Quenderbilt 1940 Prof Emeritus Business Ed Office Admin

McCain, Robert Francis 1969 Assoc Prof Emeritus Business Admin

McFarlane, Dale Donald 1965 Prof Emeritus Finance & Int'l Business

Martin, George R. 1967 Assoc Prof Emeritus Accounting

Newton, Bryon Louis 1947-48, 1949 Prof Emeritus Business Admin

Phillips, Mary Ellen 1973 Assoc Prof Emeritus Acctg & Info Mgmt

Rettig, Jack Louis 1961 Prof Emeritus Business Admin

Schary, Philip 1986 Prof Emeritus Mgmt & Marketing

Shirley, Robert Edwin 1967 Assoc Prof Emeritus Business Admin

Soule, B. Linn 1967 Assoc Prof Emeritus Business Admin

Stonehill, Arthur Ira 1966 Prof Emeritus Finance

Weiler, Jerome Conrad 1961 Assoc Prof Emeritus Business Admin

Wells, Patricia Ann 1974 Prof Emeritus Business Admin

Widicus, Wilbur Wilson 1964 Prof Emeritus Finance & Int'l Business

Winger, Fred Everett 1947 Prof Emeritus Business Ed Office Admin

ENGINEERING

Alexander, Gerald Corwin 1955 Assoc Prof Emeritus Electrical & Computer Engineering

Arthur, John Read 1983 Professor Emeritus Electrical & Computer Engineering

Bell, J. Richard 1962 Prof Emeritus Civil Engineering

Boubel, Richard William 1954 Prof Emeritus Mechanical Engineering

Burgess, Fredrick J. 1953 Prof Emeritus Civil Engineering

Campbell, John Carl 1948 Prof Emeritus Indust & Mfg Engineering

Croff, Howard Lester 1957 Prof Emeritus Indust & Mfg Engineering

Engesser, William Frederick 1941 Prof Emeritus Indust & Mfg Engineering

Frazier, Lloyd McDonald 1947 Prof Emeritus Mechanical Engineering

Garrard, James Lathrop 1957 Prof Emeritus Industrial Engineering

Gray, James Latimer 1949 Prof Emeritus Industrial & Mfg Engineering

Haith, Marvin R. 1943 Prof Emeritus General Engineering

Jensen, Leland Christian 1955 Assoc Prof Emeritus Electrical & Computer Engineering

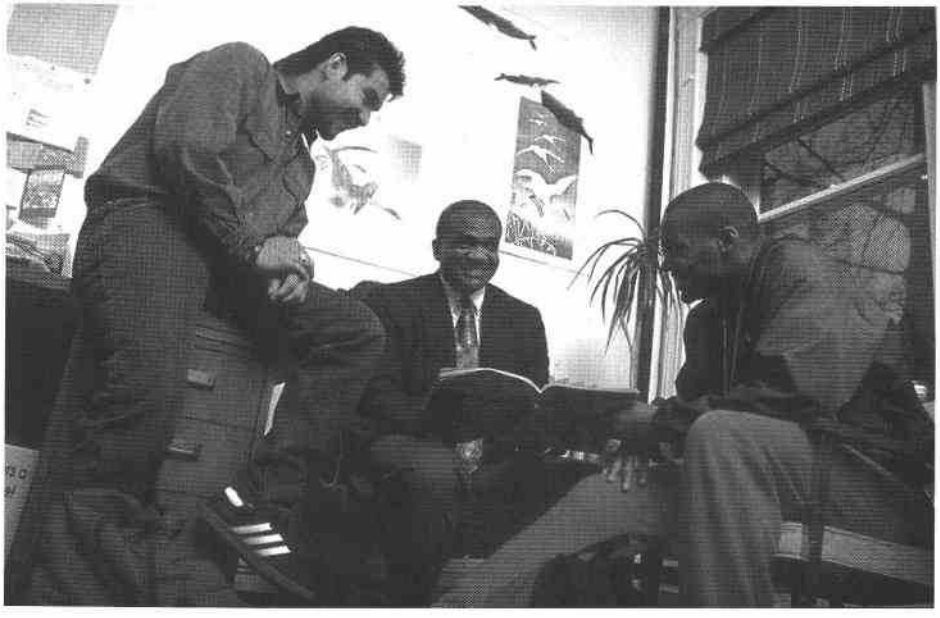
Johnson, Arthur Guy 1966 Director Emeritus Radiation Center, Prof Emeritus Nuclear Engineering

Knudsen, James George 1949-52 1953 Prof Emeritus Chemcal Engineering

LaBaun, George Bradford 1958 Assoc Prof Emeritus Civil Engineering

Laursen, Harold I. 1963 Professor Emeritus Civil Engineering

Larson, Milton Byrd 1952 Prof Emeritus Mechanical Engineering



Levenspiel, Octave 1968 Prof Emeritus Chemical Engineering

Looney, James Chester 1957 Assoc Prof Emeritus Electrical & Computer Engineering

Magnusson, Phillip Cooper 1946 Prof Emeritus Electrical & Computer Engineering

McClellan, Thomas John 1945-46, 1948 Prof Emeritus Civil Engineering

Mingle, John Glenn 1960 Prof Emeritus Mechanical Engineering

Nath, John Henry 1970 Prof Emeritus Civil Engineering & Mechanical Engineering

Northcraft, Martin Ellis 1955 Assoc Prof Emeritus Civil Engineering

Oorthuys, Hendrik Jacob 1941-44, 1957 Assoc Prof Emeritus Electrical & Computer Engineering

Paasche, Olaf Gustav 1946 Prof Emeritus Mechanical Engineering

Phelps, Robert Elton 1968 Assoc Prof Emeritus Civil Engineering

Popovich, Milosh 1947 Prof Emeritus Mechanical Engineering

Saugen, John Louis 1964 Assoc Prof Emeritus Electrical & Computer Engineering

Short, Robert Allen 1966 Prof Emeritus Electrical & Computer Engineering

Slotta, Larry Stewart 1962 Prof Emeritus Civil Engineering

Smith, Wesley Warren 1947-48, 1956 Prof Emeritus Mechanical Engineering

Staton, Warren Spencer 1958 Assoc Prof Emeritus Civil Engineering

Stone, Solon Allen 1956 Assoc Dean Emeritus Engineering, Prof Emeritus Electrical & Computer Engineering

Thornburgh, George Earl 1952 Prof Emeritus Mechanical Engineering

Wang, Chih 1950 Director Emeritus Radiation Center, Prof Emeritus Chemistry, & Nuclear Engineering

Weber, Leonard Joseph 1954 Assoc Dean Emeritus Engineering, Prof Emeritus Electrical & Computer Engineering

Wicks, Charles Edward 1954 Prof Emeritus Chemical Engineering

FORESTRY

Bell, John Frederick 1959 Prof Emeritus Forest Mgmt

Bengtson, George W. 1979 Prof Emeritus Forestry

Bever, Dale Nestrund 1961 Prof Emeritus Forest Mgmt

Bublitz, Walter J. 1966 Prof Emeritus Forest Products

Ching, Kim K. 1961 Prof Emeritus Forest Genetics

Currier, Raymond Alan 1961 Assoc Prof Emeritus Forest Products

Ferrell, William Kreiter 1956 Prof Emeritus Forest Mgmt

Froehlich, Henry A. 1970 Prof Emeritus Forest Engineering

Graham, Robert D. 1961 Prof Emeritus Forest Products

Hermann, Richard Karl 1961 Prof Emeritus Forest Resources

Jemison, George Meredith 1969 Prof Emeritus Forestry

Kallander, Rudolph Martin 1961 Prof Emeritus Forestry

Kozlik, Charles James 1961 Assoc Prof Emeritus Forest Products

Kramer, Robert 1959 Prof Emeritus Forest Products

Krygier, James Theodore 1954 Prof Emeritus Forestry

Lavender, Denis Peter 1961 Prof Emeritus Forest Physiology, Forest Science

McKimmy, Milford D. 1953 Prof Emeritus Forest Products

McLaren, Earle Kenneth 1963 Assoc Prof Emeritus Forest Engineering

McMahon, Robert Ormond 1966 Assoc Prof Emeritus Forest Products

Miller, Donald James 1961 Assoc Prof Emeritus Forest Products

Milliken, Margaret 1947 Assoc Prof Emeritus Forest Recreation Research

O'Leary, John E. 1949 Prof Emeritus Forest Engineering

Paine, David Philip 1962 Prof Emeritus Forest Mgmt

Robinson, Dan D. 1944 Prof Emeritus Forest Mgmt

Rowley, Marvin Lavern 1973 Sr Instr Forest Engineering

Slezak, Edward John 1961 Prof Emeritus Forest Recreation Research

Stoltenberg, Carl Henry 1966 Prof Emeritus Forest Resources

Sutherland, Charles Fearn Jr. 1959 Assoc Prof Emeritus Forest Resources

VanVliet, Antone Cornelis 1955 Prof Emeritus Forest Products

Wheeler, William Perry 1949 Prof Emeritus Forest Mgmt

Wilson, Robert Lee 1952 Assoc Prof Emeritus Forest Engineering

Yoder, Ray A. 1949 Prof Emeritus Forestry

HEALTH & HUMAN PERFORMANCE

Anderson, Gordon Wilcox 1962 Prof Emeritus Health

Brust, Velda Jean 1964 Assoc Prof Emeritus Phys Education

Campbell, Donald Eugene 1969 Prof Emeritus Phys Education

Cox, Joseph Alfred 1946 Prof Emeritus Phys Education

Cramer, Richard P. 1957 Assoc Prof Emeritus Exercise & Sport Science

Dailey, Charles Henry Jr. 1947 Prof Emeritus Phys Education

Dickinson, R. Vern 1968 Assoc Prof Emeritus Exercise & Sport Science

Drlica, Karl Francis 1950 Assoc Prof Emeritus Phys Education

Ellis, John Kenneth 1964 Prof Emeritus Health

Foster, Roy Archibald 1955 Prof Emeritus Health

Houston, Robert J. 1966 Assoc Prof Emeritus Public Health

Ingram, Patricia C. 1971 Asst Prof Emeritus Phys Education

Irvin, Richard Fredrick 1967 Assoc Prof Emeritus Exercise & Sport Science

Lambert, Charlotte LaVerne 1966 Prof Emeritus Phys Education

Long, James Waldo 1966 Prof Emeritus Phys Education

Martin, Don Bruce 1966 Assoc Prof Emeritus Phys Education

Martinson, Norman Harry 1958 Assoc Prof Emeritus Phys Education

Masilionis, Genevieve Jeannette Ann 1960 Assoc Prof Emeritus Phys Education

Megale, Donald Manuell 1958 Assoc Prof Emeritus Phys Education

Moe, Harold William 1935-42 1949 Assoc Prof Emeritus Phys Education

O'Shea, John P. 1962 Prof Emeritus Exercise & Sport Science

Phelps, David Walton 1965 Prof Emeritus Public Health

Poling, Dow Peter 1963 Assoc Prof Emeritus Exercise & Sport Science

Pye-Petersen, Lois 1960 Assoc Prof Emeritus Phys Education

Smith, Margaret 1977 Assoc Prof Emeritus Public Health

Tanselli, Gene Natale 1962 Assoc Prof Emeritus Phys Education

Tillman, Thomas Norman 1969 Asst Prof Emeritus Phys Education

Thomas, Dale Oren 1956 Prof Emeritus Phys Education

Torpey, James Edward 1971 Assoc Prof Emeritus Phys Education

Weir, Erma Marion 1945 Prof Emeritus Phys Education

HOME ECONOMICS AND EDUCATION

Ahrendt, Kenneth Martin 1971 Assoc Prof Emeritus Education

Anderson, Edwin LeRoy 1970 Assoc Prof Emeritus Education

Bailleaux, Muriel Woodring 1946-50 1955 Senior Instr Emeritus Foods Nutrition

Baker, Katherine Haskell Read 1941 Prof Emeritus Human Development & Family Sciences

Barte, Georgene Violette 1959 Assoc Prof Emeritus Nutrition & Food Management

Becker, Gerald Lester 1968 Assoc Prof Emeritus Counseling Education

Brennan, William James 1966 Assoc Prof Emeritus Education

Britton, Gwyneth Elaine 1965 Prof Emeritus Education

Bubl, Janet Laird 1946-48 1959 1960 Asst Prof Emeritus Clothing, Textiles & Related Arts

Carlin, Marian Cushing 1954 Assoc Prof Emeritus Human Development & Family Sciences

Charley, Helen Geneva 1944 Prof Emeritus Foods Nutrition

Chick, Robert William 1962 Prof Emeritus Education

Clark, Glenn Edwin 1968 Prof Emeritus Counseling Education

Courtney, E. Wayne 1972 Prof Emeritus Education

Craven, Gene Francis 1958 Assoc Prof Emeritus Math, Science, & Computer Science Education

Cross, Frank Richard 1969 Prof Emeritus Education

East, Dorothy May 1961 Assoc Prof Emeritus Foods & Nutrition

Edwards, Margaret Ann 1951 Sen Instr Emeritus Foods & Nutrition

Fielder, William Rodney 1971 Prof Emeritus Education

Fox, Fred W. 1957 Prof Emeritus Science Education

Fulmer, Winnifred Keil 1938 Assoc Prof Emeritus Home Economics

Gates, Ruth Elizabeth 1969 Prof Emeritus Clothing, Textiles, & Related Arts

Gathercoal, Forrest James 1969 Prof Emeritus Education

Glass, William Ray 1956 Prof Emeritus Apparel, Interiors, Housing, & Merchandising

Grant, Phyllis Emogene 1949 Asst Prof Emeritus Clothing, Textiles, & Related Arts

Gravatt, Arthur Eugene 1962-64 1973 Prof Emeritus Human Development & Family Sciences

Grieve, Mary Jane 1968 Assoc Prof Emeritus Human Development & Family Sciences

Grigsby, Tom Elvin 1974 Prof Emeritus Education

Hall, Jack Vernon 1954 Prof Emeritus Elementary Education

Harger, Virginia Frances 1967 Prof Emeritus Institutional Management

Harter, Charlotte T. 1960 Assoc Prof Emeritus Human Development & Family Sciences

Haselton, Shirley S. 1968 Assoc Prof Emeritus Education

Hlebichuk, Joseph F. 1971 Assoc Prof Emeritus Education

Hoeye, Wyman D. 1968 Assoc Prof Emeritus Education

Johnson, Elizabeth Cox 1950-60, 1965 Assoc Prof Emeritus Foods Nutrition

Ledbetter, N. Marie 1946 Assoc Prof Emeritus Clothing, Textiles, & Related Arts

Lee, Sylvia Lucile 1968 Prof Emeritus Home Economics Education

Leeland, Albert Lewis 1954 Prof Emeritus Elementary Education

Leeland, Lucille Rees 1955 Prof Emeritus Elementary Education

LeMay, Morris Lee 1964 Prof Emeritus Education

Lemon, Berlan 1959 Assoc Prof Emeritus Education

Lumpkin, Margaret Catherine 1948 Prof Emeritus Education

Meeks, Anna Rugh 1965 Prof Emeritus Education

McBride, Marjorie 1966 Prof Emeritus Education

Nice, Karl Jacob 1969 Asst Prof Emeritus Education

Peters, Jean McLeod 1958 Assoc Prof Emeritus Foods & Nutrition

Petzel, Florence Eloise 1954-61, 1967 Prof Emeritus Clothing, Textiles, & Related Arts

Plants, Constance Patricia 1960 Sr Instr Emeritus Home Economics

Plonk, Martha Amanda 1952 Prof Emeritus Human Development & Family Sciences

Reichart, Robert R. 1926 Professor Emeritus Education, Forestry

Sherburne, James Wilson 1938 Prof Emeritus Community Education

Sinnard, Harriet King 1934-36, 1940-42. 1963 Asst Prof Emeritus Human Development & Family Sciences

Sisson, Carol 1990 Assoc Prof Emeritus Education

Smith, Earl Eugene 1957 Prof Emeritus Industrial Education

Staton, Maryanne 1949-51, 1958-69, 1972 Prof Emeritus Human Development & Family Sciences

Storvick, Clara A. 1945 Prof Emeritus Foods Nutrition

Straatman, Marcelle Dorothea 1974 Assoc Prof Human Development & Family Studies

Strowbridge, Edwin David Jr. 1964 Assoc Prof Emeritus Education

Ten Pas, Henry Arnold 1948 Prof Emeritus Education

Tucker, Sylvia B. 1975 Prof Emeritus Education

Van Horn, Edna Marjorie 1939 Prof Emeritus Home Economics Administration

Wells, Vera Lucille 1948 Asst Prof Emeritus Clothing, Textiles, & Related Arts

Wiggenhorn, Miriam 1946 Assoc Prof Emeritus Human Development & Family Studies

Williamson, Stanley E. 1946 Prof Emeritus Science Education

Wilson, Robert Claude 1949 Asst Prof Emeritus Industrial Education

Wood, Carvel W. 1968 Prof Emeritus Education

Woodburn, Margy Jeanette 1969 Prof Emeritus Nutrition & Food Mgmt

Yearick, Elisabeth Stelle 1966 Prof Emeritus Foods Nutrition

LIBRARY

Brandt, Patricia E. 1962 Prof Emeritus Library

Chona, Habans Singh 1966 Asst Prof Emeritus Library

Euren, Florence Sarah 1946-49 1957 Senior Instr Emeritus Library

Franklin, Hugh Lockwood 1978 Prof Emeritus Library

Horvath, Helen Scruggs 1965 Assoc Prof Emeritus Library

Ho, Phillip Wen-Jen 1953 Assoc Prof Emeritus Library

Kelts, Lora Ives 1944 Prof Emeritus Library

Lawrence, Robert Elwood 1974 Assoc Prof Emeritus Library

Lomonte, Rose Marie 1969 Assoc Prof Emeritus Library

McDonald, Marguerita 1962 Assoc Prof Emeritus Library

Minnick, Miriam Sharp 1957 Prof Emeritus Library

Schacht, David Waldron 1967 Assoc Prof Emeritus Library

Shou, Stephens Tefen 1952 Prof Emeritus Library

Swanson, Stanley Stewart 1962 Assoc Prof Emeritus Library

Tingelstad, Gertrude Bernice 1964 Asst Prof Emeritus Library

Unger, Donald Ben 1972 Asst Prof Emeritus Library

Waldron, Rodney King 1954 Prof Emeritus Library

Webber, Nancy Ruth 1971 Asst Prof Emeritus Library

OCEANIC & ATMOPHERIC SCIENCES

Carey, Andrew Galbraith Jr. 1961 Prof Emeritus Oceanography

Couch, Richard William 1966 Assoc Prof Emeritus Oceanography

Frolander, Herbert Farley 1959 Prof Emeritus Oceanography

Gonor, Jefferson John 1964 Prof Emeritus Oceanic & Atmospheric Sciences

Hedgpeth, Joel Walke 1965 Prof Emeritus Oceanography, Marine Science Center

Mesecar, Roderick 1963 Assoc Prof Emeritus Oceanography

Morita, Richard Yukio 1962 Prof Emeritus Oceanography

Neal, Victor Thomas 1964, 1966 Assoc Prof Emeritus Oceanography

Neshyba, Stephen Joseph 1965 Prof Emeritus Oceanography

Pearcy, William Gordon 1960 Prof Emeritus Oceanography

Small, Lawrence Frederick 1961 Prof Emeritus Oceanic & Atmospheric Sciences

Strong, Elizabeth 1960 Asst Prof Emeritus Oceanography

PHARMACY

Doerge, Robert F. 1960 Prof Emeritus Pharmaceutical Chemistry

Fink, Gregory B. 1964 Prof Emeritus Pharmacy

Hermann, Freya Friederike 1962 Assoc Prof Emeritus Pharmacy

Larson, Robert E. 1977 Prof Emeritus Pharmacology

Lee, Eugene Carlton 1962 Senior Instr Emeritus Pharmacognosy

Sager, Robert William 1961 Prof Emeritus Pharmacy

Schultz, H. Wayne 1959 Assoc Prof Emeritus Pharmacy

Wilson, Charles O. 1959 Prof Emeritus Pharm Chemistry

VETERINARY MEDICINE

Bone, Jesse Franklin 1950 Prof Emeritus Veterinary Medicine

Wedman, E. Edward 1971 Prof Emeritus Veterinary Medicine

ADMINISTRATIVE, RESEARCH, & SERVICE UNITS

Bailey, Samuel Hall 1947 Prof Emeritus Dept of Information

Boice, Charles Allan 1966 Prof Emeritus Dept of Information

Boots, Donald S. 1977 Director Emeritus Student Health Center

Bowers, Waldo 1963 Assoc Prof Emeritus, Assoc Director Emeritus Admissions

Bryan, M. Edward 1972 Assoc Prof & Director Emeritus of Student Housing & Residence Programs

Bucy, David Alvin 1956 Prof Emeritus & Emeritus Director of Facilities Planning

Burris, Nedry Valentine 1968 Asst Prof Emeritus Business Affairs

Castle, Emery N. 1954 Prof & Chair Emeritus University Graduate Faculty of Economics

Dunn, James Wesley 1963 Prof Emeritus Development Office

Durham, Marvin Lyle 1970 Assoc Prof Emeritus Int'l Education

Edwards, Louis Laird 1955 Director Emeritus Career, Planning & Placement, Assoc Prof Business Admin

Fitzgerald, Duane Stanley 1952 Asst Prof Emeritus Memorial Union

Foulke, Ted E. 1969 Prof Emeritus Student Health Center

Gates, Dillard Herbert 1962 Prof Emeritus Int'l Research & Development

Gibbs, Wallace Eugene 1958 Director Emeritus of Admissions, Registrar Emeritus

Giffin, John S. 1980 Prof Emeritus Student Health Center

Graham, Crawford Henderson 1961 Director Emeritus Alumni Relations & Assoc Prof Emeritus

Harris, Irwin Cecil 1945 Director Emeritus Student Publications, Prof Emeritus Journalism

Jeffrey, Hugh Frank, Jr. 1950 Prof Emeritus (Director of Business Affairs)

Johnson, Wallace Earle 1956 Prof Emeritus & Director Emeritus of Information

LeMay, Morris L. 1964 Director Emeritus Counseling Center

Lillig, Everett Houston 1970 Director Emeritus Physical Plant

Morray, Marjorie Kuh 1968 Asst Prof Emeritus English Language Institute

McBride, Marjorie 1966 Assoc Prof Emeritus Career, Planning, & Placement

Metzger, Stuart Miles 1962 Assoc Director Emeritus Facilities Planning & Assoc Prof Emeritus Architecture

????Munford, James Kenneth 1939-46, 1948 Director Emeritus Publications & OSU Press, Prof Emeritus Education

Pahre, Richard E. 1956, Director Emeritus Financial Aid

Poling, Dan Williams 1937 Prof Emeritus, Dean Emeritus of Men

Purvis, Benjamin Percy 1964 Assoc Prof Emeritus Communication Media Ctr

Sanderson, Donald R. 1968 Assoc Prof Emeritus Student Activities

Shaw, Clayton Albert 1950-53, 1966 Asst Prof Emeritus (Asst Registrar)

Stephan, William Pershing 1968 Prof Emeritus Student Health Center

Stevens, George F. 1973 Director Emeritus Memorial Union & Educational Activities

Valenti, Paul Bartholomew 1949 Prof Emeritus Intercollegiate Athletics

Van Vliet, Antone Cornelis 1955 Director Emeritus Career, Planning, & Placement Center

Waldron, Rodney King 1954 Director Emeritus of Libraries, Prof Emeritus

Watson, John Lowe 1947 Controller Emeritus, Prof Emeritus OSSHE

Wong, Sally 1973 Asst Prof Emeritus Counseling Center

Yates, Thomas Leyba 1963 Prof Emeritus Computer Center

FACULTY

The date following the name indicates the year of first appointment to the OSU Faculty. More than one date indicates that there has been a break in service.

This Faculty Roster includes the Oregon State University faculty who serve the University, its students, and constituents through one or more of the following activities: instruction, research, extension, and administration. Also listed are a few on-campus staff members with faculty appointments in other state system agencies. The names of courtesy faculty members, individuals who provide voluntary services to the instructional and research programs of the University, appear in the faculty listings of individual departments or colleges.

The following abbreviations are used: Prof-Professor; Assoc Prof-Associate Professor; Asst Prof-Assistant Professor; Instr-Instructor; Res Assoc-Research Associate; Sr Instr-Senior Instructor; Sr Faculty Res Asst-Senior Faculty Research Assistant; Faculty Res Asst-Faculty Research Assistant; Extn-Oregon State University Extension Service.

A

Abbott, Mark R. 1988 Prof Oceanic & Atmospheric Sciences. BS UC-Berkeley 1974; PhD UC-Davis 1978

Abraham, Michael 1990 Asst Women's Basketball Coach Intercollegiate Athletics. BA St Mary's 1984

Abrassart, Arthur Eugene 1966 Assoc Prof Finance & Int'l Business. BSME Illinois Institute of Technology 1963; MA Illinois 1964, PhD 1967

Acker, David George 1985 Director (Interim) & Asst Prof Int'l Research & Development. BA Wilmington College 1975; MS UC-Davis 1980; PhD Oregon State 1989

Acker, Steven A. 1991 Res Assoc (Post Doct) Forest Science. BS Oregon 1982; PhD Wisconsin-Madison 1988

Ackerman, Jayne A. 1991 Director & Physician Student Health Ctr. BA Carolina-Greensboro 1959; MA Wisconsin-Madison 1964; MD Vermont College of Medicine 1976

Acock, Alan C. 1990 Dept Head & Prof Human Development & Family Sciences. BA East Washington 1966; MA Washington State 1968, PhD 1971

Adam, Michael D. 1994 Faculty Res Asst Forest Science. BS Wisconsin 1990; MS Kentucky 1992

Adair, Nanci L. 1991 Faculty Res Asst Botany & Plant Pathology. BS Oregon State 1990

Adams, David Gordon 1972 Prof & Extn Agent North Willamette Res & Extn Ctr. BS Michigan State 1959, MS 1962; PhD Oregon State 1966

Adams, Jennifer G. 1988 Asst Prof Veterinary Medicine. BS Furman 1976; DVM Georgia 1985

Adams, Paul William 1980 Prof Forest Engineering, Extn Watershed Mgmt Specialist. BS Vermont 1975; MS Michigan 1978, PhD 1980

Adams, Richard Melvin 1981 Prof Ag & Resource Economics. BS UC-Davis 1968, MS 1971, PhD 1975

Adams, Wesley Thomas 1978 Assoc Prof Forest Genetics. BS Humboldt State College 1968; MS North Carolina State-Raleigh 1970; PhD UC-Davis 1974

Addington, Shanda D. 1993 Faculty Res Asst Int'l Research & Development. BA Oregon 1980

Ahearn, Kerry David 1976 Assoc Prof English. BA Stanford 1967; MA Ohio 1968, PhD 1974

Ahrens, Glenn Robert 1988 Faculty Res Asst Forest Science. BS Humbolt State 1982; MS Oregon State 1990

Aitken, Sally N. 1990 Asst Prof (Sr Res) Forest Science. B.S.F. Univ of British Columbia 1984; MS UC-Berkeley 1986, PhD 1989

Akyeampong, Ataa Asham 1986 Asst Prof, Counselor & Instructional Coordinator Educational Opportunities. BA Washington 1969, MSW 1972; PhD Oregon State 1986

Albrecht, Steven 1993 Lecturer Chemistry. BA St. Olaf College 1961; PhD North Dakota State 1966

Aldrich-Markham, Susan 1984 Assoc Prof & Yamhill Co Extn Agent. BS Pomona College 1969; BS Oregon State 1973, MA 1978

AliNiazee, Mohammed Taskeen 1972 Prof Entomology. BScAgric AP Ag (Hyderabad, India) 1966; PhD Cal-Riverside 1970

Allen, John Sharer, Jr. 1973 Prof Oceanic & Atmospheric Sciences. BSE Princeton 1959, PhD 1968

Allen, Martin Brady 1993 Faculty Res Asst Zoology. BS Oregon 1993

Alloway, Silvia A. 1993 Extn WIC Nutrition Educator. BA Univ of Vera Cruz (Mexico) 1982

Altman, Stephen R. 1991 Men's Golf Coach Intercollegiate Athletics. BS Oregon State 1990

Amberg, John W., Jr. 1967 Sr Faculty Res Asst Laboratory Animal Resources. BS Oregon State 1967

Amort, Donald Louis 1959 Assoc Prof Electrical & Computer Engineering. BS Oregon State 1954, MS 1960

Amthor, Kerstin 1992 Faculty Res Asst Oceanic & Atmospheric Sciences. Vordiplom Univ of Ulm (Germany) 1985; MS Oregon State

An, Haejung 1991 Asst Prof Food Science & Technology. BS Seoul National Univ (Korea) 1981; MS Louisiana State 1984; PhD Florida 1989

Anderson, Amy E. 1991 Asst Prof Zoology. BA UC-Berkeley 1970; PhD UC-Santa Barbara 1989

Anderson, Craig Hedges 1980 Sr Instr Coordinator of Television Production, Communication Media Ctr. BA San Jose State 1978

Anderson, David A. 1994 Faculty Res Asst Fisheries & Wildlife. BA Miami Univ 1987

Anderson, James Edward 1964 Head Men's Basketball Coach, Intercollegiate Athletics. BS Oregon State 1959, MEd 1962

Anderson, Norman Herbert 1962 Prof Entomology. BSA (Honors) British Columbia 1955; MS Oregon State 1958; Diploma Imperial College (London) 1961, PhD 1961

Anderson, Sonia R. 1968 Prof Biochemistry & Biophysics. BS Nebraska 1961; PhD Illinois 1964

Anderson, Wayne C. 1986 Assoc Prof English. BA Gonzaga 1977; MA Washington 1979, PhD 1982

Andre, Norberto 1994 Res Assoc Bioresource Engineering. BS Oregon State 1985, MS 1987; PhD Cornell 1992

Andreasen Jr., James R. 1990 Asst Prof Veterinary Medicine. BA Utah 1968; MA Texas 1973;

BS Texas A & M 1980, DVM 1981; MS Georgia 1987, PhD 1990

Andreasen, Claire B. 1990 Asst Prof Veterinary Medicine. BS Texas A & M 1979, BS 1981, DVM 1982; MS Georgia 1987, PhD 1990

Arbogast, Brian L. 1974 Faculty Res Asst Ag Chemistry. BA Southern Oregon 1974

Arbogast, Daniel N. 1985 Sr Faculty Res Asst Food Science & Technology. BS Colorado State 1979

Armstrong, Donald James 1974 Prof Botany & Plant Pathology. AB Marshall 1959, MA 1961; PhD Wisconsin 1967

Arnold, Roy G. 1987 Provost & Executive Vice President, Prof Food Science & Technology. BS Nebraska 1962; MS Oregon State 1965, PhD 1967

Arp, Daniel James 1990 Prof Botany & Plant Pathology/Director Nitrogen Fixation Lab. BS Nebraska 1976; PhD Wisconsin-Madison 1980

Arrington, Julie 1988 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oklahoma State 1980.

Arthur, Jeffrey Lee 1977 Assoc Prof Statistics. BS Purdue 1973, MS 1975, PhD 1977

Asbell, Ann Cecile 1984 Instr & Physical Activity Course Program Coordinator Exercise & Sport. BS Missouri 1974; MS Indiana 1979

Ashkenas, Linda R. 1979 Sr Faculty Res Asst Fisheries & Wildlife. BA Cornell 1976; MS Boston 1979

Aune, Darrell 1989 Coord Broadcast Operations Intercollegiate Athletics. BA Washington State 1965

Aune, Patricia Elaine 1989 Assoc Prof & Multnomah Co Extn Agent. BS North Dakota State 1970; MS Arizona 1979

Austin, William E. 1993 Faculty Res Asst Crop & Soil Science. BS Western Oregon 1978

Averill, Jane E. 1990 Instr English Language Institute. BA Kansas 1974; MA San Francisco State 1980

Aylworth, Charles E. 1992 Faculty Res Asst Forest Resources. BA Oregon 1965; MA U of Louisville 1970, PhD 1975

Ayres, James W. 1970 Prof Pharmacy. BS Idaho State 1965; PhD Kansas 1970

Ayres, William Alan 1972 Sr Faculty Res Asst Computing Services. BS Seattle University 1968; MS Oregon State 1973

Azarenko, Anita Nina 1986 Assoc Prof Horticulture. BS Maryland 1981, MS 1983, PhD 1987.

Azevedo, Robert Steven 1982 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1982

B

Baek, Dae-Hyun 1991 Asst Prof Economics. BA Seoul National Univ (Korea) 1981; MA Ohio State 1986, PhD 1990

Baertlein, Dawn A. 1989 Res Assoc Horticulture. BS Arizona 1981, MS 1984, PhD 1988

Baggett, James Ronald 1956 Prof Horticulture. BS Idaho 1952; PhD Oregon State 1956

Baggott John B. 1984 Asst Prof & Washington Co Extn Agent. BS Michigan State 1975, MS 1980

Baham, John Eustis 1979 Assoc Prof Crop & Soil Science. BS Sonoma State, 1975; PhD UC-Riverside 1980

Bailes, Jack Clayton 1972 Prof Acctg & Info Mgmt. AB Stanford 1968; MBA Columbia 1970; PhD Washington 1973

Bailey, George Samuel, Jr. 1979 OSU Distinguished Prof, Prof Food Science & Technology, Director Marine Freshwater Biomedical Ctr. BS USC 1965; PhD UC-Berkeley 1969

Bailey, John D. 1994 Faculty Res Asst Forest Resources. BS Virginia Polytechnic 1983, MF 1985

Bakalinsky, Alan T. 1989 Asst Prof Food Science & Technology. BS UC-Davis 1979, MS 1983, PhD 1989

Baker, Robert Steven 1969 Asst Prof & Systems Analyst, Kerr Library. BS Oregon State 1964, MS 1972

Baker, Warren Stannard 1980 Asst Prof Extn Energy Specialist. BA Illinois 1964; PhD Edinburgh 1976

Baldwin, Barbara E. 1965 Faculty Res Asst Western Rural Development Ctr (Editor). BA Evansville 1959

Baldwin, Edith E. 1991 Instr Education. BEd La Trobe Univ (Australia) 1976; MS Wisconsin-Stout 1982; PhD Oregon State 1985

Baldwin, Virginia Ruth 1994 Asst Prof College of Pharmacy. BA Texas at Austin 1969; BS U of Houston 1970; MS Texas at Austin 1983; PhD North Carolina at Chapel Hill 1992

Ball, Daniel A. 1990 Asst Prof Crop & Soil Science. BS Kansas State 1976; MS UC-Riverside 1980; PhD Wyoming 1988

Balz, Barbara S. 1990 Director of Enrollment Services & Registrar. BA Alabama 1965; MS Indiana 1967

Banducci, Susan A. 1992 Instr Political Science. BS Santa Clara Univ 1988; MA UC-Santa Barbara 1989

Barbour, James F. 1965 Sr Faculty Res Asst Food Science & Technology. BA Linfield 1962

Barbour, Philip L. 1991 Faculty Res Asst Mechanical Engineering. BS Oregon State 1985, MS 1991

Barbour, Richmond Tyler 1992 Asst Prof English. BA Stanford 1970; PhD UC-Berkeley 1990

Barch, Sheila Anne 1992 Outdoor Rec Ctr Coordinator. BS Vermont 1988; MS Oregon State 1993

Barksdale, Brett 1988 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Harvey Mudd 1988

Barnes, David W. 1984 Prof Biochemistry & Biophysics. BA Vanderbilt 1971, PhD 1977

Barnes, Jeffrey 1984 Assoc Prof Oceanic & Atmospheric Sciences. BS Iowa State 1975; MS Cal Tech 1977; PhD Washington 1983

Barnes, Robert Kent 1969 Asst Director & Assoc Prof Office of Budgets & Planning. BA Oregon 1964; MA Portland State 1970

Barnhill, Jean Anne 1980 Faculty Res Asst Food Science & Technology. BS Oregon State 1966

Barnum, James Michael 1990 Faculty Res Asst Malheur Exp Station. BS Cal State-Chico 1969

Barofsky, Douglas Fred 1984 Prof Ag Chemistry. BS Washington State 1963; MS Penn State 1965, PhD 1967

Barofsky, Elisabeth 1985 Sr Faculty Res Asst Ag Chemistry. BS Chemie Schule Richter (Germany) 1964

Barrett, Douglas K. 1994 Faculty Res Asst Fisheries & Wildlife. BS Vermont 1987

Barry, William A. 1993 Res Assoc (Post Doct) Physics. BS Auburn 1981, MS 1985: PhD Lehigh Univ 1992

Barth, John Alexander 1987 Asst Prof (Sr Res) Oceanic & Atmospheric Sciences. BA Colorado 1982; PhD MIT-Woods Hole 1987

Bartlett, Jill 1992 Faculty Res Asst Veterinary Medicine. BS Oregon State 1992

Barton, Roxane K. 1989 Faculty Res Asst Eastern Oregon Ag Res Ctr-Squaw Butte. BS Montana State 1987; MS U of Nevada-Reno 1987

Bates, Allison C. 1973 Instr Veterinary Medicine. BS Oregon State 1974

Baughman, Dale Thomas 1989 Director of Intercollegiate Athletics. BA Ohio State 1971, MS 1976

Baxter, Wade W. 1992 Res Assoc (Post Doct) Biochemistry & Biophysics. BA Carleton College 1987; MS Northwestern Univ 1988, PhD 1992

Bayley, Peter B. 1994 Assoc Prof Fisheries & Wildlife. BS Leeds Univ (England) 1966, MS 1979; PhD Dalhousie Univ (Canada) 1982

Bayne, Christopher Jeffrey 1971 Prof Zoology. BS Wales 1963, PhD 1967

Beach, Gary L. 1988 Institutional Research Coordinator, Budgets & Planning. BS Portland State 1972; MS Oregon State 1982

Beach, Reg 1990 Asst Prof (Sr Res) Oceanic & Atmospheric Sciences. BS Univ of Miami 1982; MS Washington 1986

Beachley, Michael L. 1976 Asst Prof, Athletic's Compliance Officer Intercollegiate Athletics. BA San Francisco State 1970, MA 1971; PhD Denver 1976

Beal, John F.II 1994 Asst Prof & Jefferson Cty Extn Agent. BS Wyoming 1989; MA Washington State 1991

Beals, Eric Lee 1978 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BA San Francisco State 1978

Beals, Kenneth Louis 1970 Prof Anthropology. BA Oklahoma 1965, MA 1967; PhD Colorado 1971

Beary, Janet Kay 1993 Nutritionist Student Health Ctr. BS Southwestern Adventist College 1981; MS Kansas State 1985

Beatty, Bess 1986 Assoc Prof History. BA Wake Forest 1970; MA Florida State 1973, PhD 1976

Beatty, Joseph John 1979 Sr Instr Biology Program. BS Missouri at Columbia 1970, MA 1973; PhD Oregon State 1979

Beaumariage, Kimberly Dawn 1993 Asst Prof Industrial & Mfg Engineering. BS Oklahoma State 1987, MS 1989; PhD Arizona State 1993

Beaumariage, Terry G. 1993 Asst Prof Industrial & Mfg Engineering. BS Rochester Institute of Technology; MS Oklahoma State 1987, PhD 1990

Beck, William F. 1982 Instr Industrial & Mfg Engineering. BA Wyoming 1960; MS Arizona State 1967; MBA Oregon State 1989

Becker, Boris William 1970 Prof Mgmt & Marketing. BS UC-Berkeley 1962, MBA 1967, PhD 1970

Beckley, Beverley 1990 Director of Donor Relations, Development Office

Beekman, George E. 1980 Sr Instr Computer Science Engineering. BA Missouri 1969; MS Oregon 1972

Beeson, Luana J. 1994 Asst Prof Public Health. BS WOSC 1969; MS Oregon State 1988, PhD 1992

Beilstein, Michael 1978 Sr Faculty Res Asst Ag Chemistry. BA Oregon State 1973

Belair, Diane M. 1994 Coordinator Academic Support Svcs for Students with Disabilities. BA Cal State-Sacramento 1983; MS Western Oregon 1990

Bell, Christopher A. 1981 Prof Civil Engineering. BS Nottingham (England) 1972, PhD 1978

Bell, Neil C. 1992 Faculty Res Asst North Willamette Res & Extn Ctr. BS Univ of British Columbia 1990; MS Oregon State 1992

Bella, David Andrew 1967 Prof Civil Engineering. BS Virginia Military Institute 1961; MS New York 1964, PhD 1967

Benage, Wendy L. 1991 Asst Athletic Trainer Intercollegiate Athletics. BS Oregon 1985, MS 1987

Bender, Randall C. 1983 Faculty Res Asst Zoology. BS Texas Tech 1977

Bennett, Andrew Fawcett 1987 Prof Oceanic & Atmospheric Sciences. BSc Western Australia 1967; MS Harvard 1968, PhD 1971

Bennett, Max 1993 Instr Extn Forestry. BA Oregon 1987; MS Oregon State 1993

Bentley, Tracy Leigh 1990 Instr & Director of Svc for Students with Disabilities. BS, BA New Mexico 1987; MEd Oregon State 1994

Bergeson, Mitchell T. 1994 Faculty Res Asst Fisheries & Wildlife. BS Wisconsin 1994

Bergstrom, Robert Russel 1991 Asst Prof & Extn Commercial Energy Specialist. BS Arizona State 1961; MS Stanford 1972

Berkery, Lynn Anna 1993 Faculty Res Asst Oceanic & Atmospheric Sciences. BS New Mexico State 1984

Berry, Helen 1988 Assoc Prof & Marion Co Extn Agent. BS Oregon State 1975; MS Indiana State 1979

Berry, Ralph Eugene 1968 Dept Head (Interim) & Prof Entomology. BS Colorado State 1963, MS 1965; PhD Kansas State 1968

Beschta, Robert Lee 1974 Prof Forest Hydrology. BS Colorado State 1965; MS Utah State 1967; PhD Arizona 1974

Beauchamp, Robert O. 1991 Instr Apparel, Interiors, Housing & Merchandising. BA UC-Berkeley 1957

Bianco, Theresa M. 1990 Asst Prof Pharmacy. BS SUNY-Buffalo 1984; Pharm.D. Texas at Austin & the Health Sciences Ctr-San Antonio 1988

Bierlmaier, Frederick A. 1977 Faculty Res Asst Forest Science. BS Vermont 1974

Biermann, Christopher James 1987 Assoc Prof Forest Products. BS Maine-Orono 1980; PhD Mississippi State 1983

Bilsland, Douglas M. 1980 Faculty Res Asst Bioresource Engineering. BS Oregon State 1975

Binney, Stephen Ellis 1973 Prof Nuclear Engineering. BS Oregon State 1964; MS UC-Berkeley 1966, PhD 1970

Birkes, David Spencer 1974 Assoc Prof Statistics. BS Stanford 1964; MS Chicago 1966; PhD Washington 1969; MS Oregon State 1972

Birnbaum, Michele Amy 1993 Asst Prof English. BA Cal State-Sacramento 1986; MA Washington 1988, PhD 1992

Bishop, Donald L. 1990 Asst Prof Military Science. BS Sam Houston State 1982

Bishop, Leslie J. 1988 Instr English Language Institute. BS Missouri 1963; MEd Oregon State 1987

Biswell, Brian L. 1991 Faculty Res Asst Fisheries & Wildlife. BS Washington 1982

Bjornson, Rebecca Marie 1989 Faculty Res Asst Ag Chemistry. BA Johns Hopkins 1986; MS UC-San Diego 1989

Black, Daniel E. 1994 Faculty Res Asst Library. BA Washington State 1983

Blaustein, Andrew R. 1978 Prof Zoology. BA Southampton College 1971; MS U of Nevada-Reno 1973; PhD Cal-Santa Barbara 1978

Blazevich, Carol 1990 Promotions & Marketing Coordinator Intercollegiate Athletics. BA Washington State 1988

Blevins, Shia Shabazz 1994 Faculty Res Asst Water Resources Res Inst. BA Tuskegee 1993

Block, John H. 1966 Prof Pharmacy. BS BPhr Washington State 1961, MS 1963; PhD Wisconsin 1966

Bloomfield, Molly M. 1992 High School Coordinator - SMILE Program. BA Wellesley 1966; MA Stanford 1967

Bloomer, Sherman H. 1995 Chairperson & Prof Geosciences, BA Rice Univ 1976; PhD UC-Scripps 1982

Bloomfield, Stefan David 1971 Prof Finance & Int'l Business. BES Johns Hopkins 1966; MS Stanford 1968, PhD 1972

Blythe, Linda L. 1978 Interim Asst Dean Prof Veterinary Medicine. BS UC-Davis 1972, DVM 1974, PhD 1979

Bodenroeder, Pamela K. 1969 Sr Faculty Res Asst Survey Research Ctr. BA Oregon State 1969

Bodyfelt, Floyd Walter 1964 Prof Food Science & Technology, Extn Dairy Processing Specialist. BS Oregon State 1963, MS 1967

Boe, A. Bryan 1986 Faculty Res Asst Extn Energy Program. BA Oregon 1970

Boehm, Constance S. 1992 Project Director - NIRSA. BS Manchester College 1980; MA Ball State 1981

Boersma, Larry 1960 Prof Crop & Soil Science. MS The Netherlands 1955; PhD Cornell 1959

Bogley, William A. 1990 Asst Prof Mathematics. BA Dartmouth 1981; MS Oregon 1983, PhD 1987

Bohle, Mylen G. 1989 Asst Prof & Crook Co Extn Agent. BS Montana State 1975, 1979; MS Oregon State 1989

Boileau, Arlene Fay 1986 Instr Warm Springs Cty Extn Coordinator

Bolte, John P. 1987 Asst Prof Bioresource Engineering. BS Florida 1979, MS 1983; PhD Auburn 1987

Bondi, Michael Charles 1978 Assoc Prof & Clackamas Co Extn Agent. BS Iowa State 1973; MS Canterbury (New Zealand) 1977

Bonnichsen, Robson 1991 Director of Ctr for the Study of First Americans & Prof of Anthropology. BA Idaho State 1965; PhD Univ of Alberta 1974

Bontrager, Robert M. 1994 Assoc Dir of Enrollment Services. BA Goshen 1980; MC Arizona State 1983, EdD 1987

Bootland, Linda M. 1990 Res Assoc Microbiology. BS Univ of Guelph (Canada) 1982, PhD 1990

Borden, Susan J. 1983 Asst Dir SMILE Program. BA Iowa State 1960; MS Oregon State 1962

Borg, Marcus J. 1979 OSU Hundere Endowed Chair & Distinguished Professor Philosophy. BA Concordia College 1964; Diploma Oxford 1966, PhD 1972

Borman, Michael M. 1994 Assoc Prof Extn Rangeland Resources. BS Morehead State Univ 1973; MS Colorado State 1981; PhD Oregon State 1989

Borsa, Paul A. 1994 Asst Prof Exercise & Sport Science. BS Pittsburgh 1988, MS 1992, PhD 1994

Bose, Bella 1980 Prof Computer Science Engineering. BE Madras 1973; ME Indian Institute of Science 1975; MS Southern Methodist 1979, PhD 1980

Bothwell, Michelle K. 1994 Asst Prof Bioresource Engineering. BS Purdue 1989; PhD Cornell 1994

Bottero, Joseph Moshe 1969 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Portland State 1962; MS Oregon State 1969

Bottomley, Peter J. 1979 Prof Microbiology. BS Liverpool (England) 1972; PhD Dundee (Scotland) 1975

Boucot, Arthur James 1969 OSU Distinguished Professor, Zoology. BA Harvard 1948, MS 1949, PhD 1953

Bouvier, Claudia 1994 Res Assoc Pharmacy. BS Montreal (Canada) 1982, MS 1987, PhD 1990

Bower, Cynthia K. 1995 Res Assoc (Post Doct) Bioresource Engineering. BS OHSU 1983; PhD Oregon State 1994

Bowers, Steven C. 1994 Instr Extn Prgm for Forestry. BS Oregon 1977; MF Oregon State 1993

Bowker, Judith K. 1991 Asst Prof Speech Communication. BS Kansas, MA 1973; PhD Oregon 1989

Bowman, Sally R. 1994 Faculty Res Asst Human Development & Family Sciences. BA Auburn 1973, MA Auburn 1976; PhD Oregon 1993

Boyd, Jeffrey A. 1990 Diversity Coordinator Memorial Union. BS Oregon State 1987

Boyd, Timothy J. 1993 Faculty Res Asst Oceanic & Atmospheric Sciences. BA Carleton 1980; PhD UC-San Diego 1989

Boyer, Charles David 1993 Department Head & Prof Horticulture. BS Eastern Oregon 1971; MS Penn State 1974, PhD 1976

Boyle, James Reid 1981 Prof Forest Resources. BS Iowa State 1962; MF Yale 1963, PhD 1967

Bozanich, Patricia A. 1992 Extn Master Recycle Program Coordinator. BS Portland State 1981

Bradford, Charles S. 1992 Faculty Res Asst Biochemistry & Biophysics. BA Delaware 1980, MS 1983

Brady-Glassman, Patti 1988 Asst to the Director & Adviser Financial Aid. BS Delaware 1981; MEd Oregon State 1989

Braker, Marjorie 1979 Assoc Prof & Clackamas Co Extn Agent). BS Wisconsin-Stout 1967; BS Wisconsin-River Falls 1970; MS Wisconsin-Stout 1978

Branch, Harrison 1972 Prof Art. BFA San Francisco Art Institute 1970; MFA Yale 1972

Brandt, Jeanette Ann 1973 Assoc Prof Apparel, Interiors, Housing, & Merchandising. BS Washington State 1967; MS Oregon State 1972, PhD 1981

Brandt, Jeanne Dawn 1985 Assoc Prof & Columbia Co Extn Agent. BS Oregon State 1982; EdM 1984

Brass, Jane L. 1992 WRDC Program Coordinator. BA Dartmouth 1982; MS Cornell 1987; MS Florida State 1991

Brauner, David Ray 1977 Assoc Prof Anthropology. BA Washington State 1969, MA 1972, PhD 1976

Braunworth, William S. Jr. 1986 Assoc Prof & Extn Ag Program Leader (Interim). BS Colorado State 1975; MS 1977; PhD Oregon State 1986

Brazee, Edward Brooks 1964 Assoc Prof & Social Science & Humanities Librarian, Kerr Library. BA Oregon 1962; MLS Washington 1963; MA Oregon 1973

Brazier, Allan A. 1992 Inst Education. BEd & BA U of Saskatoon (Canada) 1970; MEd Oregon 1989

Breen, Patrick Joseph 1974 Prof Horticulture. BS College of St Thomas 1960; MS Minnesota 1963, PhD 1967

Brenner, Loretta K. 1994 Faculty Res Asst Water Resources Inst. BS Michigan State 1979; MS Oregon State 1991

Brett, Marcia Ann 1982 Sr Faculty Res Asst Crop & Soil Science. BA Michigan 1968; BS Oregon State 1982

Brewster, Bill Densmore 1975 Sr Instr Crop & Soil Science. BS Oregon State 1970, MS 1972

Brings, Stanley D. 1987 Instr Industrial & Mfg Engineering. BS Oregon State 1986, MEd 1987

Briskey, Ernest Joseph 1979 Scientific Policy & Program Advisor/Mid-East, Office of the Provost & Prof Animal Sciences/Food Science & Technology. BS Wisconsin 1952; MS Ohio State 1955; PhD Wisconsin 1958

Britt, James W. 1994 ASOSU Advocate Educational Activities. BA Oregon 1983, JD 1993

Broderick, David Joseph 1977 Faculty Res Asst Biochemistry & Biophysics. BS New Hampshire 1965, MS 1967; PhD Oregon State 1977

Broderick, William Payson 1986 Asst Prof & Morrow Co Extn Agent. BS Cal St-Fresno 1969; MA Norwich Univ 1992

Brodie, Ann E. 1975 Asst Prof (Sr Res) Animal Sciences. BS Purdue 1965; PhD UC-Berkeley 1970

Brodie, John Douglas 1975 Prof Forest Resources. BFS Toronto 1961; MS Syracuse 1963; PhD UC-Berkeley 1971

Brook, David M. 1987 Instr & Multnomah Co Extn Agent. BA Southern Illinois 1968

Brookhyser, Evelyn Anne 1966 Staff Chair & Prof Lincoln Co Extn. BS Stout State 1966; EdM Oregon State 1974

Broome, Janice Marie 1978 Asst Prof & Multnomah Co Extn Agent. BS Oregon State 1976; MPA Portland State 1986

Brophy, Laura S. 1986 Sr Faculty Res Asst Botany & Plant Pathology. BS Carleton College 1979; MS Minnesota 1985

Brose, Elizabeth Louise 1982 Development Officer, College of Ag Sciences. BS Cal Poly-San Luis Obispo 1972

Brouwers, Mariette 1985 Counselor & Assoc Prof, Counseling Ctr. BA Colorado 1975; MA Washington State 1984, PhD 1985

Brown, Carol E. 1978 Assoc Prof Acct & Info Mgmt. BS Wisconsin 1972; MS Oregon 1977; PhD Oregon State 1989

Brown, Clinton 1970 Prof Art. BFA Wisconsin-Milwaukee 1965; MA Wyoming 1966; MFA USC 1968

Brown, Daniel J. 1974 Assoc Prof Mgmt & Marketing. BA Washington 1966; MBA Fresno State 1969; PhD Iowa 1974

Brown, George Wallace 1966 Dean of College of Forestry, Director Forest Research Laboratory, Prof Forestry. BS Colorado State 1960, MS 1962; PhD Oregon State 1967

Brown, Lyle R. 1970 Prof Microbiology. BA Willamette 1963; PhD Tulane 1968

Brown, Marda Kay 1973 Sr Faculty Res Asst Biochemistry & Biophysics. BA Willamette 1963

Brown, Phillip E. 1993 Academic Computing Consultant Computing Services. BS Southern Oregon 1974

Brown, Terence Daniel 1975 Prof Forest Products, Extn Forest Products Specialist. BS Colorado State 1970; BS Utah 1971; PhD Colorado State 1975

Browne, William Griest 1968 Prof Mgmt & Marketing. BSSE Case Institute of Technology 1960; MBA Washington 1965; PhD Michigan 1968

Brownell, Philip Harry 1979 Assoc Prof Zoology. BA UC-Berkeley 1969; PhD UC-Riverside 1976

Bruce, Robert K. 1989 Interim Chief Institutional Advancement Officer/Director University Relations and Communication Services. BA Northern Illinois 1967; MA Central Michigan 1972, EdS 1974

Brumley, Richard L. 1993 Head of Acquisitions & Assoc Prof Kerr Library. BS Utah State 1963, MS 1966; MLS UC-Berkeley 1975

Brunner, Charles Calvin 1984 Assoc Prof Forest Products. BS Portland State 1968, MBA 1979, PhD 1984

Bryan, Joyce 1987 Instr English Language Institute. BA Ohio 1970; EdM Oregon State 1983

Bryant, Nancy Owens 1974 Assoc Prof Apparel, Interiors, Housing, & Merchandising. BA Washington 1968; MS Minnesota 1974

Bubl, Charles Edward 1978 Staff Chair & Assoc Prof Columbia Co Extn. BS Oregon State 1973, MS 1978

Buccola, Steven Thomas 1980 Prof Ag & Resource Economics. BA Saint Mary's College of California 1966; MS UC-Davis 1972, PhD 1976

Buchal, Michael A. 1991 Faculty Res Asst Marine Branch Station. BA Reed College 1989

Buckhouse, John Chapple 1975 Prof Rangeland Resources. BS UC-Davis 1966; MS Utah State 1968, PhD 1975

Budd, Timothy Alan 1986 Assoc Prof Computer Science Engineering. BA Western Washington State 1976; MS Yale 1978; PhD 1980

Buermeyer, Karl R. 1992 Faculty Res Asst Forest Science. BS Davis & Elkins College 1980; MS Idaho 1983

Buhler, Donald Raymond 1967 Prof Ag Chemistry. BS Oregon State 1950, MS 1953, PhD 1956

Burgett, Dennis Michael 1974 Prof Entomology. BS Edinboro State 1966; MS Cornell 1971, PhD 1973

Burhanuddin, Sheikh 1989 Asst Prof Industrial & Mfg Engineering. MS Manitoba 1980; MSE West Virginia 1983, PhD 1988

Burke, Mary E. 1985 Sr Instr Microbiology. BA Blackburn College 1964; MS Iowa State 1966, PhD 1969

Burke, Michael John 1984 Prof Horticulture, Assoc Dean College of Ag Sciences. BA Blackburn College 1964; PhD Iowa State 1969

Burke, Susan J. 1992 Instr Home Economics Child Development Lab. BS Oregon State 1983

Burnett, Margaret M. 1992 Asst Prof Computer Science Engineering. BA Miami Univ (Ohio) 1970; MS Kansas 1981, PhD 1991

Burns, Leslie Davis 1985 Prof Apparel, Interiors, Housing, & Merchandising. BA Washington State 1978; PhD Purdue 1981

Burridge, Judith A. 1960, 1971 Chair & Prof Linn Co Extn. BS Oregon State 1960, MS 1971, PhD Oregon 1985

Burt, John Grinnel 1973 Assoc Prof & Marion Co Extn Agent. BS Cal-Davis 1969; MS Ariz 1972

Burt, Lawrence Andrews 1979 Assoc Prof Extn Ag Resource Economist. BS Cal Poly-Pomona 1973; MA Washington State 1976, PhD 1979

Burton, Robert M., Jr. 1977 Prof Mathematics. BA Washington 1972; PhD Stanford 1977

Busch, Betty J. 1992 Asst Prof Music. BME Northern Colorado 1981; MM Ohio State 1987.

Bushnell, Dwight J. 1976 Prof Mechanical Engineering. BS Utah 1967, MS 1968; PhD Brigham Young 1974

Busler, Susan Lee 1987 Assoc Prof & Lincoln Co Extn Agent. BS Kent State 1983; MPA Seattle 1986

Butcher, Karyle Sue 1981 Assoc University Librarian for Research & Public Services & Assoc Prof, Kerr Library. BA UC-Berkeley 1964; MS USC 1965

Butler, David Allen 1975 Prof Statistics. BS Oregon State 1969; MS Cornell 1970; MS Stanford 1975, PhD 1975

Butler, Judy Ann 1978 Sr Faculty Res Asst Ag Chemistry. BS Oregon State 1969

Butler, Marvin D. 1991 Asst Prof & Jefferson Co Extn Agent. BA Pacific Union College 1971, MA 1972; MS Utah State 1984

Byrne, John Vincent 1960, 1984 President Oregon State University, Prof Oceanic & Atmospheric Sciences. AB Hamilton College 1951; MA Columbia 1953; PhD USC 1957

C

Cahn, Helen 1990 Faculty Res Asst North Willamette Res & Extn Ctr. BA Colorado College 1982; MS Colorado State 1989

Calder, Clarence Andrew 1978 Prof Mechanical Engineering. BSME Oregon State 1960; MS Brigham Young 1962; PhD UC-Berkeley 1969

Caldwell, Bruce A. 1978 Sr Faculty Res Asst Forest Science. BS Oregon State 1974, MS 1978

Caldwell, Douglas Ray 1968 Prof College of Oceanic & Atmospheric Sciences. BA Chicago 1955, BS 1957, MS 1958, PhD 1963

Callender, William J. 1994 Steven's Natatorium Coordinator. BS Sam Houston State Univ 1993, MS 1994

Callison, H. Rebecca 1994 Asst Prof Computer Science Engineering. BS South Carolina 1972; MS Washington 1990

Calvert, Janet Kathryn 1985 Asst Prof & Lane Co Extn Agent. BS Oregon State 1958, MS 1965

Calvert, Leonard J. 1961-65 1969 Assoc Prof Communication Specialist, Ag Communications. BA Oregon 1955, MA 1976

Camacho, Rodolfo A. 1991 Asst Prof Finance & Int'l Business. BA UC-Santa Barbara 1980; MBA Pennsylvania; JD Univ of Santa Clara 1982

Campbell, Allan III 1976 Staff Chair & Assoc Prof Jackson Co Extn. BS Massachusetts 1958; MS Oregon State 1973

Campbell, Courtney S. 1990 Assoc Prof Philosophy. BA Yale Univ 1981; MA Virginia 1984, PhD 1988

Campbell, Donald T. 1985 Assoc Prof (Sr Res) Pharmacy. BA Colorado College 1968; PhD Washington 1974

Campbell, Elizabeth Anne 1984 Assoc Prof English. BA Tennessee 1967; MA Virginia 1978, PhD 1983

Campbell, Larry T. 1990 Asst Prof & Clackamas Co Extn Agent. BS Cal Poly-Pomona 1973; MS Missouri-Columbia 1979

Candolfi-Vasconcelos, Maria Do Carmo 1994 Asst Prof Horticulture. Diploma Faculty of Ag (Lisbon - Portugal) 1985; PhD Swiss Federal Inst of Technology (Zurich) 1990

Canfield, Marilyn Loree 1979 Sr Faculty Res Asst Botany & Plant Pathology. BA Cal State-Fullerton 1964, MA 1967

Cannon, Caroline Helena 1959-67 1972 Prof & Multnomah Co Extn Agent. BA St. Olaf College 1959; MS Pacific Lutheran 1973

Canty, Bridget A. 1992 Faculty Res Asst Fisheries & Wildlife. BS Lewis & Clark 1991

Cappaert, Marlys R. 1988 Sr Faculty Res Asst Botany & Plant Pathology. BS Oregon State 1982, MS 1987

Caputo, John A. Instr & Extn Seed Cert Specialist. BS Idaho 1980; MS Oregon State 1985

Carbonell-Moore, Maria Consuelo 1987 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Tadeo Lozano (Colombia) 1978; MS Oregon State 1985

Carlson, Angela Ruth 1969 Senior Instr Music. BA Idaho 1964; MM Wisconsin 1965

Carlson, Matthew L. 1994 Faculty Res Asst Botany & Plant Path. BS Willamette 1994

Carlson, Marlan 1969 Dept Chair & Prof Music. BME Kansas 1959, BM 1959; MM Eastman School of Music 1961, DMA 1964

Carney, John R. 1993 Res Assoc (Post Doct) Chemistry. MS Cal State-Fullerton 1985; PhD Illinois-Urbana 1990

Carpenter, Charles E 1972 Prof Education. BS Ft. Hays State College 1952; MA Colorado 1959; PhD Texas 1969

Carpenter, Hillary M. 1978 Asst Prof Fisheries & Wildlife. BS Cal State-Long Beach 1970, MA 1973; PhD Dartmouth 1978

Carr, Jay B. 1979 Staff Chair & Prof Baker Co. BS Missouri 1972, MS 1973

Carr, Mark H. 1992 Res Assoc (Post Doct) Zoology. BA UC-Santa Cruz 1976; MA San Francisco State 1983; PhD UC-Santa Barbara 1991

Carroll, Carleton Warren 1974 Prof French. BA Ohio State 1961; MA Wisconsin 1965, PhD 1968

Carrol, Diane J. 1991 Asst Prof Animal Sciences. BA Edinboro State College 1970; MS Maine 1986; PhD Wisconsin-Madison 1991

Carson, Mina Julia 1989 Assoc Prof History. BA Harvard-Radcliffe 1975; AM Harvard 1979, PhD 1984

Carson, Ward William 1992 Assoc Prof (Sr Res) Forest Resources. BS Oregon State 1960; MS Illinois 1964; PhD Washington 1973

Carter, Cheri Jo 1973 Asst Prof & Area Extn Agent Wallowa Co. BS Oregon State 1971, MEd 1980

Carter, W. Gibson 1980 Assoc Prof & Multnomah Co Extn Agent. BF Stephen F. Austin State 1953; MS George Washington 1967; MS Rhode Island 1971

Casey, Patrick M. 1994 Head Baseball Coach Intercollegiate Athletics. BS George Fox 1988

Castagnoli, Steven P. 1992 Faculty Res Asst Horticulture. BA UC-Santa Cruz 1981; MS UC-Davis 1988

Castaneda, Keith K. 1995 Instructor Military Science

Caswell-Reno, Prudence A. 1990 Faculty Res Asst Microbiology. BS Maine 1972, MS 1985

Caughey, Carol Conlee 1990 Asst Prof Apparel, Interiors, Housing & Merchandising. BA Mills College 1966, MA Cal State-Hayward 1967

Cerklewski, Florian Lee 1979 Assoc Prof Nutrition & Food Mgmt. BS Penn State 1971; PhD Illinois 1976

Chadwick, Scott A. 1994 Asst Prof Speech Communication. BS Iowa 1984; MBA Kansas 1986, PhD 1994

Charlton, Brian A. 1994 Faculty Res Asst Crop & Soil Science. BS Oregon State 1994

Chamberlain, David Jack 1980 Staff Chair & Assoc Prof Harney Co. BS Idaho 1968, MS 1973

Chambers, Carol L. 1988 Sr Faculty Res Asst Forest Science. BS Kentucky 1979, MS 1988

Chambers, Eve 1978 Director & Instr English Language Institute. BA SUNY 1966; MA Middlebury 1969

Chambers, M. Jean 1992 Asst Prof Nutrition & Food Mgmt. BS Washington State 1961; MS Michigan State 1969; PhD Ohio State 1975

Chan, W. Ellen 1994 Admissions Counselor. BS Oregon 1993; MS Western Washington 1994

Chandraskakar, Ashok 1994 Asst Prof Management & Marketing. BE Univ of Burdway (India) 1980; MBA Indian Inst of Management (India) 1983; MS Chaminade Univ of Honolulu 1989; PhD Arizona State 1994

Chao, Chi-Chur 1990 Assoc Prof Economics. BC National Chenchi Univ (China); MA National Taiwan Univ 1978; PhD Southern Illinois Univ 1987

Chappell, Berkley 1963 Prof Art. BFA Colorado 1956, MFA 1958

Charlton, Brian A. 1994 Faculty Res Asst Crop & Soil Science. BS Oregon State 1994

Chastain, Thomas G. 1989 Asst Prof Crop & Soil Science, Columbia Basin Ag Res Ctr. BA Cal State-Chico 1981; MS Oregon State 1985, PhD 1987

Cheeke, Peter Robert 1969 Prof Animal Sciences. BSA Univ of British Columbia 1963, MSA 1965; PhD Oregon State 1969

Chelton, Dudley Boyd 1983 Prof Oceanic & Atmospheric Sciences. BA Colorado 1974; PhD UC-San Diego 1980

Chen, Chaur Fong 1991 Asst Prof Bioresource Engineering. BS National Taiwan Univ (China) 1978; MS Oregon State 1988, PhD 1992

Chen, Donald D. 1994 Faculty Res Asst Veterinary Medicine. BS Oregon State 1981, MS 1993

Chen, Fuqiang 1991 Res Assoc (Post Doct) Crop & Soil Science. BS Fujian Agriculture College 1982, MS 1985; PhD Oregon State 1991

Chen, Hua 1993 Faculty Res Asst 1993 Forest Products. BS Sichuan Univ (China) 1966

Chen, Lung-Kee 1986 Assoc Prof Mathematics. BS National Taiwan 1977; MS Chicago 1981, PhD 1986

Chen, Paul M. 1978 Prof Horticulture Mid-Columbia Ag Res & Extn Ctr. MS North Dakota State 1971; MS Minnesota 1973, PhD 1976

Chen, Tony Hwei-Hwant 1986 Prof Horticulture. BS National Taiwan 1974; MS Minnesota 1979, PhD 1981

Chen, Tse-Fang Susan 1984 Res Assoc Ag Chemistry. BS Fu Jen U (Taiwan) 1979; MS UC-San Diego 1982, PhD 1985

Chen, Yongshun (John) 1991 Asst Prof Oceanic & Atmospheric Sciences. BS Univ of Sci & Tech (China) 1982; MS Princeton 1985, PhD 1989

Chesley, Marie M. 1986 Assoc Prof Speech Communication. BA Valparaiso 1957; BS UC-Davis 1980; MA Stanford 1963

Chi, Chunhuei 1990 Asst Prof Public Health. BS China Medical College 1978; MPH Texas 1982; ScD Harvard 1990

Childers, Richard 1993 Faculty Res Asst Marine Brance Station. BS Humboldt State 1984

Chovanec, Stephen F. 1990 Asst Prof Art. BFA Virginia Commonwealth Univ 1976, MFA 1986

Chown, Eric Lance 1994 Res Assoc Computer Science Engr. BS Northwestern 1985, MS 1987; PhD Michigan 1994

Christensen, J. Mark 1979 Assoc Prof Pharmacy. BS Utah 1975, PhD 1980

Christensen, Neil Walter 1978 Prof Crop & Soil Science. BS Nevada 1966; MS New Mexico State 1968; PhD Oregon State 1972

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Christie, David M. 1988 Assoc Prof Oceanic & Atmospheric Sciences. BSc Australian Nat'l 1969; MSc LaTrobe (Australia) 1978; PhD Hawaii 1984

Chua, Boon 1989 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1987, MS 1990

Ciuffetti, Lynda Marie 1989 Asst Prof Botany & Plant Pathology. BS Massachusetts 1973; MS Michigan Tech 1976; PhD Purdue 1983

Clark, Beverly Jeanne 1985 Sr Instr Crop & Soil Science. BS Montana State 1978; BS Washington State 1985

Clark, Charlene C. 1994 Physician Student Health Center. MD Wayne State School of Medicine 1978

Clark, Peter U. 1988 Asst Prof Geosciences. BS St. Lawrence 1978; MS Waterloo 1980; PhD Colorado 1984

Clarke, Sharon 1990 Faculty Res Asst Forest Science. BS Fitchburg State College 1979; MS Oregon State 1987

Clauson, Milo L. 1986 Sr Faculty Res Asst Forest Products. BA Eastern Oregon State College 1969

Claussen, Dale D. 1990 Instr Public Health Mobile Program Specialist. BA Oregon State 1988, BS 1988

Cleary, Susan Eileen 1993 Deputy Training Coordinator Int'l Research & Development. BA Oregon 1992

Clement, Lawrence D. 1993 Prof Military Science. BS Oregon 1971; MS Boston Univ (Nurnberg, Germany) 1975

Clements, Stephen E. 1993 Instr & Union Co Extn Forestry Asst. MS Virginia Tech 1984, PhD 1987

Clinton, Richard Lee 1976 Prof Political Science. BA Vanderbilt 1960, MA 1964; PhD North Carolina 1971

Clough, George H. 1987 Assoc Prof Hermiston Ag Res & Extn Ctr. BA Florida 1977, BS 1978, MS 1981, PhD 1986

Cloughesy, Michael Joseph Jr. 1987 Assoc Prof & Lane Co Extn Agent. BS Iowa State 1978; MF Oregon State 1983

Cluskey, Steven Allen 1989 Faculty Res Asst Botany & Plant Pathology. BS Southern Illinois 1974; MS West Virginia 1989

Coakley, James A. Jr. 1988 Prof Oceanic & Atmospheric Sciences. BS UCLA 1968; MA UC-Berkeley 1970, PhD 1972

Coakley, James R. 1990 Asst Prof Acct & Info Mgmt. BS Oregon State 1970; MBA Utah 1976, PhD 1982

Coakley, Stella Melugin 1988 Dept Head & Prof Botany & Plant Pathology. BS UC-Davis 1969, MS 1970, PhD 1973

Coates-Markle, Linda Joan 1986 Director Horse Ctr & Sr Instr Animal Sciences. BSc Guelph 1979, MSc 1982

Coats, D. Dale 1993 Faculty Res Asst Central Oregon Ag Res Ctr. BS Oregon State 1983

Coblentz, Bruce Evan 1975 Prof Fisheries & Wildlife. BS Fairleigh Dickinson 1967; MWM Michigan 1969, PhD 1974

Cohen, Leonora B. Marx 1994 Assoc Prof Education. BA Oregon 1966, MEd 1967; EdD Temple Univ 1985

Cole, Elizabeth Carol 1983 Sr Faculty Res Asst Forest Science. BS Utah State 1981, MS Oregon State 1984

Cole, Richard Lee 1977 Prof & Program Director Ag Education. BS Oregon State 1966, MEd 1973; PhD Iowa State 1977

Coleman, Gary D. 1990 Res Assoc (Post Doct) Horticulture. BS Colorado 1978, MS 1986; PhD Nebraska-Lincoln 1989

Coll, Jacqueline 1995 Res Assoc (Post Doct) Pharmacy. BSc Univ of Strathclyde (Scotland) 1989; PhD Univ of Glasgow (Scotland) 1993

Collay, Ryan S. 1994 Educational/Special Events Coordinator - SMILE Program. BS Oregon 1982. MS 1991

Collier, Douglas Holden 1993 Asst Prof Exercise & Sport Science. BEd McGill Univ (Canada) 1975, MA 1985; PhD Indiana 1993

Collier, Mary Jane 1989 Assoc Prof Speech Communication. BA Colorado 1975; MA USC 1979, PhD 1982

Collier, Robert William 1981, 1984 Assoc Prof Oceanic & Atmospheric Sciences. BS MIT 1974; MS Cal Tech 1975; PhD MIT-Woods Hole Oceanographic Inst 1981

Collins, Vicki Tolar 1993 Director Writing Intensive Curriculum & Asst Prof English BA Wake Forest Univ 1967; MAT Duke 1968; PhD Auburn 1993

Collison, Brooke B. 1989 Assoc Prof Education. BS Kansas 1956, MEd 1961; PhD Missouri-Columbia 1969

Conard, Roberta Lee 1976 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BA Oregon State 1973, MS 1976

Cone, Joseph Sutton 1994 Asst Director for Communications - Sea Grant. BA Yale 1971; MA Oregon 1980

Cone, Martha Carol 1978 Res Assoc Chemistry. BA Texas 1969, PhD 1972

Connolly, Laura S. 1994 Asst Prof Economics. BA Colorado 1985; PhD Northwestern Univ 1994

Conrad, Diana Kay 1970 Director & Assoc Prof Admissions. BS Idaho 1959; MEd W Washington 1970

Conrady, Michael R. 1980 Faculty Res Asst Radiation Ctr. BS Oregon State 1973

Constantine, George H. 1966 Prof Pharmacy. BS Utah 1960, MS 1962; PhD Oregon State 1966

Conroy, Judith A. 1987 Instr Pharmacy. BS Oregon State 1975

Conway, Flaxen D.L. 1989 Asst Prof & Extn Community Outreach Specialist. BS Oregon State 1984, MS 1987

Conway, James Patrick 1988 Head Coach Men's Soccer Intercollegiate Athletics

Cook, Curtis Roger 1970 Prof Computer Science Engineering. BA Augustana College 1965; MS Iowa 1967, PhD 1970

Cook, Gordon Henry 1965 Assoc Prof & Union Co Extn Agent. BS Oregon State 1964, MS 1974

Cook, Ronald Lawrence 1977 Asst Prof Crop & Soil Science, Extn Certification Asst. BS Oregon State 1975, MS 1979

Cook, Thomas William 1977 Assoc Prof Horticulture. BS Washington State 1972; MS Rhode Island 1975

Cooke, Maryellen C. 1994 Instructional Computing Coordinator College of Business. BA Allentown College of St Francis de Sales 1986; MA South Florida 1993

Coolen, Michael Theodore 1978 Assoc Prof Music. BA Seattle 1969; MA Washington 1972, PhD 1979

Cooley, Fielding Edwards 1990 Asst Prof & Extn Coastal Watershed Human Ecologist Staff Development Coordinator. BS Tennessee 1967; MS Oregon 1985, PhD 1988

Coop, Leonard Bryan 1987 Res Assoc Entomology. BA Baker Univ 1979; MS Oregon State 1982, PhD 1987

Cope, Thomas C. 1990 Instr English Language Institute. BA Oregon State 1981; MA Ohio & Denver 1989

Copek, Peter Joseph 1972 Director Ctr for Humanities, Assoc Prof English. BS Loyola (Chicago) 1967; MA Northwestern 1969, PhD 1973

Corcoran, Patrick E. 1987 Instr Ag & Resource Economics. BS Wisconsin-Eau Claire 1984; MS Oregon State 1987

Cordray, Sheila Mary 1982 Assoc Prof Sociology. BA Cal Poly-Pomona 1976; MS Oregon 1978, PhD 1982

Cordy, Clifford B. III 1991 Res Assoc Statistics. BA Southern Oregon State 1982; MS Oregon State 1984; PhD UC-Santa Barbara 1988

Corey, Ann Elizabeth 1979 Sr Faculty Res Asst Crop & Soil Science. BS Oregon State 1978

Cornelius, James Conley 1979 Dept Head (Interim) & Prof Ag & Resource Economics. BS UC-Davis 1970; MS Wyoming 1972; PhD Washington State 1977

Cornell, Jennifer C. 1994 Asst Prof English. BA Harvard 1985; MA Univ of Ulster, Magee College (Ireland) 1991; MFA Cornell 1994

Corwin, Michael David 1981 Assoc Athletic Director Intercollegiate Athletics. BA San Francisco State 1977

Couture, Randy D. 1992 Asst Wrestling Coach Intercollegiate Athletics. BS Oklahoma State 1993

Cowan, Hal Everett 1976 Asst Athletic Director-Sports Information, Asst Prof Intercollegiate Athletics. BA Linfield 1964

Cowles, Timothy James 1984 Prof Oceanic & Atmospheric Sciences. BS Stanford 1973, MA 1973; PhD Duke 1977

Cox, Douglas W. 1992 Instr Military Science

Craig, A. Morrie 1977 Prof Veterinary Medicine. BA Oregon State 1965, PhD 1970

Craig, Beverly Ann 1987 Assoc Prof & Klamath County Extn Agent. BS Eastern Illinois 1969, MS in Ed 1983

Cramer, Lori A. 1993 Asst Prof Sociology. BS Illinois State 1985; MS Utah State 1988, PhD 1993

Crane, Jimmie Merle 1992 Faculty Res Asst Crop & Soil Science. BS Idaho 1965

Crawford, Cameron Allen 1988 Asst Prof Military Science. BS US Military Academy 1978

Crawford, Gregory Blair 1993 Res Assoc (Post Doct) College of Oceanic & Atmopheric Sciences. BS Univ of Victoria (Canada) 1983, MS 1986; PhD British Columbia 1993

Crawford, John Arthur 1974 Assoc Prof Fisheries & Wildlife. BS Creighton 1968; MS Nebraska 1971; PhD Texas Tech 1974

Creech, Harold Clayton 1967 1971 Sr Faculty Res Asst Marine Science Ctr BS Oregon State 1965, MS 1967

Crisman, Russell Owen 1979 Assoc Prof Veterinary Medicine. DVM Purdue 1970; PhD Georgia 1979, Dipl ACT

Crisp, Lloyd Earle 1972 Prof Speech Communication. BA San Francisco State 1958, MA 1960; PhD Denver 1967

Crockett, Judith C. 1993 Instr & Master Recycler Prog Coordinator - Marion Co. BA Clark Univ 1967

Croft, Brian A. 1982 Prof Entomology. BS Brigham Young 1966, MS 1968; PhD Cal-Riverside 1970

Cromack, Kermit, Jr. 1974 Assoc Prof Forest Science. BA Texas 1963, MA 1967; PhD Georgia 1973

Cronk, Richard V. 1974 Team Physician Intercollegiate Athletics. AB Pennsylvania 1960; MD Harvard 1965

Crowe, Debra A. 1993 Manager, User Services - Computer Services. BS OSU 1985

Crowe, Frederick James 1984 Assoc Prof Plant Pathology, Superintendent Central Oregon Ag Exp Station. BA Stanford 1971; MS UC-Davis 1975, PhD 1978

Crowl, Lawrence A. 1991 Asst Prof Computer Science Engineering. BS Denison Univ 1981; MS Virginia Tech 1983; PhD Univ of Rochester 1991

Cruse, Donna F. 1970 Assoc Prof Psychology. BS Colorado State 1965; MS Massachusetts 1967, PhD 1970

Crust, Susan L. 1994 Int'l Student Advisor International Education. BA Ball State 1974; MA San Jose State 1988

Cuenca, Richard H. 1978 Prof Bioresource Engineering. BS Cal State Polytechnic 1971; MS Cal State-Sacramento 1975; PhD UC-Davis 1978

Cull, Paul 1970 Prof Computer Science Engineering. BS Providence College 1965; PhD Chicago 1970

Cunningham, Jeffrey E. 1994 Asst Prof Military Science. BS Northern Arizona 1986

Currans, Kevin Garrett 1982 Faculty Res Asst Entomology. BS Oregon State 1981

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Curtis, Lawrence R. 1980 Prof Fisheries & Wildlife. BS South Alabama 1974, MSc 1977; PhD Mississippi Medical Ctr 1980

Cusack, Thomas J. 1984 Assoc Prof Int'l Research & Development. BS London 1970; MS Guelph (Canada) 1972; PhD Oregon State 1977

Cusimano, Barbara Ewens 1988 Assoc Prof Exercise & Sport Science. BS Oklalhoma State 1970; MS Arizona State 1975, PhD 1981

Cutshall, Neil S. 1994 Res Assoc (Post Doct) Chemistry. BS North Carolina State 1986, PhD 1994

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Dahlhoff, Elizabeth P. 1992 Res Assoc (Post Doct) Zoology. BA UC-Santa Cruz 1986; PhD UC-San Diego 1992

Daley, Bryon 1993 Faculty Res Asst Zoology. BS Oregon State 1991

Daly, Christopher 1994 Faculty Res Asst Botany & Plant Pathology. BS UC-Davis 1978; MA Colorado 1984

Daley, Laurence Stephen 1983 Assoc Prof Horticulture. BS Florida 1964, MS 1966; PhD UC-Davis 1975

Dalrymple, G. Brent 1994 Dean & Prof College of Oceanic & Atmospheric Sciences. BA Occidental College 1959; PhD UC-Berkeley 1963

Dalton, Clifford Sherman 1971 Director of Library Development, Kerr Library. BS Oregon State 1966, MBA 1969

Daniels, Malcolm 1965 Prof Chemistry (Radiation Ctr): BSc Kings College, Durham (England) 1951, PhD 1955

Daniels, Rachelle E. 1991 Asst Director, Counselor, Academic Coordinator Upward Bound. BA Oregon State 1991

Daniels, Richard Jacob 1970 Assoc Prof English. BA Ohio State 1964, MA 1966, PhD 1972

Daniels, Steven E. 1989 Assoc Prof Forest Resources. BS Whitman College 1981; MS Duke 1984, PhD 1986

Danielson, Harold Rodger 1968 Sr Instr Crop & Soil Science. BA Montana State 1961; MS Oregon State 1973

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Dark, Cathy 1991 Instr Exercise & Sport Science. BS Oregon; MA Laban Centre for Movement & Dance 1988

Darnell, Thomas J. 1978 Assoc Prof & Umatilla Co Extn Agent. BS Kansas State 1967, MS 1969

Daugherty, Ron 1993 Assoc Prof Education. BS Oregon State 1962, MS 1966, EdD 1970

Daugherty, Tracy Don 1986 Asst Prof English. BA Southern Methodist 1976, MA 1983; PhD Houston 1985

Davenport, Sally A. 1990 Asst Prof Political Science. BA Stanford 1963; MA UCLA 1968; PhD John Hopkins Univ 1983

Davidson, Jeanne R. 1994 Asst Prof Kerr Library. MS Wyoming 1987; MA Missouri 1990

Davis, Elizabeth Anne 1993 Faculty Res Asst Botany & Plant Pathology. BS Cal Poly 1977; MS Oregon State 1982

Davis, Lawrence E. 1992 Faculty Res Asst Fisheries & Wildlife. BS UC-Davis 1988

Davis, Lorin Richard 1969 Prof Mechanical Engineering. BA Brigham Young 1958, BESME 1959; MSME Purdue 1961; PhD Illinois 1964

Davis, Richard F. 1993 Faculty Res Asst Oceanic & Atmopheric Sciences. BS Texas 1986; MA Washington 1990

Davis, Steven Lewis 1983 Prof Animal Sciences. BS Idaho 1964, MS 1966; PhD Illinois 1969

Davis-Butts, Eda 1989 Instr Ed Opp Program. BS Georgia 1974

Daw, Sonya 1992 Faculty Res Asst Fisheries & Wildlife. BA UC-Santa Cruz 1989

Dawley, Juli Ann 1993 Instr Naval Science

De Young, Bruce Richard 1988 Assoc Dir Oregon Sea Grant & Extn Program Leader, Assoc Prof Ag & Resource Economics. BA Augustana 1974; MS Oregon State 1976; PhD Union Graduate School 1986

Deagen, Debbie Ann 1994 Faculty Res Asst Research Forest. BS Oregon State 1990

Deagen, John T. 1970 Sr Faculty Res Asst Ag Chemistry. BS San Francisco 1969; MS Oregon State 1972

Dealy, Glen Caudill 1967 Prof Political Science. BA Washington 1957; MA George Washington 1958; PhD UC-Berkeley 1965

Deane, Lydia Borden 1984 Instr & Social Science Reference Librarian, Kerr Library. BA Oregon 1977, MLS 1978

DeAngelis, Jack Douglas 1988 Assoc Prof Extn Entomologist. BA Miami (Ohio) 1976; MS New Mexico State 1978; PhD Oregon State 1981

DeBevoise, Anne E. 1986 Res Assoc Oceanic & Atmospheric Sciences. BS Stanford 1974; MS UC-Santa Barbara 1983, PhD 1985

Deboodt, Timothy Lee 1987 Chair & Assoc Prof Crook Co Extn. BS Oregon State; MS Wyoming 1984

DeFrancesco, Joseph Thomas 1986 Sr Faculty Res Asst North Willamette Res & Extn Ctr. BS Oregon State 1977, MS 1987

Deinzer, Max Ludwig 1973 Prof Ag Chemistry, Chemistry. BS Rutgers 1960; MS Arizona 1963; PhD Oregon 1969

DeKock, Carroll Wayne 1967 Dept Chair & Prof Chemistry. BS Calvin College 1960; PhD Iowa State 1965

DeLander, Gary E. 1983 Assoc Prof Pharmacy. BS Colorado 1977; PhD Minnesota 1983

DelCurto, Timothy 1989 Asst Superintendent, EOARC-Union, Asst Prof Animal Sciences. BS Oregon State 1984, MS 1986; PhD Kansas State 1989

DeSzoeke, Roland Andreas 1973 Prof Oceanic & Atmospheric Sciences. MSc New South Wales 1972; PhD Nova 1973

Delph, Cathy L. 1994 Faculty Res Asst Engineering. BS Oregon State 1990

Delson, Irma 1990 Asst Dir-Student Services Oceanic & Atmospheric Sciences. BA Eastern Oregon State College 1984

Demaio, Ruth S. 1991 Cultural & Conversant Coordinator English Language Institute. BA Stanford 1970; MAIS Tulane Univ 1974

Dempsey, Moira E.W. 1993 Instr English. BA Oregon State 1991, MAIS 1993

Denning, Diane L. 1992 Academic Advisor College of Business. BS Oregon State 1991, MBA 1992

Dennis, Bradford J. 1994 FIS Systems Integrator Information Services. BS Oregon State 1978

Derryberry, Douglas A. 1984 Assoc Prof Psychology. BA Oregon 1978, MS 1981, PhD 1983

Desiderio, Russell A. 1987 Res Assoc Oceanic & Atmospheric Sciences. BS Cal Tech 1975; PhD Stanford 1984

Dewitt, Lynn M. 1983 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BA Humboldt State 1978; MS Oregon State 1981

Deyo, Laurie Carpenter 1988 Res Assoc (Post Doct) Biochemistry & Biophysics. BS SUNY Oswego 1982; PhD Michigan State 1988

Dezzani, Brian M. 1992 Instr Exercise & Sport Science, Asst Director Intramural Sports. BS UC-Davis 1986; MS Purdue 1988

Dibble, Terence L. 1986 Sr Faculty Res Asst Civil Engineering. BSEE Oregon State 1969, MSCE 1981

Dick, Richard P. 1985 Assoc Prof Crop & Soil Science. BS Minnesota 1974; MS Louisiana State 1977; PhD Iowa State 1985

Dick, Thomas P. 1986 Assoc Prof Mathematics. BA, BS Kansas 1978; MA Brandeis 1979; PhD New Hampshire 1984

Dickenson, Stephen E. 1992 Asst Prof Civil Engineering. BA UC-Berkeley 1985; MSCE Virginia Tech 1988; PhD UC-Berkeley 1992

Dickson, Robert L. 1981 Faculty Res Asst Animal Sciences. BS Idaho 1978

Diebel, Penolope L. 1995 Asst Prof Eastern Oregon Ag Research Center, BS Colorado State 1983; MS Colorado State 1986; PhD Virginia Ploytechnic Inst & State Univ 1990

Dietterich, Thomas G. 1985 Assoc Prof Computer Science Engineering. AB Oberlin College 1977; MS Illinois 1979; PhD Stanford 1984

Di Julio, Nadine 1991 Faculty Res Asst Botany & Plant Pathology. BS San Diego State 1989.

Dileone, Julie A. 1993 Faculty Res Asst Extn Plant Pathology. BS Rhode Island 1990

Dilles, John H. 1989 Assoc Prof Geosciences. BS Calif Inst Tech 1975, MS 1976; PhD Stanford 1984

Dillon, Thomas M. 1977 Prof Oceanic & Atmospheric Sciences. BA Sacramento State 1969; MA UC-Davis 1971, PhD 1974

Dilson, Wolfgang Otto 1970 Assoc Prof German. BA UC-Riverside 1968; PhD UC-Davis 1972

Dix, Russell Grover 1964 Assoc Prof, Assoc Registrar. BS Oregon State 1962, MF 1964

Dixon, Alfred Ray 1970 Sr Faculty Res Asst Horticulture. BS Oregon State 1966, 1984

Dodd, Brian 1978 Director, Radiation Center, Prof Nuclear Engineering, Radiation Health Physics. BS London 1969, PhD 1973

Dodrill, Steven Jeffrey 1990 Asst Prof Electronic Media Spec Ag Communications. BA Montana 1984; MS Oregon 1990

Doescher, Paul Steven 1984 Assoc Prof Rangeland Resources. BS Illinois 1975; MS Montana 1977; PhD Oregon State 1983

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Dolan, Jonathan S. 1994 Virtual Academic Lab Admin. Telecommunication Services. BS Oregon State 1992

Dolja, Valerian V. 1994 Asst Prof Botany & Plant Pathology. MS Moscow State Univ (USSR) 1980, PhD 1980

Dollar, Natalie J. 1993 Asst Prof Speech Communication. BA Mississippi State 1985; MA Arizona State 1988; PhD Washington 1993

Donaldson, Laurie 1986 Instr English Language Institute. BA Utah 1974, MA 1976

Donatelle, Rebecca 1984 Assoc Prof Public Health. BS Wisconsin-LaCrosse 1972, MS 1979; PhD Oregon 1981

Donel, John Ray 1989 Instr & Reference Librarian, Kerr Library. BS Pennsylvania 1979; MLS SUNY-Albany 1989

Dorbolo, Jon Louis 1987 Asst Prof (Sr Res) Philosophy. BA Delaware 1982; PhD Oregon 1987

Doss, Robert Paul 1983 Assoc Prof Horticulture. PhD UC-Davis 1974

Dougherty, William G. 1987 Prof Microbiology. BA Rutgers 1974; MS Florida 1976, PhD 1979

Douglass, James Marlin 1968 Director of Bands, Prof Music. BME Denver 1960; MFA Ohio 1962

Douthit, Peggy 1988 Coordinator Instr Outdoor Recreation Ctr. BS Oregon 1986, MS 1988

Dovel, Randy L. 1987 Assoc Prof, Research Agronomist, Klamath Exp Station. BS Abilene Christian College 1981; MS Texas A & M 1983, PhD 1987

Dowling, Barbara Tolley 1978 Instr English Language Institute. BA Ohio 1971, MA 197

Dowling, Thomas 1982 Instr Mgmt & Marketing. BA Ohio 1973; MS Univ of Pittsburgh 1978

Drake, Philip Michael 1993 Director of Development, College of Business. BS Portland State 1976

Drapek, Raymond James 1985 Faculty Res Asst Entomology. BS Michigan 1981; MS Michigan State 1985; PhD Oregon State 1993

Dray, Tevian 1988 Assoc Prof Mathematics. BS MIT 1976; MA UC-Berkeley 1977, PhD 1981

Dreher, Theo Wolfgang 1987 Assoc Prof Ag Chemistry. BAgr Melbourne (Australia) 1976, PhD 1980

Drexler, John Anthony Jr. 1983 Assoc Prof Mgmt & Marketing. BA Wayne State 1968, MA 1971; PhD Michigan 1975

Driscoll, Debra Minar 1984 Curry Co Interim Staff Chair & Assoc Prof. BS Mankato State 1975; MS Wisconsin-Stout 1982

Drobnic, Karl S. 1974 Instr English Language Institute. BA Ohio 1965

Druliner, Pamela Sue 1994 Public Ed Spec for Ecosystem Mgmt Forest Science. BA Oregon 1975

Du, Shi-Hua 1990 Faculty Res Asst Nutrition & Food Mgmt. Nankai Univ, (China) 1962

Duddles, Ralph Edward 1988 Assoc Prof & Coos Co Extn Agent. BS Mich Tech 1962; MS Wash 1963

Duncan, James Andrew 1979 Coordinator Print Media & Assoc Prof, Ag Communications. BA Central Arkansas 1969; MA Oregon 1975

Duncan, Robert Ames 1977 Prof Oceanic & Atmospheric Sciences. AB Princeton 1971; MS Stanford 1972; PhD Australian National 1976

Dungan, Diane G. 1985 Adviser Career Planning & Placement Ctr. BS Oregon State 1981, MEd 1989

Dunham, Daniel 1983 Director Office of Continuing Higher Education. BS Oregon State 1962, MS 1963, EdD 1970

Dunn, Barbara 1986 Asst to the Director & Instr, Financial Aid. BA Alaska 1973; MEd Oregon State 1984

Dunn, John Maximillian 1975 Associate Provost for Academic Affairs, Prof Exercise & Sport Science. BS Northern Illinois 1967, MS 1969; EdD Brigham Young 1972

Dunnington, Leslie Garner 1969 Asst Director & Assoc Prof Counseling Ctr. BME Central Missouri State 1958, MS 1961; PhD Wyoming 1966

Duringer, Robert A. 1993 Director of Business Affairs. BA Ohio Northern Univ 1971; MBA Indiana State 1979

Dunsdon, David 1981 Instr Acctg & Info Mgmt. BA Pacific 1969; MBA Central Michigan 1979

Durst, Bob 1984 Sr Faculty Res Asst Food Science & Technology. BS Cal Tech 1974; MS Oregon State 1988

Dutson, Thayne R. 1987 Dean Ag Sciences & Director Ag Exp Station, Prof Food Science & Technology. BS Utah State 1966; MS Michigan State 1969, PhD 1971

Dymond, Jack R. 1969 Prof Oceanic & Atmospheric Sciences. BA Miami (Ohio) 1961; PhD UC-San Diego 1966

Dziak, Robert P. 1988 Sr Faculty Res Asst Hatfield Marine Science Center. BS Illinois 1985; MS Memphis State 1988

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Earl, William A. 1994 Instr Speech Communication. BA Cal State-Long Beach 1972, MA 1975; MPA Brigham Young 1988; PhD Oregon 1992

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Easley, Patricia J. 1991 Faculty Res Asst Water Resources. BA Calif State U 1989, MA 1991

Ebbeck, Vicki 1990 Asst Prof Exercise & Sport Science. BEd C.T.C. Australia 1984; MS Oregon 1986, PhD 1990

Eberhart, Joyce Louise 1989 Faculty Res Asst Forest Science. BA Wisconsin 1978

Ebersole, Joseph 1993 Faculty Res Asst Fisheries & Wildlife. BS Oregon State 1990

Ebrahem, Kais S. 1994 Faculty Res Asst Horticulture. BS Univ of Baghdad (Iraq) 1975; MS Kansas State 1985, PhD Oregon State 1992

Eddleman, Lee Elbert 1981 Prof Rangeland Resources. BS Colorado State 1960, MS 1962, PhD 1967

Ede, Lisa S. 1980 Director Ctr for Writing & Learning, Prof English. BS Ohio State 1969, MA Wisconsin 1970, PhD 1975

Edge, William Daniel 1989 Asst Prof Fisheries & Wildlife. BS Montana 1979, MS 1982, PhD 1985

Edmonston, George P. Jr. 1986 Instr & Editor The Oregon Stater. BA Louisiana State 1971; MA SW Louisiana 1975

Edwards, William C. 1990 Director Memorial Union & Educational Activities. BS SUNY Oswego 1965; MS Oklahoma State 1967; MBA Missouri 1981; PhD South Dakota 1990

Egbert, Gary 1988 Assoc Prof (Sr Res) Oceanic & Atmospheric Sciences. BA UC-Berkeley 1977; MS Washington 1981, PhD 1987

Egna, Hillary S 1986 Sr Faculty Res Asst Int'l Research & Development. BS Michigan State 1980; MS Oregon State 1985

Ehrensing, Daryl 1981 Sr Faculty Res Asst Crop & Soil Science. BS Oregon State 1976

Eiseman, David 1968 Prof Music. AB UC-Berkeley 1963; MM Illinois 1964, PhD 1972

Eisgruber, Ludwig Maria 1973 Prof Ag & Resource Economics. Dipl Agr Tech Univ of Munich 1955; MS Purdue 1957, PhD 1959

Ek, Michael B. 1988 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1980, 1987, MS 1982

Eldin, Neil N. 1992 Assoc Prof Civil Engineering. BS Cairo Univ (Egypt) 1972; MS Concordia Univ (Canada) 1978; MS McGill Univ (Canada) 1979; PhD Oklahoma State 1987

Eleveld, Bartelt 1984 Assoc Prof Ag & Resource Economics. BS Cal Poly 1972; MA Washington State 1974; PhD Texas A & M 1979

Ellard, Mary J. 1994 Res Assoc (Visiting) Botany & Plant Pathology. BS Univ College Dublin (Ireland) 1987, MS 1988; PhD British Columbia 1994

Ellingson, Anne Marie 1992 Faculty Res Asst Fisheries & Wildlife. BS Oregon State 1992

Ellingson, Lisa J. 1991 Faculty Res Asst Rangeland Resources. BS Oregon State 1985

Elwood, Norman Eugene 1979 Assoc Prof, Extn Forest Resources Specialist. BS Michigan State 1969; MS Minnesota 1978, PhD 1984

Emami, Ali 1984 Asst Prof (Sr Res) Ag & Resource Economics. BS Natl Iran 1972; MS Oregon 1980; PhD Oregon State 1987

Emmingham, William H. 1980 Prof & Extn Silviculture Specialist, Forest Science. BS Idaho 1961; MS Oregon State 1972, PhD 1974

Endres, David A. 1992 Asst Athletic Director-Fundraising & Development, Intercollegiate Athletics. BS Oregon State 1982

Engel, Harold N. 1979 Prof Veterinary Medicine. BS Missouri 1969, DVM 1969; MS Auburn 1974; PhD Iowa State 1979

Engel, Joanne B. 1990 Assoc Prof Education. BS Penn State 1965; MEd Univ of Sydney (Australia) 1972; MS Iowa State 1978, PhD 1979

English, Marshall Joseph 1978 Prof Bioresource Engineering. BS San Jose State 1965; MS UC-Berkeley 1974, PhD 1978

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Erickson, Linda 1979 Assoc Prof & Clackamas Co Extn Agent. BA Marshall 1961, MEd Maryland 1971

Erickson, Robert P. 1994 Res Assoc (Post Doct) Physics. BS Alaska 1987; MS UC-Irvine 1989, PhD 1991

Ernst, Sandra Segna 1990 Faculty Res Asst Marine Freshwater Biomedical Ctr. BS Cal Poly-San Luis Obispo; MS Oregon State 1992

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Esbensen, Steven K. 1977 Prof Oceanic & Atmospheric Sciences. BA UCLA 1968, MS 1972, PhD 1976

Escher, Christine M. 1993 Asst Prof Mathematics. BA Universitat Kaiserslautern (Germany) 1985; PhD Pennsylvania 1993

Evans, Danny 1990 Asst Women's Basketball Coach Intercollegiate Athletics. BS Oregon State 1988

Evans, Glenn Thomas 1977 Prof Chemistry. BS Seton Hall 1968; PhD Brown 1973

Evans, Gwil Owen 1966 Project Director, FSPE Initiative, College of Ag Sciences. BS Oregon State 1961; AM Stanford 1962

Evans, John Simon 1994 Res Assoc (Post Doct) Chemistry. BS (equivelant) Marling School, Stroud (England) 1986; PhD Keble College (Oxford) 1994

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Everett, Randy L. 1993 Alumni Club Program Leader. BS Oregon State 1992

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Falkner, Kelly Kenison 1992 Asst Prof Oceanic & Atmospheric Sciences. BA Reed College 1983; PhD MIT/Woods Hold 1989

Fallow, Gary L. 1993 Instr English Language Inst. BA Oregon 1972; MS Amer Grad School of Int'l Mgmt 1979

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Farber, Paul Lawrence 1970 OSU Distinguished Professor, Dept Chair & Prof History. BS Pittsburgh 1965; MA Indiana 1968, PhD 1970

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Faridani, Adel 1990 Asst Prof Mathematics. Diplom Physiker 1982; Dr. Rer. Nat. Westalische Wilhelms-Univ Munster 1988

Farkas, Daniel F. 1990 Dept Head & Prof Food Science & Technology. BS MIT 1954, MS 1955, PhD 1960

Farmer, Rainier Haines 1990 Instr & Radiation Safety Officer Radiation Safety. BS Oregon State 1983, MS 1991

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Farrell, John Patrick 1968 Assoc Prof Economics. BS Wisconsin 1961, MS 1964, PhD 1973

Farris, Neysa A. 1992 Faculty Res Asst Central Oregon Ag Res Ctr. BS Oregon State 1991

Farthing, Mary-Katherine 1994 Asst Prof Pharmacy. BS Kansas-Lawrence 1991. PharmD 1992

Faudskar, John David 1972 Asst Prof & Staff Chair Tillamook Co Extn. BS Oregon State 1969, MS 1980

Faulhaber, Duane D. 1978 Asst Director Budgets & Planning. BS Oregon 1972

Fausett, Lowell A. 1992 Project/Cost Mgr. Ag. Exp. Station-Directors Office. BA Idaho 1983

Federiuk, Joyce 1991 Faculty Res Asst Oceanic & Atmospheric Sciences. AB UC-Berkeley 1980, MA 1982; MSc MIT 1987

Fee, Victoria S. 1993 Academic Advisor Health Careers Opportunity Pgm. BS Oregon, MS 1984; MLS Kent State 1992

Fein, Betty Y. 1970 Asst Prof Mathematics. BS UCLA 1961, MS 1963, PhD 1968

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Ferngren, Gary Burt 1970 Prof History. BA Western Washington 1964; MA British Columbia 1967, PhD 1973

Ferrara, Pam Ann 1994 Instr Political Science. BA Holyoke College 1966; MS Oregon State 1978

Ferrigno, Daniel Patrick 1987 Asst Football Coach Intercollegiate Athletics. BA San Francisco State 1975

Ferschweiler, Kenneth J. 1994 Faculty Res Asst Computer Science Engr. BSEE Univ of Portland 1979

Fessenden, Lynne Marie 1994 Faculty Res Asst Oceanic & Atmospheric Sciences. BA New Hampshire 1982

Fetch, Deborah Ann 1987 Instr & Asst Head Catalog Librarian, Kerr Library. AB Illinois 1979, MS 1987

Fichter, Eugene Frank 1977 Assoc Prof Industrial & Mfg Engineering. BME Rensselaer Polytechnic Institute 1967; MS New Brunswick 1973; PhD Monash (Australia)1977

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Fiegener, Mark K. 1990 Asst Prof Mgmt & Marketing. BA UC-Santa Barbara 1977; MBA Washington 1983; PhD Pennsylvania 1990

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Field, Katherine G. 1988 Asst Prof (Sr Res) Microbiology. BA Yale 1975; MA Boston 1979; PhD Oregon 1985

Filip, Gregory M. 1990 Assoc Prof Forest Science. BS Oregon State 1972; PhD New Hampshire 1976

Finch, David V. 1977 Assoc Prof Mathematics. BA Swarthmore College 1972; PhD MIT 1977

Finnan, Robert Wilson 1986 Int'l Student Adviser, Instr English Language Institute. BA Arizona 1973, MA 1976

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Fisher, Charles E. 1981 Instr, Director of Facilities & Intramural Sports Health & Human Performance. BS Colorado State 1966, MEd 1969

Fisher, Glenn Collins 1976 Prof & Extn Entomologist. BS UC-Davis 1969, PhD 1977

Fisher, Joseph Patrick 1981 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BA Macalester College 1975; MS Oregon State 1979

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Fitzpatrick, Martin S 1989 Res Assoc Fisheries & Wildlife. BA Harvard 1980; PhD Oregon State 1990

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Fleischbein, Jane Helen 1982 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1975; BA Western Washington 1981

Fletcher, Richard Allan 1979 Assoc Prof & Area Extn Agent Benton Co. BS Oregon State 1975, MBA 1977

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Folts, James A. 1972 Assoc Prof of Art. AB Princeton 1966; BA Oregon State 1972; MS Oregon 1980

Forbes, Leonard 1983 Prof Electrical & Computer Engineering. BS Alberta-Edmonton 1962; MS Illinois 1963, PhD 1970

Ford, Ellen M. 1989 Instr Science & Math Education. BS Oregon 1966

Ford, Mary S. Jesse 1990 Assoc Prof Fisheries & Wildlife. BA Swarthmore College 1973; MS Yale 1976; PhD Minnesota 1984

Forge, Thomas A. 1993 Res Assoc (Post Doct) Botany & Plant Pathology. BS Kansas State 1985; PhD Wisconsin-Madison 1990

Forrer, Johannes B. 1982 Faculty Res Asst Forest Products. BS Univ of Stellenbosch (South Africa) 1969; BS Univ of South Africa 1978; MS Oregon State 1987

Forsberg, Neil Elliott 1985 Assoc Prof Animal Sciences. BSA Manitoba 1975, MSc 1977; PhD UC-Davis 1983

Forson, Raymond K. 1994 Faculty Res Asst Fisheries & Wildlife. BS Oregon State 1985

Foster, James C. 1985 Dept Chair & Assoc Prof Political Science. BA Lewis & Clark College 1969; MA Cal State-Los Angeles 1971; PhD Washington 1976

Foster, Rebecca 1993 Asst Director for Program for Ethics, Science, & Environment. BA Lycoming College 1982; MS Penn State 1988

Fowles, Nanci 1991 Faculty Res Asst Microbiology. BS Oregon State 1990

Fox, Margaret Wynne 1982 Asst Prof Educational Opportunities. BS Georgia Southern College 1971; MEd Oregon State 1983, PhD 1992

Fox, Susan D. 1993 Faculty Res Asst Health & Human Performance. BS UC-Davis 1989, MS 1992

Foxal, Richard 1987 Asst Gymnastics Coach Intercollegiate Athletics. BA Central Washington 1970, MEd 1972

France, Thomas Traxler 1969 Asst Prof, Asst Director of Publications. BS Iowa State 1959

Francis, Sally K. 1982 Dept Head & Prof Apparel, Interiors, Housing, & Merchandising. BS Bowling Green 1969; MEd Miami 1971; PhD Ohio State 1981

Francis, Wilbur M., Jr. 1986 Manager, Environmental Health & Public Safety. BA UCLA 1972, MA 1977

Frank, Robert Joseph 1969 Prof English. BA St. John's (Minnesota) 1962; MA Minnesota 1968, PhD 1969

Franklin, Paul H. 1986 Asst Prof (Sr Res) Pharmacy. BA Washington 1975, BS 1978; MS Rochester 1981, PhD 1985

Franz, Christian Rulofson 1988 Staff Chair & Asst Prof Deschutes Co. BS Cal Poly 1985; MS Nevada-Reno 1987

Fraundorf, Martha Norby 1975 Assoc Prof Economics. BA Carleton College 1968; MA Cornell 1971, PhD 1976

Frederick, William James Jr. 1983 Dept Head & Prof Chemical Engineering. BS Maine 1967, MS 1969, PhD 1973

Freeman, John W. 1994 Asst Strength Coach Intercollegiate Athletics. BS Southwestern Missouri State 1982

Freeman, Peter Kent 1968 Prof Chemistry. BS UC-Berkeley 1953; PhD Colorado 1958

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Freitag, Camille M. 1985 Faculty Res Asst Forest Products. BS SUNY-Syracuse 1980

Friedkin, William C. 1993 Faculty Res Asst North Willamette Res & Extn Ctr. BS Maryland 1986

Friedman, Leonard H. 1992 Asst Prof Public Health. BA Cal State-Northridge 1977, MPH 1982; PhD USC 1991

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Frissell, Christopher A. 1985 Asst Prof (Sr Res) Fisheries & Wildlife. BA Montana 1982; MS Oregon State 1987, PhD 1992

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Froman, David Paul 1984 Assoc Prof Animal Sciences. BS Bob Jones 1976; MS Clemson 1978, PhD 1982

Fryer, Sarah Elizabeth Asst Prof (Sr Res) Zoology. BSc Wales (UK) 1980, PhD 1986

Fuchigami, Leslie Hirao 1970 Prof Horticulture. BS Hawaii 1964; MS Minnesota 1966, PhD 1970

Fuller, Kelly A. 1993 Asst Prof Naval Science. BA Jacksonville Univ 1989

Fulling, Stephen W. 1991 Senior Network Research Asst College of Engineering. BS UC-Central Office 1990

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Fulton, David C. 1991 Development Communications Officer, Development Office. BA Stanford 1949

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Gallagher, Sally K. 1994 Asst Prof Sociology. BA Gordon College 1981; PhD Massachusetts 1991

Gamble, Wilbert 1962 Prof Biochemistry & Biophysics. BS Wayne State 1955, PhD 1960

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Garbutt, Kenneth C. 1994 Faculty Res Asst Microbiology. BS Wayne State Univ 1988, MS 1991

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Garets, Steve Brent 1984 Acting Instr, Training Specialist Public Health

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Garland, John Joseph, Jr. 1973 Prof Forest Engineering, Extn Timber Harvesting Specialist. BS Oregon State 1970; MS Minnesota 1972; PhD Oregon State 1990

Garman, Steve 1990 Res Assoc Forest Science. BS Penn State 1979; MS New Hampshire 1981; PhD Massachusetts 1990

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Gartner, Barbara L. 1992 Asst Prof Forest Products. BA Swarthmore College 1979; MS Alaska 1982; PhD Stanford 1990

Geier, Gilda Naziri 1989 Implementation Project Director, Development Office. BS Southwest Texas 1981

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Gentle, Thomas H. Prof, Communication Specialist, Ag Communications. BA Michigan 1962; MFA Oregon 1969

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George, Richard Allen 1969 Assoc Prof Speech Communication. BS Illinois State 1965, MS 1967; MFA San Diego State 1980

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Gerros, Terry C. 1992 Asst Prof Veterinary Medicine. BS Kentucky 1976; DVM Auburn Univ 1981

Gerth, William J. 1992 Faculty Res Asst Fisheries & Wildlife. BS Fairfield Univ 1988

Gerwick, William H. 1984 Prof Pharmacy. BS UC-Davis 1976; PhD Cal-San Diego 1981

Getsiv, Julia E.R. 1993 Faculty Res Asst Marine Science Ctr. BS Washington 1993

Ghanadan, Hamid 1994 Faculty Res Asst Biochemistry & Biophysics. BS George Washington 1993

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Giese, Alan 1994 Faculty Res Asst Fisheries & Wildlife. BA UC-Santa Cruz 1990

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Gillis, John Simon 1976 Prof Psychology. BA Stanford 1959; MS Cornell 1961; PhD Colorado 1965

Gingrich, Gale Allen 1973 Assoc Prof & Marion Co Extn Agent. BS Oregon State 1972, MS 1979

Giovannoni, Stephen J. 1988 Assoc Prof Microbiology. BA Cal-San Diego 1974; MS Boston 1978; PhD Oregon 1984

Girard, Anne-Marie 1989 Faculty Res Asst Ctr for Gene Research. BA Carleton College 1986

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Gleicher, Gerald Jay 1966 Prof Chemistry. BS Brooklyn College 1959; MS Michigan 1961, PhD 1963

Gleicher, Mary Kay 1980 Sr Instr Chemistry. BA Denison 1956; MS Michigan 1962

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Gobeli, David Harold 1982 Director Oregon Productivity & Technology Ctr & Prof Mgmt & Marketing. MSEE Minnesota 1965, MBA 1978, PhD 1982

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Goldfinger, Chris 1993 Res Assoc Oceanic & Atmospheric Sciences. BS Humboldt State 1980; PhD Oregon State 1994

Gonnerman, Gregory D. 1994 Faculty Res Asst Food Science & Technology. BS Oregon State 1994

Gonzalez, Manolete 1985 Asst Prof Mgmt & Marketing. BS Ateneo de Manila Univ 1972; MBA Northwestern 1974; PhD Southern California 1985

Good, James Wunder 1980 Assoc Prof & Extn Oceanographer. BA Susquehanna 1966; MS Oregon State 1976, PhD 1982

Goodlett, Sally 1993 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Texas-Arlington 1990; MS Texas Tech 1992

Goodnick, Stephen Marshall 1986 Prof Electrical & Computer Engineering. BS Trinity 1973; MS Colorado State 1977, PhD 1983

Goodwin, Joel B. 1994 Faculty Res Asst Microbiology. BS Washington State 1994

Gordon, Louis Irwin 1969 Assoc Prof Oceanic & Atmospheric Sciences. BS UCLA 1951; MS Scripps 1953; PhD Oregon State 1973

Gould, Steven J. 1982 Prof Chemistry. BS UCLA 1966; PhD MIT 1970

Gourdine, Angeletta Kim Marie 1994 Asst Prof English. BA Johnson C. Smith Univ 1986; MA North Carolina State 1990; PhD Michigan State 1994

Gradin, Joseph L. 1973 Res Assoc Veterinary Medicine. BS Oregon State 1973, MS 1976, PhD 1989

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Graham, David 1992 Asst Prof (Sr Res) Oceanic & Atmospheric Sciences. BS Florida Inst of Tech 1975; MS Rhode Island 1980; PhD MIT/Woods Hole 1987

Graham, Roger C. 1990 Asst Prof Acctg & Info Mgmt. MS Montana 1984; PhD Oregon 1990

Grass, Charlene G. 1992 Assoc Univ Librarian for Automation & Technical Services, Kerr Library. BA Univ of Detroit 1973; MLS Missouri 1978

Grass, Jeffrey Brian 1978 Asst Prof, Director Publications & OSU Press. BA Oregon 1970; MAIS Oregon State 1985

Gray, Carrie Ann 1992 Faculty Res Asst Fisheries & Wildlife. BS Wisconsin 1990

Gray, Linda L. 1989 Instr & Washington Co Extn Agent. BS Youngstown 1973

Gray, Lizbeth Ann 1984 Assoc Prof Education. BS Oregon 1973; MSW Chicago 1976; PhD Washington State 1985

Gray, Tracy A. 1990 Faculty Res Asst College of Liberal Arts. BS Oregon Inst of Tech 1983

Green, Anita Louise 1976 Sr Instr Horticulture. BS Montana State 1964; MS Colorado State 1968

Green, James L. 1975 Prof & Extn Specialist Horticulture. BS Colorado State 1965, MS 1967, PhD 1973

Green, John R. 1991 Faculty Res Asst Ag & Resource Economics. BS Iowa State 1982, MS 1991

Green, Kinsey B. 1984 Dean of Home Economics & Education; Prof of Home Economics, Communication & Education. BS Virginia 1960; MS Maryland 1965, PhD 1969

Green, Ronald R. 1992 Faculty Res Asst Oceanic & Atmospheric Sciences. BA Washington 1972

Greer, Arthur J. 1985 Asst Prof Ag & Resource Economics. BS Colorado State 1966, MS 1968; PhD Nebraska 1981

Gregerson, Donna Marie 1974 Prof & Benton Co Extn Agent. BS Oregon State 1974, MS 1977

Gregg, Janice M. 1981 Assoc Prof & Jackson Co Extn Agent. BA Central Washington 1972; MACE Washington State 1981

Gregorwich, Joseph W. 1994 Men's Novice Crew Coach Intercollegiate Athletics. BA Gonzaga 1991

Gregory, Shirley M. 1987 Director & Instr Career Planning & Placement Ctr. BS North Dakota 1967, MS 1969; PhD Oregon State 1985

Gregory, Stanley V. 1977 Prof (Sr Res) Fisheries & Wildlife. BS Tennessee-Knoxville 1971; MS Oregon State 1975, PhD 1980

Gremmels, John H. 1993 Asst Prof Naval Science. BA Oregon State 1987

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Griffin, Donald Alan 1964 Sr Faculty Res Asst Ag Chemistry. BA Cal State-Chico 1964; MS Oregon State 1970

Griffin, Richard William 1984 Head of Library Automation, Kerr Library. BA Reading 1973; MLS Poly of N. London 1975; BA Texas 1982; MS Oregon 1984

Griffiths, David J. 1967 Prof Physics. BA British Columbia 1959, MS 1960, PhD 1965

Griffiths, Robert P. 1972 Assoc Prof (Sr Res) Microbiology. AB Oberlin 1961; MA San Jose State 1968; PhD Oregon State 1972

Griggs, Lawrence F. 1972 Assoc Prof & Director Educational Opportunities. BA Pacific Lutheran 1970, MA 1972; PhD Oregon State 1978

Grogan, Jeffrey 1994 Faculty Res Asst Forest Resources. BS Oregon State 1994

Groome, John T. 1992 Faculty Res Asst Nuclear Engineering.

Grosenbach, Douglas W. 1992 Faculty Res Asst Microbiology. BS Oregon State 1992

Gross, Joan E. 1989 Asst Prof Anthropology. BA Montana 1979; MA Texas 1981, PhD 1985

Gross, Karen S. 1994 Academic Advisor/Tutor Academic Affairs. BA San Jose State 1977

Gross, Pauline P. 1993 Academic Advisor Liberal Studies. BA College of St. Benedict 1969

Grover, Jill J. 1983 Res Assoc Oceanic & Atmospheric Sciences. BS Utah 1973; PhD Rutgers 1982

Grunder, Anita L. 1986 Asst Prof Geosciences. BS UC-Berkeley 1977; PhD Stanford 1986

Gu, Sanliang 1993 Res Assoc (Post Doct) Horticulture. BS Ag Univ of Shandong (China) 1981; MS Oregon State 1987, PhD 1992

Guenther, Ronald Bernard 1966 Prof Mathematics. BA Oregon State 1959, MA 1962; PhD Colorado 1964

Gush, Amy D. 1993 Director of Development, Health & Human Performance. BS Virginia Poly 1987, MBA 1990

Gutbrod, Oscar A. 1965 Asst Prof Extn Seed Certification. BS Oregon State 1964

Gutenberger, Susan K. 1987-91, 1992 Res Assoc Fisheries & Wildlife. BS Idaho 1976, MS 1983; PhD Oregon State 1992

Gvakharia, Varo O. 1994 Research Assoc Biochemistry & Biophysics. MS Moscow State Univ (Russia) 1974, PhD 1979

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Haddon, R. Lance 1985 Asst Director-School of Education. BA Michigan State 1967, MA 1973; PhD Oregon State 1987

Hafner-Eaton, Chris P. 1992 Asst Prof Public Health. BA UC-San Diego 1986; MPH UCLA 1988, PhD 1992

Hagar, Joan 1990 Faculty Res Asst Forest Science. BS Wisconsin-Madison 1984

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Haley, Martin J. 1993 Director of Development, College of Home Economics & Education. BS SUNY 1985; BS New Hampshire College 1988

Hall, Charlotte Dianne 1994 Instr Kerr Library. BA Linfield 1986; MS North Texas 1993

Hall, Jean A. 1990 Asst Prof Veterinary Medicine. BS Oregon State 1981; DVM Washington State 1982; MS Colorado State 1987, PhD 1989, Dipl ACVIM

Hall, Roberta Louise 1974 Prof Anthropology. BA Indiana 1963; MA Oregon 1969, PhD 1970

Halse, Richard Ray 1990 Inst Botany & Plant Pathology. BS Northern State 1970; MS Arizona 1973; PhD Oregon State 1980

Halverson, Robert L. 1991 Contract Officer Business Office. BS Denver 1965

Hamilton, Robert Roy 1968 Prof & Union Co Extn Staff Chair. BS Washington State 1966, MS 1971

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Han, Kyuang-Hwan 1994 Asst Prof (Sr Res) Forest Science. BS Kyungpook Nat'l Univ (Korea) 1984, MS 1986; PhD Michigan State 1991

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Hanna, Susan Steele 1981 Assoc Prof (Sr Res) Ag & Resource Economics. BA Maine 1966, MS 1977; PhD Oregon State 1981

Hannaway, David B. 1979 Assoc Prof Crop & Soil Science. BS Delaware 1973; MS Tennessee 1975; PhD Kentucky 1979

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Hansen, Donald E. 1983 Assoc Prof Veterinary Medicine. BS UC-Davis 1970, DVM 1972, MPVM 1983

Hansen, Eric J. 1992 Instr & Educational Program Coordinator-Student Housing. BS Oregon State 1990, MBA 1992

Hansen, Eric Neal 1994 Asst Prof & Extn Specialist, Value-Added Forest Products. BS Idaho 1990; PhD Virginia Polytechnic 1994

Hansen, Everett Mathew 1972 Prof Botany & Plant Pathology. BS Oregon State 1968; MS Wisconsin 1971, PhD 1972

Hansen, Michael C. 1992 Faculty Res Asst Fisheries & Wildlife. BS Oregon State 1978, MS 1982

Hansen, Richard C. 1993 Asst Comm Spclst Extn Communications. BA Thomas Edison State 1984

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Hanson, Dean B. 1972 Sr Faculty Res Asst Crop & Soil Science. BS Oregon State 1966, MS 1968

Hanson, Eric D. 1992 Faculty Res Asst Forest Science. BS Colorado State 1986, MS 1991

Hanus, Frank Joseph 1970 Sr Faculty Res Asst Botany & Plant Pathology. BS Houston 1962, MS 1966

Hanus, Janet Williams 1966 Sr Faculty Res Asst Botany & Plant Pathology. BS Washington State 1965; MS Oregon State 1971

Hanus, Mark L. 1994 Faculty Res Asst Forest Resources. BS San Jose State 1981

Hardeman, Kristine J. 1994 Res Assoc (Post Doct) Botany & Plant Pathology. BS Iowa 1985; PhD Oregon 1992

Hardesty, David P. 1968 Dept Chair & Prof Art. BFA Miami (Ohio) 1966; MFA Cranbrook Academy of Art 1968

Hardesty, Penny M. 1990 Director of Dvlpmt Communications. BS Oregon State 1971

Hardin, Karin 1979 Faculty Res Asst Nutrition & Food Mgmt. BS Oregon State 1979; BS Oregon Health Sciences Univ 1980

Harding, Anna Kristine 1990 Asst Prof Public Health. BS Oregon 1972; PhD Oregon State 1990

Hardison, John Robert 1944 Prof Plant Pathology. BS Washington State 1939; MS Michigan 1940, PhD 1942

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Harmon, Mark E. 1985 Asst Prof Forest Science. BA Amherst 1975; MS Tennessee 1980; PhD Oregon State 1986

Harold, Rosalind R. 1992 Instr Naval Science

Harris, Saint Lawrence 1992 Asst Men's Basketball Coach Intercollegiate Athletics. BS Pittsburgh 1978

Harris, William C. 1994 Asst Prof Air Force Studies. BA Webster Univ 1993

Harrison, William L. 1974 Prof Acctg & Info Mgmt. BS Kansas State 1959; MBA Missouri-Kansas City 1965; PhD UC-Berkeley 1973

Hart, Douglas Arthur 1989 Asst Prof & Columbia Co Extn Agent. BS Oregon State 1979, MS 1985

Hart, John M. 1985 Assoc Prof Extn Soil Scientist. BS Arizona 1969, MS 1971; PhD Nebraska 1976

Hart, Roger Alan 1971 Asst Prof (Sr Res) Oceanic & Atmospheric Sciences. BS Tufts 1962; MSc Yale 1965

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Harttig, Ulrich 1992 Res Assoc (Post Doct) Food Science & Technology. PhD Univ of Kaiserslautern (Germany)

Harwood, Steven H. 1993 Res Assoc (Post Doct) Ag Chemistry. BA UC-Santa Cruz 1980; MS Oregon State 1987, PhD 1993

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Haskell, William T. 1984 Assoc Prof & Multnomah Co Extn Agent. BA UC-Santa Barbara 1972; MA Michigan 1974

Hathaway, Ronald Lee 1972 Staff Chair & Prof Klamath Co Extn. BS Cal Poly-San Luis Obispo 1968; MS Nevada-Reno 1972; PhD Oregon State 1987

Haugen, Christian 1992 Res Assoc (Post Doct) Chemistry. BA Reed College 1986; MS Univ of Rochester 1988, PhD 1991

Haun, James Franz 1964 Prof & Coordinator of Retention Services. BS Eastern Oregon State College 1954; MEd Oregon 1960; EdD Oregon State 1967

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Haverson, Wayne W. 1978 Director & Prof School of Education. BA Willamette 1958; EdD Northern Colorado 1975

Hawkins, Dawn Christina 1970 Staff Chair & Prof Umatilla & Union County Extn. BS Oregon State 1970; MS Southern Oregon State 1977

Hawley, L. Burton 1991 Faculty Res Asst Ag Chemistry. BS North Carolina-Chapel Hill 1962; PhD Georgia 1966

Haxby, Dean G. 1988 Asst Prof Pharmacy. BS Oregon State 1980; PharmD Medical University of South Carolina 1985

Hay, James Warren 1977 Senior Instr Horticulture, Greenhouse Manager. BS Oregon State 1975; MS Colorado State 1977

Hayes, John P. 1992 Asst Prof (Sr Res) Forest Science. BS Oregon State 1978; MS Southern Oregon 1983; PhD Cornell 1990

Hayes, Patrick Milo 1986 Assoc Prof Crop & Soil Science. BS Arizona State 1980; MS Oregon State 1982; PhD Michigan 1986

Hayes, Thomas Edward 1993 Faculty Res Asst Forestry. BS Oregon State 1993

Haynes, Erin J. 1973 Director of Annual Giving, Development Office. BS Oregon State 1972, EdM 1979

Hays, John B. 1987 Prof Ag Chemistry. BS New Mexico 1960; PhD Cal-San Diego 1968

Haytas, John J. 1993 Faculty Res Asst Nuclear Engineering.

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Headrick, Charlotte Jane 1982 Assoc Prof Speech Communication . BA Tennessee 1969, MACT 1971; PhD Georgia 1982

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Hebing, Bradley L. 1992 Asst Prof Aerospace Studies. BA U of Puget Sound 1987; MA U of Northern Colorado 1991

Hedstrom, Olaf R. 1984 Assoc Prof Veterinary Medicine. BA Montana 1971; MA UC-Berkeley 1972; DVM UC-Davis 1976; MS Iowa State 1981; PhD 1986, Dipl ACVP

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Hellman, Edward W. 1994 Assoc Prof & District Extn Agent, NWREC. BS Illinois 1977, MS 1979; PhD Arkansas 1982

Helmick, Sandra A. 1991 Assoc Dean Academic Affairs, College of Home Economics & Education, Prof Home Economics. BS Ohio Univ 1962, MBA 1964; PhD Missouri 1972

Hemphill, Delbert D., Jr. 1976 Prof Horticulture, North Willamette Res & Extn Ctr. BS Notre Dame 1966; PhD Michigan State 1971

Henderson, Marilyn Christine 1972 Sr Faculty Res Asst Ag Chemistry. BA Central Washington 1972

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Henderson, Robert L. 1980 Asst Prof Extn Seed Certification Specialist. BS Cal Poly 1967, 1977; MS Oregon State 1983

Hendricks, Jerry Dean 1975 Prof Food Science & Technology. BS Colorado State 1966, PhD 1971

Hendricks, Jon Albert 1988 Dept Chair & Prof Sociology. BA Washington 1966; MA Nevada 1968; PhD Penn State 1971

Hendrickson, Daniel E. 1992 Asst Prof Military Science. BA San Jose State 1984

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Hermes, James C. 1987 Assoc Prof & Extn Poultry Specialist. BS UC-Davis 1979, MS 1981, PhD 1988

Herndon, Bob D. 1978 Asst Prof, Assoc Athletic Director for Operations Intercollegiate Athletics. BS Oklahoma 1955

Hernried, Alan G. 1989 Assoc Prof Civil Engineering. BS UC-Berkeley 1977, MS 1978, PhD 1982

Hershey, Katherine T. 1993 Faculty Res Asst Fisheries & Wildlife. BS Montana 1988

Herzog, James Herman 1967 Assoc Prof Electrical & Computer Engineering. BS Northwestern 1962; MS Michigan 1963, PhD 1967

Hester, Arlene S. 1983 Instructor Forest Resources, Microcomputer Lab. BA Cal State-Long Beach 1969

Hetherington, William Morley, III 1987 Assoc Prof Physics. BS UC-Berkeley 1971; PhD Stanford 1977

Hibbs, David E. 1983 Assoc Prof & Extn Forestry Specialist. BA Carleton College 1972; MS Massachusetts 1976, PhD 1978

Hickey, Beverly J. 1992 Instr Home Econ Child Development Lab. BS UC-Davis 1975; MA Stanford 1977

Hicks, R. Gary 1975 Assoc Dean College of Engineering, Prof Civil Engineering. BS UC-Berkeley 1963, MS 1965, PhD 1970

Hicks, Jill D. 1986 Asst Gymnastics Coach Intercollegiate Athletics. BS Oregon State 1982

Higdon, Robert L. 1982 Assoc Prof Mathematics. BA Missouri 1975; MS Stanford 1978, PhD 1981

Higginbotham, Jack F. 1987 Assoc Prof, Radiation Ctr & Dept of Nuclear Engineering. BS Kansas State 1981, MS 1983, PhD 1987

Higgins, Karen 1992 Asst Prof Education. BS Oregon 1974, MA 1982, PhD 1991

Higley, Kathryn Ann 1994 Asst Prof Nuclear Engineering. MS Colorado State 1992, PhD 1994

Hilderbrand, Kenneth Stephen, Jr. 1969 Assoc Prof, Seafood Specialist. BS Oregon State 1962, MS 1964

Hill, Hatsue Akimoto 1978 Asst Prof, Head Women's Basketball Coach Intercollegiate Athletics

Hill, Thomas W. 1984 Sr Instr Animal Sci, Superintendent of Farm Operations. BS Cal Poly-San Luis Obispo 1976; MS Oregon State 1990

Hilton, Richard Judd 1987 Faculty Res Asst, Southern Oregon Exp Station. BA Pomona College 1981; MS UC-Davis 1987

Hinman, Robert Charles 1978 Assoc Prof & Douglas Co Extn Agent. BS Cal State-Chico 1965; MS Cornell 1967

Hino, Jeffry Chester 1984 Sr Instr Production Specialist Forestry Media Ctr. BS Arizona 1975; MS Oregon 1979

Hiratsuka, Yuji 1992 Asst Prof Art. BS Toyko Gakugei Univ 1978; MA New Mexico State 1987; MFA Indiana Univ 1990

Histand, Phillip Claude 1989 Physician Student Health Ctr. BA Goshen 1972; MD Northwestern 1976

Hixon, Mark Anthony 1984 Prof Zoology & Oceanic & Atmospheric Sciences. BA UC-Santa Barbara 1973, MA 1974, PhD 1979

Ho, Pui Shing 1987 Assoc Prof Biophysics. BA Franklin & Marshall College 1979; PhD Northwestern 1984

Hobbs, Beverly B. 1991 Asst Prof & Extn 4-H Youth Dev Specialist. BA New Hampshire 1968; MS Idaho 1974; PhD Oregon State 1993

Hobbs, Deborah J. 1989 Faculty Res Asst Biochemistry & Biophysics. BS Idaho 1984; MA Oregon State 1987

Hobbs, Stephen D. 1978 Prof Forest Science. BS New Hampshire 1969; PhD Idaho 1977

Hoffman, Peter Donald 1989 Faculty Res Asst Ag Chemistry. BS Oregon State 1986

Hoffman, Robert Lawrence Jr. 1983 Faculty Res Asst Fisheries & Wildlife. BS Oregon 1972; BS Oregon State 1982

Hogan, Lewis Gregory 1970 Res Assoc Oceanic & Atmospheric Sciences. BA, BS Oregon State 1959, MS 1968, PhD 1973

Hogg, Roen S. 1993 Faculty Res Asst Oceanic & Atmospheric Sciences. BA Bates College 1982; MS Montana State 1989

Hogue, Teresa Ann 1974 Assoc Prof & Community Resource Education Specialist. BS Oregon State 1972, MS 1984

Hoke, Brady 1989 Asst Football Coach Intercollegiate Athletics. BS Ball State 1981; MS Grand Valley State 1983

Holbo, Richard K. 1994 Product Testing Engineer College of Business.

Holbo, H. Richard 1975 Res Assoc Forest Products 1960; MS Nevada-Reno 1964; PhD Oregon State 1972

Holder, Thurman II 1987-1990; 1992 HCOP Coordinator Academic Affairs. BS Northern Arizona 1976, MA 1977

Holland, Michael Edward 1989 Archivist. BS Oklahoma State 1976, MA 1978

Holleman, Kendrick A. 1984 Prof Animal Sciences, Extn Poultry Specialist. BS Texas A & M 1958; MS Nebraska 1962; PhD Missouri 1971

Hollings, William H. 1983 Sr Faculty Res Asst Civil Engineering. BS Bucknell 1976; MS Oregon State 1984

Hollingshead, Nancy C. 1989 Faculty Res Asst Veterinary Medicine. BS Oregon State 1973

Holloway, James L. 1992 Res Assoc (Post Doct) Crop & Soil Science. BS Heidelberg College 1984; M.S. Oregon State 1988, PhD 1992

Holman, Robert Alan 1979 Prof Oceanic & Atmospheric Sciences. BSc Royal Military College of Canada 1972; PhD Dalhousie 1979

Holmes, Donald Clifford 1993 Instr Education. BA Linfield 1964; MA Western Washington State 1967

Holmes, Zoe Ann 1965-69 1974 Prof Nutrition & Food Mgmt. BS Kansas State 1964, MS 1965; PhD Tennessee-Knoxville 1972

Holoboski, Mark 1995 Res Assoc (Post Doct) Chemistry. BS SUNNY-Albany 1987; MS Rensselaer Polytechnic Institute 1991, PhD 1994

Holroyd, Michael Hayden 1978 Asst Prof & Marion Co Extn Agent. BA San Fernando Valley State 1974; MS Cal State-Northridge 1979

Holsberry, Willard M. 1975 Exec Director - NIRSA. BA Eastern New Mexico 1962, MS 1965

Holt, Timothy 1986 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1983

Holtan, Donald W. 1975 Assoc Prof Animal Sciences. BS North Dakota State 1963; MS Washington State 1967, PhD 1973

Holthofer, Donald J. 1975 Faculty Res Asst Veterinary Medicine. BS Oregon State 1975

Holyoak, Arlene 1981 Assoc Prof Human Development & Family Sciences. BS Utah State 1961; MS Oregon State 1972; PhD Penn State 1981

Hommes, Norman G. 1992 Faculty Res Asst Botany & Plant Pathology. BA Notre Dame 1975; MS Oregon 1982; PhD Oregon State 1988

Hong, Seung-Tae 1994 Res Assoc (Post Doct) BS Seoul National Univ (Korea) 1987, MS 1989, PhD 1994

Hooker, Karen A. 1994 Director, Program on Gerontology & Assoc Prof Human Dev & Family Sciences. BS Denison Univ 1978; MA William and Mary 1981; PhD Pennsylvania State 1985

Hopkins, Roswitha Gertrud 1971 Sr Faculty Res Asst Botany & Plant Pathology. Chemotechniker, Chemistry Institute of Munich 1962

Horn, Robert 1994 Faculty Res Asst Fisheries & Wildlife. BS Oregon State 1981

Horne, Clara J. 1987 Head Adviser College of Business. BA Kansas 1959

Horne, Fredrick Herbert 1986 Dean College of Science, Prof Chemistry. AB Harvard 1956; PhD Kansas 1962

Horowitz, Irwin A. 1994 Prof Psychology. BS Brooklyn College 1961, MA 1963; PhD Michigan State 1966

Horton, Gary A. 1990 Faculty Res Asst Horticulture. BS Oregon State 1987

Hosoi, Yasuharu Timo 1969 Assoc Prof Philosophy. BTh, Tokyo Bible Seminary 1954; BD Christian Theological Seminary (Indianapolis) 1964; MA Butler; MA Chicago 1968, PhD 1974

Hostetler, William Wayne 1987 Director of Technology Transfer. BA Washington State 1967, MBA 1980

Hosty, Maureen 1991 Asst Prof & Multnomah Co Extn Agent. BS Kansas State 1981, MA 1986

Hou, Jianguo 1993 Res Assoc (Post Doct) Chemistry. BS Univ of Science & Tech (China) 1983, MS 1986, PhD 1989

Hough, David Kenneth 1993 Asst Prof Naval Science. BS Pennsylvania 1981

Houglum, Lyla E. 1985 Assoc Prof & Interim Dean of Extended Education & Director of Extn Services. BS Montana State 1972; MS Oregon 1981, PhD 1985

House, Reese Milton 1969 Prof-School of Education. BA Ball State 1960, MA 1961; EdD Oregon State 1970

Hovermale, Jeannette T. 1992 Faculty Res Asst Veterinary Medicine. BS Humboldt State 1990

Howard, Eric D. 1992 Faculty Res Asst Microbiology. BS Oregon State 1986; MS Arkansas 1991

Howard, Nancy Lee 1994 Director of Quality & Continuous Improvement. BS Oregon 1982

Howell, Meredith L. 1993 Res Assoc (Post Doct) Biochemistry & Biophysics. BS Oregon State 1987; MS Michigan 1988; PhD Oregon State 1992

Howell, Michael Edward 1973-77, 1978 Staff Chair & Prof Jackson Co Extn, Southern Oregon Exp Station Superintendent. BS Idaho 1972, MS 1973

Hruby, Dennis E. 1983 Prof Microbiology. BS Oregon State 1973; PhD Colorado 1977

Hsu, Victor L. 1993 Asst Prof Biochemistry/ Biophysics. BS Harvey Mudd College 1984; PhD UC-San Diego 1989

Hu, Ching Yuan 1985 Assoc Prof Animal Sciences. BS National Chung Hsing 1975; MS UC-Davis 1979, PhD 1984

Hua, Chen 1985 Res Assoc Chemistry. Certificate - Sichuan (China) 1966

Huber, Andrew G. 1985 Assoc Prof Crop & Soil Science. BS Wisconsin-Platt 1969; MS Oklahoma State 1978; PhD Oregon State 1983

Huber, Michael J. 1986 Asst Prof Veterinary Medicine. BS UC-Davis 1978, DVM 1980

Huber, Wayne Charles 1991 Dept Head & Prof Civil Engineering. BS California Inst of Technology 1963; MS Massachusetts Inst of Technology 1965, PhD 1968

Huddleston, James Herbert 1975 Prof & Extn Soil Scientist. BS Cornell 1963, MS 1965; PhD Iowa State 1969

Hudspeth, Robert Turner 1974 Prof Civil Engineering. BS US Naval Academy 1963; MSCE Washington 1966; PhD Florida 1974

Huestis, Gordon M. 1993 Res Assoc (Post Doct) Crop & Soil Science. BS Utah State 1980; MS Uc-Davis 1983, PhD 1992

Huffman, David W. 1993 Faculty Res Asst Forest Resources. BS Northern Arizona 1989; MS Oregon State

Hughes, Joy R. 1994 Assoc Provost for Info Services, Prof Kerr Library. BA Rider College 1971; MS Rutgers 1975, 1986; PhD Union Institute 1989

Huh, Chih-An 1984 Assoc Prof Oceanic & Atmospheric Sciences. BS National Taiwan 1974, MS 1978; PhD USC 1982

Humphrey, Mark A. 1985 Sr Faculty Res Asst Civil Engineering. BS Oregon State 1984

Humphrey, Philip Edward 1982 Assoc Prof Forest Products. BS Univ College of North Wales (UK) 1976, PhD 1982

Humphries, Merideth 1994 Faculty Res Asst Zoology. BS Oregon State 1986; MS UC-Davis 1994

Hundley, Patrick D. 1990 Director of Development, Pharmacy . BA Tennessee Wesleyan 1970; MA Middle Tennessee State 1975

Hunt, Sam K. 1989 Asst Director Upward Bound. BS Oregon State 1987

Hunter-Zaworski, Katharine M. 1983 Asst Prof Civil Engineering. BSc British Columbia 1978; MS Tennessee 1980; PhD Oregon State 1988

Hurelbrink, Richard L. 1992 Chief of Party/Agro-Business Spec Sri Lanka. BS Illinois 1967, MS 1969

Husband, William B. 1985 Assoc Prof History. BA Texas Tech 1969; MA Cal State-Long Beach 1977; PhD. Princeton 1984

Huso, Manuela M.P. 1987 Faculty Res Asst Geosciences. BA Whitman College 1978; MS Oregon 1984; MS Oregon State 1988

Husted, Elaine V. 1976 Staff Chair & Asst Prof Grant Co Extn. BS Montana State 1973; EdM Oregon State 1983

Hutton, Norman E. 1977 Interim Dean & Prof College of Veterinary Medicine. DVM Iowa State 1966, MS 1969

Huyer, Adriana 1972 Prof Oceanic & Atmospheric Sciences. BSc Toronto 1967; MS Oregon State 1971, PhD 1974

Hyman, Michael Richard 1990 Asst Prof (Sr Res) Botany & Plant Pathology. BS Univ College, London 1980; PhD Univ of Bristol 1984

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Iisa, Maarit K. 1992 Asst Prof Chemical Engineering. MS Helsinki Univ (Finland) 1983; PhD ABO Akademi (Finland) 1992

Iltis, Robert S. 1991 Asst Prof Speech Commication. BA Colorado State 1978, MS 1981; PhD Wisconsin-Madison 1989

Ingham, Elaine R. 1986 Assoc Prof Botany & Plant Pathology. BA St Olaf College 1974; MS Texas A & M 1977; PhD Colorado State 1981

Ingham, Russell Elliot 1985 Assoc Prof Botany & Plant Pathology. BA St. Olaf College 1974; MS Texas A & M 1977; PhD Colorado State 1981

Ingle, James Davis, Jr. 1972 Prof Chemistry. BS Illinois 1968; PhD Michigan State 1971

Inman, Roderick Daner 1971 Sr Faculty Res Asst Ag Chemistry. BS Oregon State 1967

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Isaacs, Frank Barrett 1979 Sr Faculty Res Asst Fisheries & Wildlife. BS Michigan Technical 1973, MS 1976

Isensee, Philip H. 1990 Mgr Integration Training & Support - Computer Services. BSEE Idaho 1970

Istok, Jonathan David 1986 Assoc Prof Civil Engineering. BS Ohio State 1978; MS Oregon State 1981, PhD 1986

Ivantchenko, Maria G. 1994 Res Assoc (Post Doct) Biochemistry/Biophysics. MS Sofia State Univ (Bulgaria) 1975; PhD Inst of General Genetics (USSR) 1984

Ivey, Richard G. 1991 Faculty Res Asst Microbiology. BS Oregon State 1991

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Jacks, Clinton C. 1972 Staff Chair & Assoc Prof Jefferson Co Extn. BA Sacramento State 1965; BS Oregon State 1970, MS 1972

Jackson, David 1994 Instr Forest Engineering. BA Alabama-Birmingham 1986; MS Auburn 1992; PhD Mississippi State 1993

Jackson, Philip L. 1978 Assoc Prof Geosciences. BA Cal State-Chico 1968; MA Arizona State 1970; PhD Kansas 1977

Jackson, Robert L. 1990 Asst Football Coach Intercollegiate Athletics. BS Northern Illinois 1974

Jackson, Royal Gale 1970 Assoc Prof Forest Resources. BA New Mexico 1960; MA Western New Mexico 1965; PhD New Mexico 1971

Jacobson, Robert Warren 1967 Prof & Lincoln Co Extn Agent. BS Oregon State 1963

Jaeger, John R. 1994 Faculty Res Asst EORC-Union. BS Oregon State 1984, MS 1987

James, Corinne 1987 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Ft. Lewis College 1976; MS Oregon State 1980, PhD 1987

James, Molly O. 1994 Job Developer/Coordinator College of Liberal Arts. BS Oregon State 1970; MEd Idaho 1980

James, Rodney L. 1992 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Arizona 1987; MS Oregon State 1992

James, Steven R. 1975 Sr Faculty Res Asst Central Oregon Exp Station. BS Oregon State 1975

Jansen, Henri Johan F. 1985 Prof Physics. BS Groningen (The Netherlands) 1972, MS 1976, PhD 1981

Jarvis, Debra Joyce 1971 Coordinator Youth Traffic Safety. BS Oregon State 1975

Jarvis, Robert Leo 1971 Prof Fisheries & Wildlife. BS Humboldt State 1963, MS 1965; PhD Southern Illinois 1969

Jasman, Lora Lee 1990 Physician Student Health Ctr. BS Idaho 1980; MD Washington 1985

Jayakumar, Puthenpura K. 1992 Res Assoc (Post Doct) Oceanic & Atmospheric Sciences. MS Georgia Inst of Technology 1983; PhD Florida State 1992

Jeffers, Ronald Harrison 1974 Assoc Prof Music. BM Michigan 1966, MA 1968; MA Occidental College 1971

Jeffreys, Bradford Joseph 1987 Assoc Prof & Extn 4-H Specialist. BS Cal Poly-San Luis Obispo 1977, MS 1981; EdD Virginia Tech 1987

Jeknic, Zoran 1992 Faculty Res Asst Horticulture. BS Univ of Sarajevo (Yugoslavia) 1989

Jenkins, Jeffrey James 1990 Assoc Prof Ag Chemistry. BS Cal Poly-San Luis Obispo 1972; PhD Michigan State 1981

Jenne, William Charles 1965 Assoc Prof Sociology. BS Illinois State 1953; AM Illinois 1958, PhD 1964

Jennings, Joe Cannon, Jr. 1981 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS North Carolina 1972; MS Oregon State 1981

Jensen, Chris L. 1992 Faculty Res Asst Hermiston Res Extn Ctr. BS Iowa State 1987

Jensen, Christine R. 1991 Faculty Res Asst Education. BS Oregon State 1991

Jensen, Edward Charles 1976 Asst Prof Forest Resources, Coordinator Forestry Media Ctr. BS Illinois 1973; MS Washington 1976

Jensen, Lynn B. 1983 Staff Chair & Assoc Prof Malheur Co Extn. BS Idaho 1972; MS Utah State 1980

Johnson, Don B. 1976 Asst Director & Asst Prof Student Activities Memorial Union. BS Southern Oregon 1971; MFA U of Puget Sound 1973

Johnson, Douglas Edward 1982 Assoc Prof Rangeland Resources. BA Hastings 1970; MS Fort Hays State 1976; PhD Colorado State 1981

Johnson, Duane Paul 1959 Prof & Extn 4-H Specialist. BS Iowa State 1959; MEd Colorado State 1970

Johnson, Eugene 1965 Sr Faculty Res Asst Ag Chemistry. BS Oregon State 1966

Johnson, Kenneth Bjorn 1988 Assoc Prof Botany & Plant Pathology. BS Minnesota 1979; MS Oregon State 1982; PhD Minnesota 1986

Johnson, Kenneth Norman 1985 Prof Forest Resources. BS UC-Berkeley 1965; MS Wisconsin 1969; PhD Oregon State 1973

Johnson, LaDonna 1995 Physician Student Health Center, MA Chapman College 1976; DO College of Osteropathic Medicine of the Pacific 1987

Johnson, Linda A. 1991 Head Adviser, College of Health & Human Performance. BS UC-San Bernardino 1985

Johnson, Melanie T. 1992 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Nevada-Las Vegas 1992

Johnson, Michael P. 1985 Sr Instr Computer Science Engineering. BS UC-Davis 1959; PhD Oregon 1966

Johnson, Rebecca Lynn 1984 Assoc Prof Forest Resources. BA Wisconsin 1977; MS Michigan State 1979, PhD 1984

Johnson, Saralyn S. 1990 Asst Prof & Douglas Co Extn Agent. BS Oregon State 1983; MS Penn State 1989

Johnson, Simon Sigvart 1971 Assoc Prof English. BA Colorado State 1962; MS Columbia 1963; MFA Iowa 1969, PhD 1972

Johnson, W. Curtis 1968 Prof Biochemistry & Biophysics. BA Yale 1961; PhD Washington 1966

Johnston, Richard Stanley 1966 Prof Ag & Resource Economics. BA Washington State 1960; MS Massachusetts 1963; PhD UC-Berkeley 1970

Jolliff, Gary David 1976 Prof Crop & Soil Science. BS Ohio State 1956, MS 1966; PhD Colorado State 1969

Jones, Cynthia L. 1993 Faculty Res Asst Civil Engineering. BS Oregon State 1987

Jones, Donald A. 1990 Assoc Prof (Visiting) Mathematics. BS Iowa State 1952, MS 1956, PhD Iowa 1959

Jones, Frederick J. 1994 Marine Superintendent Oceanic & Atmospheric Sciences. BS UC-Berkeley 1969; MS Washington 1984

Jones, Joyce Lucile 1994 Asst Prof & Tillamook Cty Extn Agent. BS Oregon State 1981, MEd 1991

Jones, Julia Allen 1989 Assoc Prof Geosciences BA Hampshire 1977; MA Johns Hopkins 1979, PhD 1983

Jones, Scott Howard 1994 Residence Hall Area Coordinator. BA South Dakota 1992; MEd Oregon State 1994

Jordan, Cheryl W. 1976 Asst Prof Apparel, Interiors, Housing, & Merchandising. BS Kansas State 1968, MS 1971; PhD Oklahoma State 1987

Jordon, Shelley I. 1986 Assoc Prof Art. BFA NYC School of Visual Arts 1976; MFA Brooklyn College 1986

Joseph, Gladwin 1994 Faculth Res Asst Forest Science. BS Univ of Agriculture Bangalov (India) 1986; MS Oregon State 1989

Jovanovic, Goran Nadezda 1992 Assoc Prof Chemical Engineering. BS Univ of Belgrade (Yugoslavia) 1971; MS Oregon State 1974, PhD 1979

Juliette, Jamie J. 1993 Res Assoc (Post Doct) Chemistry. BS San Jose State 1988; PhD Oregon 1993

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Kalk, Peter Arthur 1968 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Michigan Tech 1962

Kaldenberg, Dennis O. 1987 Director Professional Svcs Program & Res Assoc College of Business. BS Iowa State 1974, MS 1977, PhD 1980

Kanury, A. Murty 1985 Prof Mechanical Engineering. BEng Andhra Waltair (India) 1961; MS Minnesota 1963, PhD 1969

Karchesy, Joseph J. 1979 Assoc Prof Forest Products. BS Washington 1968; MS Victoria 1970; PhD Oregon State 1974

Karow, Russell Stanley 1983 Assoc Prof, Extn Crop Specialist. BS Wisconsin-Stevens Point 1975; MS Wisconsin-Madison 1980, PhD 1983

Kaser, John Robert 1971 Faculty Res Asst Electronics Engineer Communication Media Ctr. BS Oregon State 1969

Kashchy, John P. 1993 Asst Prof Military Science. BS SUNY 1979

Kasimor, Kathryn 1990 Faculty Res Asst Horticulture. BS Oregon State 1984, MS 1989

Kassner, Michael Ernest 1990 Prof Mechanical Engineering. BSSE Northwestern 1972; MS Stanford 1979, PhD 1981

Katz, Jonathon G. 1993 Asst Prof History. BA Harvard 1975; PhD Princeton 1990

Katzev, Aphra R. 1994 Res Assoc Home Economics & Education. BA Stanford 1959; MA Univ of Calif 1961; PhD Oregon State 1994

Kauffman, John Boone 1986 Assoc Prof Rangeland Resources. BS Texas Tech 1978; MS Oregon State 1982; PhD UC-Berkeley 1986

Kaufman, Diane 1988 Assoc Prof & Extn Agent North Willamette Res & Extn Ctr. BA Illinois 1969, BS 1982, MS 1985

Kaufmann, Philip R. 1991 Assoc Prof (Res) Fisheries & Wildlife. BS Gonzaga 1971; MS Washington State 1977; PhD Oregon State 1987

Kavanagh, Kathleen L. 1993 Asst Prof & Clatsop/Tillamook Co Extn Agent. BS SUNY-Syracuse 1977, MS 1987; PhD Oregon State 1993

Keefer, Jonathan P. 1994 Asst Prof Military Science. BS Youngstown State Univ 1977

Keith, William M. 1993 Asst Prof Speech Communication. BA Bowlling Green 1980, MA 1982; PhD Texas 1986

Keller, George Henrik 1975 Vice Provost for Research, & Int'l Programs, Prof Oceanic & Atmospheric Sciences. BA Connecticut 1954; MS Utah 1956; PhD Illinois 1966

Keller, Mark Robert 1988 Faculty Res Asst Animal Sciences. BS Oklahoma State 1978

Kellogg, Loren Dudley 1978 Assoc Prof Forest Engineering. BS Humboldt State 1974; MF Oregon State 1976, PhD 1986

Kelsey, Mary Wallace 1958 Assoc Prof Nutrition & Food Mgmt. BS New York State-Plattsburgh 1955; MS Rhode Island 1957

Kelso, Debran L. 1994 Faculty Res Asst Fisheries & Wildlife. BS Colorado 1977; MS Univ of Witwatersrand (South Africa) 1987

Kemp, Kurtis K. 1988 Asst Baseball Coach Intercollegiate Athletics. BS Oregon State 1983

Kendrick, Catherine Mary 1983 Instr HCOP Academic Affairs. BS North Wales 1976, MS 1977

Kennard, Mark 1994 Res Assoc (Post Doct) Chemistry. BS UC-Berkeley 1986; MS Northwestern Univ 1989, PhD 1993

Kennedy, Timothy Christopher 1976 Prof Mechanical Engineering. BS SUNY-Buffalo 1968; MS Stanford 1969, PhD 1972

Kenneke, Larry Jon 1970 Prof Education. BS Northern Illinois 1961, MS 1965; EdD Oregon State 1968

Kenney, John G. 1992 Asst Prof Elec & Computer Engineering. BS Columbia; PhD Carnegie Mellon 1991

Kennison, James 1988 Director of College Programs, Development Office. BA Eastern Washington 1958; MS Washington 1959; EdD Kentucky 1965

Keowmookdar, Nattaya 1994 Instr Kerr Library. BEd Chulalongkorn Univ (Thailand) 1981; MS Oregon State 1987, PhD 1993

Kerber, Delmar David 1976 Event Manager Intercollegiate Athletics. BA Oregon State 1964, MA 1967

Kerkvliet, Joe R. 1988 Assoc Prof Economics. BA Montana 1981; PhD Wyoming 1986

Kerkvliet, Nancy I. 1977 Assoc Prof & Extn Toxicology Spec Ag Chemistry. BS Wisconsin State-Eau Claire 1970; MS Oregon State 1973, PhD 1976

Kerl, Caroline A. 1986 Legal Adviser President's Office, Asst Prof. AB UC-Berkeley 1971; JD Hastings College of Law 1974

Kerle, Elizabeth 1990 Faculty Res Asst Ag Chemistry. BS Cornell 1982; MS Oregon State 1986

Kershaw, Nancy L. 1984 Assoc Prof & Tillamook Co Extn Agent. BS Oregon State 1978; MS Stephen F. Austin 1981

Kesler, Linc 1983 Assoc Prof English. BA Yale 1971; MA Toronto 1973, PhD 1981

Ketchum, James Scott 1995 Faculty Res Asst Forest Science, BS Oregon State 1992, MS 1994

Keszler, Douglas A. 1985 Assoc Prof Chemistry. BS Southwestern Oklahoma State 1979; PhD Northwestern 1984

Ketchum Lynn G. 1988 Assoc Prof Electronic Media Spec Ag Communications. BA Arizona 1974, MED 1987

Ketchum, Sharon 1993 Faculty Res Asst Pharmacy. BA Luther College 1981; MS North Dakota 1985

Khapalov, Alexandre 1992 Res Assoc (Visiting) Electrical & Computer Engineering. BS Ural State Univ (USSR) 1976; PhD Inst of Math & Mechanics (USSR) 1982

Kiaei, Sayfe 1987 Assoc Prof Electrical & Computer Engineering. BS Washington State 1982, MS 1984, PhD 1987

Kiekel, Robert Dene 1966 Assoc Prof . BA Willamette 1956; MA Washington 1962; PhD Oregon 1971

Kiemnec, Gary Lee 1986 Assoc Prof Crop & Soil Science. BS Indiana 1969; MS Purdue 1974; PhD Oregon State 1984

Kim, Carol Hyungmie 1992 Res Assoc (Post Doct) Microbiology. BA Wellesley College 1987; PhD Cornell 1992

Kimerling, A. Jon 1976 Prof Geosciences. BA Washington 1972; MS Wisconsin 1973, PhD 1976

Kimerling, R. Ann 1986 Faculty Res Asst Civil Engineering. BS Washington 1972

Kimura, Shoichi 1989 Assoc Prof Chemical Engineering. BE Osaka 1967; MS Oregon State 1976; PhD Osaka 1982

Kimzey, Lorina F. 1989 Instr English Language Institute. BS Oregon State 1977; MA Western Oregon 1987

Kinch, Michael Paul 1969 Head of Reference Services & Prof, Kerr Library. BS Portland State 1968; MLS Washington 1969; MS Oregon State 1974

King, Charles Everett 1977 Prof Zoology, AB Emory 1958; MS Florida State 1960; PhD Washington 1965

King, Belinda B. 1993 Asst Prof Mathematics. BS Maryland-College Park 1985; MS Maryland-Baltimore County 1987; PhD Clemson 1991

King, David Burnett 1962 Prof History. BA Hamilton 1951; MA Rutgers 1955; PhD Cornell 1962

King, Jonathan 1980 Assoc Prof Mgmt & Marketing. BA Antioch College 1965; MBA Washington 1975, PhD 1980

King, Keith Irl 1970 Sr Instr Biology. BS Montana State 1963; MS Oregon State 1970

King, Lynda Jeanne 1989 Assoc Prof German. BA USC 1971, MA 1973, PhD 1977

Kingsley, Kenneth K. 1974 Dept Head (Interim) & Assoc Prof Ag. Communications. BA Kansas State 1964, MS 1973

Kirch, Thomas G. 1986 Director & Asst Prof Recreational Sports. BS Oregon 1975; MS U of Puget Sound 1980

Kitchen, James 1975, 1991 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BA Bloomsburg State; MS Oregon State 1978

Klein, Andrew Clifford 1985 Assoc Prof Nuclear Engineering. BS Penn State 1977; MS Wisconsin 1979, PhD 1983

Kleinsorge, Ilene K. 1987 Assoc Prof Acctg & Info Mgmt. BS Emporia State 1981; PhD Kansas 1988

Klemke, Lloyd Walter 1970 Prof Sociology. BA UCLA 1963; MA Cal State-Northridge 1965; PhD Oregon 1969

Kliewer, Julie Elise 1985 Instr Forest Engineering. BSCE, BSFE Oregon State 1983

Kling, Donna Sirinek 1975 Faculty Res Asst Ag Chemistry. BS Bucknell 1964

Kling, Gerald Fairchild 1974 Assoc Prof Crop & Soil Science. BS Purdue 1968; MS Cornell 1973, PhD 1974

Klingeman, Peter Clayton 1966 Prof Civil Engineering. BS Northwestern 1957, MS 1959; PhD UC-Berkeley 1965

Klinkhammer, Gary 1990 Assoc Prof Oceanic & Atmospheric Sciences. BS Minnesota 1972; MS Rhode Island 1977, PhD 1979

Klopsch, Mark W. 1980 Sr Faculty Res Asst Forest Science. BS Oregon State 1977, MS 1985

Knapp, Carolyn Sperry 1981 Faculty Res Asst Environmental Health Sciences Ctr. BA Northwestern 1960

Knapp, Patricia A. 1993 Asst Prof Speech Communication. BS Clarion Univ of Pennsylvania 1985; MA Emerson 1987; PhD Pittsburgh 1993

Knapp, Steven John 1985 Assoc Prof Crop & Soil Science. BS Nevada-Reno 1978, MS 1980; PhD Nebraska 1983

Knapp, Wallace H., Jr. 1986 Assoc Prof Student Health Ctr (Consultant). BA Indiana 1965, MD 1968

Knight, Randall William 1984 Sr Faculty Res Asst Crop & Soil Science. BS Oregon State 1973

Knittel, Laura M. 1992 Faculty Res Asst Zoology. BS Oregon 1992

Knothe, Carol Alicia 1972 Assoc Prof & Malheur Co Extn Agent. BS Nebraska 1962; MHEc Oregon State 1971

Knott, Catherine 1994 Director of Women in International Development. BA Yale 1981; MA Cornell 1988, PhD 1993

Knowe, Steven A. 1990 Asst Prof (Sr Res) Forest Science. BS Auburn 1977, MS 1980; PhD Georgia 1990

Knutson, Devon D. 1994 Asst Prof & Malheur Co Extn Agent. BS Colorado State 1972, MS 1981

Koc, Cetin K. 1992 Asst Prof Electrical & Computer Engineering. BS Istanbul Technical Univ (Turkey) 1980, MS 1982; MS UC-Santa Barbara 1985, PhD 1988

Koch, John David 1988 Director Facilities Planning. BArch Cal Poly State 1974

Kocher, Carl Alvin 1973 Prof Physics. AB UC-Berkeley 1963, PhD 1967

Kock, Jo Anne 1976 Staff Chair & Assoc Prof Sherman, Gilliam, & Wheeler Co Extn. BS Oregon State 1983, MA 1984

Koenig, Harold F. 1987 Asst Prof Mgmt & Marketing. BA Rochester 1980; MBA Nebraska 1982, PhD 1988

Koenitzer, Marilyn T. 1991 Inst English Lang Institute. BA San Jose State 1966; MEd Oregon State 1990

Koester, Ardis Williams 1974 Prof & Extn Textiles Clothing Specialist. BS Oregon State 1961; MSHE North Carolina- Greensboro 1971, PhD 1974

Kogan, Marcos 1991 Prof, Director of the Integrated Plant Protection Ctr. BS Universidade Rural do Rio de Janeiro (Brazil) 1961; PhD UC-Riverside 1969

Kolbe, Cheryl 1990 Instr Ag & Resource Economics. BA New Hampshire 1967

Kolbe, Edward Robert 1974 Prof Bioresource Engineering. BME Rensselaer Polytechnic Institute 1964; MSE Case Western Reserve 1966; PhD New Hampshire 1975

Kolchugina, Tatyana P. 1990 Research Assoc Civil Engr. BS Moscow State Univ (USSR), PhD 1985

Koller, Duncan G. 1992 Prof & Colonel Aerospace Studies. BS Oregon State 1969; MA Chapman College 1977; DEd USC 1992

Koller, Loren D. 1972, 1985 Prof Veterinary Medicine. DVM Washington State 1965; MS Wisconsin 1969, PhD 1971

Kolodziej, Terrie L. 1990 Project Coord Eastern & Central Europe Int'l Research & Development. BS Oregon State 1977; MS WOSC 1979

Kolodziej, Wojciech J. 1980 Assoc Prof Electrical & Computer Engineering. MS Technical Warsaw (Poland) 1974; PhD Oregon State 1980

Komar, Paul Douglas 1970 Prof Oceanic & Atmospheric Sciences. BA Michigan 1962, MS (Math) 1963, MS (Geol) 1966; PhD UC-San Diego 1969

Kondapaka, Sudhir Babu 1994 Res Assoc (Post Doct) Microbiology. BS Osmania Univ (India) 1981; MS National Dairy Res Inst (India) 1985, PhD 1989

Koong, Ling Jung (Kelvin) 1987 Assoc Dean Ag Sciences & Prof Animal Sciences. BS Nat'l Taiwan 1964; MS North Carolina State 1968; PhD 1973

Kopperman, Paul Edward 1978 Prof History. BA Queens College 1966, MA 1969; PhD Illinois 1972

Koretsky, Milo David 1992 Asst Prof Chemical Engineering. BS UC-San Diego 1984, MS 1985; PhD UC-Berkeley 1991

Koskela, Gina P. 1993 Faculty Res asst North Willammette Res & Extn Ctr. BS Oregon 1980

Kosro, P. Michael 1984 Assoc Prof (Sr Res) Oceanic & Atmospheric Sciences. BA UC-Santa Cruz 1973; MS Stanford 1977; PhD Scripps 1984

Kovac, David Carl 1991 Rec Sports Program Coordinator. BA UC-Berkeley 1978; ME Oregon State 1985

Kovac, Natalie S. 1987 Asst Director - NIRSA. BA UC-Berkeley 1979; MEd Oregon State 1982

Kovar, Richard Bowen 1983 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1982

Kramer, Brian William 1985 Instr Forest Engineering. BS Idaho State 1971; MF Oregon State 1978

Kramer, Mark T. 1994 Assoc Director Communication Media Ctr. BS Bowling Green 1974; MA Kent State 1976

Kramer, Mari Jeannine 1994 Instr & Lane Co Extn Agent. BS Washington State 1984

Krane, Kenneth Saul 1974 Dept Chair & Prof Physics. BS Arizona 1965; MS Purdue 1967, PhD 1970.

Krause, Denise Rae 1989 Instr Speech Communication. BA Cal Poly-San Luis Obispo 1985; MA San Diego State 1987

Krause, Joseph T. 1988 Assoc Prof French. BA Oregon State 1976; MA Michigan State 1979, PhD 1981

Kreth, Raymond D. 1987 Faculty Res Asst Oceanic & Atmospheric Sciences. BA Reed College 1984; MS Oregon 1985

Krishnamurthy, Ramesha S. 1994 Project Coordinator Kerr Library. BS Bangalore Univ (India) 1984; BS Oregon State 1989, MA 1992

Kronstad, Warren Ervind 1959 Wheat Research Chair; OSU Distinguished Prof; Plant Breeding & Genetics, Crop & Soil Science. BS Washington State 1957, MS 1959; PhD Oregon State 1963

Krueger, James Harry 1961 Prof Chemistry. BS Wisconsin 1958; PhD UC-Berkeley 1961

Krueger, Judith Crookham 1966 Sr Instr Music. BA Idaho 1957; MA Oregon State 1965

Krueger, Sharon Kay 1990 Instr Zoology. BS Wisconsin-Madison 1983, MS 1984; PhD Oregon State 1990

Krueger, William Clement 1971-80, 1981 Dept Head & Prof Rangeland Resources. BS St Mary's College 1964; MS Humboldt State 1967; PhD Utah State 1970

Kulm, LaVerne Duane 1964 Prof Oceanic & Atmospheric Sciences. BA Monmouth College 1959; PhD Oregon State 1965

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Kumaran, Santhosh 1991 Faculty Res Asst Oceanic & Atmospheric Sciences. BTech Univ of Cochin (India) 1983; MS Brandeis 1988

Kwong, Paula Jerome 1995 Instr Pharmacy, BS Oergon State 1986

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Ladd, Linda Darmer 1988 Asst Prof & Metro Area Extn Agent Washington Co. BA Texas-Arlington 1976; BS Portland State 1983, MS 1985; PhD Oregon State 1989

Ladd, Sheldon Lane 1985 Dept Head & Prof Crop & Soil Science. BS Cal State-Fresno 1963; PhD UC-Davis 1966

Lafi, Abd Younia 1992 Res Assoc (Post Doct) Nuclear Engineering. BS Al-Mustansiriyah Univ (Iraq) 1976; MS Baghdad Univ 1978; PhD Oregon State 1991

LaFever, Roy E. 1994 Res Assoc (Post Doct) Chemistry. BS Humboldt State 1989; PhD Washington State 1993

LaFrance, David G. 1986 Assoc Prof History. BS Georgetown 1971; MA de las Americas (Mexico) 1977; MLS Indiana 1981, PhD 1984

Lail, Bernice P. 1991 Program Coordinator Admission & Orientation. BS Cal State-Fresno 1987

Lakowske, Rise 1990 Head Women's Golf Coach Intercollegiate Athletics. BS Oregon State 1977

Landau, Rubin Harold 1974 Prof Physics. BS Cornell 1965; MS Illinois 1966, PhD 1970

Landgren, Chal Gordon 1979 Staff Chair (Interim) & Assoc Prof Washington Co Extn. BS UC-Berkeley 1975; MS Utah State 1977; MBA Portland State 1989

Lang, Jeanette Ann 1973 Assoc Prof Apparel, Interiors, Housing, & Merchandising. BS Washington State 1967; MS Oregon State 1972, PhD 1981

Lang, Karen L. 1988 Asst Prof & Crook Co Extn Agent. BS Oregon State 1966; MS 1991

Langdon, Christopher J. 1985 Asst Prof Fisheries & Wildlife. BS Edinburgh (UK) 1975; MS Wales 1977, PhD 1981

Langford, Charles Clinton 1970 Assoc Prof Sociology. BA Kansas State 1963, MA 1965; PhD Oregon 1971

Lanning, Kevin 1987 Assoc Prof Psychology. MA UC-Berkeley 1978, PhD 1986

Lantis, Glenda Lea 1993 Instr & Gilliam Co Extn Agent. BS Oregon State 1987, MS 1990

Laramee, James Andre 1984 Asst Prof (Sr Res) Ag Chemistry. BS Cal State 1976; MS Purdue 1980, PhD 1980

LaRiviere, Jane A. 1994 Asst Women's Crew Coach Intercollegiate Athletics. BA Calgary (Canada) 1986; MS Oregon 1990

Larsen, Knud Sonderhede 1969 Prof Psychology. BA Cal State-Los Angeles 1964, MA 1966; PhD Brigham Young 1969

Larsen, Lori J. 1994 Faculty Res Asst Extn Sea Grant. BA Northern Colorado 1982

Larson, Ann Lindsay 1980 Instr English Language Institute. BA Scripps 1975; MA Utah 1976

Larson, Erik W. 1980 Assoc Prof Mgmt & Marketing. BA Claremont Mens College 1974; PhD SUNY-Buffalo 1982

Larson, Larry L. 1984 Assoc Prof Rangeland Resources. BS Colorado State 1973, MS 1975, PhD 1978

Larwood, Lillian Louise 1988 Assoc Prof & Lane Co Extn Agent. BS Oregon State 1968; MACE Washington State 1979

Lattin, John Daniel 1955 Prof Entomology. BS Iowa State 1950; MA Kansas 1951; PhD UC-Berkeley 1964

Lau, Tai Kwan Andy 1985 NOAA Computing Coordinator Marine Science Ctr. BS Oregon State 1980, MS 1982

Laver, Murray Lane 1969 Assoc Prof Forest Products. BSA Toronto 1955; PhD Ohio State 1959

Lavery, Mark R. 1994 Faculty Res Asst Forest Products. BA Notre Dame 1991

Lawler, Barry 1978 Sr Instr English. BA Cal State-Long Beach 1968, MA 1971

Lawrence, Jeannine 1984 Faculty Res Asst Biochemistry & Biophysics. BS Oregon State 1969, MS 1972

Lawrence, Robert Dale 1970 Assoc Prof Geosciences. BA Earlham College 1965; PhD Stanford 1968

Lawson, David Cadden 1969 Assoc Prof Public Health. BS West Virginia 1963, MS 1966, EdD 1969

Lawton, Stephen J. 1980 Assoc Prof Finance & Int'l Business. BA Southern Methodist 1973; MBA K.U.L. (Belgium) 1975; MBA Cornell 1975

Layton, Robert Davis 1972 Prof Civil Engineering. BSCE Colorado State 1959; MSCE Kansas State 1965; PhD UC-Berkeley 1970

Leach, Thomas G. 1988 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1986

Leahy, Rita B. 1993 Asst Prof (Sr Res) Civil Engr. BA St Louis Univ 1975; BS South Carolina 1982, ME 1983; PhD Maryland 1989

Leavengood, Scott A. 1994 Asst Prof & Klamath Co Extn Agent. BS Colorado State 1992; MS Oregon State 1994

Leavitt, Ron J. 1988 Sr Instr Speech Communication. BS Arizona 1976, MS 1978

Lederer, Cindy L. 1986 Sr Faculty Res Asst Food Science & Technology. BS Oregon State 1983

Lederman, Norman G. 1985 Assoc Prof Science & Math Education. BS Bradley 1971; MS New York 1973; MS Bradley 1977; PhD Syracuse 1983

Lee, Ben 1991 Asst Prof Electrical & Computer Engineering. BE State Univ of New York; PhD Penn State 1991

Lee, Deanna M. 1992 Faculty Res Asst Radiation Ctr. BA Oregon 1987

Lee, Insook 1992 Res Assoc (Post Doct) Electrical & Computer Engineering. BS Seoul National University 1983; MS Hawaii 1986; PhD UC-Davis 1990

Lee, Janet 1991 Director & Assoc Prof Women's Studies. BA Stirling Univ (Scotland); MA Washington State 1982, PhD 1985

Lee, John Walter 1969 Prof Mathematics. BS Stanford 1964, MS 1966, PhD 1969

Lee, Kenneth K. 1994 Institutional Res Analyst Budgets & Planning. BS Glassboro State 1985; MS Univ of Charleston 1988

Lee, Pei-Yu 1994 Res Assoc (Post Doct) Microbiology. BS National Taiwan Univ (Taiwan) 1987; PhD Oregon State 1993

Lee, Phyllis S. 1991 Director Multicultural Affairs. BS WOSC 1957, MS Portland State 1970, PhD Oregon State 1983

Lee-Smeltzer, Kuang-Hwei 1993 Asst Prof Kerr Library. BA Fu Jen Catholic Univ (Taiwan) 1979; MS Southern Illinois-Carbondale 1982; MS Illinois at Urban-Champaign 1992

Leeson, Theodore A. 1984 Sr Instr English. BA Marquette 1976, BS 1976; MA Virginia 1978, PhD 1984

Lehman, Gila 1991 Faculty Res Asst Fisheries & Wildlife. BS Oregon State 1988

Leibowitz, Flora Lynn 1977 Prof Philosophy. BA SUNY-Stony Brook 1969; MA Johns Hopkins 1975, PhD 1979

Leichti, Robert J. 1986 Assoc Prof Forest Products. BS Illinois 1974, MS 1977; PhD Auburn 1986, MS 1990

Leid, Mark E. 1992 Asst Prof Pharmacy. BS Washington State 1983; PhD Oregon State 1989

Leisy, Douglas Jerald 1992 Res Assoc (Post Doct) Ag Chemistry. BS Oregon 1976; MS Iowa 1980; PhD Oregon State 1986

Leitner, Beate 1992 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Universitate (Germany) 1985; MS LLM (Germany) 1990

Leklem, James Erling 1975 Prof Nutrition & Food Mgmt. BS Wisconsin 1964, MS 1966, PhD 1973

Lenihan, James M. 1992 Res Assoc Botany & Plant Pathology. BS Humboldt State 1978, MS 1985; PhD Oregon State 1993

Leno, Janice R. 1988 Chair & Assoc Prof Josephine Co Extn. BS South Dakota State 1961; MS Oklahoma State 1964

Leon, Daryl Anthony 1994 Faculty Res Asst Radiation Center. BS Oregon State 1994

Leong, Jo-Ann C. 1975 OSU Distinguished Professor, Microbiology. BA UC-Berkeley 1964; PhD UC-San Francisco 1971

Lerner, Michael M. 1990 Asst Prof Chemistry. BA Pennsylvania 1983; PhD UC-Berkeley 1988

Lesser, Virginia M. 1992 Director Survey Research Ctr & Asst Prof (Sr Res) Statistics. BS Lebanon Valley College 1980; MS North Carolina State 1987; PhD North Carolina 1991

Letelier, Richardo M. 1994 Res Assoc (Post Doct) Oceanic & Atmospheric Sciences. BS Universidad de Concencion (Mexico) 1985; PhD Hawaii 1994

Lev, Larry Steven 1984 Assoc Prof Ag & Resource Economics. BA Wesleyan 1975; MS Michigan State 1981, PhD 1984

Levi, Shaul 1977 Prof Oceanic & Atmospheric Sciences. BS San Francisco 1964; MA UC-Berkeley 1966; PhD Washington 1974

Levien, Keith Lester 1985 Assoc Prof Chemical Engineering. BS Iowa State 1970; BS Wisconsin 1975, PhD 1985

Levine, Murray David 1978 Assoc Prof Oceanic & Atmospheric Sciences. BA UC-Irvine 1972; PhD Washington 1979

Levy, Gad 1989 Asst Prof (Sr Res) Oceanic & Atmospheric Sciences. BSc Hebrew 1980; MS Colorado State 1982; PhD Washington 1987

Lewis, Jon R. 1983 Assoc Prof English. BA Hobart & William Smith College 1977; MFA SUNY-Buffalo 1979; PhD UCLA 1983

Lewis, Margaret J. 1972 Asst Prof & Lane Co Extn Agent. BS Utah 1956; MS Oregon State 1972

Lewis, Osia 1991 Asst Football Coach Intercollegiate Athletics. BS Oregon State 1986, MS 1989

Lieuallen, Thomas O. 1992 Instr Support Asst Electrical & Computer Engineering. BS Oregon State 1992

Li, Judith 1993 Asst Prof (Sr Res) Fisheries & Wildlife. BA UC-Berkeley 1966; BA Cal State-San Jose 1967; MS UC-Davis 1977; PhD Oregon State 1990

Lichen, Timothy Robert 1993 Instr Forestry. BA Evergreen State College 1988; MA Eastern Oregon 1993

Lillie, Robert J. 1984 Assoc Prof Geosciences, Oceanic & Atmospheric Sciences. BS Southwestern Louisiana 1975; MS Oregon State 1977; PhD Cornell 1984

Lindsey, Patricia J. 1988 Asst Prof Ag & Resource Economics. BA Cal State-Chico 1975; MA Cal State-Hayward 1983; PhD UC-Davis 1987

Lippoldt, Debra J. 1994 Instr & Extn Nutrition and Foods Specialist Extn Home Ec. BS Florida 1978; MS Cornell 1986

Lisec, Robert 1989 Assoc Prof & Polk Co Extn Agent. BS Peru State College 1971; MS Nebraska 1980

Liss, Evelyn Arlene Engel 1983 Assoc Prof, Communication Specialist, Ag Communications. BA Oregon State 1975, MAIS 1984

Liss, William John 1977 Assoc Prof Fisheries & Wildlife. BS Penn State 1969; MS Oregon State 1974, PhD 1977

List, Peter Charles 1967 Prof Philosophy. BA Michigan State 1961, MA 1964, PhD 1969

Liston, Aaron Irving 1991 Director of Herbarium & Asst Prof Botany & Plant Pathology. BS The Hebrew Univ (Jerusalem) 1982, MS 1984; PhD Claremont 1990

Litz, Vaneska C. 1994 Faculty Res Asst Forest Resources. BA McGill Univ (Canada) 1990; MS Louisiana State 1994

Llewellyn, Ed 1989 Faculty Res Asst Forest Science. BS Cal Inst of Tech 1987

Locke, Kerry A. 1985 Asst Prof & Klamath Co Extn Agent. BA San Francisco State 1971; BS Colorado 1978, MS 1980; PhD OSU 1991

Loeb, Barbara E. 1984 Assoc Prof Art. BA SUNY-Buffalo 1969; MA Texas 1974; PhD Washington 1982

Loeffler, David A. 1992 Asst Prof Military Science. BA Washington 1982

Loeser, John Garret 1988 Assoc Prof Chemistry. BA Princeton 1977; CPGS Cambridge 1978; MA Harvard 1980, PhD 1984

Logendran, Rasaratnam 1989 Assoc Prof Industrial & Mfg Engineering. BS Sri Lanka 1975; MEng Asian Inst of Tech 1980; PhD Oklahoma State 1984

Lomax, Terri Lynn 1987 Assoc Prof Botany & Plant Pathology. BS Washington 1975; MS San Diego State 1978; PhD Stanford 1983

Long, Lynn E. 1988 Staff Chair & Assoc Prof Wasco Co Extn. BS Lewis & Clark 1975; MS Washington State 1977

Long, Roderick J. 1991 Asst Football Coach Intercollegiate Athletics. BS New Mexico 1974

Longerbeam, Susan 1991 Assoc Director for Admin Svcs Student Health Ctr. BA UC-Santa Cruz 1984; MA Antioch Univ 1988

Loo, Deryk T. 1994 Res Assoc (Post Doct) Biochemistry & Biophysics. BS Oregon State 1985, PhD 1991

Loschl, Peter J. 1994 Faculty Res Asst Fisheries & Wildlife. BS Rutgers 1988

Losli, Tyson Bruce 1993 Faculty Res Asst Forestry. BS Oregon State 1993

Loudd, Richard C. 1992 Investigations Officer Affirmative Action.

Love, Connie Sue 1985 Sr Faculty Res Asst Crop & Soil Science. BS Wyoming 1981

Loveland, Patricia M. 1975 Sr Faculty Res Asst Food Science & Technology. BS Washington 1963

Loveland, Walter David 1967 Prof Chemistry, Radiation Ctr. SB MIT 1961; PhD Washington 1966

Lovell, Ronald Paul 1971 Prof English. BA UCLA 1959, MS 1961

Lowrie, Miriam Carlson 1971 Prof & Polk Co Extn Agent. BS North Dakota State 1968, MS 1971

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Luckett, Mary Alison 1995 Faculty Res Asst Forest Science. BS Amer Univ of Paris 1988; MS Humboldt State 1994

Ludy, Robin L 1992 Faculty Res Asst Botany & Plant Pathology. BS Southern Illinois 1985; MS Oregon State 1991

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Lunch, William M. 1984 Assoc Prof Political Science. BA UC-Riverside 1969; MA UC-Berkeley 1970, PhD 1976

Lundin, Fredrick M. 1985 Staff Chair & Asst Prof Clatsop Co Extn. BS Nevada-Reno 1979, MS 1981

Lundy, James R. 1990 Asst Prof Civil Engineering. BS Oregon State 1984, MS 1986; PhD Texas-Austin 1990

Luoma, Daniel L. 1986 Res Assoc Forest Science. BS Oregon 1978; MS OSU 1987, PhD 1988

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Lysne, David Holton 1994 Director, Research Forest College of Forestry. BS Iowa State 1968; MS Oregon State 1980

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MacDonald, Melinda H. 1995 Asst Prof Veterinary Medicine. BS William & Mary 1981; DVM Virginia-Maryland 1985

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Mackay, Richard 1993 Res Assoc (Post Doct) Chemistry. BS UC-Riverside 1988; PhD Iowa State 1993

Macnab, Alexander W. 1979 Assoc Prof & Wasco Co Extn Agent. BS Oregon State 1975, MEd 1983

Maddalozzo, John G.F. 1988 Instr Exercise & Sport Science. BPE British Columbia 1979, BEd 1981; MS Eastern Washington 1988

Madsen, Victor Arviel 1963 Prof Physics. BS Washington 1953, PhD 1961

Magana, Mario Edgardo 1989 Asst Prof Electrical & Computer Engineering. BSEE Iowa State 1979; MSEE Georgia Tech 1980; PhD Purdue 1987

Mahrt, Larry 1972 Prof Oceanic & Atmospheric Sciences. BS Wisconsin 1967, MS 1969, PhD 1972

Maier, Claudia S. 1994 Res Assoc (Post Doct) Ag Chemistry. BS (Equiv) Technical College (Algeria) 1987; Univ of Konstanz (Germany) 1990, PhD 1994

Maksud, Michael George 1980 Dean College of Health & Human Performance & Prof Exercise & Sport Science. BS Illinois 1955; MA Syracuse 1957; PhD Michigan State 1965

Malencik, Dean Anthony 1980 Res Assoc Biochemistry & Biophysics. BS Notre Dame 1965; MS Cal Tech 1968; PhD Oregon State 1972

Mallery, Mike D. 1992 Info Resources Analyst - Budgets & Planning. BS Oregon State 1988, MBA 1991

Mallory-Smith, Carol Ann 1994 Asst Prof Crop & Soil Science. BS Idaho 1986, PhD 1990

Malmanger, Barry 1993 Faculty Res Asst Forest Science. BS Kansas State 1992

Malouf, Robert E. 1991 Director Oregon Sea Grant & Prof Fisheries & Wildlife. BA Montana 1968; MS Oregon State 1970, PhD 1977

Manlove, Anne Kathryn 1982 Asst Prof & Jackson Co Extn Agent. BS North Dakota State 1982; MS Southern Oregon

Mann, Judith 1994 Grant & Script Writer/ Teleconference Producer Communication Media Center. BS New York Univ 1957

Manning, Thomas 1991 Faculty Res Asst Fisheries & Wildlife. BS Calif State 1982; MS Minnesota 1988

Manogue, Corinne Alison 1988 Assoc Prof Physics. BA Mount Holyoke 1977; PhD Texas-Austin 1984

Manoogian-O'Dell, Margaret 1992 Career Advisor Centralized Placement. BA UC-Santa Barbara 1981; MEd Vermont 1984

Mansour, N. S. 1970 Extn Vegetable Crop Specialist, Prof Horticulture. BS Wisconsin-Stevens Point 1956; MS Wisconsin-Madison 1961; PhD Michigan State 1966

Manuelito-Kerkvliet C. 1988 Indian Education Coordinator Multicultural Affairs. BS Wyoming 1976, MS 1988

Maresh, Carolyn R. 1974 Asst to Dean–Administration College of Liberal Arts

Maresh, Thomas Joseph 1967 Dean of Graduate School, Prof of Geography. BA Washington State 1962; PhD Illinois 1968

Marino, Deborah A. 1978 Instr English Language Institute. BA Ohio 1971; MEd Oregon State 1977

Maristany, Alberto G. 1986 Sr Faculty Res Asst Forest Products. BS Universidad Nacionalde Cordoba 1978; MS Idaho 1982; MS Oregon State 1986

Markle, Frank Douglas 1985 Prof Fisheries & Wildlife. BS Cornell 1969; MA William & Mary 1972, PhD 1976

Marks, Andrea S. 1992 Asst Prof Art. BFA Philadelphia College of Art 1983; MFA (Equivalent) Basel School of Design (Switzerland) 1989

Marks, Barbara Jean 1989 Sr Faculty Res Asst Forest Science. BA UC-Santa Barbara 1977, MA 1981

Marler, Bruce A. 1992 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1992

Marlow, Daniel D. 1992 Asst Football Coach Intercollegiate Athletics. BA Luther College 1988

Marshall, Melanie J. 1994 Director of Development 4-H & Youth Development. BA Huron College 1983

Martin, Ruth C. 1987 Faculty Res Asst Horticulture. BS Wisconsin- Madison 1985; MS Oregon State 1989

Martin, Sharon Lee 1980 Academic Adviser College of Business. BS Oregon State 1980, MBA 1981

Martin, Toby J. 1993 Faculty Res Asst Marine Branch Station. BS Oregon State 1992

Martinez, Guadalupe L. 1993 Admissions Officer. BA Oregon State 1989

Martinez, Rebecca Lelack 1982 Asst Director & Instr Financial Aid. BS Oregon State 1981, MEd 1983

Martinez, Madelyn Taberdo 1995 Faculty Res Asst Ag Chemistry. BS Univ of the Philippines 1991

Martins-Filho, Carlos 1992 Asst Prof Economics. BS Fed Univ Cear-Brazil; MA Tennessee 1981, PhD 1992

Marty, Valerie 1992 Faculty Res Asst Crop & Soil Science. BS Winona State 1986

Mary-Lou 1986 Asst Prof Education. BA Massachusetts 1958; MS Oregon State 1982, PhD 1987

Mason, Robert T. 1991 Asst Prof Zoology. BA College of Holy Cross 1982; PhD Texas-Austin 1987

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Matano, Ricardo 1990 Asst Prof (Sr Res) Oceanic & Atmospheric Sciences. Licenciado Univ Nac del Sur, Argentina 1983; MA Princeton 1988, PhD 1990

Mate, Bruce 1972 Prof Fisheries & Wildlife. BS Oregon 1968, PhD 1973

Mathany, Allan Riley 1975 Director & Assoc Prof Office of Budgets & Planning. BS Oregon State 1963, MBA 1971

Mathews, Christopher K. 1978 OSU Distinguished Prof & Dept Chair of Biochemistry & Biophysics. BA Reed 1958; PhD Washington 1962

Matsumoto, Hiroshi 1993 Asst Prof Japanese. BA Kyoto Univ (Japan) 1980; MEd Washington 1988, PhD 1994

Matsumoto, Masakazu 1975 Prof Veterinary Medicine. DVM Hokkaido (Japan) 1964; MS Hawaii 1966; PhD UC-Davis 1972, Dipl ACVM

Mattes, Lisa C. 1990 Director of Development, College of Forestry. BS Idaho 1980

Mattoon, John S. 1991 Asst Prof Veterinary Medicine. BS Oregon State 1981; DVM 1984; Dipl ACVR

Mattson, Donald Eugene 1965 Assoc Prof Veterinary Medicine. BS UC-Davis 1957, DVM 1959; PhD Washington State 1966

Matylonek, John C. 1992 Instr Kerr Library. BA Western Michigan Univ 1988; MA Michigan 1989

Matzke, Mary Ann 1987 Advising Specialist College of Science. BS Oklahoma State 1972; MS Syracuse 1973

Matzke, Gordon Edwin 1977 Assoc Dept Chair Geosciences & Assoc Prof of Geography. BA Valparaiso 1966; MS Oklahoma State 1971; PhD Syracuse 1975

Maughan, Laurel Smith 1972 Assoc Prof & Reference Librarian, Kerr Library. BA Utah State 1968; MLS Pittsburgh 1972, MA 1973; MA Oregon 1980

Maul, Jerry Lee 1986 Asst Prof & Douglas Co Extn Agent. BS Kearney State 1977; MS Oregon State 1980

Maul, John Bentley 1991 Asst Prof Art. BA Oregon State 1977; MFA Syracuse 1980

McAlear, Christopher J. 1995 Instr Forestry. BS Oregon State 1991, MS 1993

McAlexander, James H. 1990 Assoc Prof Mgmt & Marketing. BA Brigham Young 1981; PhD Utah 1987

McAlexander, Kim 1992 Advising Coordinator Home Economics & Education. BS Brigham Young 1990

McCabe, Rachelle 1984 Asst Prof Music. BM Washington 1977; MM Juilliard 1979; DMA Michigan 1984

McCambridge, Mark E. 1994 Director of Business Services. BS Santa Clara 1973

McCann, Kevin Lee 1983 Director, Community & Government Relations. BS Oregon State 1977

McClouskey, Andy D. 1989 Asst Men's Basketball Coach Intercollegiate Athletics. BS Oregon State 1982

McCluskey, Rebecca Lynn 1989 Faculty Res Asst Horticulture. BS Oregon State 1985

McComb, William C. 1987 Prof Forest Science. BS Connecticut 1974, MS 1976; PhD Louisiana State 1979

McCoy, Rodney D. 1990 Assoc Prof & Douglas Co Extn Agent. BS Idaho, MS 1980

McCreight, Keith Russell 1971 Director & Asst Prof Financial Aid. BS Nebraska 1965, MA 1967; PhD Oregon State 1981

McCreight, Richard W. 1982 Faculty Res Asst Forest Science. AA Pasadena City College 1969; BS California 1979; MS Oregon State 1983

McCubbin, Jeffrey Allen 1988 Assoc Prof Exercise & Sport Science. BS East Stroudsburg State 1976; MA Connecticut 1977; PhD Virginia 1983

McCullough, Brenda Gayle 1981 Sr Instr French BA Berea 1963; MA Ohio 1965

McCune, Bruce 1987 Assoc Prof Botany & Plant Pathology. BA Montana-Missoula 1974, MA 1979; PhD Wisconsin-Madison 1982

McDaniel, Mina R. 1983 Prof Food Science & Technology. BS Oregon State 1967, MS 1968; PhD Massachusetts 1974

McDougal, William G. 1981 Prof Civil Engineering, Oceanic & Atmospheric Sciences. BS Humboldt State 1976; MCE Delaware 1977; PhD Oregon State 1981

McDowell, Edward David 1974 Assoc Prof Industrial & Mfg Engineering. BS Ohio State 1965; MS Ohio 1970; PhD Ohio State 1974

McEvoy, Peter Bens 1976 Assoc Prof Entomology. BA Amherst 1971; PhD Cornell 1977

McEwan, Barbara 1990 Asst Prof Education. BEd Univ of Toledo 1969; EdD Oregon State 1987

McFadden, Philip N. 1990 Asst Prof Biochemistry & Biophysics. BS Texas (El Paso) 1979; PhD UCLA 1983

McGinty, John Charles 1984 Instr Educational Opportunities. BS Oregon State 1980, MS 1984

McGrath, Daniel Morton 1983 Assoc Prof & Marion Co Extn Agent. BS UC-Davis 1980, MS 1982

McGuinness, Margaret E. 1994 Asst Prof Pharmacy. Diploma in Pharmacy Central Inst of Tech (New Zealand) 1977; Diploma in Hospital Pharmacy Univ of Sydney (Australia) 1980; PharmD Mercer Univ 1991

McGuire Joseph 1987 Assoc Prof Bioresource Engineering. BChe Georgia Tech 1980; MS North Carolina State 1983, PhD 1987

McInnis, Michael Lindsay 1986 Assoc Prof Rangeland Resources. BS Humboldt State 1973; MS Oregon State 1977, PhD 1985

McIntyre, David Hampton 1989 Assoc Prof Physics. BS Arizona 1980; MS Stanford 1984, PhD 1987

McKee, Walter Arthur 1977 Site Director H.J. Andrews Experimental Forest, Forest Science. BS Maine 1967; PhD Georgia 1971

McLain, Thomas Ernest 1992 Dept Head & Prof Forest Products. BS Colorado State 1969, MS 1973, PhD 1975

McManus, James 1994 Res Assoc Oceanic & Atmopheric Sciences. BS Stockton State College 1986; PhD Oregon State 1992

McMullen, B. Starr 1980 Department Chair (Acting) Prof Economics. BA SUNY-Stony Brook 1973; MA UC-Berkeley 1976, PhD 1979

McNamara, Marion C. 1990 Faculty Res Asst International R & D. BA Arizona State 1977

McNeilan, Ray Arthur 1958-71, 1977 Prof & Multnomah Co Extn Agent. BS New Mexico State 1957; MS Oregon State 1958

McParland, Reginald H. 1968 Res Assoc Ctr for Gene Research. BS Cal Tech 1965; PhD Oregon State 1968

McQuate, Robert S. 1986 Prof & Exec Director Advanced Science & Technology Institute. BS Lebanon Valley 1969; PhD Ohio State 1973

Mead, Clifford S. 1986 Head of Collection Services & Special Collections & Asst Prof, Kerr Library. BA Utica 1975; MLS Syracuse 1977

Mehlenbacher, Shawn Albert 1986 Assoc Prof Horticulture. BS Penn State 1978; PhD Cornell 1982

Meilan, Richard 1994 Asst Prof Forest Science. BS Humboldt State 1983, MS 1985; PhD Iowa State 1990

Meints, Russel H. 1988 Director of Ctr for Gene Research, Prof Botany & Plant Pathology. BA Macalester 1960; MS Kent State 1962, PhD 1965

Mellbye, Mark Edward 1986 Assoc Prof & Linn Co Extn Agent. BS Oregon State 1973, MS 1980

Meneghelli, Luigi P. 1993 Faculty Res Asst Horticulture. BS Ohio State 1993

Menge, Bruce Allan 1976 Prof Zoology. BA Minnesota 1965; PhD Washington 1970

Menino, Alfred R., Jr. 1984 Assoc Prof Animal Sciences. BA Hawaii 1976; MS Washington State 1978, PhD 1981

Meredith, Charlotte 1988 Faculty Res Asst Oceanic & Atmospheric Sciences. BA Lawrence 1967; MS Stanford 1971

Merickel, Mark 1991 Asst Prof Education. BA Cal State-Fresno 1972, MA 1985; PhD Oregon State 1991

Merrifield, Kathryn Jean 1990 Faculty Res Asst Botany & Plant Pathology. BS Oregon State 1973, MS 1990

Merrill, Gary Frederic 1984 Assoc Prof Biochemistry & Biophysics. BA Ohio State 1973; PhD Syracuse 1977

Messersmith, Ann M. 1978 Dept Head & Prof Nutrition & Food Mgmt. BS Muskingum 1959; MS Michigan State 1970; PhD Missouri-Columbia 1975

Meyer, Howard H. 1983 Assoc Prof Animal Sciences. BS Minnesota 1967, MS 1969; PhD UC-Davis 1972

Michael, Robert Emerson 1968 Assoc Prof Exercise & Sport Science. BS North Central College 1962; MS Northern Illinois 1966; EdD Oregon 1972

Michael-Bennett, Carol Lea 1989 Staff Chair (Interim) & Asst Prof Morrow Co Extn. BS Cal Poly-San Louis Obispo 1962, MS 1985

Michel, Frank Clifford 1970 Assoc Prof & Counselor, Counseling Ctr. BS Washington State 1961; MEd Arkansas 1967; EdD Washington State 1974

Middleton, Barbara Anne 1985 Instr Forest Resources, Forestry Education Program. BS East Stroudsburg State College 1976; MS Penn State 1981

Mielke, Eugene A. 1984 Prof Horticulture, Superintendent Mid-Columbia Ag Res & Extn Ctr. BS Cal Poly-San Luis Obispo 1969; MS Mich State 1970, PhD 1974

Miles, Stanley Donovan 1966 Assoc Prof & Extn Economist, Ag & Resource Economics. BS North Dakota State 1965; MS Oregon State 1971

Miller, Anita Nina 1986 Assoc Prof Horticulture. BS Maryland 1981, MS 1983, PhD 1986

Miller, Charles Benedict 1970 Prof Oceanic & Atmospheric Sciences. BA Carleton 1963; PhD Scripps 1969

Miller, Donald A. 1991 Asst Prof Military Science. BS Indiana 1987

Miller, Jeffery Clark 1979 Prof Entomology. BS UC-Davis 1973, PhD 1977

Miller, Jessica Adele 1994 Faculty Res Asst (TBNEP) Extension Program for Counties. BA Montana 1989; MS Washington 1993

Miller, Karen Illman 1984 Res Assoc Biochemistry & Biophysics. BS San Diego State 1969; MA Oregon State 1972, PhD 1980

Miller, Lorraine Theresa 1966 Prof Nutrition & Food Mgmt. BS Wisconsin 1953, MS 1958, PhD 1967

Miller, Mark E. 1993 Faculty Res Asst Forest Engineering. BS Oregon State 1992

Miller, Richard Frank 1977 Prof Rangeland Resources, Eastern Oregon Ag Res Ctr-Union. BS Cal State-Humboldt 1972; MS Oregon State 1974; PhD New Mexico State-Las Cruces 1977

Miller, Robert N. 1987 Assoc Prof Oceanic & Atmospheric Sciences. AB Brown 1971; MSc Cal Tech 1972; PhD UC-Berkeley 1976

Miller, Roger J. 1982 Faculty Res Asst Animal Sciences. BS Wyoming 1971

Miller, Ronald L. 1987 Dept Chair & Prof Mgmt & Marketing. BA Syracuse 1957; MA Pennsylvania 1964, PhD 1969

Miller, Stanley Frank 1973 Prof Ag & Resource Economics. BS Brigham Young 1960; MS Utah State 1962; PhD Oregon State 1965

Miller, Terry L. 1970 Assoc Prof & Extn Specialist Entomology. BA San Diego State 1964, MS 1965; PhD Oregon State 1969

Miller, Thomas H. 1989 Asst Prof Civil Engineering. BS Cornell 1980, ME 1981, PhD 1989

Miller, Tomas A. 1992 Faculty Res Asst Food Science & Technology. BS Washington 1990

Mills, Dallice I. 1976 Prof Botany & Plant Pathology. BS Wisconsin State 1961; MS Syracuse 1964; PhD Michigan State 1969

Mills, Randall R. 1984 Assoc Prof & Umatilla Co Extn Agent. BS Washington State 1977, MS 1979

Milota, Michael R. 1988 Assoc Prof Forest Products. BS Iowa State 1978; MS Oregon State 1981, PhD 1984

Miner, John Ronald 1972 Prof Bioresource Engineering. BS Kansas 1959; MSE Michigan 1960; PhD Kansas State 1967

Ming, Xintian 1993 Faculty Res Asst Microbiology. BS Liaoning Univ (China) 1982; MS Academia Sinica (China) 1985; PhD Oregon State 1993

Minoura, Toshimi 1982 Assoc Prof Computer Science Engineering. BS Tokyo 1968, MS 1970; PhD Stanford 1980

Miranda, Cristobal L. 1977 Asst Prof (Sr Res) Ag Chemistry. DVM Univ Philippines 1959; MS Virginia Tech 1971, PhD 1974

Mirosh, Larry Wayne 1986 Sr Faculty Res Asst Animal Sciences. BS Washington State 1964; MS Oregon State 1966

Mitchell, Alan 1990 Asst Prof Central Oregon Ag Res Ctr. BS Utah State 1983, MS 1984; PhD UC-Riverside 1990

Mitchell, Gregg F. 1979 Assoc Prof & Clackamas Co Extn Agent. BS Arizona 1969, MS 1979

Mitchell, Richard G., Jr. 1980 Assoc Prof Sociology. BA Cal State-Los Angeles 1970; MA USC 1974, PhD 1980

Mix, Alan C. 1984 Assoc Prof Oceanic & Atmospheric Sciences. BS Washington 1978; MS Columbia 1980, MPhil 1984

Mix, Michael Cary 1970 Chair Biology Program & Prof Zoology. BS Washington State 1963; PhD Washington 1970

Moate, Thomas F. 1992 Faculty Res Asst Ag Chemistry. BS Idaho 1991

Mobley, Ronald T. 1968 Superintendent/Chair & Prof North Willamette Res & Extn Ctr. BS Oregon State 1967, MEd 1975

Mohler, Ronald Rutt 1972 Prof Electrical & Computer Engineering. BS Penn State 1956; MS USC 1958; PhD Michigan 1965

Mok, David W. S. 1975 Prof Horticulture. BSc National Taiwan 1967; MSc Guelph 1970; PhD Wisconsin 1975

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Moldenke, Alison Feerick 1980 Res Assoc Entomology. BA Wellesley College 1964; MA Wesleyan 1966; PhD Stanford 1973

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Moore, Daniel Louis 1979 Sr Faculty Res Asst Botany & Plant Pathology. BA Indiana State-Evansville 1976; MS Purdue 1979

Moore, Frank Ludwig 1975 Prof Zoology. BA Wooster 1967; MA Colorado 1974, PhD 1974

Moore, James A. 1979 Prof Extn Bioresource Engineering. BS Cal Poly 1962; MS Arizona 1964; PhD Minnesota 1975

Moore, Kathleen Dean 1975 Chair & Assoc Prof Philosophy. BA Wooster 1969; MA Colorado 1971, PhD 1977

Moore, Larry Wallace 1969 Prof Plant Pathology. BS Idaho 1962, MS 1964; PhD UC-Berkeley 1970

Moore, Marilyn Jean 1976 Instr & Malheur Co Extn Agent. BS Oregon State 1975

Moore, Mark Paul 1990 Assoc Prof Speech Communication. BA Cal State- Fresno 1976; MA Cal State-Hayward 1980; PhD Indiana 1984

Moore, Mike David 1985 Sr Faculty Res Asst Crop & Soil Science. BS Colorado State 1985

Moore, Stanley A., Jr. 1973 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Michigan 1968; MS Florida State 1972

Moore, Sylvia Lee 1966 Director of Univ Marketing, Conferences, & Spec Events, Assoc Prof Exercise & Sport Science. BS Washington 1963; MS Oregon 1966, PhD 1980

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Morandi, Thomas 1986 Prof Art. BS Indiana (Pennsylvania) 1966; MFA Ohio Univ 1971

Morey, Ann 1989 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Minnesota 1985

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Morris, John Edward 1968 Dept Chair & Prof Zoology. BA Stanford 1958; MS Hawaii 1960; PhD UCLA 1966

Morris, Robert James, Jr. 1965 Assoc Prof Geosciences. BS U.S. Military Academy 1954; MGE (Geological) Oklahoma 1961, PhD 1965

Morrissey, Michael Thomas 1990 Director Coastal Oregon Marine Exp Station-Astoria, Assoc Prof Food Science & Technology,. BS Notre Dame 1970; MS Wisconsin 1977; PhD Oregon State 1982

Morrow, Alice Mills 1980 Prof & Extn Family Econ Specialist. BS Massachusetts 1962; MA Michigan State 1965; JD Louisville 1973

Mosbaugh, Dale William 1989 Assoc Prof Ag Chemistry. BA Cincinnati 1975, PhD 1979

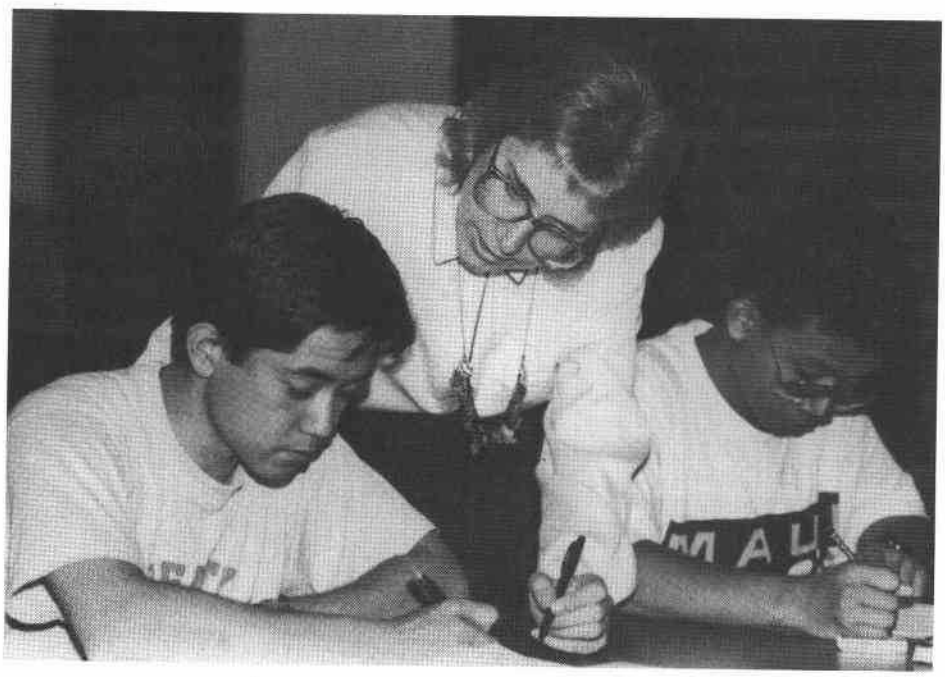
Moser, John Christian 1979 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Dickinson 1971; MS Oregon State 1979

Mosier, Nola Jean 1985 Faculty Res Asst Botany & Plant Pathology. BS Oregon State 1984

Mosley, Alvin Ray 1978 Assoc Prof Crop & Soil Science. BA Kentucky 1965, MS 1968; PhD Oregon State 1972

Moss, Dale Nelson 1977 Prof Crop & Soil Science. BS Ricks College 1956; MS Cornell 1956, PhD 1959

Mosser, Valerie A. 1990 Faculty Res Asst Biochemistry & Biophysics. BS Washington State 1985



Moum, James Norman 1984 Assoc Prof Oceanic & Atmospheric Sciences. BASc Toronto 1978, MASc 1979; PhD British Columbia 1984

Mozzochi, Jeffrey J. 1993 Head Women's Volleyball Coach Intercollegiate Athletics. BA UC-Berkeley 1980, MS 1982

Mpitsos, George J. 1983 Prof (Sr Res) Pharmacy. BS Michigan 1963; PhD Virginia 1969

Muckleston, Keith Way 1964 Prof Geosciences. BA Washington 1960, MA 1963, PhD 1970

Muir, Patricia S. 1987 Dir Undergrad Envin. SC Prog & Assoc Prof Botany & Plant Pathology. BA Montana-Missoula 1975; PhD Wisconsin-Madison 1984

Mukatis, W. Alfred 1980 Assoc Prof Finance & Int'l Business. BS Northwestern 1960; PhD Cal Tech 1965; JD Illinois 1976

Mull, Jeffrey C. 1983 Physician Student Health Ctr. BS Allegheny College 1976; MD Pittsburgh 1980

Mullens, Jo Beth 1992 Faculty Res Asst Water Resources Res. Institute. BS Central Arkansas 1986; MS Southern Illinois 1989

Mulligan, M. Kathleen 1988 Director of Facilities Services. BA Memphis State 1973, MPA 1974

Mullins, Thomas M. 1994 Faculty Res Asst Ag Chemistry. BS Wisconsin 1980

Mulrooney, Donna M. 1988 Faculty Res Asst Crop & Soil Science. BS Oregon State 1987

Mumaw, Catherine R. 1987 Assoc Prof Human Development & Family Sciences. BS Eastern Mennonite 1954; MS Penn State 1958, PhD 1967

Mullen, John W. 1992 Faculty Res Asst Forest Science. BS Evergreen State College 1982; MS Arizona 1986

Munar, Myrna Y. 1988 Assoc Prof Pharmacy. BA Southern California 1981, PharmD 1985

Mundt, Christopher Charles 1985 Assoc Prof Botany & Plant Pathology. BS Cornell 1979; MS Iowa State 1981; PhD North Carolina State 1985

Munro, Alan A. 1962 Prof Art BA George Peabody 1952; MFA Wichita State 1956

Munroe, Dennis A. 1992 Facilities Coordinator of Recreational Sports. BS Walla Walla College 1972; MS U of Dayton 1975

Murphy, Lea Frances 1980 Assoc Prof Mathematics. BA Temple 1976; PhD Carnegie-Mellon 1980

Murray, Thomas F. 1983 Prof Pharmacy. BS North Texas State 1971; PhD Washington 1979

Murtaugh, Paul A. 1992 Asst Prof Statistics. BA Cornell 1976; PhD Washington 1981, 1989

Musser, Gary Loren 1972 Prof Mathematics. BS Michigan 1961, MS 1963; PhD Miami (Florida) 1970

Myers, Carolyn J. 1993 Instr Education. BS Western Oregon 1990, MS 1993

Myrold, David Douglas 1984 Assoc Prof Crop & Soil Science. BS Michigan Technological 1977; MS Washington State 1979; PhD Michigan State 1984

N

Nabelek, John Ludvik 1987 Assoc Prof Oceanic & Atmospheric Sciences. BS MIT 1974, MS 1975, PhD 1984

Nakajima, Setsuko 1990 Sr Instr Japanese. BA Oregon 1982, MA 1984

Nakaue, Harry Sadao 1975 Prof Animal Sciences. BS Cal State Poly 1959; MS Arizona 1963, PhD 1966

Navarrete, Sergio A. 1994 Res Assoc Zoology. MS Univ de Conception (Chile) 1987; PhD Oregon State 1994

Neeley-Brown, Michael Don 1981 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1975, BS 1979

Nelson, David M. 1977 Prof Oceanic & Atmospheric Sciences. AB Dartmouth 1969; PhD Alaska 1975

Nelson, Peter Oliver 1975 Assoc Prof Civil Engineering. BS Cornell 1968, MS 1972, PhD 1975

Nelson, Sheila 1991 Faculty Res Asst Botany & Plant Pathology. BA Kansas State 1961, MS 1963; MS Oregon State 1991

Nesse, Philip E. 1989 Asst Prof & Gilliam Co Extn Agent. BA Minnesota 1971, BS 1978, MS 1986

Nesson, Michael H. 1981 Res Assoc Biochemistry & Biophysics. SB MIT 1960; PhD Cal Tech 1969

Neumann, Catherine M. 1994 Asst Prof Public Health. BS Penn State 1981; PhD Univ of Michigan-Ann Arbor 1989

Neumann, Kristin M. 1993 Special Events Coordinator Intercollegiate Athletics. BS Oregon State 1990

Newberger, Priscilla Anne 1981 Res Assoc Oceanic & Atmospheric Sciences. BS MIT 1964; PhD Oregon State 1981

Newberger, Stuart Marshall 1969 Assoc Prof Mathematics. BEE City College of New York 1960; PhD MIT 1964.

Newcomb, Gene B. 1976 Res Assoc Botany & Plant Pathology. BA UC-Berkeley 1952, PhD 1962

Newell, Teresa K. 1994 Instr Veterinary Medicine. BS Kansas State 1979; DVM Kansas State 1981, PhD 1986

Newton, Michael 1960 Prof Forest Science. BS Vermont 1954; BS Oregon State 1959, MS 1960, PhD 1964

Neyhart, Charles Amos, Jr. 1973 Dept Chair & Prof Acctg & Info Mgmt. BS Penn State 1968, MBA 1969, PhD 1973

Nibler, Joseph William 1967 Prof Chemistry. BS Oregon State 1963; PhD UC-Berkeley 1966

Nickell, Danny L. 1991 Asst Prof & Curry Co Extn Agent. BS Cal State-Fresno 1979, MS 1981

Nielsen, James Frederick 1974 Prof Finance & Int'l Business. BME General Motors Institute 1967; MBA Colorado 1969, DBA 1972

Nielsen, Roger L. 1988 Assoc Prof (Sr Res) Oceanic & Atmospheric Sciences. BS Arizona 1976, MS 1978; PhD Southern Methodist 1983

Nielson, Norma L. 1985 Prof Finance & Int'l Business. BS Northwest Missouri State 1974; MA Pennsylvania 1977, PhD 1979

Niem, Alan Randolph 1970 Assoc Prof Geosciences. BS Antioch 1966; MS Wisconsin 1969, PhD 1971

Niess, Margaret Louise 1980 Prof Science & Math Education. BS Oregon State 1965, MS 1966, PhD 1981

Nishball, Jill Diane 1993 Instr Forestry. BA Calif State 1982; MA Humboldt State 1992

Nishihara, Janet Seiko 1983 Asst Prof, Counselor/ Academic Coordinator Educational Opportunities. BS Oregon State 1978, MEd 1983

Nishiyama, Kazuo 1991 Asst Prof (Sr Res) Biochemistry & Biophysics. BS Kyushu (Japan) 1980, MS 1982, PhD 1989

Nolan, Mary Lee 1973 Prof Geosciences. BA Louisiana State 1957; MA Sam Houston State 1963; MA Texas 1967; PhD Texas A & M 1972

Norris, Logan A. 1961 Dept Head & Prof Forest Science. BS Oregon State 1961, MS 1964, PhD 1970

Nunn, Mary Ellen 1989 Faculty Res Asst Research Office

Nye, Mary Jo 1994 Horning Professor of History. BA Wisconsin 1965, PhD 1969

Nye, Robert A. 1995 Horning Professor of History. BA San Jose State 1964; MA Wisconsin 1965, PhD 1969

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O'Connor, J. Jerry 1970 Asst Dean of Student Svcs College of Liberal Arts. BA Loras 1958; MA Mt St Marys 1963; EdD U of Pacific 1970

O'Dea, Mary E. 1993 Faculty Res Asst Forest Science. BS Cal Poly-San Luis Obispo 1987; MS Oregon State 1992

O'Hare, Thomas J. 1993 Res Assoc (Post Doct) Chemistry. BS Southern Oregon 1986; PhD Washington 1993

O'Malley, Robert 1986 Faculty Res Asst Oceanic & Atmospheric Sciences. BS U of Puget Sound 1979; MS Washington 1981

O'Sullivan, Arthur 1992 Assoc Prof Economics. BS Oregon; PhD Princeton 1981

Obermiller, Frederick William 1974 Prof Extn Ag & Resource Economics. BA Missouri 1966, PhD 1969

Oehler, Nellie Joan 1964, 1988 Asst Prof & Lane Co Extn Agent. BS Oregon State 1964

Oester, Paul Thomas 1980 Assoc Prof & Union Co Extn Agent. BS Oregon State 1972, MS 1977

Ohno, Yuka 1994 Asst Prof Economics. BA Aoyama Cakuin Univ (Japan) 1990; PhD Washington 1993

Ohvall, Richard A. 1976 Dean & Prof Pharmacy. BS Wisconsin 1953, MBA 1959, PhD 1962

Olenchek, Elizabeth G. 1990 Faculty Res Asst College of Pharmacy. BS Wisconsin 1986

Orjala, Jimmy E. 1993 Res Assoc (Post Doct) Pharmacy. Diploma of Pharmacy Swiss Federal Inst of Technology (Switzerland) 1988, PhD 1989

Olsen, Christina L. 1991 Faculty Res Asst Forest Engineering. BS UC-Berkeley 1968

Olsen, Eldon Dale 1976 Assoc Prof Forest Engineering. BS Utah 1966; MS Montana State 1969; PhD Oregon State 1979

Olsen, Jeffery Lynn 1983 Assoc Prof & Yamhill Co Extn Agent. BS Washington State 1981; MS Oregon State 1983

Olsen, Pamela Sue 1987 Assoc Prof & Yamhill Co Extn Agent. BS North Dakota State 1983; MS Minnesota 1987

Olson, Geraldine I. 1975 Assoc Prof Human Development & Family Sciences. BS Wisconsin 1961; MS Cornell 1965; PhD Ohio State 1975

Olson, Jon 1990 Instr Ctr for Writing & Learning. BA Andrews 1977, MA 1979; PhD USC 1988

Olson, Kathryn M. 1987 Assoc Prof Music. BA Pacific Lutheran 1975; MM Westminster Choir College 1984

Olson, Robert Eldon 1968 Assoc Prof (Sr Res) Fisheries & Wildlife. BA Concordia 1962; MS Montana State 1964, PhD 1968

Oriard, Michael Vincent 1976 Prof English. BA Notre Dame 1970; PhD Stanford 1976

Orzech, Miriam W. 1965 Director & Prof, Pre-College Programs Academic Affairs. BA UC-Berkeley 1953; MA Oregon State 1969, PhD 1974

Osborne, Judith L. 1992 Asst Prof Education. BS Missouri 1965; BS Oklahoma State 1968, MS 1969, DEd 1971

Osborne, Owen D. 1971, 1990 Assoc Director Extension Service & Prof Engineering BS Missouri 1966; MS Oklahoma State 1967, PhD 1972

Osheroff, Shiela Keil 1984 Asst Prof & Serials Librarian, Kerr Library. BA U of Puget Sound 1968; MS Washington 1969; EdM Oregon State 1988

Osis, Vicki Jean 1971 Assoc Prof & Extn Marine Ed Specialist, Marine Science Ctr. BS Southwest Missouri State 1965; MA Missouri 1968

Ossiander, Mina 1988 Assoc Prof Mathematics. BA Washington 1978, MS 1982, PhD 1985

Osterlund, Cynthia Marie 1993 Instr & Gilliam Co Extn Agent. BS Oregon State 1972

Ottow, Carolyn M. 1995 Instr Kerr Library. BA Wisconsin-Madison 1988, MA 1991

Oughton, Julie A. 1977 Sr Faculty Res Asst Ag Chemistry. BS Washington State 1970

Oviatt, Robert L. 1985 Fitness Director Intercollegiate Athletics. BS Alabama 1980; ME Mississippi 1982

Owen, Charles K. 1992 Head Women's Crew Coach Intercollegiate Athletics. BS Oregon State 1992

Owen, Sydney John Thomas 1975 Dean College of Engineering, Prof Electrical & Computer Engineering. BSc Nottingham (England) 1957, PhD 1961

Oye, William N. 1994 Coordinator, Student Conduct & Mediation Programs. BA Eastern Illinois 1975; MS Illinois Inst of Tech 1979

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Paasch, Robert Kenneth 1990 Asst Prof Mechanical Engineering. BS Cal Poly 1976; MS UC-Davis 1981; PhD UC-Berkeley 1990

Pacheco, Manuel 1993 Asst Prof Philosophy. BA San Jose State 1964; MA Oregon 1972, PhD 1973

Padman, Laurence 1986 Assoc Prof (Sr Res) Oceanic & Atmospheric Sciences. BSc Sydney 1981, MS 1983, PhD 1986

Page, Cynthia L. 1992 Faculty Res Asst Botany & Plant Pathology. BS New Mexico 1982

Pahl, Janet Maurene 1976 Asst Prof & Clatsop Co Extn Agent. BS Kearney State College 1968; MS Oregon State 1982

Paige, Barbara 1994 Assoc Prof & Acting Director Difference, Power & Discrimination Program. MA UC-Berkeley 1976. PhD 1985

Painter, Kara 1992 Faculty Res Asst EORC-Burns. BS North Dakota 1990; MA South Dakota 1992

Palmer, Terry Lynn 1993 Instr & Multonomah Co Extn Agent. BA Freed Hardeman College 1984

Palmer, Todd S. 1995 Asst Prof Nuclear Engineering. BS Oregon State 1987; MS Michigan 1988, PhD 1993

Pancake, Cherri M. 1992 Assoc Prof Computer Science Engineering. BS Cornell 1971; PhD Auburn Univ 1986

Pancheco, Alexander A. 1993 Faculty Res Asst Forest Science. BS UC-Berkeley 1983

Pandelova, Iovanna G. 1992 Res Assoc (Post Doct) Biochemistry & Biophysics. BS Moscow State Univ 1985, PhD 1991

Paradis, Georges L. 1993 Faculty Res Asst Marine Science Center. BA UC-Santa Barbara 1984

Park, Jae Won 1992 Asst Prof Marine Branch Station. BS Kon-Kuk Univ (Korea) 1980; MS Ohio State 1982: PhD North Carolina State 1985

Parker, Donald F. 1991 Sara Hart Kimball Dean & Prof College of Business. BA Oklahoma 1957; MS George Washington 1966; PhD Cornell 1975

Parker, Jill E. 1991 Asst Prof Veterinary Medicine. BA S Florida 1978; VMD Pennsylvania 1983, Dipl ACVS

Parker, Lisa M. 1981 Faculty Res Asst Environmental Health Sciences Ctr. BS Oregon State 1981

Parks, Harold Raymond 1977 Prof Mathematics. AB Dartmouth 1971; PhD Princeton 1974

Parks, T. Dawn 1987 Faculty Res Asst Microbiology. BS North Carolina State 1980, MS 1985

Parnell, Dale 1992 Prof Education. BA Willamette 1951; MEd Oregon 1956, DEd 1964

Parrott, Keith A. 1976 Head Adviser & Assoc Prof Pharmacy. BS Idaho State 1970; Pharm D Kentucky 1976

Parsons, Gary Lee 1988 Faculty Res Asst Entomology. BS Cal Poly 1975, MS 1978

Paschke, Paul Edward 1969 Assoc Prof Finance & Int'l Business. SB Chicago 1962, MBA 1964; DBA Indiana 1970

Pascoe, Nanci J. 1992 Faculty Res Asst Botany & Plant Pathology. BS UC-Berkeley 1982, MS 1985

Pastorek, Christine 1980 Sr Instr Chemistry. BS San Francisco 1974; PhD Oregon State 1980

Pattee, Heidi Ann 1988 Instr Mechanical Engineering. BS Colorado School of Mines 1979; MS Colorado State 1987

Patterson, Lisa-Marie Jean 1992 Faculty Res Asst Columbia Basin Ag Res Ctr. BS Univ of Western Australia 1990

Patterson, Madge 1984 Catalog Coordinator. BA Northern Illinois University 1970.

Patton, Nephi Monroe 1972 Director Laboratory Animal Resources, Prof Veterinary Medicine. BS Utah State 1958; DVM UC-Davis 1962; PhD Missouri 1972

Paulson, Clayton Arvid 1971 Prof Oceanic & Atmospheric Sciences. BA Augsburg 1960; PhD Washington 1967

Paulson, Donna C. 1986 Instr Budgets & Planning. BA Augustana College 1953

Pawelek, Robert W. 1992 Instr Jefferson Co/Warm Springs. BS Texas A & M 1985

Peachey, Ronald E. 1993 Faculty Res Asst Horticulture. BS Oregon State 1986, MS 1993

Pearson, Erwin G. 1981 Prof Veterinary Medicine. BS Oregon State 1954, MS 1979; DVM Cornell 1958, Dipl ACVIM

Pearson, George Denton 1971 Assoc Dean for Res & Admin College of Science/Director Genetics Prog & Prof Biochemistry & Biophysics. BS Stanford 1964, PhD 1969

Pearson, Margot Noall 1971 Asst Prof (Sr Res) Ag Chemistry. BA Oregon 1963; PhD Stanford 1971

Pease, James Robert 1973 Prof Geosciences; Extn Land Resource Mgmt Specialist. BA Massachusetts 1960, MS 1970, PhD 1972

Peck, Robert W. 1993 Faculty Res Asst Forest Science. BS Minnesota 1984

Peckham, Charles Wesley 1965 Asst Prof & Director of Printing & Mailing Services. BS Cal State Poly-San Luis Obispo 1958

Pedersen, Elaine L. 1991 Assoc Prof Apparel, Interiors, Housing & Merchandising. BA Washington 1973; MA Michigan State 1975; PhD Minnesota 1983

Pederson, Thomas W. 1994 Asst Dir Business Affairs. BS Portland State 1963

Pelletier, Judith Karen 1993 Faculty Res Asst Marine Science Ctr. BA Earlham College 1966

Pelofske, Peter Joseph 1980 Faculty Res Asst North Willamette Res & Extn Ctr. BA Winona State 1969 Evangelical Theological Seminary 1973; MS Oregon State 1977

Peltz, Barbara J. 1992 Coordinator for Marketing - NIRSA. BA Wichita State 1984

Penhallegon, Ross H. 1984 Assoc Prof & Lane Co Extn Agent. BA Washington State 1973, MA 1983

Penn, John Roger 1972 Dean of Students, Prof Education; Director CSSA Graduate Program. BA Colorado State 1967, MS 1968; PhD Oregon State 1972

Penner, Michael Henry 1986 Assoc Prof Food Science & Technology. BS Washington State 1976, MS 1979; PhD UC-Davis 1984

Pereira, Cheryl B. 1987 Pre-Health Advising Specialist College of Science. BS Portland State 1981

Pereira, Clifford Brian 1985 Res Assoc Statistics. BA Reed 1973; MS Portland State 1978; PhD Oregon State 1985

Peremislov, Valery V. 1994 Faculty Res Asst Botany & Plant Pathology. MS Novosibirsk State Univ (Russia) 1983

Perry, David Anthony 1977 Prof Forest Science. BS Florida 1961, MS 1966; MS Montana State 1971,PhD 1974

Perry, Gregory Merrill 1986 Assoc Prof Ag & Resource Economics. BS Utah State 1981, MS 1982; PhD Texas A & M 1986

Perry, Joanne Marion 1979, 1985 Asst Prof & Map Librarian, Kerr Library. BA Arizona 1971; MLS Kentucky 1972; MA Arizona 1976

Peters, Amy 1994 Asst Prof Extn Prog for Oregon Counties. BS UC-Davis 1989; MS Oregon State 1994

Peters, Dawn M. 1988 Assoc Prof Statistics. BA Florida 1979, MA 1984, PhD 1988

Peters, James R. Jr. 1992 Int'l Training Coordinator, Int'l Research & Development. BA Kenyon College 1984; MA Oregon State 1990

Peters, John A. 1985 Instr Crop & Soil Science. BS Notre Dame 1976; MS Oregon State 1993

Petersen, Bent Edvard 1968 Prof Mathematics. BS British Columbia 1964; PhD MIT 1968

Petersen, Gary Paul 1982 Instr College of Engineering. BS Oregon State 1976, MEd 1980

Peterson, Blake E. 1993 Asst Prof Mathematics. BS Utah State 1986; MS Washington State 1990, PhD 1993

Peterson, Gary L. 1980 Res Assoc Biochemistry & Biophysics. BA UC-Irvine 1967; MS Hawaii 1969; PhD Oregon State 1975

Peterson, John 1964 Assoc Prof Civil Engineering. BS South Dakota State 1951; MS Illinois 1959; PhD Wisconsin 1964

Peterson, Richard B. 1985 Assoc Prof Mechanical Engineering. BS Nevada-Reno 1979; MS UC-Berkeley 1982, PhD 1984

Pettibone, Gerald E. 1990 Head Football Coach Intercollegiate Athletics. BA Oklahoma 1963

Phelps, James J. 1994 Faculty Res Asst Gene Research & Biotechnology. BS Utah 1985

Philbrick, David Alan 1983 Assoc Prof Mechanical Engineering. AB Brown 1970; PhD UC-Berkeley 1976

Picton, Jeffrey S. 1988 Faculty Res Asst Veterinary Medicine. BS Utah State 1979; BS Oregon State 1988

Picton, Rebecca A. 1993 Faculty Res Asst Veterinary Medicine. BA Chadron State College 1979; MS Oregon State 1993

Piel, Eric William 1992 Instr Int'l Education. BA Pomona College 1989

Piepmeier, Edward Harman 1966 Prof Chemistry. BS Northwestern 1960; PhD Illinois 1966

Piepmeier, Karen S. 1994 Int'l Coop Ed Coordinator Career Planning & Placement. BA Northwestern 1960; MA Oregon State 1983, PhD 1987

Pierce, Donald Alan 1966 Prof Statistics. BS Oklahoma State 1961, MS 1962, PhD 1965

Pierce, Stephen D. 1994 Acting Res Assoc (Post Doct) College of Oceanic & Atmospheric Sciences. BS Tufts 1984; MS Mass Inst of Technology 1987

Pilkerton, Stephan J. 1988 Sr Faculty Res Asst Forest Engineering. BS Humbolt State 1985

Pilliod, Elizabeth A. 1989 Asst Prof Art. BA Michigan 1976, MBA 1978, MA 1983, PhD 1989

Pillsbury, Ronald Dale 1967 Assoc Prof (Sr Res) Oceanic & Atmospheric Sciences. BA Chico State 1961; MA UC-Davis 1964; PhD Oregon State 1972

Pinto, Fabrizio 1995 Instr Physics, MS Univ of Rome (Italy) 1984; PhD Brigham Young 1989

Pirelli, Gene Jack 1979 Staff Chair & Assoc Prof Polk Co Extn. BS Oregon State 1977, MS 1979

Pisias, Nicklas G. 1981 Assoc Dean & Prof Oceanic & Atmospheric Sciences. BA San Francisco State 1970; MS Oregon State 1974; PhD Rhode Island 1978

Plant, Thomas Kent 1978 Assoc Prof Electrical & Computer Engineering. BS Kansas State 1968; MS Iowa State 1969; PhD Illinois 1975

Platt, Barbara T. 1988 Instr Exercise & Sport Science. BA Stanford 1977

Platzer, Karl Roland 1994 Res Assoc Physics. Vordiplome Univ of Konstanz (Germany) 1983; Diplome 1986

Poet, Steven E. 1993 Res Assoc Marine Branch Station. BS Southampton College 1980; MS Oregon State 1985, DVM 1993, PhD 1993

Pohjanpelto, Petri Juha 1989 Asst Prof Mathematics. MS Technology, Finland 1983; PhD Minnesota 1989

Polasky, Stephen 1993 Assoc Prof Ag & Resource Economics. BA Williams College 1979; PhD Michigan 1986

Polensek, Helen M. 1968 Instr English Language Institute. BA Houghton 1960; MA Michigan 1963

Poole, Arthur Parker 1975 Staff Chair (Interim) & Prof Coos Co Extn. BA Northeastern 1965; BS Oregon State 1969, MAgr 1971

Poole, Susan Hufford 1986 Instr Pharmacy, Staff Pharmacist, Student Health Ctr. BS Oregon State 1969

Potter, Joanne 1974 Faculty Res Asst Environmental Health Sciences Ctr

Potter, Nathan 1989 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Antioch 1985

Potter, Sandra J. W. 1977 Asst Prof (Sr Res) Zoology. BA Minnesota 1960; MAT College St. Thomas 1963; MS Arizona 1967, PhD 1970

Potts, Willard Charles 1959 Prof English. BA Washington 1952, MA 1956, PhD 1969

Powell, Rachel 1982 Instr English Language Institute. BA Trinity 1971; MA Oregon State 1981

Powelson, Mary Lois 1972 Prof Botany & Plant Pathology. BS Bloomsburg State College 1963; MS Michigan State 1965; PhD Oregon State 1972

Prahl, Fredrick George 1984 Assoc Prof Oceanic & Atmospheric Sciences. BS Kentucky 1975; MS Washington 1978, PhD 1982

Pratt, Clara Collette 1978 Barbara Emily Knudson Chair in Family Policy & Prof Human Development & Family Sciences. BA Gonzaga 1970; MS Oregon 1972, PhD 1974

Pratt, David Sheldon 1981 Faculty Res Asst, Health Physicist Radiation Ctr. BS Oregon State 1977, MS 1993

Pribyl, Larry LeRoy 1982 Sr Instr, Distance Learning Coord/Prod-Director, Communication Media Ctr. BA Nebraska 1978

Price, Steven F., Sr. 1983 Faculty Res Asst Horticulture. BS Oregon State 1975; MS UC-Davis 1983

Primak, Paul 1991 Int'l Exchange Coordinator, Int'l Education. BA Southern Oregon 1977

Pritchett, Harold Duane 1957 Prof Civil Engineering. BS Oregon State 1957, MS 1961; DE Stanford 1965

Proebsting, William Martin 1980 Prof Horticulture. BS Washington 1973; PhD Cornell 1978

Prows, Susan L. 1993 Asst Prof Public Health. BA LaVerne College 1973; MPH Tulane 1975; PhD Massachusetts-Amherst 1993

Prucha, Mary Strickroth 1994 Coordinator (Acting) of Graduate Services - Graduate School.

Pscheidt, Jay William 1988 Assoc Prof & Extn Plant Pathologist. BS Wisconsin-Madison 1980, MS 1983, PhD 1985

Pugh, Tim Francis II 1992 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Cal Poly 1987

Punches, John W. 1994 Asst Prof & Douglas Co Extn Agent. BS Michigan Tech 1990; MS Virginia Tech 1993

Putnam, Melodie L. 1993 Instr & Extn Plant Clinic Diagnostician. BS Oregon State 1981; MS Wisconsin-Madison 1984

Pyles, Marvin R. 1974-75, 1981 Assoc Prof Forest Enginering. BS Oregon State 1973, MS 1975; PhD UC-Berkeley 1981

Q

Quan, Thomas J. 1994 Project Administrator Internat'l Res & Development. BA Unversity of IFE (Nigeria) & Universite de Grenoble III (France) 1984; MPA American Univ 1992

Quebbeman, Bryon McKay 1993 Faculty Res Asst Crop & Soil Science. BS Oregon State 1987

Quinn, Michael Jay 1989 Assoc Prof Computer Science Engineering. BS Gonzaga 1977; MS Wisconsin-Madison 1979; PhD Washington State 1983

R

Raab, Carolyn Ann 1975 Prof & Extn Food & Nutrition Specialist. BS UC-Berkeley 1970; MS UC-Davis 1972; PhD VPI & State 1984

Rackham, Robert L. 1971 Staff Chair & Prof Benton Co Extn. BS Wyoming 1956, MS 1958

Radosevich, Steven R. 1984 Prof Forest Science. BS Washington State 1968; MS Oregon State 1971, PhD 1972

Ragnow, Gary D. 1993 Sr Development Officer, Charitable Estate Planning. BA Nebraska 1964, JD 1968

Ragulsky, Frank A. 1982 Asst Prof, Director of Student Media. BS Southern Colorado 1968; MA Adams State College 1969; EdD Oklahoma State 1979

Rainbolt, Michael T. 1986 Academic Adviser College of Business. BS Washington State 1966; MS Washington State 1968

Rainey, Rochelle C. 1991 Faculty Res Asst & Deputy Project Coordinator Int'l Research & Development. BA Oregon State 1983

Rajagopal, Indira 1989 Res Assoc Biochemistry & Biophysics. BS Delhi Univ (India) 1976, MS 1978; PhD Indian Institute of Science 1985

Rambo, Neil L. 1991 Inst & Washington Co Extn Agent. BS Calif Poly-San Luis Obispo 1978

Ramsey, Fred Lawrence 1966 Prof Statistics. BA Oregon 1961; MS Iowa State 1963, PhD 1964

Ramsey, Jeffry Lee 1994 Asst Prof Philosophy. BA Kansas State 1984; MA Chicago 1986, PhD 1990

Randhawa, Sabah U. 1983 Department Head (Acting) & Assoc Prof Industrial & Mfg Engineering. BS Eng & Tech (Pakistan) 1976; MS Oregon State 1980; PhD Arizona State 1983

Ratchford, Paulette L. 1990 Asst Director & Inst Univ Housing & Dining Services. BA California Lutheran 1970; MA Cal State-Northridge 1985

Rathja, Roy C. 1977 Asst Dean, Head Adviser College of Engineering, Assoc Prof Electrical & Computer Engineering. BS UC-Davis 1969; MS Oregon State 1973, PhD 1980

Ratzlaff, Jane Lavonne 1993 Director of Development, College of Engineering. BS Eastern Montana 1983

Rauser, Connie J. 1993 Asst Trainer Intercollegiate Athletics. BS Montana State 1986; MS Arizona 1989

Ream, Walt 1988 Assoc Prof Ag Chemistry. BA Vanderbilt 1975; PhD UC-Berkeley 1980

Reardon, Amy J. 1987 Instr Exchange Coordinator, Office of Int'l Education. BA Lake Erie College 1984

Rector, Michael L. 1992 Faculty Res Asst Forestry. BA Cal State-Chico 1979; MS Oregon State 1988

Reddy, Ashok P. 1992 Res Assoc (Post Doct) Food Science & Technology. BS Osmania Univ (India) 1978; MS Michigan Tech U 1983; PhD Wayne State 1991

Reddy, Satish C. 1993 Asst Prof Mathematics. BS British Columbia 1987; PhD MIT 1991

Reeb, James E. 1994 Asst Prof & Extn Specialist Extn Forestry. BS Oklahoma State 1976, MS 1979; PhD Texas A & M 1991

Reed, A. Scott 1990 Asst Dean College of Forestry, Extn Forestry Program Ldr. BS Michigan State 1975, MS 1977; PhD Minnesota 1987

Reed, Donald James 1962 OSU Distinguished Professor, Biochemistry & Biophysics, Director Environmental Health Sciences Ctr. BS College of Idaho 1953; MS Oregon State 1955, PhD 1957

Reed, Gary L. 1985 Superintendent & Prof Hermiston Ag Research & Extn Ctr. BS Iowa State 1965, MS 1970, PhD 1974

Reed, Marjorie A. 1989 Asst Prof Psychology. BS Montana State 1978; MS Oregon 1980, PhD 1984

Reed, Mark D. 1987 Instr, Media Specialist, Forestry Media Ctr. BS Oregon 1979; MA Cal State-Long Beach 1987

Reed, Ralph L. 1978 Res Assoc Ag Chemistry. BS Peru State 1971; PhD Oklahoma State 1976

Reichstein, Zivony 1993 Asst Prof Mathematics. BS Cal Tech 1983; MS Harvard 1985; PhD Harvard 1988

Reid, William H. 1994 Asst Prof & Extn 4-H Youth Development Specialist. BS Virginia Polytech 1971, MS 1975; PhD Purdue 1981

Reiley, Ralph Hunt, Jr. 1976 Asst Prof, Asst Registrar. AB Muhlenberg College 1953; JD Rutgers 1957

Reinert, David Edward 1979 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1972

Reischman, David E. 1994 Head Men's Crew Coach Intercollegiate Athletics. BS Gonzaga 1987

Reistad, Gordon M. 1970 Dept Head & Prof Mechanical Engineering. BS Montana State 1966; MS Wisconsin 1967, PhD 1970

Reiter, Maryanne L. 1992 Faculty Res Asst Forest Engineering. BS Minesota-Central Office 1986; MS Oregon State 1990

Reiter, William F. Jr. 1993 Boeing Prof Mechanical Engineering. BS Rutgers; MS Auburn 1966; PhD North Carolina State 1973

Reitz, Alan E. 1990 Faculty Res Asst Mid-Columbia Ag Res & Extn Ctr. BS Colorado State 1989

Rellergert, Mary H. 1990 Instr & Program Assistant Foresty. BS Missouri 1979; MS Idaho 1986

Reno, Paul W. 1990 Assoc Prof Microbiology, Coastal Oregon Marine Exp Station. BS Fairleigh Dickinson 1966; MS Florida 1971; PhD Guelph 1976

Rettig, Raymond Bruce 1968 Prof Ag & Resource Economics. BA Montana 1962; MA Northwestern 1964; PhD Washington 1969

Reyes, Jose N. 1987 Assoc Prof Nuclear Engineering. BS Florida 1978; MS Maryland 1984, PhD 1986

Reynolds, Janice D. 1990 Asst Prof & Baker Co Extn Agent. BS Oregon State 1988, MAg 1990

Rhinhart, Karl E. L. 1984 Faculty Res Asst Columbia Basin Ag Res Ctr. BS Oregon State 1984

Rice, Laura Prindle 1979 Assoc Prof English. BA Ohio State 1968; MA Kent State 1971; PhD Washington 1976

Rice, Marvin R. 1994 Prof Naval Science. BA Cal State-Chico 1967; MS Salve Regina Univ 1990; MA US Naval War College 1990

Richards, Jeffrey R. 1990 Instr Spanish. BS Miami-Oxford 1982; MA New Mexico 1984

Richards, Leslie N. 1989 Asst Prof Human Development & Family Sciences. BA Stanford 1975; MA Stanford 1976; PhD Cornell 1987

Richardson, Carla Francis 1994 Faculty Res Asst Zoology. BS Louisiana State 1993

Richardson, Daryl Garnet 1973 Prof Horticulture. BS Minnesota 1969, MS 1971, PhD 1973

Richman, James G. 1978 Assoc Prof Oceanic & Atmospheric Sciences. BSc Harvey Mudd 1971; PhD MIT-Woods Hole Oceanographic Institution 1977

Rickson, Fred Richard 1971 Prof Botany & Plant Pathology. BA Cal State-Northridge 1961; MA Miami (Ohio) 1963; PhD UC-Berkeley 1966

Ridlington, James W. 1983 Res Assoc Nutrition & Food Mgmt. BS Washington State 1966; PhD Purdue 1971

Ridlington, Sandra S. 1973 Faculty Res Asst Sea Grant Communications. BA Washington State 1966; MA Purdue 1969, PhD 1979

Riebold, Thomas W. 1981 Director & Prof Veterinary Teaching Hospital. BS Illinois 1970, DVM 1972, Dipl ACVA

Riedl, Helmut 1985 Assoc Prof Entomology, Mid-Columbia Ag Res & Extn Ctr. Dipl Ing Vienna (Austria) 1968; PhD Michigan State 1973

Riggs, William Wilson 1989 Lake Co Interim Staff Chair & Asst Prof. BS New Mexico State 1987, MS 1989

Righetti, Timothy Lynn 1983 Prof Horticulture. BS Maryland 1976; PhD UC-Davis 1980

Riley, Jack Etter 1972 Assoc Prof, Assistant to Athletic Director Intercollegiate Athletics. BA Linfield 1960; MA Oregon State 1971

Rinehold, John William 1977 Sr Faculty Res Asst Ag Chemistry. BS Oregon State 1974, MS 1987

Ringle, John Clayton 1966 Assoc Dean Graduate School, Prof Nuclear Engineering. BS Case Inst of Tech 1957, MS 1959; PhD UC-Berkeley 1964

Ripple, William John 1981 Assoc Prof (Sr Res) Forest Resources, Director ERSAL. BS South Dakota State 1974; MS Idaho 1978; PhD Oregon State 1984

Ritchie, Nancy J. 1992 Faculty Res Asst. BS Michigan State 1992

Rivin, Carol Jane 1984 Assoc Prof Botany & Plant Pathology. AB UC-Santa Cruz 1973; PhD Washington 1978

Robbins, Barbara L. 1990 Faculty Res Asst Ctr for Gene Research. BS Oregon 1987, MS 1988

Robbins, Scott H. 1979 Sr Faculty Res Asst Horticulture. BS Oregon State 1975, MS 1981

Robbins, William Grover 1971 Prof History. BS Western Connecticut State 1962; MA Oregon 1965, PhD 1969

Roberts, Leilani Anne 1989 Sr Inst Philosophy. BA Oregon 1985, PhD 1989

Roberts, Mary Ann 1991 Faculty Res Asst Pharmacy. BS Wisconsin 1970; MS Oregon State 1977

Roberts, Paul Alfred 1966 Prof Zoology. BS Illinois 1953, MD 1957; PhD Chicago 1962

Roberts, Sheila Marie 1983 Instr, Counselor, Financial Aid Coordinator Educational Opportunities. BS Southern Oregon State 1975

Robinson, Alan Hadley 1966 Dept Head & Prof Nuclear Engineering. BS Swarthmore 1956; MS Stanford 1961, PhD 1965

Robinson, Anja Marjatta 1970 Sr Faculty Res Asst Fisheries & Wildlife. BS Turku (Finland) 1963, MS 1965

Robinson, Ann E. 1982 Instr & Asst Director, Student Media Communications. BA Oregon 1977; MAIS Oregon State 1987

Robinson, David Miller 1976 OSU Distinguished Prof Oregon Professor of English, Director American Studies Program. BA Texas, 1970; MTS Harvard Divinity School 1972; MA Wisconsin 1973, PhD 1976

Robson, Robert Oscar 1984 Assoc Prof Mathematics. BA Hampshire College 1975; MS Stanford 1977, PhD 1981

Rochefort, Willie E. 1993 Assoc Prof Chemical Engineering. BS Massachusetts 1976; MS Northwestern Univ 1978; PhD UC-San Diego 1986

Rogers, Ann 1994 Faculty Res Asst Research Forest. BA Oregon State 1975, MAIS 1989

Rogers, Forrest B. 1994 Corporate Relations Officer Development Office. BA Pacific Univ 1973; MS Willamette 1990

Rogers, William Reinhold 1980 Assoc Prof & Lincoln Co Extn Agent. BA Virginia 1967; MA Stanford 1968, MA 1969; BS Oregon State 1978, MS 1980

Rogerson, Patricia A. 1980 Academic Adviser, College of Liberal Arts. BS Oregon State 1956

Rogge, David F. 1982 Assoc Prof Civil Engineering. BS Nebraska 1970, MS 1971; PhD Texas 1981

Rohovec, John S. 1977 Prof (Sr Res) Microbiology. BS New Mexico 1967; PhD Oregon State 1975

Rohrmann, George F. 1976 Prof Ag Chemistry. BA Washington 1965, PhD 1970

Root, Dennis Charles 1973 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1972

Root, Jon Richard 1969 Director & Prof Communication Media Ctr. BA Kansas State 1966; MS Oregon 1972, PhD 1978

Rorrer, Gregory L. 1989 Asst Prof Chemical Engineering. BS Michigan 1983; MS Michigan State 1985, PhD 1989

Rosato, Suzanne C. 1991 Faculty Res Asst Crop & Soil Science. BS Florida 1979, MAg 1990

Rose, Debra Jean 1985 Assoc Prof Exercise & Sport Science. BEd Melbourne 1976; MS Oregon 1982; PhD Penn State 1985

Rose, Jeffrey Alan 1988 Faculty Res Asst Eastern Oregon Ag Res Ctr-Squaw Butte. BA Yankton College 1983; MS Oregon State 1989

Rose, Robert W. 1986 Assoc Prof Forest Science. BA Connecticut 1968; MS Vermont 1975; PhD North Carolina State 1980

Roseberg, Richard J. 1990 Asst Prof Crop & Soil Science, Southern Oregon Exp Station. BS Oregon State 1980, MS 1985; PhD Ohio State 1988

Rosenberg, Valerie Palmer 1991 Int'l Student Advisor Int'l Education. BA Oregon 1980

Rosenberger, Nancy R. 1988 Assoc Prof Anthropology. BA Wooster 1970; MA Michigan 1978, PhD 1984

Rosenfeld, Charles Louis 1974 Assoc Prof Geosciences. BA Pittsburgh 1968, MA 1971, PhD 1973

Ross, Andrew 1989 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Stockton State 1986

Ross, Dana N.R. 1994 Faculty Res Asst Entomology. BS Oregon State 1994

Ross, Darrell W. 1990 Asst Prof Forest Science. BS Penn State 1981; MS Oregon State 1985; PhD Georgia 1990

Rossi, Marion O., Jr. 1994 Instr Speech Communication. BA Viterbo College 1987; MA Oregon 1992

Rossignol, Annette MacKay 1988 Dept Chair & Prof, Public Health. BA Wellesley 1974; MS Harvard 1977, ScD 1981

Rossignol, Philippe Albert 1988 Assoc Prof Entomology. BSc Ottawa 1971; MSc Toronto 1975, PhD 1978

Robbins, Barbara L. 1990 Faculty Res Asst Ctr for Gene Research. BS Oregon 1987, MS 1988

Roth, Barbara 1994 Asst Prof Anthropology. BS Colorado-Boulder 1980, MA 1984; PhD Arizona 1989

Rottmann, William H. 1990 Res Assoc Forest Science. BS SUNY-Stony Brook 1978; PhD UC-Berkeley 1985

Roush, Mary Lynn 1988 Asst Prof (Sr Res) Forest Science. 2 eme Grenoble (France) 1977; BH Colorado State 1979; MS UC-Davis 1984; PhD Oregon State 1988

Rowe, Sonnia E. 1987 Sr Faculty Res Asst Crop & Soil Science. BS Oregon State 1987

Rowney, Thomas R. 1992 Head Women's Soccer Coach Intercollegiate Athletics. BA Univ of Essex (England) 1978; MS Central Washington 1985

Ruben, John Alex 1975 Prof Zoology. BS Humboldt State 1968; MA UC-Berkeley, PhD 1975

Rubert, Steven C. 1991 Asst Prof History. BA Cal State-Northridge 1972; MA UC-Santa Barbara 1977; PhD UCLA 1990

Rubico, Sonia M. 1993 Res Assoc (Post Doct) Food Sci & Tech. BS Philipines-Los Banos 1978, MS 1983; PhD Oregon State 1993

Rudd, Walter G. 1985 Dept Chair & Textronix Professor, Computer Science Engineering. BA Rice 1966, PhD 1969

Ruddenklau, Helle Goddik 1992 Faculty Res Asst Crop & Soil Science. BS Oregon State 1990

Rudolph, Jacquelyn T. 1990 Director of Human Resources. BA Oregon State 1976, MBA 1980

Rugh, William Daniel 1979 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1979

Rulofson, Franz C. 1988 Staff Chair & Asst Prof Deschutes Co Extn. BS Cal Poly-San Luis Obispo 1985; MS Nevada-Reno 1987

Runyon, John R. 1991 Faculty Res Asst Forest Science. BS Oregon State 1983, MS 1988

Ruscoe, Jeffrey L. 1985 Instr Public Health. BS Oregon State 1983, MEd 1987

Rusk, Cherie R. 1989 Instr & Catalog Librarian, Kerr Library. BA Vermont 1984; MLS S Conn State 1989

Russell, Brian W. 1993 Faculty Res Asst Botany & Plant Pathology. BS Oregon State 1987

Russell, Douglas E. 1979 Sr Faculty Res Asst Art. BS James Madison 1974

Russell, Judith S. 1989 Counselor/Coordinator Educational Opportunities. BS Oregon State 1988

Russell, Rebecca Lynn Quant 1982 Sr Faculty Res Asst Ag Chemistry. BS Oregon State 1978, MS 1983

Russell, Sterling Arthur 1963 Sr Instr Botany & Plant Pathology. BS Utah State 1960, MS 1962

Rutledge, James A. 1994 Program Leader & Professor 4-H Youth Development. BS Wisconsin-Madison 1969, MS 1975; EdD Oklahoma State 1989

Ryan, Lawrence J. 1988 Dept Chair & Assoc Prof Psychology. BS Duke 1974; MA Colorado, 1978, PhD 1981

Rykbost, Kenneth A. 1987 Superintendent & Prof Klamath Exp Station. BSc Cornell 1963, MS 1966; PhD Oregon State 1973

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Sadac, Teobaldo G. 1993 Instr Naval Science.

Saeed, Mohammad 1987 Faculty Res Asst Entomology. BS Agric (Pakistan) 1970, MS 1974

Sahr, Kevin M. 1993 Faculty Res Asst Geosciences. BA Bucknell Univ 1984

Sahr, Robert Clifford 1984 Assoc Prof Political Science. BA Washington State 1966; MDiv Yale 1970; PhD MIT 1979

Sakuma, Kazuhiko 1987 Res Assoc Chemistry. BS Gifu Pharmaceutical (Japan) 1978, MS 1980, PhD 1984

Saletore, Vikram 1990 Asst Prof Computer Science Engineering. BE Birla Institute of Tech & Sci 1975; MS UC-Berkeley 1977; PhD Illinois at Urbana-Champaign 1990

Samborski, Adam 1992 Res Assoc (Post Doct) Chemistry. MS Warsaw Univ (Poland) 1983; PhD Polish Academy of Sciences 1991

Sampson, David 1990 Asst Prof Fisheries & Wildlife Coastal Oregon Marine Exp Station. BA Stanford 1975; MS Washington 1984; PhD London 1989

Samuel, Scott R. 1985 Sr Instr Russian. BA Oregon State 1974; MS Stanford 1976, PhD 1983

Samuels, Linda Marie 1975 Pharmacist Student Health Ctr. BS Oregon State 1972

Sandago, Michael Paul 1984 Head Trainer Intercollegiate Athletics. BS Washington State 1979; MA Ohio State 1983

Sandeno, Joan M. 1989 Faculty Res Asst Crop & Soil Science. BS Oregon State 1961

Sanders, Brian J. 1993 Asst Trainer (Football) Intercollegiate Athletics. BS Idaho 1984, MS 1990

Sanders, Raymond S. 1967 Chief Clinical Psychologist Student Health Ctr. AB Chico State 1960; MA Michigan State 1965, PhD 1967

Sanderson, Rebecca A. 1994 Director & Asst Prof Counseling & Testing Ctr. BSE NE Missouri State 1973, MA 1975; PhD Missouri 1988

Sandine, William E. 1958 OSU Distinguished Prof, Prof Microbiology. BS Iowa State 1950; MS North Carolina State 1955; PhD Oregon State 1958

Sandor, Marjorie Jeanne 1994 Asst Prof English. BA UC-Davis 1980; MFA Iowa 1984

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Sarasohn, Lisa Tunick 1978 Assoc Prof History. BA New York 1971; MA UCLA 1973, PhD 1979

Saunders, Julie S. 1986 Head Swimming Coach Intercollegiate Athletics. BS Oregon State 1986

Savage, Thomas F. 1982 Prof Animal Sciences. AB Suffolk University 1966; PhD University of New Hampshire 1972

Savonen, Carol A. 1988 Assoc Prof Science Comm Spec Ag Comm. BA Lewis & Clark 1975; MS Vermont 1986

Sawer, Barbara J. 1974 Prof & Extn 4-H Specialist. BS Kansas State 1962; MS Montana State 1967; EdD British Columbia 1972

Sawyer, Teresa 1990 Faculty Res Asst Botany & Plant Pathology. BS Oregon State 1990

Sawyer, Thomas E. 1992 Faculty Res Asst Crop & Soil Science. BS Colby College 1987; MS Maine 1990

Sayavedra-soto, Luis Alberto 1990 Res Assoc Botany & Plant Pathology. BS Universidad Nacional Autonoma de Mexico 1975; MS Oregon State 1981, PhD 1985

Sayre, Henry M. 1984 Prof Art. BS Stanford 1971; PhD Washington 1976

Scanlan, Michael J. 1981 Assoc Prof Philosophy. BA Goddard 1973; MA Emory Univ 1981; PhD SUNY Buffalo 1982

Scanlan, Richard Anthony 1964 Dean of Research, Prof Food Science & Technology. BS Cornell 1960, MS 1962; PhD Oregon State 1967

Schaake, Jay E. 1990 Asst Football Coach Intercollegiate Athletics. BS Wyoming 1979, MS 1986

Schafer, Daniel W. 1982 Assoc Prof Statistics. BA Pomona 1978; MS Chicago 1981, PhD 1982

Schaff, Barbara M. 1992 OSSHE French Study Resident Director - France. BS Oregon State 1981; MA Portland State 1992

Schaffer, Kay F. 1994 Dean College of Liberal Arts, Prof of Psychology. BS Ohio State 1965; MS Wisconsin 1967; PhD Ohio State 1972

Schauber, Ann C. 1984 Staff Chair & Assoc Prof Yamhill Co Extn. BS Delaware 1972; MS Michigan State 1977

Schauber, Eric M. 1994 Faculty Res Asst Fisheries & Wildlife. BS Massachusetts 1992

Schaup, Henry W. 1973 Prof Biochemistry & Biophysics. BA Steubenville 1964; PhD Colorado State 1969

Scheuermann, Thomas A. 1990 Director & Inst Univ Housing & Dining Services. BS Ohio State 1976, MA 1979; JD Catholic Univ of America 1985

Schimerlik, Michael I. 1978 Prof Biochemistry & Biophysics. BS Penn State; PhD Wisconsin 1975

Schlax, Michael G. 1988 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS UC-Berkeley 1978; MS British Columbia 1984; MS Stanford 1986

Schmidt, Thomas A. 1993 Asst Prof Mathematics. BS New College of USF; PhD Pennsylvania 1989

Schmisseur, Wilson Edward 1971 Assoc Prof Ag & Resource Economics. BS Illinois 1964; MS Purdue 1966, PhD 1973

Schmitt, Molly 1988 Faculty Res Asst Botany & Plant Pathology. BS Illinois 1977

Schmotzer, Wayne B. 1982 Assoc Prof Veterinary Medicine. BS Michigan State 1981, DVM 1981

Shneider, William G. 1992 Faculty Res Asst Forest Products. BS Maryland 1987; MS Virginia Tech 1991

Scholz, Todd V. 1989 Faculty Res Asst Civil Engineering. BS Oregon State 1987, MS 1989

Schori, Richard Miles 1978 Prof Mathematics. BS Kenyon College 1960; MS Iowa 1962, PhD 1964

Schowalter, Timothy Duane 1981 Prof Entomology. BA Wichita State 1974; MS New Mexico State 1976; PhD Georgia 1979

Schreier, Richard 1991 Asst Prof Electrical & Computer Engineering. BS Univ of Toronto 1983, MS 1985, PhD 1991

Schreiner, Anthony E. 1992 Res Assoc Marine Science Ctr. BS Massachusetts 1978; MS Hawaii 1983; PhD Scripps 1989

Schroeder, Warren Lee 1967 Chief Business Officer & Prof Civil Engineering. BSCE Washington State 1962, MSCE 1963; PhD Colorado 1967

Schroth, Gary P. 1991 Res Assoc (Post Doct) Biochemistry & Biophysics. BS UC-Davis 1985, PhD 1990

Schrumpf, Barry J. 1972 Assoc Prof, Seed Cert Asst Crop & Soil Science. BA Willamette 1966; MS Oregon State 1968, PhD 1975

Schultz, Robert James 1962 Prof Civil Engineering. BSCE Worcester Poly 1955, MSCE 1960

Schuyler, Michael W. 1981 Prof Chemistry. BS UC-Berkeley 1966; PhD Indiana 1970

Schwartz, Robert B. 1978 Dept Chair & Prof English. BA Tulane 1972; PhD Virginia 1978

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Scott, Gregory Gould 1987 Information Services Mgr, College of Business. BS Oregon State 1974

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Seely, Justus Frandsen 1969 Dept Chair & Prof Statistics. BS Utah State 1963, MS 1965; PhD Iowa State 1969

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Selker, John S. 1991 Asst Prof Bioresource Engineering. BA Reed College 1981; MS Cornell Univ 1989, PhD 1990

Sellers, Allen L. 1977 Instr English Language Institute. BA Antioch 1967; MA Oregon 1976

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Senephansiri, Phouvong 1993 Faculty Res Asst Microbiology. BS Iowa State 1993

Sessions, Julian 1983 Prof Forest Engineering. BS UCLA 1966; MS Cal State 1968; MS Washington 1971; PhD Oregon State 1978

Seville, Mary Alice 1983 Assoc Prof Acctg & Info Mgmt. BA Southern Methodist 1964; MA Illinois 1968; BBA Alaska 1975; PhD Illinois 1983

Sexton, Jay 1990 Sr Faculty Res Asst Forest Science. BS SUNY-Syracuse 1980

Seymour, Thomas A. 1992 Res Assoc Marine Branch Station. BS Illinois at Urbana-Champaign 1984; MS Wisconsin-Madison 1985; PhD Florida 1990

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Shafabakhsh, Farhad 1985 Instr Crop & Soil Science. BS Cal State-Fresno 1981; MS Oregon State 1985

Shane, Barry 1971 Assoc Prof Mgmt & Marketing. BS Northeastern 1965, MBA 1967; PhD Massachusetts 1973

Sharp, Robyn R. 1994 Assoc Athl Director/Sr Women's Administrator Intercollegiate Athletics. BS Oregon State 1984

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Shaughnessy, Margaret M. 1991 Faculty Res Asst Fisheries & Wildlife. BA Saint Olaf College 1984; MS Minnesota 1989

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Shelby, Bo 1976 Prof Forest Resources. BA Colorado 1970; MS Wisconsin 1973; PhD Colorado 1976

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Shepard, W. Bruce 1972 Director, Undergrad Academic Programs Academic Affairs & Assoc Prof Political Science. AB UC-Riverside 1969, MA 1970, PhD 1972

Sherr, Barry 1990 Assoc Prof Oceanic & Atmospheric Sciences. BA Kansas Wesleyan Univ 1965; MA Kansas 1970; PhD Georgia 1977

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Shibley, Gilbert Almon 1993 Instr & Clackamas Co Extn Foresty Asst. BA Lewis & Clark 1960; MA Oregon 1962, PhD 1964

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Shindler, Bruce A. 1991 Asst Prof (Sr Res) Forest Resources. BA Cal State-Long Beach 1968; MS Oregon State 1990; PhD Oregon State 1993

Shirazi, Abbas Mohammad 1993 Faculty Res Asst Botany. BS Arkansas 1979; MS Oregon State 1988, PhD 1992

Shock, Clinton C. 1984 Prof Crop & Soil Science, Superintendent Malheur Exp Station. BA UC-Berkeley 1966; MS UC-Davis 1972, PhD 1982

Shor, Molly H. 1992 Asst Prof Electrical & Computer Engineering. BA Harvard 1984; MS Illinois-Urbana 1987, PhD 1992

Shriver, Ann L. 1986 Instr Ag & Resource Economics. BS Georgetown 1979; MS Michigan State 1984

Shula, Robert 1990 Faculty Res Asst Forest Science. BS Oregon State 1976

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Siddens, Beth K. 1982 Faculty Res Asst Fisheries & Wildlife. BS Oregon State 1982

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Simko, Ben Christopher 1978 Assoc Prof & Malheur Co Extn Agent. BS UC-Davis 1974, MS 1977

Simoneit, Bernd Rolf Tatsuo 1981 Prof Oceanic & Atmospheric Sciences. BS Rhode Island 1960; PhD Bristol (England) 1976

Simonsen, John 1990 Asst Prof Forest Products. BS Missouri 1969; PhD Colorado 1975

Simonson, William 1974 Assoc Prof Pharmacy. BS Rhode Island 1970; PharmD Michigan 1974

Simpkins, John III 1977 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Worcester Poly 1972

Simpson, Norma L. 1992 Asst Prof & Jefferson Co/ Warm Springs Extn Agent. BA Idaho State 1957; MS Wisconsin 1969; EdD Oklahoma State 1974

Simas, David 1992 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Michigan 1982, MS 1987

Sivaramakrishnan, S. 1994 Res Assoc Electrical & Computer Engineering. BS University of Madras (India) 1970; MS Annamalai Univ (India) 1972; PhD Univ of Bombay (India) 1980

Skarda, Steven M. 1993 Faculty Res Asst Bioresource Engineering. BS Oregon State 1986; MS Southern Illinois 1988

Skaugset, Arne E. 1988 Instr Forest Engineering. BS Colorado State 1977; MS Oregon State 1980

Skehen, Joseph W. 1990 Director of Charitable Estate Planning, Development Office. BS Illinois 1960, MS 1963

Skilling, Douglas Edward 1981 Sr Faculty Res Asst Veterinary Medicine. BS Cal Poly-San Luis Obispo 1970

Skjelstad, Lucy Sperlin 1977 Director Horner Museum, Asst Prof Anthropology. BA Cal State-Chico 1971, MA 1979

Skubinna, Tamelyn K. 1983 Assoc Prof & Benton Co Extn Agent. BA Pacific Lutheran 1974, MA 1981

Skuzeski, James M. 1993 Res Assoc (Post Doct) Ag Chemistry. BS Oregon State 1977; PhD Minnesota 1982

Slabaugh, Mary B. 1981 Asst Prof (Sr Res) Biochemistry & Biophysics. BA Michigan State 1972; PhD Wisconsin 1981

Sleight, Arthur W. 1989 Milton Harris Professor of Materials Science (Chair) & Prof Chemistry. BA Hamilton College 1960; PhD Connecticut 1963

Slocombe, Edmond N. 1986 Assoc Prof & Lane Co Extn Agent. BS Kansas State 1963; MEd Colorado State 1975

Smart, William H. 1984 Assoc Prof, Int'l Student Adviser Int'l Education. BA North Carolina 1965; MA Illinois 1967, PhD 1974

Smiley, Richard W. 1985 Prof & Superintendent Columbia Basin Ag Res Ctr. BS Cal Poly-San Luis Obispo 1965; MS Washington State 1969, PhD, 1972

Smiley, William 1987 Assoc Prof & Wasco Co Extn Agent. BA Washington State 1964; MA Kansas 1972; MS Wyoming 1984

Smith, Alvin W. 1980 Prof Veterinary Medicine. BA Washington State 1955, DVM 1957; MS Texas A & M 1967; PhD UC-Berkeley 1975, Dipl ACLAM

Smith, Bradford B. 1983 Assoc Prof Veterinary Medicine. BA Pomona College 1974; MS San Diego State 1976; BS Illinois-Urbana 1980, DVM 1982, PhD 1983

Smith, Charles Edward 1961 Prof Mechanical Engineering. BS ME Oregon State 1955; MS ME Rensselaer Poly 1958; PhD Stanford 1962

Smith, Courtland L. 1969 Prof Anthropology. BME Rennselaer Poly 1961; PhD Arizona 1968

Smith, David Clayton 1982 Sr Faculty Res Asst Horticulture. BS Oregon State 1982

Smith, Frederick John 1964 Prof Ag & Resource Economics. BS Cornell 1958; MS Oklahoma State 1962; PhD North Carolina State 1964

Smith, Gerald A. 1989 Asst Prof Exercise & Sport Science. BS Walla Walla 1972; MS Illinois 1985; PhD Penn State 1989

Smith, J.A. Sandy 1992 Faculty Res Asst Seed Certification. BS Arizona State 1978; MBA Oregon State 1990

Smith, Kamela S. 1995 Asst Dir of Student Media. BA Oregon State 1992

Smith, Orrin E. 1980 Community Resource Education Program Leader & Prof Horticulture. BS Oregon State 1957; PhD UC-Davis 1962

Smith, Robert Lloyd 1962 Prof Oceanic & Atmospheric Sciences. BA Reed 1957; MA Oregon 1959; PhD Oregon State 1964

Smith, Stephen T. 1989 Associate Director Alumni Relations. BS Ohio State 1969; MA Ohio University 1983

Smith, Wendy 1993 Life-Skills Coordinator Intercollegiate Athletics. BS Oregon State 1993

Smith, Yvonne Loretta 1990 Counselor/Instructor Educational Opportunities. BS Oregon State 1985, MEd 1992

Smyth, William D. 1992 Asst Prof (Sr Res) Oceanic & Atmospheric Sciences. BS Univ of Alberta (Canada) 1984; MS Univ of Toronto (Canada) 1986, PhD 1990

Snelling, John C. 1991 Faculty Res Asst Fisheries & Wildlife. BA Claremont 1964; MA Wisconsin 1967

Snow-Harter, Christine M. 1990 Asst Prof Exercise & Sport Science. BA Washington 1973; MS Arizona 1975; PhD Oregon 1985

Snyder, Stanley P. 1985 Director Veterinary Diagnostic Laboratory, Prof Veterinary Medicine. DVM Colorado State 1966, MS 1967; PhD UC-Davis 1971, Dipl ACVD

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Soleau, Carol Jean 1977 Assoc Prof Exercise & Sport Science. BA Stanford 1972, MA 1974

Sollins, Phillip 1977 Prof (Sr Res) Forest Science. BA Swarthmore 1966; MA North Carolina 1970; PhD Tennessee 1972

Sollitt, Charles Kevin 1972 Assoc Prof Civil Engineering. BSCE Washington 1966, MSCE 1968; PhD MIT 1972

Solmon, Donald Clyde 1977 Prof Mathematics. BS Southeastern Massachusetts 1967; MS Oregon State 1973, PhD 1974

Somero, George Nicholls 1991 Wayne & Gladys Valley Professor of Marine Biology, Chair Marine Biology, Prof Zoology. BA Carleton College 1962; PhD Stanford 1967

Somoza, Carmen 1994 Asst Prof Chemistry. BS National Univ of Buenos Aires 1980, PhD 1989

Sonn, Anita E. 1981 Faculty Res Asst Veterinary Medicine. BS Oregon State 1980

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Sorte, Bruce M. 1990 Asst Director Ag Exp Station. BS Oregon State 1973

Sorte, Joanne Marion 1990 Director of Child Development Ctr, Instr Human Dev & Family Studies. BA Oregon State 1974, MS 1990

Souliotis, George A. 1994 Res Assoc (Post Doct) Chemistry. BS Univ of Athens (Greece) 1986; PhD Michigan State 1992

Southers, Chris Lee 1986 Assoc Prof Education & Human Development & Family Sciences. BS Central Missouri State 1967; MEd Missouri 1970; PhD Missouri-Columbia 1981

Sowa, Michael J. 1994 Asst Prof Naval Science. BS Oregon State 1989

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Spatafora, Joseph W. 1995 Asst Prof Botany & Plant Pathology. BS Louisiana Tech Univ 1986; PhD Louisiana State 1992

Spee, Rene 1988 Assoc Prof Electrical & Computer Engineering. Vodiplom Stuttgart (West Germany) 1981; MS Oregon State 1984, PhD 1988

Spencer, Todd North 1990 Asst Football Coach Intercollegiate Athletics. BA Pacific Luteran 1979; MA Linfield 1981

Spencer, William G. 1986 Acting Instr Public Health

Spiegelberg, Scott F. 1990 Assoc Director for Public Relations Intercollegiate Athletics/Beaver Club Director. BS Oregon State 1976

Spiewak, Slawomir Antoni 1994 Asst Prof Mechanical Engr. MS Warsaw Tech Univ (Poland) 1970, PhD 1980

Spikes, Kristine E. 1974 Instr & Asst to Director Int'l Education. BA Oregon State 1973

Splean, Scott 1990 Faculty Res Asst Forest Science. AS Coleman College 1972; BA Hawaii 1988; MS Oregon State 1990

Spotts, Robert Allen 1978 Prof Botany & Plant Pathology, Mid-Columbia Ag Res & Extn Ctr. BS Colorado State 1967, MS 1969; PhD Penn State 1974

Sproul, Christine 1985 Assoc Dir & Asst Prof Int'l Education. BA Brigham Young 1968, MA 1972; MS Utah 1982, PhD 1982

Spycher, Gody 1979 Sr Faculty Res Asst Forest Science. BS Eth Zurich 1970; MS Oregon State 1972, PhD 1978

Sredl, Henry John 1983 Prof Education. BS New York 1956, MA 1960; PhD Ohio State 1964

Stafford, Coral Lynn 1993 Faculty Res Asst Marine Brance Station. BS Idaho 1974

Stafford, Susan G. 1979 Prof Forest Science. BS SUNY-Syracuse 1974, MS 1975, PhD 1979

Stander, Mary Alice 1982 Coordinator of Student Athlete Svcs Academic Affairs. BS Oregon State 1968, EdM 1983

Standley, David R. 1972 Sr Faculty Res Asst Civil Engineering. BS Oregon State 1968, MS 1972

Stang, Jack Rudolf 1976 Assoc Prof Horticulture. BS Clemson 1968, MS 1970; PhD Oregon State 1976

Stangel, David E. 1995 Faculty Res Asst Bioresource Engineering. BS Oregon State 1992, MS 1994

Stanger, Charles Earl, Jr. 1973 Prof Malheur Exp Station. BS Utah State 1961; MS Oregon State 1971, PhD 1972

Stanik, Valerie 1984 Faculty Res Asst Biochemistry & Biophysics. BS UC-Davis 1976; MS Oregon State 1980

Stankey, George H. 1989 Prof (Sr Res) Forest Resources. BS Oregon State 1965, MS 1966; PhD Michigan State 1970

Stanley, John D. 1991 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Michigan State 1978, MS 1982

Starnes, Charles Edwin 1976 Assoc Prof Sociology. AB Indiana 1961, MS 1964, PhD 1973

Stauth, David D. 1984 Inst & News Writer, News & Communication Services. BS Northern Illinois 1974

Steffanson, Patricia Ann 1988 Asst Prof & Umatilla Co Extn Agent. BS Idaho 1981; MA Norwich University 1992

Stehr, Christian Peter 1974 Assoc Prof German & Linguistics. Dip Philos Wurzburg (West Germany) 1967; MA Oregon 1971, PhD 1975

Steidl, Robert J. 1995 Res Assoc (Post Doct) Fisheries & Wildlife. BS Rutgers 1986; MS Massachusetts 1990; PhD Oregon State 1994

Steinbrecher, Rosa E. 1988 Instr English Language Institute. BA Western Kentucky 1983, MA 1988

Stennett, Douglass J. 1974 Prof Pharmacy. PharmD, UC-San Francisco 1970

Stephen, William Procuronoff 1953 Prof Entomology. BSA Manitoba 1948; PhD Kansas 1952

Stephens, Kay K. 1993 Instr English. BS Valley City State 1967; MA Fort Hays State 1987

Stephenson, Garry Owen 1986 Asst Prof & Linn Co Extn Agent. BA Arizona State 1977; MAIS Oregon State 1980, MAg 1988

Steppan, Linda G. 1976 Sr Faculty Res Asst Ag Chemistry. BS Oregon State 1967

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Stetz, Albert William 1976 Prof Physics. BS Penn State 1962; PhD UC-Berkeley 1968

Stevens, Billie K. 1976 Chair & Assoc Prof Hood River Co Extn. BS Idaho 1973; MEd Oregon State 1982

Stevens, Donald G. 1988 Faculty Res Asst Microbiology. BS Wisconsin State College 1963; MS Oregon State 1977

Stevens, Joe Bruce 1966 Prof Ag & Resource Economics. BS Colorado State 1958; MS Purdue 1963; PhD Oregon State 1965

Steward, Judith A. 1988 Staff Chair & Instr Lake Co Extn. BS Oregon State 1988

Stewart, Kenneth R. 1993 Faculty Res Asst Food Science & Technology. BS Oregon State 1974

Stiehl, Ruth E. 1972 Prof Education. AB Northwest Nazarene 1966; MEd Eastern Washington State 1969; EdD Idaho 1972

Stillinger, Ronald Robert 1994 Faculty Res Asst Kerr Library. BS Oregon State 1971

Stoffregen, Paul 1993 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1992

Stoltz, Michael A. 1979 Prof & Umatilla Co Extn Agent. BS Montana State 1962; MS Oregon State 1975

Stone, Jeffrey Kyle 1987 Asst Prof (Sr Res) Botany & Plant Pathology. BA Antioch 1976; PhD Oregon 1986

Stopherd, Murray J. 1987 Assoc Director & Instr Univ Housing & Dining Services. BA Central Washington 1970; BA Washington State 1976

Stormshak, Fredrick 1968 Prof Animal Sciences. BS Washington State 1959, MS 1960; PhD Wisconsin 1965

Stoynoff, Stephen J. 1990 Asst Prof Education. BS Willamette 1976; MA Portland State 1984; PhD Oregon 1990

Strandberg, Lee R. 1975 Prof Pharmacy. BS North Dakota State 1968, MS 1970; PhD Colorado 1975

Strauss, Steven H. 1985 Assoc Prof Forest Science. BS Cornell 1978; MS Yale 1980; PhD UC-Berkeley 1985

Strik, Bernadine C. 1987 Assoc Prof Horticulture. BS Victoria (Canada) 1983; PhD Guelph (Canada) 1987

Stringham, Ben 1993 Faculty Res Asst Forest Engineering. BS Oregon State 1985

Strohmeyer, Elizabeth Ann 1979 Asst to Director of MU & Educational Activities. BS Illinois 1975, MS 1976

Strub, Paul Ted 1984 Assoc Prof Oceanic & Atmospheric Sciences. BS UC-Davis 1969, MS 1979, PhD 1983

Stuart, Moira 1988 Instr Coordinator Memorial Union Recreation. BS SUNY- Cortland 1986, MS 1988

Sugar, David 1981 Asst Prof Southern Oregon Ag Exp Station. BA Michigan 1971; BS Washington 1975; MS UC-Davis 1977; PhD Oregon State 1989

Sugawara, Alan Iwao 1970 Prof Human Development & Family Sciences. BA Hawaii 1961; MDiv Chicago Theological Seminary 1965; MA Michigan State 1967; PhD Oregon State 1971

Sullivan, David 1981 Assoc Prof Acctg & Info Mgmt. BBA Oregon 1974; MS Carnegie-Mellon 1980, PhD 1981

Summers, Michael R. 1990 Asst Football Coach Intercollegiate Athletics. BS Georgetown 1978

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Sun, Le 1992 Res Assoc (Post Doct) Biochemistry & Biophysics. BS NW Inst of Light Industry (China) 1982; MS Academic of Light Industry (China) 1985; PhD Tsinghua Univ (China) 1989

Sunderland, Paul Lewis 1987 Staff Chair & Assoc Prof Multnomah Co Extn. BS Washington State 1973; MS Idaho 1980

Suttie, Sandra Jean 1969 Assoc Prof Exercise & Sport Science. BS Colorado 1960; MS Oregon 1962; PhD USC 1970

Suzuki, Warren Noboru 1974 Assoc Prof Education. BS Illinois 1963, MEd 1964, EdD 1968

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Swaney, Sherri Lynn 1992 Faculty Res Asst Microbiology. BA Western State College of Colorado 1992

Swanson, Lloyd Vernon 1971 Prof Dairy Physiology. BS Minnesota 1960, MS 1967; PhD Michigan State 1970

Swanson, Stephen P. 1993 Newswriter News & Communication. BS Cal-State Pamona 1983

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Sylvia, Gilbert R. 1988 Asst Prof Ag & Resource Economics. BS Mass 1973; MS Colorado State 1981; PhD Rhode Island 1989

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Tanaka, John Augustus 1985 Assoc Prof Ag & Resource Economics. BS Oregon State 1978, MS 1982; PhD Utah State 1985

Tang, Shuang 1992 Res Assoc (Post Doct) Chemistry. BS Univ of Science & Technology of China 1982; PhD SUNY-Stony Brook 1988

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Terrio, Deone M. 1990 Asst Prof Political Science. BA SUNY-Albany 1979; MA Cornell Univ 1984, PhD 1990

Tesch, Steven D. 1981 Assoc Prof Forest Science. BS Montana 1973, MS 1975, PhD 1981

Thiegles, Bart A. 1990 Assoc Dean for Research, College of Forestry. BS Southern Illinois 1963; MF Yale School of Forestry 1964; M Phil Yale Univ 1967, PhD 1968

Thies, Richard William 1968 Assoc Dean College of Science, Prof Chemistry. BS Michigan 1963; PhD Wisconsin 1967

Thomann, Enrique A. 1987 Assoc Prof Mathematics. BS Nat Cordoba 1977; PhD UC-Berkeley 1985

Thomas, Claire Daines 1992 Instr Statistics. BS Oregon State 1974; MBA Oregon 1977

Thomas, David Reginald 1967 Prof Statistics. BS Oregon State 1960, MS 1962; PhD Iowa State 1965

Thomas, Thomas Darrah 1971 OSU Distinguished Professor Chemistry. BS Haverford 1954; PhD UC-Berkeley 1957

Thomas, William Howard 1994 Employment Specialist Affirmative Action. BA Sonoma State 1980, MA 1982; PhD Oregon State 1992

Thomas-Bradley, Carin 1993 Res Assoc (Post Doct) Biochemistry & Biophysics. BA Humboldt State 1983, MA 1986; PhD Univ of Nevada-Reno 1991

Thompson, Chris S. 1994 Faculty Res Asst College of Engineering. BS Oregon State 1991

Thompson, Georgine Emmily 1969 Psychiatric Social Worker, Student Health Service. BS Michigan State 1964; MSW, Illinois 1969, ACSW 1972, RCSW 1978

Thompson, James 1989 Assoc Prof & Extn Sheep Specialist. BS Wisconsin 1969; MS Missouri-Columbia 1977, PhD 1980

Thompson, Virginia 1987 Faculty Res Asst & Manager 4-H Conference Ctr. BS Oregon State 1980; MS Southern Oregon 1983

Thomson, Patricia Alice 1966 Sr Faculty Res Asst Ag Chemistry. BS Oregon State 1964

Tibbs, Larry W. 1989 Asst Prof & Klamath Co Extn Agent. BS Cal Poly-San Luis Obispo 1981, MS 1988

Tibbs, Teena M. 1991 Faculty Res Asst Eastern Oregon Ag Res Ctr-Union. BS Eastern Oregon State College 1991

Tice, Ezra M. 1988 Asst Prof Bioresource Engineering. BS Penn State 1973, MS 1983; PhD Auburn Univ 1988

Tiedeman, Gary Howard 1970 Prof Sociology. BA Colorado 1961; MA Stanford, 1963; PhD North Carolina 1968

Tiger, George Wayne 1966 Asst Prof & Jackson Co Extn Agent. BS Oregon State 1966; MS Oregon 1977

Tilles, E. Doris 1968 Head of Inter-Library Loans & Assoc Prof, Kerr Library. AB UC-Berkeley 1956, MLS 1957; MA Stanford 1976

Tillson, Gregory Davis 1970 Prof, Coordinator Extn Family Community Leadership Project. BS Oregon State 1970, MS 1977

Timm, Karen I. 1983 Assoc Prof Veterinary Medicine. BS UC-Davis 1966, DVM 1968, PhD 1985 Dipl Aclam

Tinsley, Ian James 1957 Dept Chair & Prof Ag Chemistry. BSc Sydney (Australia) 1950; MS Oregon State 1955, PhD 1958

Todd, Rodney Morris 1974 Assoc Prof & Klamath Co Extn Agent. BS UC-Davis 1968; MS Colorado State 1970

Topielec, Richard R. 1991 Asst Prof & Union Co Extn Agent. BS Southern Illinois 1971; MA Governor's State Univ 1975; MAg Oregon State 1984

Torne, Erwin Gerhard 1993 Faculty Res Asst Radiation Ctr. BS Univ of Frankfort (Germany) 1989

Torres, J. Antonio 1985 Assoc Prof Food Science & Technology. BS Catholic Technology 1973; ScM MIT 1978, PhD 1984

Torset, Clay William 1984 Asst Director & Instr Admission & Orientation. BS Oregon State 1981, MBA 1990

Toumadje, Arazdordi 1984 Asst Prof (Sr Res) Biochemistry & Biophysics. BS Shiraz (Iran); MS UC-Davis 1980; PhD Oregon State 1984

Tower, Terrill Kay 1989 Asst Director & Instr Univ Housing & Dining Services. BA Oregon State 1969, MEd 1980

Traeger, Mary Lee 1994 Instr Human Development & Family Sciences. BS Oregon State 1994

Trehu, Anne Martine 1987 Assoc Prof Oceanic & Atmospheric Sciences. BA Princeton 1975; PhD MIT 1982

Tremblay, Carol Hofton 1990 Asst Prof Kerr Library & Economics. BA UC-Irvine 1976; MA Washington State 1982, PhD 1984

Tremblay, Victor 1990 Dept Chair & Prof Economics. BA UCLA; MA Cal State-Northridge; PhD Washington State 1983

Trempy, Janine E. 1989 Asst Prof Microbiology. BS Kansas State 1980; PhD Texas 1985

Tricker, Raymond 1989 Assoc Prof Public Health. DiPED Cambridge 1966; DiPPE Carnegie, Leeds 1968; MA Oregon 1978, PhD 1985

Tripathi, Vijai Kumar 1974 Dept. Head & Prof Electrical & Computer Engineering. BSc Agra 1958; MSc Tech Allahabad 1961; MSEE Michigan 1964, PhD 1968

Trow, Clifford Wayne 1965 Prof History. AB Kansas Wesleyan 1951; MA Colorado 1958, PhD 1966

Trow, Jo Anne J. 1965 Vice Provost for Student Affairs, Prof Education. BA Denison 1953; MA Indiana 1956; PhD Michigan State 1965

Trowbridge, Cynthia D. 1993 Res Assoc Zoology. BA Cornell 1982; PhD Oregon State 1989

Truitt, Robert Eugene 1989 Sr Faculty Res Asst Forest Resources. BS Oregon State 1984

Tsay, Hwang-Nan 1993 Faculty Res Asst Oceanic & Atmospheric Sciences. BA Feng-Chia Univ (Taiwan) 1986; Oregon State 1992

Tuck, Brian Victor 1984 Assoc Prof & Assoc Peace Corps Director/Ag Business. BS Cal State-Fresno 1974, MA Oregon State 1984

Tucker, Gabriel F. 1990 Res Assoc Forest Science. BS Oregon State 1976; MS Washington 1983; PhD Cornell 1990

Turnbull, Richard L. 1991 Asst Director University Dining Services. BA Washington State 1970, 1974

Turner, Harley A. 1974 Assoc Prof Animal Sciences, Eastern Oregon Ag Res Ctr-Union. BS Oregon State 1964, MS 1965; PhD Missouri 1974

Turpin, Jim 1985 Asst Prof, Head Gymnastics Coach Intercollegiate Athletics. BS San Jose State 1971

U

Ulaeto, David O. 1992 Asst Prof (Sr Res) Microbiology. BS Univ of Birmingham (United Kingdom) 1984, PhD 1988

Ullman, David G. 1984 Prof Mechanical Engineering. BS Cincinnati 1968, MS 1970; PhD Ohio State 1978

Ungerer, Carl A. 1977 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Cal Poly 1973; MS Oregon State 1981

Unsworth, Michael H. 1992 Director Ctr for Analysis of Environmental Change, Prof Oceanic & Atmospheric Sciences. BS Univ of Edinburgh (England) 1965, PhD 1968

Urbach, Ena 1995 Res Assoc (Post Doct) Microbiology. BS Yale 1980; PhD MIT 1994

Urquhart, N. Scott 1991 Prof (Sr Res) Statistics. BS Colorado State 1961, MS 1962, PhD 1965

Uzgalis, William L. 1981 Assoc Prof Philosophy. BA UC-Irvine 1972; MA Cal State-Long Beach 1976; PhD Stanford 1981

V

Vaidyanathan, Rajani 1994 Faculty Res Asst Computer Science Engr. BS Coimbatore 1991; MS Syracuse Univ 1994

Valladao, Marilin 1992 Faculty Res Asst Horticulture. BS Oregon State 1987, MS 1991

Van Buskirk, Philip D. 1984 Asst Prof & Jackson Co Extn Agent. BS Davis & Elkins College 1976; MS West Virginia 1981

van der Mars, Hans 1992 Asst Prof Exercise & Sport Science. Teaching Diploma Christelijke Acad. voor Lichamelijke Opvoeding (Netherlands) 1978; MS Ithaca College 1979; PhD Ohio State 1984

Van de Water, John 1976 Dean & Prof Int'l Education. BA St. Lawrence 1961; MA Syracuse 1967, PhD 1970

Van de Water, Nancy Carolyn 1985 Asst to the Director & Instr, Financial Aid. BS Syracuse 1968, MLS 1976

Van Saun, Robert J. 1992 Asst Prof Veterinary Medicine. BS Michigan State 1978, DVM 1982, MS 1988

Van Vechten, James A. 1985 Prof Electrical & Computer Engineering. BA UC-Berkeley 1965; MA Chicago 1976, PhD 1969

Vanderpool, Nancy M. 1979 Asst Dean of Students, Asst Prof Education. BA Oregon 1958; MA Syracuse 1960; PhD Oregon State 1987

Vanderveen, Randall L. 1988 Assoc Prof, Asst Dean for Pharmacy Practice. BS Purdue 1974, MS 1976; PhD Michigan State 1987

Vandetta, Curt 1989 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1989

VanGarde, Shirley J. 1994 Instr & Extn Agent, Metro Hotline. BS Washington State 1974, MS 1976; PhD Oregon State 1984

Vars, R. Charles, Jr. 1966 Prof Economics. BS Denver 1958, MBA 1960; MA UC-Berkeley 1965, PhD 1969

Vatovec, Milan 1994 Faculty Res Asst Forest Products. BS Belgrade Univ (Yugoslavia) 1988; MS Illinois 1991

Vavra, Martin 1971 Prof Animal Sciences & Rangeland Resources, Superintendent Eastern Oregon Ag Res Ctr-Union. BS Arizona 1966, MS 1969; PhD Wyoming 1972

Vecchione, Gina M. 1994 Asst Softball Coach (Interim) Intercollegiate Athletics. BA UCLA 1984

Vejil, Emilio 1974 Assoc Director & Asst Prof Financial Aid. BS Oregon State 1973, MEd 1979

Velayudhan, Ajoy 1995 Asst Prof Bioresource Engineering. BS Indian Inst of Technology-Madras (India) 1982; MS Yale 1983, PhD 1990

Velicheti, Ramakrishna 1993 Res Assoc (Post Doct) Forest Products. MS Osmania Univ (India) 1982, PhD 1989

Veltri, Anthony Thomas 1985 Assoc Prof Public Health. BS Salem College 1973; MS West Virginia 1975, EdD 1985

Vendeland, Susan C. 1987 Res Assoc Ag Chemistry. BS Washington 1973; PhD Cornell 1983

Vergin, Kevin L. 1993 Faculty Res Asst Microbiology. BS Cornell 1986

Vergun, Judith R. 1993 Asst Dir Native Americans in Marine Science Program. BS Oregon State 1987, PhD 1993

Verhoeven, Mary Boulger 1973 Instr Crop & Soil Science. BA Skidmore 1968; BS Oregon State 1972, MS 1980

Verts, B. J. 1965 Prof Fisheries & Wildlife. BS Missouri 1954; MS Southern Illinois 1956, PhD 1965

Verts, Lita Jeanne 1974 Director Special Services Project & Asst Prof Educational Opportunities. BA Oregon State 1973; MA Oregon 1974

Verzasconi, Ray A. 1967 Dept Chair Foreign Languages & Literatures Prof of Spanish. BA UC-Berkeley 1960; MA Washington 1962, PhD 1965

Vickers, Dean 1983 Faculty Res Asst Oceanic & Atmospheric Sciences. BS SUNY 1975; MS Oregon State 1979

Vilbig, Glory 1983 Physician Student Health Ctr. BS Southern Methodist 1956; MD Texas-Galveston 1960

Vinson, Ted Stephen 1976 Prof Civil Engineering. BS UC-Berkeley 1966, MS 1967, PhD 1970

Vloedman, Herb R. Jr. 1992 Faculty Res Asst College of Liberal Arts. BS Oregon State 1988

Vogue, Margaret A. 1992 Faculty Res Asst Ag Chemistry. BS Western Washington 1984; MS Oregon State 1990

Volk, Elzibeth 1987 Faculty Res Asst Botany & Plant Pathology. AS Maine 1983; BS Oregon State 1986

Volk, Veril Van 1966 Prof Crop & Soil Science. BSc Ohio State 1960, MS 1961; PhD Wisconsin 1965

Vollmer, Sheila Sequin 1993 Faculty Res Asst Forest Science. BS Ohio 1972; MS Colorado State 1976

Voller, Bernadette E. 1982 Faculty Res Asst Veterinary Medicine. BS Oregon State 1982, MS 1991

Vong, Richard J. 1989 Asst Prof Oceanic & Atmospheric Sciences. BS North Carolina State 1971; MSE Washington 1982, PhD 1985

Vuchinich, Donna J. 1991 Development Officer, University Projects. BA New Mexico 1984

Vuchinich, Samuel 1988 Assoc Prof Human Development & Family Sciences. BA Indiana 1970; MA Michigan 1972; PhD Michigan 1975

Vydra, Marianne J. 1992 Asst Academic Counselor for Athletics, Academic Affairs. BS SW Missouri State 1989; MA Maine 1992

W

Waddington, John S. 1992 Faculty Res Asst Fisheries & Wildlife. BA Western State College-Colorado 1988

Wagener, Joseph Mark 1969 Clinical Psychologist, Student Health Ctr. AB Ohio 1962; MA Kent State 1964; PhD Purdue 1969

Wager, John Fisher III 1984 Prof Electrical & Computer Engineering. BS Oregon State 1977; MS Colorado State 1978, PhD 1981

Wagner, Frank F. 1985 Faculty Res Asst Fisheries & Wildlife. BS Missouri 1971

Wagner, Gerald F. 1991 Asst Volleyball Coach Intercollegiate Athletics. BS Montana 1986, MS 1990

Wagner, Julia 1993 Faculty Res Asst Chemistry. BS Utah State 1983; BS Oregon State 1991

Wagner, Sheldon L. 1966 Prof Ag Chemistry. BS Wisconsin-Madison 1954; MD 1957

Wagner, Tim A. 1995 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1991

Wald, Andrew E. 1994 Res Assoc (Post Doct) Oceanic & Atmospheric Sciences. BS & MS Univ of Rochester 1987; PhD Johns Hopkins 1994

Waldorf, Walt 1992 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Humboldt State 1971

Walenta, Darrin L. 1992 Faculty Res Asst Columbia Basin Ag Res Ctr. BS Oklahoma State 1992

Walker, Alexis J. 1986 Prof Human Development & Family Sciences. BA Mercyhurst 1974; MS Purdue 1975; PhD Penn State 1979

Walker, Gregg B. 1987 Director Peace Studies Certif. Program, Assoc Prof Speech Communcation. BA/BS Minnesota 1974; MA Kansas 1982, PhD 1983

Walker, Karen C. 1986 Faculty Res Asst Veterinary Medicine. BS Ore Inst of Tech 1975

Walker, Kirk N. 1994 Head Softball Coach Intercollegiate Athletics. BS UCLA 1988

Walker, Lori L. 1988 Faculty Res Asst Veterinary Medicine. BA/BS Oregon State 1983; BS Washington State 1985; DVM Oregon State 1988

Walker, Stel Nathan 1986 Asst Prof Mechanical Engineering. BS Oregon State 1970, PhD 1976

Wallace, Alan Keith 1984 Assoc Prof Electrical & Computer Engineering. BEng Sheffield (England) 1963, PhD 1966

Walstad, John Daniel 1980 Dept Head & Prof Forest Resources. BS William & Mary 1966; MF Duke 1968; PhD Cornell 1971

Wander, Rosemary 1986 Assoc Prof Nutrition & Food Mgmt. BS Centenary (Louisiana) 1964; MS Ohio State 1968; PhD Georgia 1984

Wang, Jun-Lan 1970 Res Assoc Agricultral Chemistry. BS Normal (Taiwan) 1960; BA North Carolina-Greensboro 1970; PhD Oregon State 1977

Warburton, Christopher D. 1995 Asst Prof & Josephine Co Extn Agent. BS Utah State 1992, MS 1994

Ward, David T. 1993 Assoc Prof Naval Science. BA Jacksonville Univ 1975; MA Naval Postgraduate School 1988

Ward, Kathy 1990 Faculty Res Asst Columbia Basic Ag Res Ctr. BS Oregon State 1973

Ward, Neil E. III 1993 Faculty Res Asst Fisheries & Wildlife. BS Texas A & M 1990; MS South Dakota State 1992

Wardrop, Duncan 1995 Res Assoc (Post Doct) Chemistry. BS Univ Glasgow (Scotland) 1991, Ph 1995

Waring, Richard Harvey 1963 OSU Distinguished Prof, Prof Forest Science. BS Minnesota 1957, MS 1959; PhD UC-Berkeley 1963

Warkentin, Benno P. 1977 Prof Crop & Soil Science. BSA British Columbia 1951; MS Washington State 1953; PhD Cornell 1956

Warner, Rebecca Lynn 1990 Assoc Prof Sociology. BA Portland State 1980; MA Washington State 1982, PhD 1985

Warnes, William H. 1986 Assoc Prof Mechanical Engineering. BA UC-San Diego 1979; MS Wisconsin-Madison 1981, 1983, PhD 1986

Warren, William W., Jr. 1991 Prof Physics. BS Stanford 1960; PhD Washington (St. Louis) 1965

Washburn, James L. 1968 Sr Faculty Res Asst Civil Engineering. BS Oregon State 1968

Wasserman, Allen Lowell 1965 Prof Physics. BS Carnegie Institute of Technology 1956; PhD Iowa State 1963

Waterhous, D. Vincent 1992 Res Assoc (Post Doct) Biochemistry & Biophysics. BS Kentucky 1976, 1981; MS Case Western Reserve 1984; PhD Univ of Alabama-Birmingham 1989

Watkins, Patti Lou 1993 Asst Prof Psychology. BA West Virginia 1980; MA Univ of the Pacific 1983; PhD Virginia Tech 1985

Watral, Virginia 1990 Faculty Res Asst Microbiology. BS Oregon State 1989

Watrous, Barbara J. 1981 Prof Veterinary Medicine. BS UC-Davis 1972, DVM 1974, Dipl ACVR

Watson, Barney T. **Jr.** 1976 Sr Instr Food Science & Technology. BA UC-Berkeley 1971; MS UC-Davis 1975

Watson, Jairus H. 1992 University Architect. BA Oregon 1970

Watson, Philip 1984 Assoc Prof Chemistry. BA Oxford 1974; PhD British Columbia 1979

Wax, Darold Duane 1962 Prof History. BA Washington State 1956; MA Washington 1959, PhD 1962

Way, James Douglas 1989 Asst Prof Chemical Engineering. BS Colorado 1978, MS 1980, PhD 1986

Waymire, Edward C. 1982 Prof Mathematics. BS Southern Illinois-Edwardsville 1971; MS Arizona 1972, PhD 1976

Weaver, Roger Keys 1962 Prof English. BA Oregon 1957; MA Washington 1962; MFA Oregon 1967

Webb, Warren L. 1992 Assoc Prof (Sr Res) Forest Science. BS Oregon State 1959, 1964, MS 1966, PhD 1971

Weber, Bruce Alan 1974 Prof Ag & Resource Economics. BA Seattle Univ 1965; MS Wisconsin 1972, PhD 1973

Weber, Dale William 1976 Prof Animal Sciences. BS Iowa State 1952, MS 1970, PhD 1974

Weber, Lavern John 1969 Director Hatfield Marine Science Ctr, Supervisor Coastal Oregon Exp Station, Prof Pharmacology & Fisheries & Wildlife. BA Pacific Lutheran 1958; MS Washington 1962, PhD 1964

Weber, Mysti 1992 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Oregon State 1991

Webster, Janet Gray 1989 Asst Prof, Head of Hatfield Marine Science Ctr Library. BA Chicago 1975; MLS Columbia 1986

Weeks, Herschel Paul 1988 Asst Prof Ag Education & General Agriculture. BS Cal State-Chico 1976; BS Oregon State 1983, MS 1983; PhD Iowa State 1989

Weideman, Jacob Andreas Cornelius 1990 Asst Prof Mathematics. BS Univ of Orange Free State 1978, MS 1980, PhD 1986

Weinman, Richard Jay 1967 Prof Speech Communication. AB Indiana 1955; MFA Columbia 1956; PhD Indiana 1965

Weiser, Kent L. 1993 Athletics Corporate Marketing Coordinator. BA Kansas 1981, MS 1982

Weisshaar, Andreas 1991 Asst Prof Electrical & Computer Engineering. Vordiplom Universitat Stuttgart (Germany) 1981; MS Oregon State 1986; Diplom-Ingenieur Universitat Stuttgart (Germany) 1987; PhD Oregon State 1991

Walker, Donald L. 1993 Instr & KID Konnection Coordinator Lincoln Co Extn. BA Cal State-Sacramento 1959, MA 1966

Well, Reinhard 1994 Res Assoc (Post Doct) Crop & Soil Science. BS Univ of Gottingen (Germany) 1989, PhD 1993

Welle, J. Janice 1992 Chief Admin Officer, Development Office. BA Portland State 1960, MA 1968; PhD Oregon State 1977

Weller, Brenna Best 1980 Instr English. BA Oregon State 1978; MA Oregon 1979

Wells, Gail 1990 Natural Resources Communications Specialist College of Forestry. BA Western Oregon 1985

Wells, Joseph T. 1992 Head Wrestling Coach Intercollegiate Athletics. BS Iowa 1970

Wells, William K. 1991 Faculty Res Asst Forest Resources. BS Utah State 1991

Welty, James Richard 1958 Prof Mechanical Engineering. BSME Oregon State 1954, MSME 1959, PhD 1962

Wendler, Brian 1988 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Illinois 1980; MS Florida Inst of Technology 1984

Wendt, Nancy J. 1990 Instr Speech Communication. BS Cal State Sacramento 1980, MA 1982

Werner, Brian K. 1994 Faculty Res Asst Forest Science Res. Bs Wisconsin-Stevens Point 1991

Wernz, James G. 1981 Faculty Res Asst Crop & Soil Science. MS Oregon State 1966, PhD 1972

Wess, Robert Victor 1978 Assoc Prof English. BA Chicago 1963, MA 1966, PhD 1970

West, H. Milton 1980 Instr & CAMP Director Educational Opportunities. BS Oregon State, MA 1980

West, Kenneth J. 1994 Faculty Res Asst Forest Science. BS SUNY 1978; MS Oregon State 1990

West, Thomas Moore 1976 Assoc Dean Engineering (Interim) Assoc Prof Industrial & Mfg Engineering. BS Tennessee-Knoxville 1963, MS 1965; PhD Oregon State 1976

Westall, John C. 1980 Prof Chemistry. BS North Carolina 1971; PhD MIT 1977

Westfall, Larry G. 1994 Museum Specialist Horner Museum. BA Washington State 1982

Westlund, Robert E. 1992 Sr Development Officer, University Projects. BA UC-Santa Barbara 1956

Whanger, Philip Daniel 1966 Prof Ag Chemistry. BS Berry College 1959; MS West Virginia 1961; PhD North Carolina State 1965

Wheeler, George MacGregor 1980 Assoc Prof & Extn Energy Specialist. BS MIT 1967; MS UC-Berkeley 1970, PhD 1972

Wheeler, Linda Joyce 1988 Faculty Res Asst Biochemistry & Biophysics. BS Oregon State 1974

Wheeler, Patricia A. 1982 Prof Oceanic & Atmospheric Sciences. BA UC-Irvine 1971, MS 1974, PhD 1976

Whipple, Margaret J. 1989 Faculty Res Asst Microbiology. BA UC-San Diego 1973

White, Anthony John 1974 Assoc Director Computing Services. BA Pomona College 1963; MS US Int'l Univ 1970

White, George Randolph 1989 Instr & Jackson Co Extn Agent. BS Cal State-Fresno 1981

White, James David 1971 OSU Distinguished Professor, Chemistry. BA Cambridge 1959; MSc British Columbia 1961; PhD MIT 1965

White, Richard Denis 1992 Faculty Res Asst Geosciences. BA Wisconsin 1969; MA Boston Univ 1984

White, Teresa J. 1994 Faculty Res Asst Horticulture. BS Texas A & M 1986, MS 1991

Whitmore, Diana L. 1991 Faculty Res Asst Animal Sciences. BS Oregon State 1991

Whitney, John R. 1990 Instr English Language Institute. BA Northern Arizona 1976, MA 1984

Wiens, Gregory D. 1991 Res Assoc (Post Doct) Microbiology. BA Occidental College 1983; PhD Oregon State 1991

Wilcox, Anthony Robert 1987 Dept Chair & Assoc Prof Exercise & Sport Science. BA Massachusetts 1973, PhD 1980

Wilder, Brent C. 1993 Beaver Club Membership Coordinator Intercollegiate Athletics. BS Oregon State 1988, MS 1991

Wildman, Randall C. 1985 Sr Faculty Res Asst Fisheries & Wildlife. BS Drake 1976; MS Wisconsin 1979

Will, Theodore 1990 Faculty Res Asst Food Science & Technology. BS Oregon State 1962, MS 1965

Willard, Corwin 1980 Sr Faculty Res Asst Biochemistry & Biophysics. BS New Mexico Inst Mining & Technology 1971

William, Ray D. 1979 Prof Extn Horticulture. BS Washington State 1968; MS Purdue 1971, PhD 1974

Williams, Ellis E. 1992 Res Assoc (Post Doct) Zoology. BS North Carolina-Wilmington 1983, MS 1987; PhD Arizona State 1992

Williams, David Edward 1986 Assoc Prof Food Science & Technology. BA Reed 1975; MS Oregon State 1981, PhD 1982

Williams, John 1986 Staff Chair & Assoc Prof Wallowa Co Extn. BS Oregon State 1975, MS 1987

Williams, Susan M. 1993 Instr Microbiology. BS Loyala Marymount 1985

Williams, Thomas 1992 Faculty Res Asst Fisheries & Wildlife. BS Humboldt State 1985; MS Montana State 1990

Williams-Hanus, Janet Lynn 1966 Sr Faculty Res Asst Botany & Plant Pathology. BS Washington State 1965; MS Oregon State 1971

Williamson, Kenneth Jay 1973 Prof Civil Engineering. BS Oregon State 1968, MS 1970; PhD Stanford 1973

Williamson, Stephen J. 1992 Faculty Res Asst Fisheries & Wildlife. BS Oregon State 1990

Willis, John Marcus 1979 Sr Faculty Res Asst Oceanic & Atmospheric Sciences. BS Colorado State 1977; MS Oregon State 1980

Willis, Mitchell J. 1994 Faculty Res Asst EORC-Burns. BS Oregon State 1975; MS Nevado 1978

Wilson, Beverly 1994 Asst Prof Psychology. BA Cal State-Fresno 1985, MA 1987; PhD Washington 1994

Wilson, James Brian 1973 Prof Forest Products. BS SUNY-Syracuse 1964, PhD 1971

Wilson, June 1991 Faculty Res Asst Oceanic & Atmospheric Sciences. MA Scotland 1977

Wilson, Mark Virgil 1983 Assoc Prof Botany & Plant Pathology. BA UC-Berkeley 1976; PhD Cornell 1982

Wilson, Robert Elliot 1957 Prof Mechanical Engineering. BS Oregon State 1955; MS Illinois 1956; PhD Oregon State 1963

Winkler, William, Jr. 1957 Assoc Prof Exercise & Sport Science. BS Michigan 1955, MS 1960

Winner, William E. 1987 Assoc Prof Botany & Plant Pathology. BA Lewis & Clark 1970, MAT 1973; MA South Dakota 1974; PhD Calgary 1978

Winograd, Kenneth 1990 Asst Prof Education. BA Rider College 1973; EdM Rutgers Univ 1973; EdD N. Colorado 1990

Winsor, Martha H. 1992 Faculty Res Asst Hatfield Marine Science Ctr. BS Brown Univ 1976; MS Oregon State 1987

Wiprud, Theodore 1964 Prof Art. BA Washington 1958; ME Central Washington State 1962; MFA Claremont Graduate School 1964

Wirth, Donald Shelby 1971 Director & Assoc Prof Alumni Relations. BS Oregon State 1961

Wisecaver, Anne L. 1993 Faculty Res Asst Statistics. BS Oregon State 1992, MS 1993

Witbeck, Michael Clair 1985 Instr English Language Institute. BA Utah 1972, MA 1974; TESL UCLA 1975

Withee, Shana Colleen 1986 Assoc Prof & Harney Co Extn Agent. BS Utah State 1982, MS 1986

Witters, Robert 1977 Prof Int'l Research & Development. BS Eastern Illinois 1962; MS Michigan State 1967, PhD 1970

Wittig, Hans P. P. 1992 Faculty Res Asst Botany & Plant Pathology. BS Oregon 1983; MS Oregon State 1992

Wogaman, Mariol Ruth 1968 Assoc Prof & Reference Librarian, Kerr Library. BA Linfield 1967; MLS UC-Berkeley 1968; MA Oregon 1980

Wojtusik, Timothy 1993 Asst Prof & Jefferson/ Warm Springs Extn Agent. BS Eastern Connecticut State 1986; MS Texas A & I 1992

Wolfe, Alan S. 1991 Assoc Prof Resident Director OSSHE Japan Study. BA Columbia 1966, MA 1971; PhD Cornell 1984

Wolfe, Gordon V. 1993 Res Assoc (Post Doct) Oceanic & Atmospheric Sciences. BA Harvard 1982; MS Washington 1988, PhD 1992

Wolff, Ernest G. 1987 Assoc Prof (Sr Res) Mechanical Engineering. BSc MIT 1956; PhD Imperial College (London) 1961

Wolpert, Thomas Joseph 1988 Asst Prof Botany & Plant Pathology. BS Nebraska 1973; MS Purdue 1979, PhD 1983

Wong, John R. 1992 Faculty Res Asst Oceanic & Atmospheric Sciences. BS Portland State 1990

Wood, Guy H. 1987 Assoc Prof Spanish. BS Minnesota 1971; MA New York 1973; PhD Colorado 1984

Wood, Terence Michael 1985 Assoc Prof Exercise & Sport Science. BA British Columbia 1971, BPE 1976, MPE 1979; PhD Wisconsin 1984

Woods, LaVerne 1976 Counselor & Recruiter Educational Opportunities Program

Woods, Sandra L. 1984 Assoc Prof Civil Engineering, Director Hazardous Waste Mgmt. BS Michigan State 1976; MS Washington 1980, PhD 1984

Workman, William G. 1991 Asst Prof Ag & Resource Economics. BS Wyoming 1969; MA Utah State 1972, PhD 1978

Worona, Marc Andrew 1993 Faculty Res Asst Forest Science. BS Penn State 1990; MS Oregon 1993

Wright, David W. 1975 Physician Student Health Ctr. BS Seattle Pacific 1968; MD UC-Davis 1972

Wrolstad, Ronald Earl 1965 Prof Food Science & Technology. BS Oregon State 1960; PhD UC-Davis 1964

Wykes, R. Thomas 1984 Instr & Deschutes Co Extn Agent. BS Oregon State 1977, BS 1984

Wysocki, Donald J. 1985 Assoc Prof Crop & Soil Science. BS Wisconsin- Stevens Point 1974; MS Washington State 1977; PhD Iowa State 1983

Y

Yahn, Becky L. 1990 Asst Sports Info Director News & Communication Services. BA Washington State 1985

Yamada, Sylvia Behrens 1981 Instructor Zoology. BSc British Columbia 1968, MSc 1971; PhD Oregon 1974

Yamamoto, Melissa K. 1993 Housing & Residence Program Area Coordinator. BS Eastern Washington 1990; MEd Oregon State 1993

Yapi, Atse 1993 Res Assoc (Visiting) Forest Resources. BA Universite Nationale de Cote d'Ivoire (France) 1980; MA SUNY-Albany 1985; PhD Oregon State 1993

Yeats, Robert S. 1977 Prof Geosciences. AB Florida 1952; MS Washington 1956, PhD 1958

Yeck, Karie A. 1993 Compliance Asst Intercollegiate Athletics. BS Oregon State 1993

Yim, Solomon C. S. 1987 Assoc Prof Civil Engineering. BSCE Rice 1976; MSCE UC-Berkeley 1977, MA 1981, PhD 1983

Yoder, Barbara Jane 1977-79; 1985-88; 1992 Res Assoc Forest Science. BS UC-Irvine 1972; MS Oregon State 1984, PhD 1992

Yorgey, Brian Marshall 1985 Sr Faculty Res Asst Food Science & Technology. BS MIT 1972

Youmans, Russell Clark 1966 Director Western Rural Development Ctr, Prof Ag & Resource Economics. BS Illinois 1958; MS Purdue 1962, PhD 1966

Young, John Aubrey 1972 Dept Chair & Prof Anthropology. BA Macalester College 1963; MA Hawaii 1965; PhD Stanford 1971

Young, William Clyde III 1978 Asst Prof Crop & Soil Science. BS Western Illinois 1973; MS Oregon State 1980, PhD 1987

Yu, L. Shiao-Ling 1987 Assoc Prof Chinese. BA Caldwell 1958; MS Boston College 1961; MA Kansas 1977; PhD Wisconsin 1983

Yundt, Michael S. 1993 Faculty Res Asst Nuclear Engr.

Yusuf, Qismullah 1991 Instr Education. BA Syiah Kuala Univ (Indonesia) 1975; MEd Oregon State 1986

Z

Zabriskie, T. Mark 1992 Asst Prof Pharmacy. BSc Utah 1985, PhD 1989

Zaerr, Joe B. 1965 Prof Forest Science. BS UC-Berkeley 1954, PhD 1964

Zaneveld, Jacques Ronald Victor 1971 Prof Oceanic & Atmospheric Sciences. BS Old Dominion 1964; SM, MIT 1966; PhD Oregon State 1971

Zautner, Jeffrey H. 1992 Assoc Prof Aerospace Studies. BS Wisconsin, 1979, MS 1983

Zaworski, Joseph Robert 1987 Asst Prof (Sr Res) Mechanical Engineering. BS Oregon State 1972, MS 1976, PhD 1994

Zhang, Zhengkun 1994 Res Assoc Ag & Resource Economics. BA Bejing Chem & Engr Inst (China) 1982; MBA Quinghua Univ (China) 1985; PhD Oregon State 1994

Zheng, Daolan 1994 Faculty Res Asst Forest Science. BS NE Normal Univ (China) 1982, MS 1984; MS Central Washington 1989; PhD Montana 1993

Zheng, Qi 1993 Res Assoc (Post Doct) Pharmacy. MS Shanghai Inst of Pharmacy 1986; PhD Arizona 1993

Zhou, Lin 1995 Res Assoc (Post Doct) Food Science & Technology. BS Fudan Univ (China) 1984. PhD Arizona 1994

Zimmerman, Anne H. 1989 Faculty Res Asst Biochemistry & Biophysics. BS Oregon State 1983

Zlatanova, Jordanka 1991 Prof (Sr Res) Biochemistry & Biophysics. Diploma Leningrad State Univ (USSR) 1968; PhD Bulgarian Academy of Sciences 1980

Zobel, Donald Bruce 1968 Prof Botany & Plant Pathology. BS North Carolina State 1964; AM Duke 1966, PhD 1968

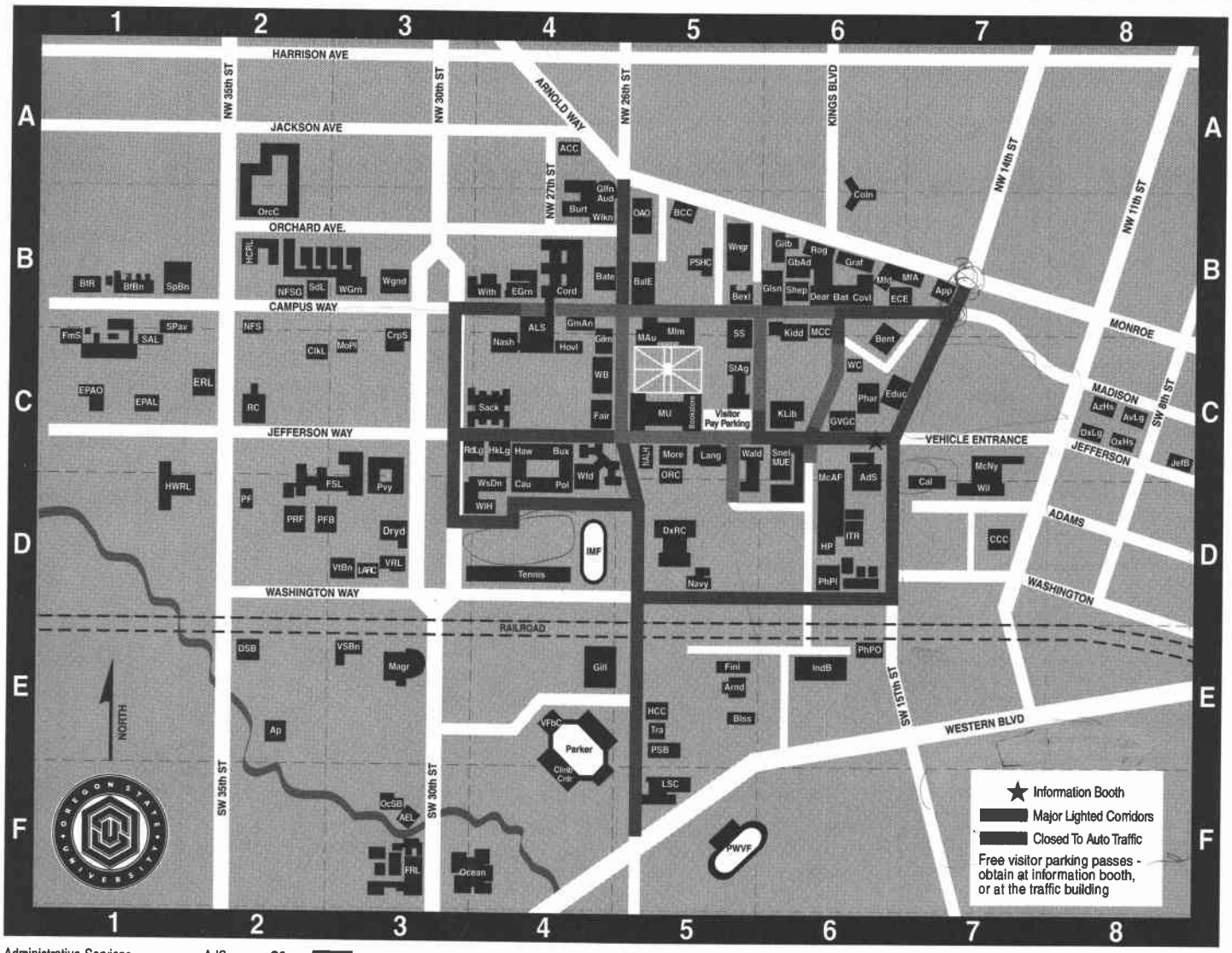
Zollinger, William A. 1985 Assoc Prof & Extn Beef Specialist. BS Brigham Young 1967; MS Oklahoma State 1970; PhD Nebraska 1981

Zolotov, Ilia 1993 Assoc Prof (Visiting) Oceanic & Atmospheric Sciences. MS Leningrad Univ (Russia) 1960; PhD USSR Academic of Sciences 1970

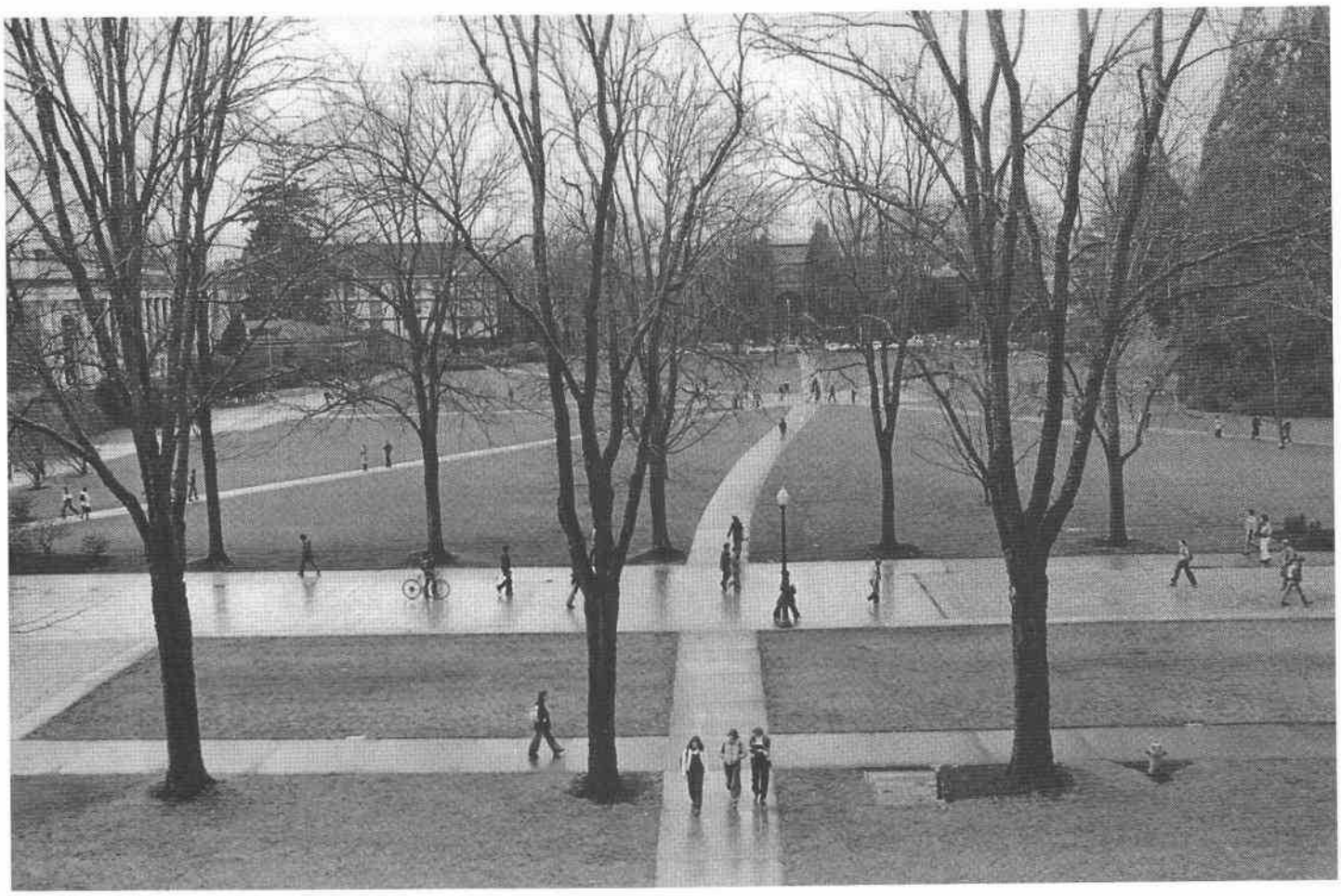
Zvonkovic, Anisa Mary 1985 Asst Prof Human Develoment & Family Sciences. BA Virginia 1981; MS Penn State 1983, PhD 1986

Zwieniecki, Maciej 1993 Faculty Res Asst Forest Science. MS Warsaw Agricultural Univ 1987

Campus Map



Administrative Services	AdS	C6
Aero Engineering	AEL	F3
Agricultural and Life Science	ALS	B4
Apiary (Bees)	Ap	E2
Apperson	App	B7
Arnold	Arnd	E5
Asian Culture Center	ACC	A4
Avery Lodge	AvLg	C8
Azalea Lodge	AzHs	C8
Ballard Extension	BalE	B5
Batcheller Hall	Bat	B6
Bates Hall	Bate	B4
Benton	Bent	C6
Beef Barn	BfBn	B1
Beef Research	BfR	B1
Bexell	Bexl	B5
Black Cultural Center	BCC	B5
Bloss	Blss	E5
Burt Hall	Burt	B4
Buxton	Bux	C4
Callahan	Cal	C7
Cauthorn	Cau	D4
Child Care Center	CCC	D7
Clark Laboratory	ClkL	C2
Climbing Center	ClmbCntr	F4
College Inn	ColIn	B6
Cordley	Cord	B4
Covell	Covl	B6
Crop Science	CrpS	C3
Dearborn	Dear	B6
Dixon Lodge	DxLg	C8
Dixon Recreation	DxRC	D5
Dormitory Services Bldg.	DSB	E2
Dryden Hall	Dryd	D3
Education	Educ	C6
Electrical Computer Engineering	ECE	B6
EPA Environmental Research Lab	ERL	C2
EPA Laboratory	EPAL	C1
EPA Office	EPAO	C1
Fairbanks	Fair	C4
Farm Services	FmS	C1
Finley	Finl	E5
Forestry Research Lab	FRL	F3
Forest Sciences Lab	FSL	D3
Gilbert Addition	GbAd	B6
Gilbert	Gilb	B6
Gilfillan Auditorium	Glfn Aud	B4
Gill Coliseum	Gill	E4
Gilmore	Gilm	C4
Gilmore Annex	GmAn	B4
Gleeson	Glsn	B6
Graf	Graf	B6
Greenhouses East	EGrn	B4
Greenhouse West	WGrn	B3
Gladys Valley Gymnastics Center	GVGC	C6
Hawley Hall	Haw	C4
Heating Plant	HP	D6
Heckart Lodge	HkLg	C4
Hinsdale Wave Research Lab	HWRL	D1
Hispanic Cultural Center	HCC	E5
Hovland Hall	Hovl	B4
Indoor Target Range	ITR	D6
Industrial Building	IndB	E6
Intramural Field	IMF	D4
Jefferson Building	JefB	C8
Kerr Library	KLib	C6
Kidder	Kidd	B6
Lab Animal Resource Center	LARC	D3
Langton Hall	Lang	C5
Lasells Stewart Center	LSC	F5
McAlexander Field House	McAF	C6
McNary	McNy	C7
Magruder Hall	Magr	E3
Memorial Union	MU	C5
Memorial Union East (Snell Hall)	MUE	C6
Merryfield Annex	MfA	B7
Merryfield	Mfd	B6
Milam Auditorium	MAu	C5
Milam	Mlm	B5
Milne Computer Center	MCC	B6
Moreland	More	C5
Motor Pool	MoPl	C3
Nash Hall	Nash	C4
National Forage Seed Research Center	NFS	B2
Greenhouse	NFSG	B2
Native American Longhouse	NALH	C5
Navy Armory	Navy	D5
Oceanography Admin	OAO	B5
Oceanography	Ocean	F4
Oceanography Staging	OcSB	F3
Orchard Court Apartments	OrcC	B2
Outdoor Recreation Center	ORC	C5
Oxford House	OxHs	C8
Parker Stadium	Parker	E4
Patrick Wayne Valley Field	PWVF	F5
Peavy	Pvy	D3
Pahrmacy Building	Phar	C6
Physical Plant Office	PhPO	E6
Plageman Student Health Center	PSHC	B5
Poling Hall	Pol	D4
Poultry Feeding	PFB	D2
Poultry Research Facilities	PRF	D2
Public Safety Building	PSB	E5
Radiation Center	RC	C2
Reed Lodge	RdLg	C4
Rogers	Rog	B6
Sackett	Sack	C4
Seed Labs	SdL	B2
Sheep Barn	SpBn	B1
Shepard	Shep	B6
Small Animal Lab	SAL	C1
Snell Hall (MU East)	Snel	C6
Social Sciences	SS	C5
Stock Judging Pavilion	SPav	B1
Strand Agriculture Hall	StAg	C5
Tennis Courts	Tennis	D4
Traffic Office	Tra	E5
USDA-ARS Hort Crops	Research Lab	
HCRL	B2	
Valley Football Center	VFbC	E4
Veterinary Research Lab	VRL	D3
Vet Dairy Barn	VtBn	D3
Vet Sheep Barn	VSBn	E3
Waldo	Wald	C5
Weatherford	Wfd	C4
Weniger	Wngr	B5
West Dining Hall	WsDn	D4
Wiegand	Wgnd	B3
Wilson Hall	Wil	D7
Wilkinson	Wlkn	B4
Withycombe	With	B4
Womens Building	WB	C4
Womens Center	WC	C6



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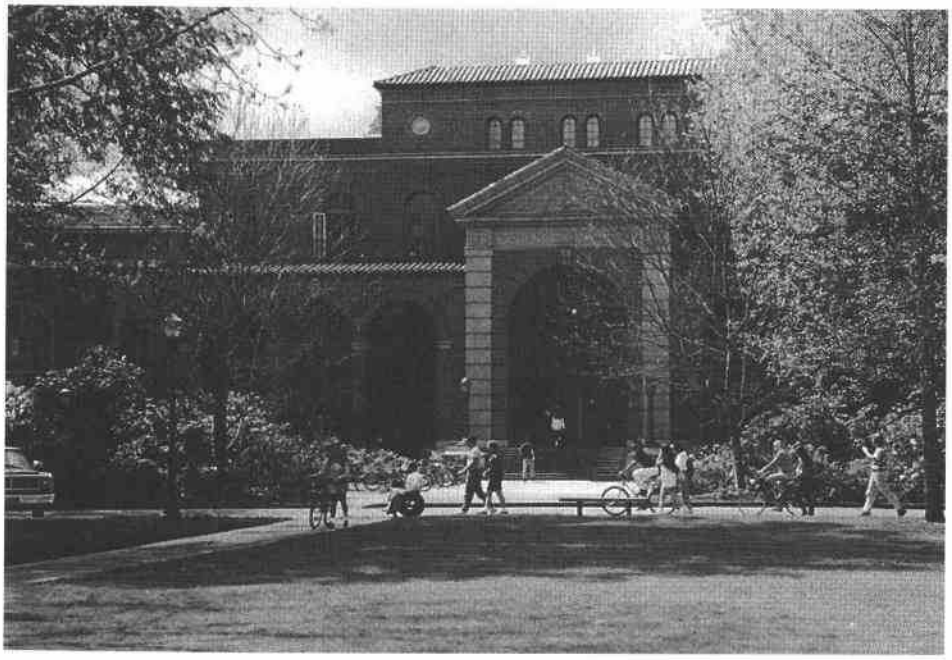

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