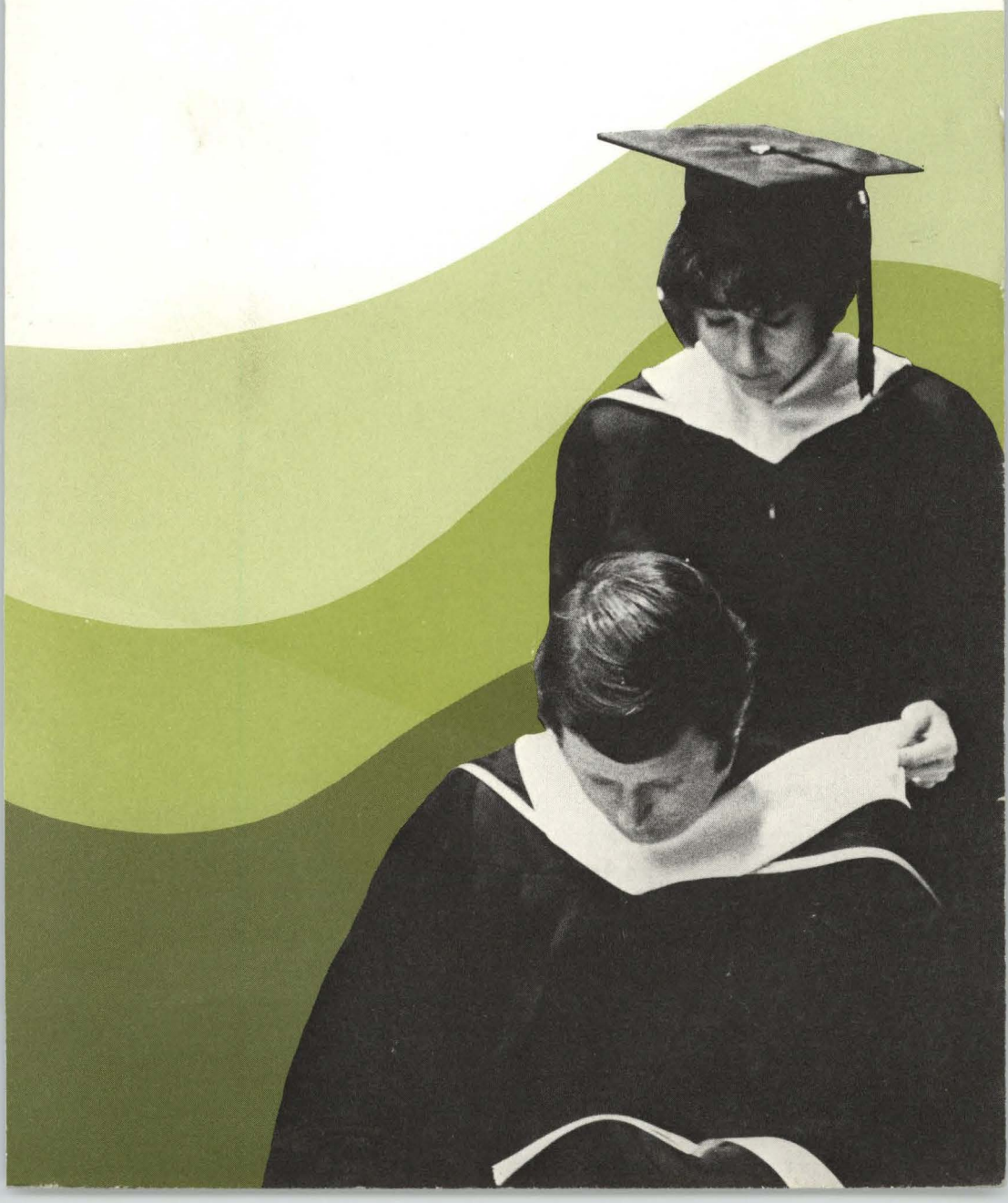
University of Idaho

Bulletin 1973-74

General Catalog



It is the policy of the University of Idaho to afford equal opportunities in education and personnel relations to qualified persons regardless of race, color, religion, sex, or national origin.

The university is an equal opportunity employer

The University of Idaho Bulletin is published four times a year. January, February, March and July by the University of Idaho, Moscow Idaho 83843. Second-class postage is paid at Moscow, Idaho.

Moscow, Idaho

Correspondence Directory

University of Idaho, Moscow, Idaho 83843
Telephone: (Area Code 208) 885-6111

Further information may be obtained from the following officers. On campus dial the number listed. Off campus dial the prefix 885 and the number listed.

Academic Matters . . . . . Dean of the college in which the student plans to major -------
Admissions . . . . . Director of Admissions (204 Ad. Office Bldg.) 6326
Adult Education . . . . . Coordinator of Continuing Education (103 Adult Ed. Bldg) 6641
Associated Students (student government) . . . . . Student Union Bldg. 6331
Career Placement . . . . . Director of the Career Planning and Placement Center (Faculty Office Bldg.) 6121
Continuing Education (correspondence/extension) . . . . . Coordinator of Continuing Education (103 Adult Ed. Bldg.) 6641
Counseling and Testing . . . . . Director of the Student Counseling Center (309 Univ. Classroom Center) 6716
Employment (on-campus) . . . . . Director of Staff Personnel (228 Univ. Classroom Center) 6269
Financial Aids (scholarships, loans, work/study) . . . . . Director of Student Financial Aids (228 Univ. Classroom Center) 6312
General Studies . . . . . Director of General Studies Program (305C Ad. Bldg.) 6968
Graduate Assistantships/Financial Aid . . . . Chairman of the department in which the student plans to major ------
Housing—Married or Single Students . . . . . Director of Housing (Wallace Residence Center) 6571
Information Center 6424
International Students . . . . . Foreign Student Adviser (241 Univ. Classroom Center) 6757
Registration, Academic Regulations, and Procedures . . . . . Registrar (104 Ad. Office Bldg.) 6731
Resident/Nonresident Status . . . . . Director of Admissions (204 Ad. Office Bldg.) 6326
Student Activities . . . . . ASUI Program Adviser (Student Union Bldg.) 6484
Study Abroad . . . . . Coordinator of Intercultural Programs (Satellite SUB) 6285
Summer Sessions . . . Director of Summer Sessions (103 Adult Ed. Bldg.) 6486
Tutorial Services . . . . . Director of Tutorial Services (110-F Education Bldg.) 6520
Veterans Affairs . . . . . Veterans Adviser (241 Univ. Classroom Center) 6757

Contents

1. **THE UNIVERSITY** 11
   - Origins, Growth, and Academic Environment of the University of Idaho 11
   - Degrees and Certificates Granted 14
   - Major Curricula, Options, and Programs Offered 15

2. **THE STUDENT** 21
   - Admission to the University 21
   - Mutual Responsibility Agreement 27
   - Fees and Expenses 28
   - Student Housing 32
   - Student Services 34

3. **GENERAL REQUIREMENTS AND ACADEMIC PROCEDURES** . . . 41

4. **COLLEGES, SCHOOLS, AND RELATED PROGRAMS** 60
   - General Studies Program 60
   - College of Agriculture 62
   - College of Business and Economics 68
   - College of Education 72
   - Teaching Majors and Minors 82
   - College of Engineering 91
   - College of Forestry, Wildlife and Range Sciences 97
   - College of Law 103
   - College of Letters and Science 110
     - School of Communication 128
     - School of Music 130
   - College of Mines 136
   - Teacher Education Program 141
   - Center for Native American Development 143
   - Graduate School 143
   - Continuing Education, Summer Sessions, and Special Programs 146
   - Officer Education Program 151

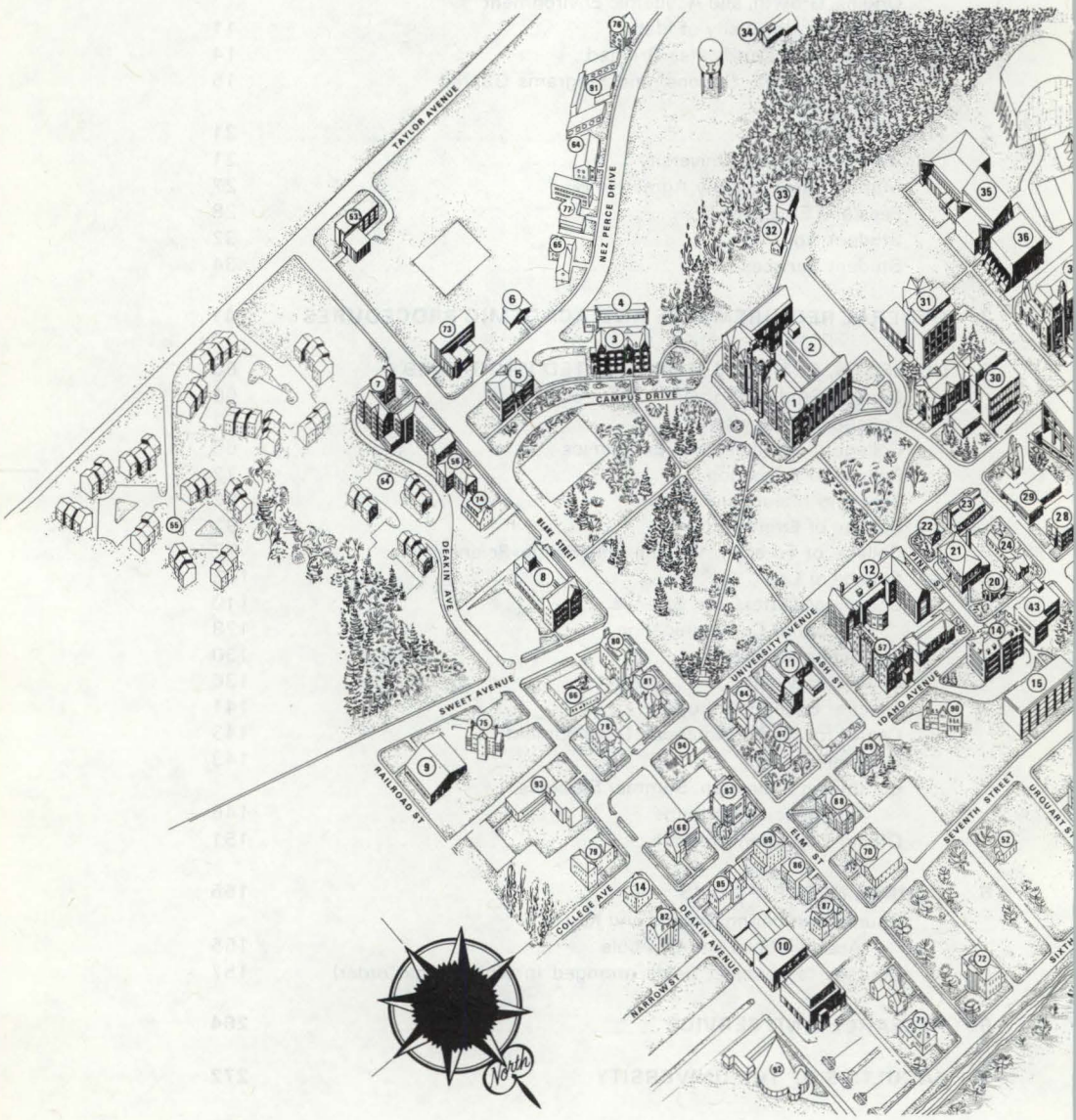
5. **COURSE DESCRIPTIONS** 155
   - Course Numbering System and Key to Abbreviations and Symbols 155
   - Courses (all subject fields arranged in alphabetical order) 157

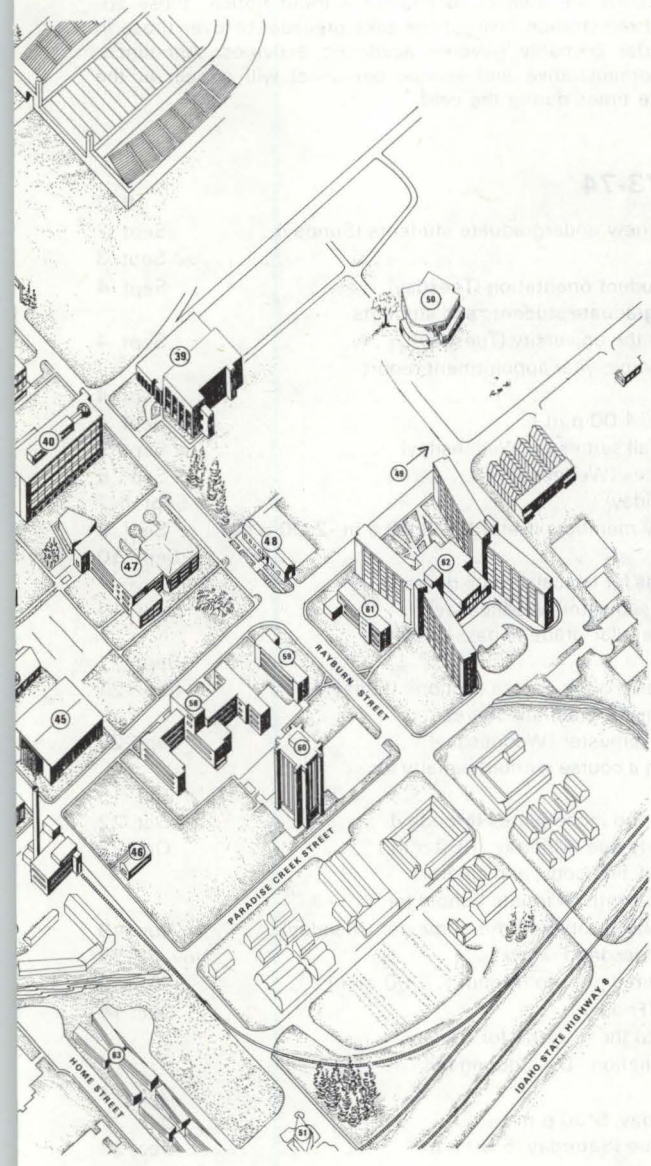
6. **RESEARCH AND SERVICE** 264

7. **FACULTIES OF THE UNIVERSITY** 272

INDEX 307

4 University of Idaho





CAMPUS BUILDINGS

1 Administration Building
2 Administration Office Building
3 Niccolls Home Economics Building
4 Graduate Art Studio
5 Ridenbaugh Hall
6 Home Management House
7 Alumni Center
8 Music Building
9 Industrial Education Building
10 Student Union and Bookstore
11 Student Health Service
12 Life Science Building
13 Museum
14 Morrill Hall
15 Mines Building
16 Buchanan Engineering Laboratory
17 Janssen Engineering Building
18 Johnson Engineering Laboratory
19 Gauss Mechanical Engineering Laboratory
20 Satellite SUB
21 Adult Education Building
22 Drama Annex
23 U-Hut (Drama)
24 Journalism Building
25 Faculty Office Building
26 Small Animals Laboratory
27 University Classroom Center
28 Agricultural Education Building
29 Agricultural Engineering Building
30 Art and Architecture Buildings
31 Education Building
32 Radio Building
33 Television Laboratory
34 President's House
35 Women's Health Education Building
36 Swimming Center
37 Memorial Gymnasium
38 Library
39 Law Building
40 Physical Science Building
41 Graduate Center
42 Entomology Building
43 Food Science Building
44 Navy Building
45 Forestry Building
46 Entomology Research Laboratory
47 Agricultural Science Building
48 Veterinary Science Classroom Building
49 Veterinary Office and Research Building
50 Performing Arts Center
51 Information Center
52 Talisman House

RESIDENCE HALLS AND UNIVERSITY HOUSING

53 Campus Club
54 South Hill Apartments
55 South Hill Terrace
56 Steel House
57 Vandal Hall
58 Gault-Upham Hall
59 McConnell Hall
60 Theophilus Tower
61 Shoup Hall
62 Wallace Residence Center
63 Park Village Apartments

SORORITIES AND FRATERNITIES

Sororities

64 Alpha Gamma Delta
65 Alpha Chi Omega
66 Kappa Alpha Theta
67 Kappa Kappa Gamma
68 Pi Beta Phi
69 Delta Gamma
70 Gamma Phi Beta
71 Alpha Phi
72 Delta Delta Delta

Fraternities

73 Farmhouse Fraternity
74 Alpha Kappa Lambda
75 Sigma Alpha Epsilon
76 Tau Kappa Epsilon
77 Pi Kappa Alpha
78 Delta Sigma Pi
79 Sigma Gamma Chi
80 Kappa Sigma
81 Delta Chi
82 Lambda Chi Alpha
83 Phi Delta Theta
84 Phi Gamma Delta
85 Alpha Tau Omega
86 Sigma Nu
87 Theta Chi
88 Beta Theta Pi
89 Phi Kappa Tau
90 Delta Tau Delta
91 Sigma Chi

RELIGIOUS INSTITUTES

92 St. Augustine's Catholic Center
93 LDS Institute
94 Campus Christian Center

Academic Calendar for 1973-74

DATES IN THIS CALENDAR are subject to change without notice; those appearing in admission and registration instructions take precedence over those in this catalog. This calendar primarily governs academic activities. Announcements of holidays for administrative and service personnel will appear in the *Staff Letter* at appropriate times during the year.

Fall Semester 1973-74

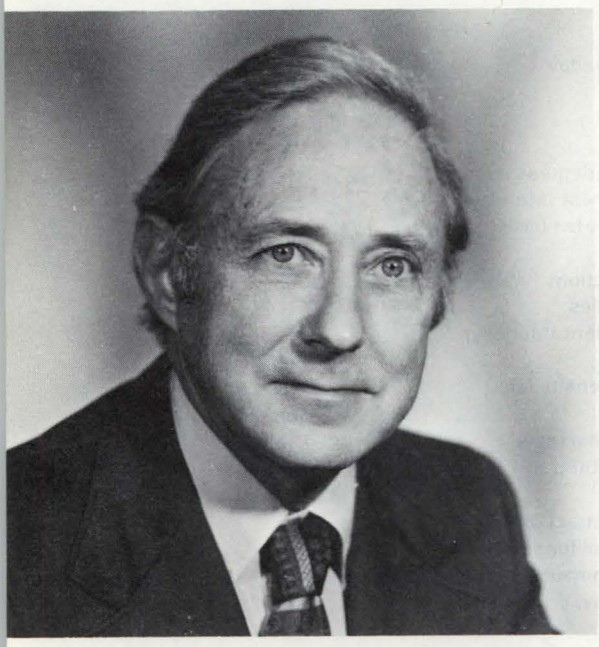
	1973
Residence halls open for new undergraduate students (Sunday)	Sept. 2
Labor Day (Monday)	Sept. 3
Freshman and transfer student orientation (Tuesday)	Sept. 4
Residence halls open for graduate students and students previously enrolled in the university (Tuesday)	Sept. 4
Faculty members on academic-year appointment report for duty (Tuesday)	Sept. 4
Faculty meeting (Tuesday, 4:00 p.m.)	Sept. 4
Official opening date for fall semester (Wednesday)	Sept. 5
Pre-registration conferences (Wednesday)	Sept. 5
Registration (Thursday-Friday)	Sept. 6-7
Orientation of new faculty members (Saturday, 8:30 a.m.-2:00 p.m.)	Sept. 8
Classes begin (Monday)	Sept. 10
Last day to file applications for baccalaureate degrees to be completed this semester (Wednesday)	Sept. 19
Last day to change from regular-grade to pass-fail basis or vice versa (Friday)	Sept. 21
Last day to add courses or change course sections (Friday)	Sept. 21
Last day to file applications for graduate degrees to be completed this semester (Wednesday)	Sept. 26
Last day to withdraw from a course without penalty for failing work (Friday)	Oct. 19
Last day to remove or extend incompletes (Monday)	Oct. 22
Mid-semester grade reports due (Monday, 1:00 p.m.)	Oct. 29
Last day to deposit original, first copy, and abstract of thesis or dissertation with Graduate School for advanced degrees to be completed this semester (Monday)	Nov. 19
Thanksgiving recess (Wednesday-Friday)	Nov. 21-23
Field trips must be completed prior to (Monday, 8:00 a.m.)	Dec. 3
Last day to drop courses (Friday)	Dec. 14
Last day to report grades to the registrar for courses challenged under regulation "D-4" during fall semester (Friday)	Dec. 14
Close of fall semester (Friday, 5:00 p.m.)	Dec. 21
Semester grade reports due (Saturday, 5:00 p.m.)	Dec. 22
Special programs sessions	Dec. 24-Jan. 11

Spring Semester 1973-74

	1974
Official opening date for spring semester (Monday)	Jan. 14
Pre-registration conferences (Monday)	Jan. 14
Registration (Tuesday-Wednesday)	Jan. 15-16
Classes begin (Thursday)	Jan. 17
Last day to file applications for baccalaureate degrees to be conferred at the 1974 commencement (Monday)	Jan. 28
Last day to change from regular-grade to pass-fail basis or vice versa (Wednesday)	Jan. 30
Last day to add courses or change course sections (Wednesday)	Jan. 30
Last day to file applications for graduate degrees to be conferred at the 1974 commencement (Monday)	Feb. 4
Washington's Birthday holiday (Monday)	Feb. 18
Last day to withdraw from a course without penalty for failing work (Wednesday)	Feb. 27
Last day to remove or extend incompletes (Thursday)	Feb. 28
Mid-semester grade reports due (Monday, 1:00 p.m.)	Mar. 18
Spring recess (Monday-Friday)	Mar. 18-22
Last day to deposit original, first copy, and abstract of thesis or dissertation with Graduate School for advanced degrees to be conferred at the 1974 commencement (Monday)	Apr. 15
Field trips must be completed prior to (Monday, 8:00 a.m.)	Apr. 29
Last day to drop courses (Friday)	May 10
Last day to report grades to the registrar for courses challenged under regulation "D-4" during spring semester (Friday)	May 10
Close of spring semester (Friday, 5:00 p.m.)	May 17
Commencement (Sunday)	May 19
Semester grade reports due (Monday, 5:00 p.m.)	May 20
Special programs sessions	May 20-June 7

Summer Sessions 1974

Applications for regular eight-week summer session should be received by (Monday)	May 20
Forestry Summer Camp begins (Monday)	May 20
Memorial Day holiday (Monday)	May 27
Official opening date for regular eight-week summer session (Monday)	June 10
Registration (Monday)	June 10
Classes begin (Tuesday)	June 11
Classes meet this date (Saturday)	June 15
Classes meet this date (Thursday)	July 4
Holiday in lieu of Independence Day (Friday)	July 5
Last day to remove or extend incompletes (Tuesday)	July 23
Summer sessions close (Friday)	Aug. 2
Special programs sessions	Aug. 5-28



ERNEST W. HARTUNG
President
1965-

University Administration

Ernest W. Hartung, *Ph.D.* . . . . . *President of the University*

Robert W. Coonrod, *Ph.D.* . . . . . *Academic Vice President*

Sherman F. Carter, *Ph.D.* . . . . . *Financial Vice President/Bursar*

Thomas E. Richardson, *Ph.D.* . . . . . *Vice President for Student and Administrative Services*

Ronald W. Stark, *Ph.D.* . . . . . *Coordinator of Research/ Dean of the Graduate School*

Warren S. Owens, *M.A.L.S.* . . . . . *Dean of Instructional Services/ Director of Libraries*

Matt E. Telin, *M.Ed.* . . . . . *Registrar*

Frank Young, *M.S.* . . . . . *Director of Admissions*

Regents of the University of Idaho

(March 1, 1973)

MALDEN T. DEATON
Pocatello (1974*)

JANET S. HAY
Nampa (1974*)

JOHN W. SWARTLEY
Boise (1975*)

J. KENNETH THATCHER
Idaho Falls (1975*)

J. P. MUNSON
Sandpoint (1976*)

JOSEPH D. McCOLLUM
Twin Falls (1977*)

A. L. ALFORD, JR.
Lewiston (1978*)

DELMAR F. ENGELKING
State Superintendent of Public Instruction
Boise (Ex Officio)

*Date current appointment expires.

Origins, Growth, and Academic Environment of the University of Idaho

A MULTIPURPOSE, publicly-supported institution, the University of Idaho was founded in 1889 by an act of the fifteenth legislature of the Idaho Territory. Its charter was confirmed by the constitution of the new state when Idaho was admitted to the union in 1890. All rights, immunities, franchises, and endowments previously granted were perpetuated and, in effect, made a part of the state constitution. As a result, an appointed board of regents became a constitutional corporation with power to enact laws for the government of the institution, to control the university's finances, to appoint and remove personnel, to establish entrance requirements, and to set fees. The constitution also confirmed the school's location in Moscow, and provided for the creation of distinct colleges within the university, each with its own faculty.

When the University of Idaho opened its doors, October 3, 1892, there were about thirty students and two professors, one of whom, Franklin B. Gault, also served as president. By 1972, the enrollment had grown to more than 7,000 students representing a broad spectrum of social and economic backgrounds. Although most of the students come from Idaho, every state and forty foreign countries are represented on campus. Since its founding, the university has granted approximately 33,500 degrees.

The University Today

The largest division of the university is the College of Letters and Science which offers a broad, liberal education in the humanities and sciences coupled with preparation for leadership in the student's selected field of concentration. Other divisions include the College of Agriculture, College of Business and Economics, College of Education, College of Forestry, Wildlife and Range Sciences, College of Engineering, College of Law, and College of Mines. Students may choose from over 130 undergraduate fields of study. The University of Idaho offers the master's degree in eighty-one areas and the doctorate in thirty, making it the state's preeminent center for comprehensive graduate programs.

The faculty is composed of many dedicated teachers and scholars who hold advanced degrees from universities throughout the world. Besides teaching, the faculty is actively involved in research, and many faculty members serve the community-at-large through consulting services, lectures, recitals, exhibits, dramatic productions, seminars, and similar activities. Specific examples of research and service agencies associated with the university are the Cooperative Extension Service, the Water Resources Research Institute, and the Bureau of Public Affairs Research.

Many of the university's facilities are among the best to be found. The J. E. Buchanan Engineering Laboratory features advanced equipment found in few other institutions in the nation. A further example is the newly-completed Forestry, Wildlife and Range Sciences Building, excellently equipped for research and instruction, and considered by many to be the best facility of its kind in the

country. Architectural honors were awarded to the recently-built Women's Physical Education Building and adjoining Swimming Center.

Within a short drive from the campus are rich mineral deposits which make the area valuable for the study of mining. Also nearby are mountains, rivers, and semi-arid areas, all important to the study of the environmental sciences. The farmlands in the region are well suited for agricultural research, while for the interested student the locale offers much in the way of native American history and artifacts. For students of recreational management there are state and national parks nearby.

The educational climate of the university is enhanced by the proximity of Washington State University in Pullman, only eight miles to the west. The interchange of library materials, programs, and course offerings between the two campuses makes the entire area a true university center.

Outside the classroom, there are many ways in which students may enhance their university experience. In addition to a range of campus-wide social and cultural events, the various living groups hold their own social activities. A large variety of varsity and intramural sports is offered, while dramatic, musical, and dance productions, as well as art and museum exhibits, enrich the total cultural picture.

Some students contribute to the campus newspaper, the *Idaho Argonaut*, which has the distinction of having been free from faculty or administrative control since it was first published in 1898. Others spend time working in the student-owned and operated radio station, KUOI. The Student Union Building is the headquarters for many of these activities and for student government. In recent years students have gained substantial representation on most standing committees of the faculty as well as the Faculty Council, and thus are active participants in the governance of the university.

Assistance, whether academic, vocational, or personal, can be obtained from various sources, including the Office of Student Advisory Services and the Student Counseling Center. The Nightline Drug Education Team, structured from the Nightline organization, is headquarted on campus in the Talisman House, which is an involvement center for drug education and other activities of interest to the university community. Nightline, an independent telephone service for advice on problems of immediacy, is always available for students and Moscow residents.

Three religious institutes are located adjacent to the campus. Courses may be taken through these centers for college credit.

A university must be able to meet the changes of society and adapt to them if it is to perform its proper functions. The University of Idaho has sought to meet the need for flexibility since its earliest days as a part of the American frontier. Because of its future-oriented attitudes, it is currently meeting contemporary educational demands and is striving to maintain relevance under the pressures of our time. A constant goal of the university is to do all that is possible to assure that each student will achieve his own, unique potential for becoming an educated person.

Accreditation

The University of Idaho is a member of the American Association of Land-Grant Colleges and Universities, the National Association of State Universities, and the National Commission on Accrediting, and is accredited by the Northwest Association of Secondary and Higher Schools. The following organizations have granted additional approval or accreditation for specific programs: American Bar Association, American Chemical Society, American Dietetics Association, Association of American Law Schools, Engineers' Council for Professional Development, National Architectural Accrediting Board, National Association of Schools of Music, National Council for Accreditation of Teacher Education, and Society of American Foresters.

In addition, the university has long possessed nationally-recognized marks of excellence, including chapters of the following general honorary societies: Phi Beta Kappa (since 1926), Phi Kappa Phi (since 1960), Sigma Xi (since 1922), and chapters of national honorary and scholarship societies in practically every specialized field. The university also holds membership in the American Association of University Women.

The Library

The University Library was completed and occupied in 1957 at a cost of 1.5 million dollars and contains a collection of nearly 700,000 volumes, to which approximately 25,000 volumes are added annually. The library receives more than 7,000 serials (periodicals), including 125 newspapers and, as the regional depository in Idaho for U.S. government documents, houses a collection of 260,000 official publications. The U.S. Geological Survey and the Army Map Service also use the library as a depository; there are now more than 60,000 maps in the library's collection.

Subject librarians administer three open-stack divisional libraries (humanities, social science, and science/technology) which have been organized to conform with the academic divisions of the university. The library shares the university objectives of teaching, research, and service, and offers individual and group instruction in elementary and advanced techniques of bibliographic research.

The Special Collections Room contains rare and curious books, and books that constitute a unique assemblage, such as the Day-Northwest Collection which consists of more than 3,000 volumes on Idaho and the Pacific Northwest.

The library also maintains a Browsing Room comprised of books of current interest, popular periodicals, and state, out-of-state, and foreign newspapers.

The library is air-conditioned, is open eighty-six hours a week during the regular school term, and provides coin-operated electric typewriters and photocopy machines at a nominal fee.

As a member of the Pacific Northwest Bibliographic Center located in Seattle, the library has access to the collections of other academic libraries within the region.

The Museum

The University Museum, located in the Graduate Center on the north-south mall, exists to serve the campus, region, and state. An all-university service, its role is to teach through the use of objects and to provide a workshop facility for students in museology who are preparing for a museum career. (Museology is one of the disciplines within the Department of Sociology/Anthropology. See part 5 of this catalog for the courses offered.)

The permanent collections include at this time objects from Africa, the Near East, and southeast Asia. Students, employees, and other friends of the university can help to build the museum's collections of scientific and artistic objects by calling the museum director's attention to significant, available material.

Degrees and Certificates Granted

UPON COMPLETION of appropriate programs of study and recommendation of the university faculty and president, the following degrees and certificates are granted by the Regents of the University of Idaho.

Baccalaureate Degrees

Bachelor of Architecture, *B.Arch.*
Bachelor of Arts, *B.A.*
Bachelor of Fine Arts, *B.F.A.*
Bachelor of General Studies, *B.G.S.*
Bachelor of Landscape Architecture, *B.L.Arch.*
Bachelor of Music, *B.Mus.*
Bachelor of Naval Science, *B.N.S.*
Bachelor of Physics, *B.Phys.*
Bachelor of Science, *B.S.*
Bachelor of Science in Agricultural Engineering, Agriculture, Business, Business Education, Chemical Engineering, Civil Engineering, Education, Electrical Engineering, Forestry, Geography, Geological Engineering, Geology, Home Economics, Mechanical Engineering, Metallurgical Engineering, Mining Engineering, Pre-Dental Studies, Pre-Medical Studies, Recreation, *B.S.**

Professional Degrees

Agricultural Engineer, *Ag.E.*
Chemical Engineer, *Ch.E.*
Civil Engineer, *C.E.*
Electrical Engineer, *E.E.*
Geological Engineer, *Geol.E.*
Mechanical Engineer, *M.E.*
Metallurgical Engineer, *Met.E.*
Mining Engineer, *E.M.*

Master's Degrees

Master of Agriculture, *M.Ag.*
Master of Architecture, *M.Arch.*
Master of Arts, *M.A.*
Master of Arts in Teaching, *M.A.T.*
Master of Arts in Teaching Art, Biological Sciences, Chemistry, Earth Science, English, French, Geography, German, History, Home Economics, Mathematics, Music, Physics, Political Science, Social Sciences, Sociology-Anthropology, Spanish, Theatre Arts-Speech, *M.A.T.**
Master of Business Administration, *M.B.A.*
Master of Education, *M.Ed.*
Master of Engineering, *M.Engr.*
Master of Fine Arts, *M.F.A.*
Master of Forestry, *M.F.*
Master of Music, *M.Mus.*

Master of Natural Science, *M.Nat. Sc.*
**Master of Nuclear Science, *M.Nuc.Sc.*
Master of Science, *M.S.*

Doctoral Degrees

Juris Doctor, *J.D.*
Doctor of Education, *Ed.D.*
Doctor of Philosophy, *Ph.D.*

Certificates

Lower Division

**Certificate of General Proficiency in Accounting, Commercial Purchasing, Computer Electronics, Computer Programming (Commercial), Computer Programming (Scientific), Health Physics, Industrial Electronics, Industrial Safety, Management, Mathematics, Nuclear Electronics, Office Operations, Secretarial Science, Subcontract Management.

Professional Certificates in Education (Sixth-Year Level)

Specialist in Education, Guidance and Counseling, School Administration, School Psychology, Special Education, Vocational Education, *Prof.Cert.**

---

* The subject signature is added to the abbreviation in each instance.
** Limited to students enrolled in the educational program of the National Reactor Testing Station, Idaho Falls.

Major Curricula, Options, and Programs Offered

MAJOR CURRICULA, OPTIONS, and programs offered by the university are shown in the two lists below. Entries followed by degree abbreviations are major curricula leading to the baccalaureate and advanced degrees indicated. Graduate programs are shown separately, following the undergraduate list.

Undergraduate

Accounting—*B.S.Bus.*
Acting
  see Theatre Arts
Advertising
  see Journalism
Aerospace Studies (AFOEP)
Agribusiness—*B.S.Ag.*
  Agricultural Economics Option
  Agricultural Mechanization Option
  Animal Industries Option
  Food Science Option
  Soils Option
Agricultural Economics—*B.S.Ag.*
  see also Agribusiness
Agricultural Education—*B.S.Ag.*
Agricultural Engineering—*B.S.Ag.E.*
Agricultural Mechanization
  see Agribusiness
Agricultural Science—*B.S.Ag.*
  Animal Industries Option
  Bacteriology Option
  Biochemistry Option
  Entomology Option
  Food Science Option
  Plant Science Option
  Range Livestock Management Option
  Soils Option
  Veterinary Science Option
Air Force OEP
  see Aerospace Studies
American Studies—*B.A.*
Animal Industries
  see Agribusiness and Agricultural Science
Anthropology—*B.A.*
Applied Mathematics
  see Mathematics

(Continued on next page)

Applied Music
see Music and Music Education

Architecture—*B.Arch.*
see also Landscape Architecture

Army OEP
see Military Science

Art—*B.A., B.F.A.*
Art Education Option
Design (Commercial Art) Option
Painting Option
Sculpture Option

Art Education
see Art

Arts and Law
see Law (Combined Program)

Bacteriology—*B.S.*
see also Agricultural Science

Bacteriology: Medical Technology—*B.S.*

Biochemistry
see Agricultural Science

Biology—*B.A., B.S.*

Botany—*B.A., B.S.*

Business (General)—*B.S.Bus.*
see also Accounting, Agribusiness, Business and Applied Science, Business and Law, Business Education, Economics, Finance, Forest Resources, Home Economics, Management, Marketing and Office Administration.

Business and Applied Science—*B.S.Bus.*

Business and Law
see Law (Combined Program)

Business Education—*B.S.Bus.Ed.*

Cartography
see Geography

Chemical Engineering—*B.S.Ch.E.*

Chemistry—*B.S.*
General Chemistry Option
Professional Option
Technical Literature Option
Technological Option

Child Development—*B.A., B.S.H.Ec.*

Civil Engineering—*B.S.C.E.*

Classical Studies—*B.A.*

Clothing, Textiles and Design—*B.S.H.Ec.*
Clothing Option
Interiors Option

Composition
see Music

Computer Programming
see Mathematics

Dance
see Physical Education: Women

Dental Studies (Pre-Dental Studies)—*Two-Year Prog. and B.S.Pre-Dent.*

Design
see Art

Dietetics
see Food and Nutrition

Distributive Education—*B.S.Bus.Ed.*

Drama
see Theatre Arts

Economics—*B.A., B.S., B.S.Bus.*
see also Agricultural Economics

Education
see Agricultural Education, Art Education, Business Education, Distributive Education, Elementary Education, Home Economics Education, Industrial Education, Music Education, Office Occupations Education, Physical Education, Secondary Education, Special Education, Technical Education, Trade and Industrial Education, and Vocational-Technical Education.

Electrical Engineering—*B.S.E.E.*

Elementary Education—*B.S.Ed.*
see also Physical Education and Special Education

Engineering
see Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Geological Engineering, Mechanical Engineering, Metallurgical Engineering, Mining Engineering, and Wood Utilization.

English—*B.A.*

Entomology
see Agricultural Science

Finance—*B.S.Bus.*

Fishery Resources
see Wildlife-Fishery Resources

Food and Nutrition—*B.S.H.Ec*
Dietetics and Institutional Management Option
Food and Nutrition Research Option

Food Science
see Agribusiness and Agricultural Science

Forest Products
see Wood Utilization

Forest Resources—*B.S.For.*
Forest Business Option
Forest Management Option
Forest Science Option
see also Range Resources, Wildlife-Fishery Resources, and Wood Utilization

French—*B.A.*

General Studies—*B.G.S.*
Geography—*B.A., B.S., B.S. Geog.*
Geological Engineering—*B.S.Geol.E.*
Geology—*B.S.Geol.*
German—*B.A.*
History—*B.A., B.S.*

Home Economics—*B.S.H.Ec.*
- General Home Economics Option
- Business Option
- Journalism Option
- *see also* Child Development, Clothing, Textiles and Design, and Food and Nutrition

Home Economics Education—*B.S.H.Ec.*
- Teaching Option
- Extension Option

Industrial Education—*B.S.Ed.*
Institutional Management
- *see* Food and Nutrition

Interdisciplinary Studies—*B.A., B.S.*
Interior Design—*B.F.A.*
- *see also* Clothing, Textiles and Design

Journalism—*B.A., B.S.*
- News-Editorial Option
- Advertising Option
- Radio-Television News Option
- *see also* Home Economics

Landscape Architecture—*B.L.Arch*
Latin—*B.A.*
Latin American Studies—*B.A.*
Law (Combined Program)—*B.A., B.S., B.S.Bus.*

Management—*B.S.Bus.*
- *see also* Agricultural Science, Food and Nutrition and Forest Resources

Marketing—*B.S.Bus.*
- Real Estate Option

Mathematics—*B.A., B.S.*

Mathematics: Applied Mathematics—*B.S.*
- Computer-Programming Option
- Statistics Option

Mechanical Engineering—*B.S.M.E.*
Mechanization (Agricultural)
- *see* Agribusiness

Medical Studies (Pre-Medical Studies)—*B.S.Pre-Med.*
Medical Technology
- *see* Bacteriology

Metallurgical Engineering—*B.S.Met.E.*
Military Science (AOEP)
Mining Engineering—*B.S.Min.E.*
Music: Applied Music—*B.A.*
Music: Composition—*B.Mus.*
Music: History and Literature—*B.A.*
Music: Instrumental Performance—*B.Mus.*
Music: Theory—*B.A.*
Music: Vocal Performance—*B.Mus.*
Music Education: Instrumental—*B.Mus.*
Music Education: Vocal—*B.Mus.*
Music Education: Vocal-Instrumental—*B.Mus.*
Naval Science (NMOEP)—*B.N.S.*
News-Editorial
- *see* Journalism

Nursing (Pre-Nursing Studies)—*One-Year and Two-Year Prog.*
Nutrition
- *see* Food and Nutrition

Office Administration—*B.S.Bus.*
- *see also* Business Education and Office Occupations Education

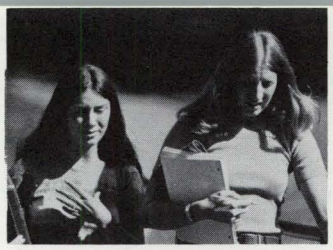
Office Occupations Education—*B.S.Bus.Ed.*
Painting
- *see* Art

Philosophy—*B.A., B.S.*
Physical Education: Elementary—*B.S.Ed.*
Physical Education: Men—*B.S.Ed.*
Physical Education: Women—*B.S.Ed.*
- Aquatics Option
- Dance Option
- Gymnastics Option
- Sports Option

Physical Therapy (Pre-Physical Therapy Studies)—*B.S.*
Physics—*B.A., B.S., B.Phys.*
Plant Science
- *see* Agricultural Science

Political Science—*B.A., B.S.*
Pre-Professional Programs
- *see* Dental Studies, Law, Medical Studies, Nursing and Physical Therapy

Psychology—*B.A., B.S.*
Radio-Television—*B.A., B.S.*
- *see also* Journalism



Range Livestock Management
see Agricultural Science
Range Resources—*B.S.For.*
Real Estate
see Marketing
Recreation—*B.S.Rec.*
Program Development Option
Youth Agencies Option
Therapeutic Recreation Option
Commercial Recreation Option
Park Recreation Option
Science and Law
see Law (Combined Program)
Sculpture
see Art
Secondary Education—*B.S.Ed.*
Sociology—*B.A., B.S.*
Soils
see Agribusiness and Agricultural Science
Spanish—*B.A.*
Special Education—*B.S.Ed.*
Elementary Option
Secondary Option
Speech—*B.A., B.S.*
Rhetoric and Public Address Option
Speech Communication Option
Statistics
see Mathematics
Technical Education—*B.S.Ed.*
Technical Theatre
see Theatre Arts
Theatre Arts—*B.A., B.S., B.F.A.*
Acting-Directing Option
Technical Theatre Option
Trade and Industrial Education—*B.S.Ed.*
Veterinary Science
see Agricultural Science
Vocational-Technical Education—*B.S.Ed.*
Wildlife-Fishery Resources—*B.S.For.*
Wood Utilization—*B.S.For.*
Forest Products Option
Science-Engineering Option
Zoology—*B.A., B.S.*

Graduate Programs

Agricultural Economics—*Ph.D.*, M.S., M.Ag.*
Agricultural Education—*M.S., M.Ag.*
Agricultural Engineering—*Ph.D., M.S., M.Engr., Ag.E.*
Applied Music
see Music
Animal Industries—*M.S., M.Ag.*
Anthropology—*M.A.*
see also Sociology-Anthropology
Architecture—*M.A., M.Arch.*
see also Interior Design
Art—*M.A., M.F.A., M.A.T.Art*
Bacteriology—*Ph.D., M.S.*
Biochemistry—*Ph.D., M.S.*
Biological Sciences—*M.Nat.Sc.*
see also Bacteriology, Biology, Botany, and Zoology
Biology—*M.A.T.Biol.*
see also Biological Sciences
Botany—*Ph.D., M.S.*
see also Biological Sciences and Biology
Business—*M.S., M.B.A.*
see also Business Education
Business Education—*M.S., M.Ed.*
Chemical Engineering—*Ph.D., M.S., M.Engr., M.Nuc.Sc.**, Ch.E.*
Chemistry—*Ph.D., M.S., M.Nuc.Sc.**, M.A.T. Chem.*
see also Biochemistry, Chemical Engineering and Physical Sciences
Civil Engineering—*Ph.D., M.S., M.Engr., C.E.*
Composition
see Music
**Computer Science—*M.S.*
Distributive Education—*M.S., M.Ed.*
Earth Science—*M.Nat.Sc., M.A.T.Ea.Sc.*
see also Geography and Geology
Economics—*Ph.D.*, M.S.*
see also Forestry Economics and Social Sciences
Education—*Ph.D., Ed.D., Prof.Cert., M.A.T.*
see also Agricultural Education, Art, Biological Sciences, Biology, Business Education, Distributive Education, Earth Science, Elementary Education, English, Geography, Guidance and Counseling, History, Home Economics, Industrial Education, Mathematics, Music, Office Occupations Education, Physical Education, Physical Sciences, Physics, Political Science, School Administration, School Psychology, Secondary Education, Social Sciences, Sociology-Anthropology, Special Education, Theatre Arts-Speech, Trade-Technical Education, and Vocational Education

Electrical Engineering—*Ph.D., M.S., M.Engr., M.Nuc.Sc.**, E.E.*

Elementary Education—*Ph.D., Ed.D., M.S., M.Ed.*

Engineering
see Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Geological Engineering, Mechanical Engineering, Metallurgical Engineering, Mining Engineering, Mining Engineering-Metallurgy, and Nuclear Engineering

English—*M.A., M.A.T.Eng.*

Entomology—*Ph.D., M.S.*
see also Forest Entomology

Fishery Management—*M.S., M.F.*
see also Wildlife Management and Wildlife Science

Food Science—*M.S.*

Forest Entomology—*M.S., M.F.*
see also Entomology and Forestry Science

Forest Genetics—*M.S., M.F.*
see also Forestry Science

Forest Management—*M.S., M.F.*
see also Forestry Science

Forest Pathology—*M.S., M.F.*
see also Forestry Science

Forest Products
see Wood Utilization

Forest Recreation—*M.S., M.F.*

Forest Soils—*M.S., M.F.*
see also Forestry Science and Soils

Forestry Economics—*M.S., M.F.*
see also Agricultural Economics, Economics, and Forestry Science

Forestry Science—*Ph.D.*
see also Forest Entomology, Forest Genetics, Forest Management, Forest Pathology, Forest Soils, Forest Economics, Range Science, Silviculture, Watershed Science, and Wildlife Science

French—*M.A., M.A.T.Fr.*

Geography—*M.S., M.A.T.Geog.*
see also Earth Science and Social Sciences

Geological Engineering—*M.S., Geol. E.*

Geology—*Ph.D., M.S.*
see also Earth Science

German—*M.A., M.A.T.Ger.*

Guidance and Counseling—*Ph.D., Ed.D., Prof.Cert., M.S., M.Ed.*
see also School Psychology

History—*Ph.D., M.A., M.A.T.Hist.*
see also Social Sciences

Home Economics—*M.S., M.A.T.H.Ec.*
includes Home Economics Education. The University of Idaho also participates in an interinstitutional Ph.D. program in home economics (child development and family relations)

Hydrology—*M.S.*
see also Watershed Science

Industrial Education—*M.S., M.Ed.*

Interior Design—*M.A.*
see also Art

Law—*J.D.*

Mathematics—*Ph.D., M.S., M.Nuc.Sc.**, M.Nat.Sc., M.A.T.Math.*

Mechanical Engineering—*M.S., M.Engr., M.Nuc.Sc.**, M.E.*

Metallurgical Engineering—*M.S., Met.E.*
see also Mining Engineering-Metallurgy

Metallurgy—*M.S., M.Nuc.Sc.*
see also Mining Engineering-Metallurgy

Mining Engineering—*M.S., E.M.*
see also Mining Engineering-Metallurgy

Mining Engineering-Metallurgy—*Ph.D.*

Music—*M.A., M.Mus., M.A.T.Mus.*
includes Music Education

Nuclear Engineering—*M.S., M.Nuc.Sc.***

Office Occupations Education—*M.S., M.Ed.*

Philosophy—*M.A.*
see also Social Sciences

Physical Education—*M.S., M.Ed.*

Physical Sciences—*M.Nat.Sc.*
see also Chemistry and Physics

Physics—*Ph.D., M.S., M.Nuc.Sc.** M.A.T.Phys*
see also Physical Sciences

Plant Science—*Ph.D., M.S., M.Ag.*

Political Science—*Ph.D., M.A., M.A.T.Pol.Sc.*
see also Social Sciences

Psychology—Ph.D.***, M.S.
see also School Psychology and Social Sciences

**Radiological Science—*M.S.*

Range Management—*M.S., M.F.*
see also Range Science

Range Science—*Ph.D.*
see also Forestry Science, Range Management, and Wildlife Science

Recreation
see Forest Recreation and Physical Education

School Administration—*Ph.D., Ed.D., Prof.Cert., M.S., M.Ed.*

School Psychology—*Prof.Cert.*
see also Guidance and Counseling

Secondary Education—*Ph.D., Ed.D., M.S., M.Ed.*

Silviculture—*M.S., M.F.*
see also Forestry Science

Social Sciences—*M.A.T.Soc.Sc.*

Sociology—*M.A.*
see also Sociology-Anthropology

Sociology-Anthropology—*M.A.T.Soc.-Anthr.*

Soils—*Ph.D., M.S., M.Ag.*
see also Forest Soils

Spanish—*M.A., M.A.T.Span.*

Special Education—*Ph.D., Ed.D., Prof.Cert., M.S., M.Ed.*

Speech
see Theatre Arts-Speech

Theatre Arts—*M.A.*
see also Theatre Arts-Speech

Theatre Arts-Speech—*M.A.T.Th.A.-Sp.*

Trade-Technical Education—*M.S., M.Ed.*
see also Vocational Education

Veterinary Science—*M.S.*

Vocational Education—*Prof.Cert., M.S., M.Ed.*
see also Agricultural Education, Business Education, Distributive Education, Home Economics, Office Occupations Education, and Trade-Technical Education

Watershed Science—*M.S., M.F.*
see also Forestry Science and Hydrology

Wildlife Management—*M.S., M.F.*
see also Fishery Management and Wildlife Science

Wildlife Science—*Ph.D.*
see also Fishery Management, Forestry Science, Range Science, and Wildlife Management

Wood Utilization—*M.S., M.F.*

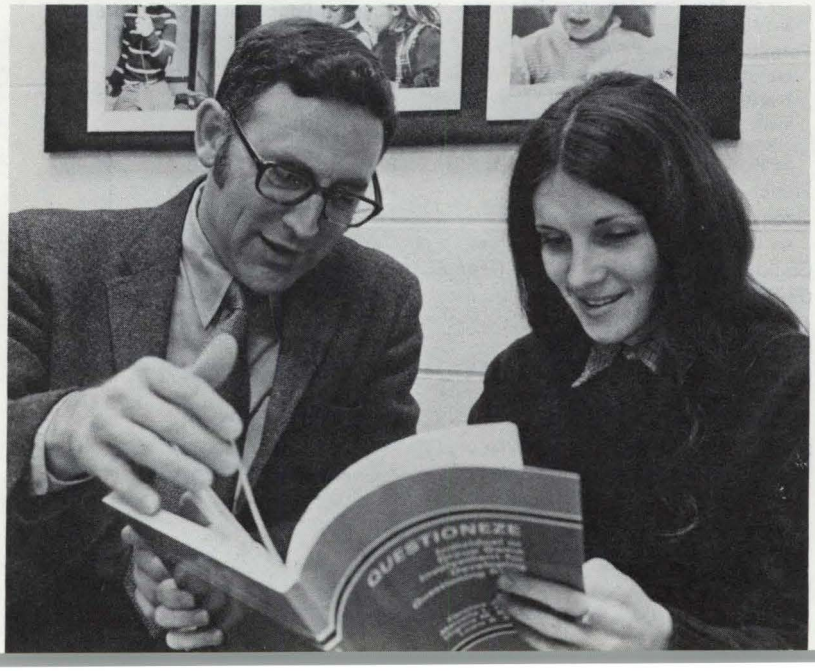
Zoology—*Ph.D., M.S.*
see also Biological Sciences

---

* Currently the doctoral major in economics is limited to the concentration in agricultural economics.

** The graduate majors in computer science, metallurgy, and radiological science, as well as the degree of Master of Nuclear Science, are limited to students enrolled in the educational program of the National Reactor Testing Station, Idaho Falls.

*** The doctoral program in psychology has been authorized by the regents, but has not as yet been implemented.



Admission to the University

STUDENTS DESIRING TO ENTER the university for the first time should write to the Admissions Office and request an admissions folder. This publication gives detailed instructions on the application procedure and provides a means of requesting information on housing and various types of financial aids.

Students who have not earned a college degree are classified as undergraduates. This catalog section contains general information pertinent to all applicants for admission to the university. See "Admission to the Graduate School and the College of Law" near the end of this catalog section for additional information.

Undergraduate students are classified as freshmen (less than twenty-six credits), sophomores (less than sixty credits), juniors (less than ninety-four credits), or seniors.

Applicants who are still in high school should apply during the first semester of their senior year and should request the school to send a record of their first seven semesters to the Admissions Office. If otherwise qualified, the applicant will be given an early notice of tentative acceptance for fall entrance based on this record. Final acceptance will be granted when the applicant has graduated from an accredited high school.

Admission Procedures

Credentials. Applicants for admission are required to submit the following:

1. Personal data on the regular application-for-admission blank. Failure to list all institutions attended as specified on the application form is considered fraud and subjects the applicant to immediate cancellation of his registration.

2. A certificate of secondary-school record from the last high school attended and a transcript and statement of honorable dismissal from each institution attended beyond high school. TRANSCRIPTS SUBMITTED IN SUPPORT OF AN APPLICATION MUST BE OFFICIAL AND MUST BE SENT DIRECTLY TO THE ADMISSIONS OFFICE BY THE ISSUING INSTITUTION (or certifying agency in the case of international students). THEY WILL NOT BE ACCEPTED FROM THE APPLICANT. THEY BECOME THE PROPERTY OF THE UNIVERSITY AND CANNOT BE RETURNED OR FORWARDED. To be official, a transcript must be signed by the registrar, superintendent, principal, or other authorized official of the school.

3. Each applicant for admission to the freshman class (including transfer students with less than twenty-six semester credits) is required to have the scores attained on either the College Entrance Examination Board tests (CEEB) or the American College Testing Program (ACT) sent to the Admissions Office prior to registration to become a part of his or her file. If the CEEB tests are selected they should include the Scholastic Aptitude Test, the English Achievement Test, and one other achievement test (the latter should include mathematics if it is basic to the applicant's proposed major).

4. Each student entering the university for the first time, except those enrolling for summer session only, is required to file with the university a complete physical examination report before registration is initiated. The physical examination should be performed by the applicant's physician before coming to the university; special forms are provided for this purpose. University physicians do not make entrance physical examinations. The university may require other or further physical examinations if deemed necessary.

5. All new nonresident undergraduate applicants, except those applying for summer sessions, must remit a fee of $25.00 for review of credentials and other services in connection with the application process. This fee is not refundable after the application has been submitted to the Admissions Office, except as follows:

a. If the applicant is not accepted for admission to the university, $20.00 of this fee will be refunded. It is recognized that this decision cannot be final until all supporting credentials are on file.

b. If the applicant is accepted by the university, the $25.00 will be applied as partial payment of registration fees for the semester for which the individual applied. If the applicant, once accepted, does not enroll at the university for the particular semester applied for, there will be no refund and no credit toward fees.

Final Dates for Application. In order to provide time for evaluation and for notice of acceptance to reach the applicant before registration days, applications and credentials should be received by the Admissions Office by August 1 for first-semester entrance and by December 15 for second-semester entrance. Applications and credentials for summer sessions should be received by the Admissions Office at least three weeks prior to the opening date of the summer sessions or the program in which the student intends to enroll. Applications received after the above dates will be accepted in the order of their receipt only as long as additional new students may be accommodated. Acceptance will be subject to space limitations in the division in which the applicant wishes to register.

Acceptance.

1. When an applicant's credentials have all been received and he or she has been found eligible, a letter of acceptance and a physical examination report form will be sent. A permit to register will be among the registration materials furnished the applicant upon arrival at the university.

2. Acceptance is granted for a specified semester or summer session. If an applicant does not register for the term for which he or she applied and was accepted, it will be necessary to submit a supplemental application if entrance at a later time is desired.

Admission Requirements

All applicants for admission to the university must present satisfactory evidence of good character.

Applicants Without Previous College Credit.

1. Applicants who are either residents of Idaho or sons or daughters of

nonresident alumni of the university are eligible for admission if they are graduates of accredited high schools.

2. Nonresident applicants who are graduates of accredited high schools are selected for admission from among those who rank scholastically in the upper half of their graduating class.

3. Applicants who are not graduates of accredited high schools may qualify for admission in one of the following ways:

a. **By Recommendation.** Applicants who have completed fifteen acceptable units in accredited high schools and who rank scholastically in the upper half of their class, but have not graduated, may be admitted upon special written recommendation of the principal and approval of the director of admissions.

b. **By Examination.** Applicants who are graduates of non-accredited high schools and those who are not graduates of any high school will be considered for admission on the basis of individual evaluation of their capability to benefit from a university education. In addition to their previous academic records and scores on specified standardized tests, special consideration will be given to evidence of maturity as indicated by their age, record of experience in the armed forces, or in employment. Applicants to whom this provision applies should write to the Admissions Office for detailed information and instructions.

4. **High School Preparation.** TRANSCRIPTS SUBMITTED IN SUPPORT OF AN APPLICATION MUST BE OFFICIAL AND MUST BE SENT DIRECTLY TO THE ADMISSIONS OFFICE BY THE ISSUING INSTITUTION (or certifying agency in the case of international students). THEY WILL NOT BE ACCEPTED FROM THE APPLICANT. THEY BECOME THE PROPERTY OF THE UNIVERSITY AND CANNOT BE RETURNED OR FORWARDED. Certificates of secondary-school record should show the length of each course in weeks, the number of class meetings per week, the length of each meeting, and the grade of scholarship attained, including a record of all failures, conditions, and repeats.

a. **Definition of High School Units.** A "unit" represents a subject taught five times per week in periods of not less than forty minutes duration (eighty minutes for laboratory periods) for a school year of at least thirty-six weeks. Units earned in the ninth grade of a junior high school are combined with those earned in a three-year senior high school. Units are classified as "academic" and "non-academic." Academic units are those earned in English (composition and literature), foreign languages, mathematics, natural sciences, and social sciences. Acceptance of units is subject to the following limitations:

(1) Units are not accepted in spelling, penmanship, reviews, project work (unless in conjunction with regular courses), and work primarily in the nature of extracurricular activities.

(2) Units are not accepted for less than one year in a foreign language, typewriting, shorthand, or bookkeeping.

(Continued on page 25)

COLLEGES OF THE UNIVERSITY

Students who plan to enter the General Studies Program (see part 4 of this catalog) should use this chart as a guide for minimum high school preparation.

HIGH SCHOOL UNITS IN	Agriculture	Business & Economics	Education	Engineering	Forestry, Wildlife & Range Sciences	Letters & Science	Mines
English	3	3	3	3	3	3	3
Social science	2	2	2	2	2	2	2
Mathematics [1]							
Algebra	1	1	1	1	1	1	1
Plane geometry	1	1		1	1	1[2]	1
Advanced algebra	½			1	1		½
Trigonometry				½	½		
Other			1	½			½[3]
Natural science							
Unspecified	1	2	2	1	0[4]	2	1[5]
Biology					1		
Chemistry				1	1		
Physics	1			1	1		1[6]
Unspecified academic units	1½	2	2		½	2	1
Total academic units	11	11	11	12	12	11	11
Additional academic, vocational, or elective units	4	4	4	3	3	4	4
Total units required	15	15	15	15	15	15	15

1 High schools offering modern mathematics programs may have course names that differ from the traditional ones, yet contain equivalent material.

2 Or one unit of advanced algebra. Both plane geometry and advanced algebra are recommended, especially for prospective students of mathematics, science, or architecture.

3 One-half unit of either advanced algebra, trigonometry, or solid geometry (in this order of preference) is required.

4 Physics strongly recommended.

5 Chemistry strongly recommended.

6 One unit required for mining, metallurgical, or geological engineering, but not required for geography where two units of natural science (unspecified) are required.

(3) Less than one-half unit in any subject is not accepted.

(4) A maximum of one unit each in physical education and military training is accepted.

b. **Subject Requirements.**

(1) The subject matter content of an applicant's secondary education does not enter directly into the determination of eligibility for admission. It does, however, provide a basis for evaluating the adequacy of his or her preparation, for advisement as to the choice of college or curriculum and for placement in certain college subjects. The required preparation for admission to the various colleges of the university is set forth in the table on the opposite page.

(2) Students may be admitted with fewer academic units than the minimum total indicated for their particular college or they may be admitted with the total academic units required but with fewer units in one or more subjects than indicated. In either case the student's college will identify subject inadequacies and prescribe the means by which these deficiencies are to be removed or satisfied. Courses needed as preparation for the student's college curriculum should be taken during the student's first year at the university.

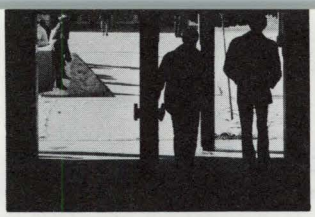
Advanced Placement.

Credit is granted for successful completion of the CEEB Advanced Placement Examination, the College Level Examination Program (CLEP), and military schools as recommended by the American Council on Education. Inquiries about advanced placement should be addressed to the Admissions Office.

Applicants With Previous College Credit.

1. Applicants who have been enrolled in other colleges or universities accredited by one of the regional agencies, such as the Northwest Association of Secondary and Higher Schools, and whose scholastic records at these institutions are satisfactory may be admitted to advanced standing. These students must submit the following credentials to the Admissions Office of the University of Idaho at least one month before they expect to enter the university: a certificate of secondary school record from the last high school attended and separate transcripts from each of the higher institutions attended. TRANSCRIPTS SUBMITTED IN SUPPORT OF AN APPLICATION MUST BE OFFICIAL AND MUST BE SENT DIRECTLY TO THE ADMISSIONS OFFICE BY THE ISSUING INSTITUTIONS (or certifying agency in the case of international students). THEY WILL NOT BE ACCEPTED FROM THE APPLICANT. THEY BECOME THE PROPERTY OF THE UNIVERSITY AND CANNOT BE RETURNED OR FORWARDED.

2. Upon admission of a transfer student, all credits earned or attempted, and all grades received in college-level courses at accredited institutions are recorded; however, no grade points for this work are included in the computa-



tion of his or her grade-point average at the University of Idaho. (For regulations covering students who entered the university prior to the 1971-72 academic year, see the applicable catalog issue.)

3. Students admitted to the University of Idaho from other collegiate educational institutions must have complied with the academic regulations for continuance in the institution or institutions which they have attended in addition to the academic regulations which are applied to students enrolled in this institution.

4. Advanced placement credit granted by other accredited institutions will be honored on transfer to the University of Idaho.

5. Transfer students are selected from those applicants who present a cumulative grade-point average of at least 2.00 (C) for all college-level study attempted in all accredited colleges attended, exclusive of courses for which grade points are not allowed.

6. Advanced-standing applicants with less than twenty-six semester hours of transfer credit must meet both beginning freshman and advanced-standing admission requirements, including submission of the required test scores.

7. The university may grant credit for completion of certain educational programs sponsored by the armed forces. In evaluating these programs, consideration will be given to recommendations made by the American Council on Education and other appropriate agencies and to university degree requirements.

8. No credit will be accepted on transfer to the university for work done at a junior college after the student has earned, at any institution or institutions, a total of sixty-four credits (or one-half the total credits required for his or her intended degree program, whichever is larger).

Admission as a Non-Matriculated Student. This category is for applicants who wish to pursue studies for their personal edification and who do not want to work toward a formal degree at the University of Idaho. No credentials are required in support of the application. However, if the student wishes to change to a formal program, he or she will be required to file a regular application form and furnish the required supporting credentials and meet all the admissions requirements. The applicability of credit earned while registered in this category is the responsiblity of the student. Permission of the dean of the Graduate School and of the instructor of the course is required to enroll in courses numbered 500 or above.

The applicant is required to complete a non-matriculated student application form attesting to his or her status at any previously-attended institutions of higher education and certifying that the applicant: (1) understands that acceptance in this category does not constitute acceptance to a degree-granting program; (2) has sufficient educational background to qualify for the course or courses in which enrollment is sought; and (3) accepts personal responsibility for the applicability of credits earned while registered in this category.

Admission of International Students. The University of Idaho accepts

qualified students from other countries to the extent that space is available. International applicants are expected to meet the requirements for admission from high school or from other colleges or universities as outlined above.

1. **Credentials.** Official transcripts and/or certified copies of the certificate, diploma, or government examination report received from any college or university must be translated into English and must be sent by the certifying agency directly to the Admissions Office.

2. **English Proficiency.** All international student applicants whose native language is other than English are required to take and receive a satisfactory score on the Test of English as a Foreign Language (TOEFL) or other examination acceptable to the University of Idaho. Arrangements to take the TOEFL examination may be made by writing directly to TOEFL, Educational Testing Service, P.O. Box 899, Princeton, New Jersey 08540. The test must be taken and the scores received by the university prior to a decision on admission of the applicant.

3. **Financial Statement.** All international students must present to the Admissions Office satisfactory statements of finances and adequate proof of financial responsiblity or sponsorship by a reputable American citizen or organization for all financial obligations while attending the university.

Admission to the Graduate School and the College of Law. See the Graduate School section in part 4 of this catalog for basic information on admission to graduate standing. Students interested in graduate study should request a copy of the catalog of the Graduate School. The special procedures for admission to the College of Law are described in that division's section in part 4 of this catalog. See "Fees and Expenses" in this part 2 for the application fee for the Graduate School and the College of Law.

Mutual Responsibility Agreement

THE ACCEPTANCE OF A STUDENT for admission and enrollment at the University of Idaho constitutes an agreement of mutual responsibility. The student's part of this agreement is to accept established university rules and policies, to respect the laws of governmental units, and to act in a responsible manner appropriate to these laws, rules, and policies. The university's part is to recognize its commitment to higher education, to fulfill its responsibilities pursuant to the attainment of the academic goals and objectives of all members of the university community, and to meet its obligations for an appropriate atmosphere which will provide an opportunity for students to be heard in matters pertaining to their welfare as students. Appropriate disciplinary action on the part of the university must be taken when it has been determined by established procedures that a student has acted contrary to university regulations and thus has violated this agreement.

Fees and Expenses

Student fees and out-of-state tuition for 1973-74 had not been set by the time this catalog went to press. The rates quoted in this section were in effect during the 1972-73 academic year. They are subject to change without notice.

EXPENSES FOR ATTENDING the University of Idaho vary with the taste and financial means of the individual. The university prides itself for its record in providing high-quality instruction at reasonable cost.

Board and room are available at relatively low rates because more than two-thirds of the single undergraduate students live on campus. For about $101.50 a month (35.50 for room; $66.00 for board) or a maximum of $470.00 a semester, students secure excellent board and room in the university-operated dormitories. Students may reduce their living costs by sharing the work in the cooperative residence halls. Costs are approximately $75.50 a month ($26.00 for room; $49.50 for board), or $337.50 a semester.

Estimated Costs Per Semester

	Idaho Resident	Nonresident
Tuition	$ 0	$ 400.00
Registration fees*	178.00	178.00
Books, supplies, etc	45.00 to 65.00	45.00 to 65.00
Room and board**	337.50 to 470.00	337.50 to 470.00
TOTAL***	$555.50 to 713.00	$960.50 to 1113.00

* Law students pay an additional $100.00.

** In university-owned dormitories. The lower figure represents the costs in cooperative dormitories in which residents provide their own janitorial and dining hall services.

*** Not including personal, incidental, or travel expenses.

Annual Expenses

In forecasting total costs for the academic year, double the semester estimates above and add miscellaneous costs — clothing, laundry, transportation, incidentals, social and recreational expenditures, fraternal affiliations, and personal needs. These miscellaneous costs will vary widely with individual tastes.

A student coming to the university needs about $470.00 to meet initial payments, including the first installment on the board payment. Out-of-state students need an additional $400.00 to cover tuition. Law students need an additional $100.00 to cover the College of Law registration fee. Personal checks, bank drafts, money orders, or travelers checks are all accepted by the university.

Regular Student Fees Per Semester

All students, unless specifically exempted, who register for more than seven

credits (or equivalent) pay the full-time student registration fees applicable to the particular division in which the student enrolls. Students in all divisions other than the College of Law pay $178.00 per semester. Law students pay $278.00 per semester unless the student was in continuous enrollment in the College of Law prior to the 1972-73 academic year, in which case the fees are $178.00 per semester. Fees are payable in full at the time of registration on the scheduled registration days.

Payment of full-time student fees includes laboratory and course charges, membership in the Associated Students of the University of Idaho (ASUI), and entitles the student to the services of the Alumni Office, as well as the other services and facilities maintained by the university for the benefit of the students, subject to additional charges for special services and the payment of the special fees listed below. No reduction in fees can be made for students who may not desire to use any part of these services.

Special Fees

Nonresident Tuition ($400.00 per semester). Students who are classified as nonresidents of the state of Idaho pay this special fee in addition to the registration fees of $178.00, making a total of $578.00 per semester. For tuition purposes, a student may be classified as a resident of Idaho by meeting one or more of the following qualifications:

1. Any student under the legal voting age whose parents or court-appointed guardian is domiciled in the state of Idaho. Domicile is deemed to exist when the parent or guardian has established residence in Idaho for an indefinite time and the former residence is abandoned. To qualify under this section the parents or guardian must be residing in the state on the opening day of the term for which the student matriculates.

2. Any student, legal voting age or older, who has continuously resided in the state of Idaho for six months next preceding the opening day of the period of instruction during which he or she proposes to attend the university. However, no student shall be deemed to have gained residence while attending any college or university in the state of Idaho. Students carrying less than eight credit hours (or equivalent) are not considered attending school.

3. Any student under the legal voting age who is a graduate of an accredited secondary school in the state of Idaho, and who matriculates at a college or university in the state of Idaho during the term immediately following such graduation regardless of the residence of his or her parent or guardian.

4. The spouse of a person who is classified, or is eligible for classification, as a resident of the state of Idaho for the purpose of attending a college or university.

5. A member of the armed forces of the United States, stationed in the state of Idaho on military orders (not for the purpose of attending school).

6. A student under the legal voting age whose parent or guardian is

a member of the armed forces and stationed in the state of Idaho on military orders. The student, while in continuous attendance, shall not lose residence status when his or her parent or guardian is transferred on military orders.

7. A person under the legal voting age, married, and who, together with spouse, has continuously resided in the state of Idaho for six months next preceding the opening day of the period of instruction during which he or she proposes to attend the college or university. No student shall be deemed to have gained residence while attending any college or university in the state of Idaho.

8. A person separated, under honorable conditions, from the United States armed forces after at least two years of service, who at the time of separation designates the state of Idaho as his or her permanent mailing address and enters a college or university in the state of Idaho within one year of the date of separation.

Application Fee for Nonresident Undergraduates ($25.00). This fee applies to out-of-state undergraduate applicants, except those applying for summer sessions. If the applicant is not accepted for admission to the university, $20.00 will be refunded. If the applicant is accepted for admission, the entire amount will be applied in partial payment of the nonresident tuition for the semester for which the student has applied for admission. If the student is accepted for admission for a particular semester, but does not complete the matriculation in the university during that semester, no credit or refund will be available.

Application Fee for the Graduate School and College of Law ($10.00). This fee is non-refundable; however, the $10.00 will be applied toward the payment of student fees for the semester or summer session for which the applicant is accepted.

Registration Packet Replacement Fee ($5.00).

Part-Time Fee ($18.00 per credit or equivalent). Students who register for seven credits or less may pay this fee in lieu of regular fees and tuition. Part-time students are entitled to instructional and library privileges only.

Audit, Zero-Credit, or In-Absentia Fee ($18.00 per credit or equivalent). This fee is not charged if the courses are part of a normal registration for a specific semester or other academic session for which the student has already paid the full registration fees.

Student Health Service Fees. The special fees charged by the Student Health Service are listed in the section headed "Student Services" later in this part 2 of the catalog.

Music Fees for Individual Instruction in Performance Studies ($25.00 per credit). All students, including graduate-student appointees, enrolling in courses numbered MusA 101, 301, 407, or 505, Individual Instruction, pay this fee. The fee is waived for students whose programs of studies specifically require these courses for graduation.

Credit by Examination Fee ($5.00 per credit). See regulation "D-4" in part 3 of this catalog. This fee is waived for graduate students holding board appointments as graduate assistant or instructional assistant.

Vocational Competence Credit Fee ($5.00). Charged for each petition for academic credit for technical competence under the vocational teacher education program.

Diploma Fee ($10.00). This fee is payable at the time the student applies for each degree or certificate to be awarded by the university. An additional fee of $5.00 is charged when a special diploma insert must be made. If the application is filed after the last day to submit such applications (see the academic calendar in the front of this catalog), an additional fee of $5.00 is assessed.

Thesis/Dissertation Binding Fee ($7.00). At the time the application for the degree is filed, every candidate for an advanced degree who is submitting a thesis or dissertation (including such terminal projects as musical compositions, etc.) pays this fee to have two copies of the document bound.

Publication and Microfilming Fee ($20.00). Candidates for the Ph.D. or Ed.D. degree pay this fee for the publication of the dissertation abstract and for the microfilming of the dissertation.

Transcript Fee ($1.00). Every individual who has established an academic record at the university (including extension and correspondence study) shall be furnished, upon request, one official copy of the academic record without charge. Additional copies, when requested, are $1.00 per copy.

Yearbook Fee ($5.00). Students wishing to order a copy of the "Gem of the Mountains" pay this special fee at the time the order is placed.

Miscellaneous Fees.

1. Students participating in field trips must pay their proportionate share of travel expenses, including transportation in university vehicles.

2. For library charges, consult the University Library.

3. For costs of special equipment for certain courses, consult the instructor.

4. A small greens fee is charged for the use of the ASUI Golf Course.

Refund of Fees

Students who withdraw in accordance with the regulations governing withdrawals are entitled to the following refund of fees, except that $21.00 of the registration fee is non-refundable once registration is completed.

1. When withdrawal is accomplished during the scheduled registration days and before the beginning of classes, fees (less $21.00) are refunded in total.

2. When withdrawal is completed after classes have begun but prior

to the close of the second week of classes, seventy-five percent of the fee balance is refunded.

3. When withdrawal is completed after the close of the second week but prior to the close of the fourth week of classes, fifty percent of the fee balance is refunded.

4. When withdrawal is completed after the close of the fourth week of classes, no refund is given.

Refunds are based upon the date of the application for refund after completion of withdrawal and not from the date of last attendance of class, except in cases of illness.

Refund of Music Fees

The above schedule does not apply to applied music lessons. Special music fees for individual instruction in performance studies may, upon prompt application by the student withdrawing, be refunded according to the following schedule: during the first two weeks of a semester, five-sixths; during the third and fourth weeks, two-thirds; fifth and sixth weeks, one-half; seventh and eighth weeks, one-third; ninth and tenth weeks, one-sixth. Application for this refund should be made to the director of the School of Music who is responsible for the approval of the application.

Student Housing

THE UNIVERSITY OF IDAHO is a residential campus with more than two-thirds of the single undergraduate students living in residence halls, fraternities, and sororities. The university recognizes that a student's total education is influenced by the nature and quality of the living environment outside the classroom and encourages the development of an environment in the residence halls that will be conducive to broad intellectual growth and greater participation in the life of the academic community. Campus living groups benefit from guidance services provided by advisers associated with them.

In addition to the twenty-one residence halls for single students, the university also provides a number of accommodations for married students, and additional housing is available in Moscow and the surrounding area.

Appropriate regulations are established by the university to assure acceptable living arrangements for all students.

Housing Requirements for Freshmen

All single freshman students are required to live on campus, either in university residence halls or in fraternities or sororities. Exceptions to this policy may be made with the approval of the dean for student advisory services for students who (1) are over twenty-one of age or who reach their twenty-first birthday during the year in question; (2) live with their parents

or relatives in Moscow or in surrounding communities; (3) for health reasons, as certified by a physician, must not live in group housing; or (4) are earning their room and/or board by performing services in a non-student household which requires that they live there.

Residence Halls

The university operates twenty-one residence halls and provides meal services for the students who live in them. Two of the halls, Steel House (women) and Campus Club (men), are cooperatives where students contribute their share of the labor in the kitchen, dining room, and public areas to reduce living costs. Each residence hall has ample study and recreation areas, lounges, and complete laundry facilities; commercial linen service is also available. Personal items, such as sheets, pillow slips, bedding, towels, and other articles deemed convenient or necessary are NOT furnished by the university residence halls and should be provided by the student.

See the section headed "Fees and Expenses," above, for the approximate cost of living in residence halls. More detailed information concerning student housing may be obtained from the Residence Halls Office, Wallace Residence Center, University of Idaho, Moscow, Id. 83843.

Sororities

Chapters of ten national sororities are represented on the University of Idaho campus. Each sorority chapter owns and operates its own house. These are: Alpha Chi Omega, Alpha Gamma Delta, Alpha Phi, Delta Delta Delta, Delta Gamma, Gamma Phi Beta, Kappa Alpha Theta, Kappa Kappa Gamma, Lambda Delta Sigma, and Pi Beta Phi. The average cost for living in a sorority ranges between $100.00 and $120.00 per month, which includes charges for room, board, and social fees. In addition there are special membership fees — pledge, initiation, and house corporation reserve fund — which are paid only once. Panhellenic Council coordinates intersorority relationships and formulates policies regarding rushing procedures.

Arrangements for Sorority Living. Membership in a sorority is by invitation only. Those women who are interested in sorority living should complete the appropriate section of the application-for-admission blank, which indicates their interest in sorority living, or write a letter to Panhellenic Council, c/o Student Advisory Services. The selection of members in each sorority is made during participation in a program known as "rushing," which is held prior to the beginning of the fall semester. Registration for rushing *must be completed no later than August 10*.

Fraternities

Nineteen national fraternities maintain chapters and houses on the University of Idaho campus. Membership in a fraternity is by invitation from the members of the group concerned. The university does not make arrangements for membership.

The average cost for living in a fraternity ranges between $100.00 and $120.00 a month, which includes charges for room, board, and social fees.

The following chapters of national fraternities maintain houses on the University of Idaho campus: Alpha Kappa Lambda, Alpha Tau Omega, Beta Theta Pi, Delta Chi, Delta Sigma Phi, Delta Tau Delta, Farmhouse, Kappa Sigma, Lambda Chi Alpha, Phi Delta Theta, Phi Gamma Delta, Phi Kappa Tau, Pi Kappa Alpha, Sigma Alpha Epsilon, Sigma Chi, Sigma Gamma Chi, Sigma Nu, Tau Kappa Epsilon, and Theta Chi. Each of these groups is represented in the Interfraternity Council which unites them in common service to the university and promotes a spirit of cooperation and self-government among fraternities.

Arrangements for Fraternity Living. Anyone interested in fraternity living should so indicate on the admissions application or write for information to: Interfraternity Council, Student Advisory Services, University of Idaho, Moscow, Id. 83843. Individuals who indicate an interest in fraternity living will be contacted by the various fraternities during the spring and summer prior to their matriculation in the University of Idaho. Invitation for living in a fraternity will generally be extended by the fraternities during the summer prior to matriculation; however, if necessary, these arrangements can be made through the Interfraternity Council upon arrival on campus for the fall semester.

Family Housing

The university operates four housing projects for married students with families. These rent for about $65.00 to $135.00 per month. Some units are not furnished.

To apply for an apartment, write to the Family Housing Office. A $25.00 advance deposit is required.

Student Services

Statement of Student Rights

The Regents of the University of Idaho adopted a "Statement of Student Rights" in 1970. This statement is published in the *Student Handbook* and all members of the university community are urged to familiarize themselves with it. In addition, a revised code of conduct is in the process of formulation.

Academic Advising and Counseling

Statement of Policy. Under the freedom of choice that is inherent in the American system, career objectives are the choice of the individual. Having enrolled at the University of Idaho as a means of fulfilling career and educational objectives, the individual student agrees to meet the requirements of a curriculum as specified by the faculty and the regents.

Each matriculating student is provided with the assistance of an advi-

ser. Advisers are faculty members established in their chosen fields and are assigned because of their experience, interest, and desire to aid students. The role of advisers is to aid students to evaluate further their career objectives and to help them select courses required in their selected curriculum.

Students who are uncertain regarding career objectives or are having difficulty with required curricula should be referred to the Student Counseling Center or to the Career Planning and Placement Center. The specialists at the Counseling Center or the Placement Center provide further aid to students in reaffirming or in modifying their career objectives and personal goals.

In all these matters, the primary responsiblity rests with the students themselves. Their career objectives are their personal choice and they are responsible for meeting curricular requirements as specified. The role of advisers and the specialists at the Counseling Center or Placement Center is to assist students.

The responsibility of faculty members to serve as advisers is second only to teaching. To this end advisers are available a reasonable number of scheduled hours each week to aid individual students. When schedules require, faculty members may have students make appointments in advance.

In seeking the aid of advisers, students must use discretion in the amount of time which they require. They are held responsible for making appointments during scheduled conference hours and for meeting appointments promptly.

Definitions. Student advisement and counseling at the University of Idaho consists of three phases: pre-registration advisement, curriculum advisement, and counseling and career planning.

A. **Pre-Registration Advisement.** Pre-registration advisement is done by faculty members during the scheduled pre-registration periods. The purposes are: (1) to see that students are in the courses they should be taking that semester as determined by: (a) standard curricula either published in the catalog or distributed by the subject matter areas, or (b) individual programs worked out either during the pre-registration period or during curriculum advisement sessions at some other time; and (2) to see that the registration packets are filled out properly.

B. **Curriculum Advisement.** Curriculum advisement is done by faculty members at a convenient time. The purposes are: (1) to provide students with data to assist in determining goals within the framework of a particular curriculum, (2) to assist students in selecting the various options available within a given curriculum with a view to students' career goals, and (3) to assist students in selecting the elective courses best suited to support the basic curriculum and other educational goals.

C. **Counseling and Career Planning.** Counseling is done by members

(Continued on page 36)

of the faculty, the Student Counseling Center, and the Career Planning and Placement Center as the needs of students require. The purpose is to assist students in understanding and resolving their educational, vocational, and personal problems.

Responsibilities.

A. **Principal Duties of Students.** The principal responsiblities of students are: (1) to select educational goals and the curriculum to follow in order to achieve those goals, (2) to be informed on rules and regulations in the catalog and with the curricular requirements (3) to take the initiative when the need arises to consult with advisers before problems become critical, (4) to take into account the advice given concerning the curriculum, and (5) when a change in goal or curriculum becomes desirable, to weigh the matter carefully, seek the services of the Student Counseling Center if necessary, make a decision, and follow that decision.

B. **Principal Duties of Faculty Members.** The principal responsibilities of members of the faculty are: (1) to be informed on rules and regulations in the catalog, (2) to know departmental curricula thoroughly, (3) to be aware of developments and opportunities in his or her own field that would influence the student's choice of options and elective courses, (4) to provide information concerning graduate study and/or extended professional preparation, (5) to be ready to use the resources of the university, such as specialists in other curricula, the Student Counseling Center, and the Career Planning and Placement Center, to assist students, (6) to be patient and to offer advice in a pleasant, accommodating, and professional manner, and (7) to be available, by appointment and at an appropriate number of posted, scheduled office hours.

C. **Principal Duties of Administrators.** The principal responsibilities of the administrators are: (1) in consultation with their faculties, to develop plans of pre-registration advisement and curricular advisement that meet the needs of their curricula and the educational philosophy of their college. (2) to assign well-prepared faculty members and adequate physical arrangements to the advisement programs so that advisement may be accomplished with maximum effect and maximum convenience to students and to the faculty, (3) to take advising duties into account in assigning routine tasks to the various members of their faculties, (4) to give due credit for student advisement in evaluating the performance of faculty members assigned advising duties, bearing in mind that with these members of their faculties, advising is second only to actual classroom teaching in the priorities of duty, and (5) in recruiting new faculty members, to keep in mind the need of possible additional advisers.

Student Advisory Services

The Office of Student Advisory Services has the responsibility to assist students with problems which arise in their non-academic lives. The office deals with individual and group problems and serves as a communica-

tion link within the university structure. Special advisory services for the residence hall system, the fraternity/sorority system, off-campus dwellers, veterans, and international students are provided to work with the unique group involved. Close contact is maintained with student government. Referrals to other student-service agencies are arranged. Resident advisers in each residence hall are also provided. The new student orientation program is also coordinated by this office.

Counseling Center

The Student Counseling Center offers specialized counseling and testing services to students without charge. Counselors, all professionally trained in educational and counseling psychology, are available to discuss educational and vocational plans, personal problems, concerns about study skills, and any other matters of concern related to the student's progress in college. The center maintains an up-to-date library of information on over 250 occupations for students who wish to obtain additional knowledge about various vocational fields. Students may use this library at any time during the normal operation of the center. The Counseling Center also serves as the university representative for a variety of national testing programs, including the Graduate Record, Law School Admissions, Admission Test for Graduate Study in Business, Miller Analogies, Dental Aptitude, and Medical Aptitude. Bulletins of information and application blanks are available in the center.

Student Health Service

The Student Health Service is comprised of a modern hospital and outpatient clinic which is equipped to take care of any ordinary illness or accident. It is operated for graduate and undergraduate students alike who must qualify by taking at least eight semester hours of credit, pay the usual medical fee, and have an entry college physical examination done by the family doctor on file at the Student Health Service Clinic.

There are three full-time physicians who see patients in the clinic daily and who furnish emergency care after hours and on weekends. A psychiatrist spends two days a week in the clinic. X-ray and laboratory departments, and the hospital are staffed by qualified technicians and six graduate nurses. The hospital provides round-the-clock services.

Special fees are charged for X-rays, laboratory tests, and medicines dispensed. The charges for hospitalization, including meals, are three dollars per day for the first seven days and six dollars per day thereafter. A list of specialists in Moscow and nearby cities is maintained for consultation when expert advice is needed.

The Student Health Service is closed during holidays. The hospital is closed during the summer.

Health and Accident Insurance Coverage

An optional health and accident insurance plan is available to University of Idaho students and their spouses/children. This coverage is intended

to supplement the services provided by the Student Health Service described above and is designed to offset expenses resulting from a major accident or serious illness which might require medical care, hospitalization, and surgery beyond services provided through the Student Health Service. This plan does *not* cover office and home calls except as provided by the Student Health Service. There is a deductible provision for dependent spouses and children of students since these dependents are not covered by regular student health services. This student health and accident insurance plan provides coverage for the entire twelve-month period whereas the services of the Student Health Service are available only during the time the university is in session. This insurance is especially useful in paying for a specialist's fees when recommended by a Student Health Service doctor.

Financial Aids

Financial aids are available through the Office of Student Financial Aids to qualified students who are in need of financial assistance to meet the normal costs of college attendance by helping them secure part-time employment (college work-study), loans, scholarships, and other grants. Students applying for admission to the University of Idaho and seeking financial aid assistance may make application for such assistance through a financial aids application blank which is part of the general admission blank. A brochure describing types of approved financial aids programs available to University of Idaho students, together with procedures for applying, is available from the Office of Student Financial Aids, University of Idaho, Moscow, Id. 83843.

The University of Idaho participates in the College Work-Study Program under Title I, Part 6, of the Economic Opportunity Act of 1964. Students who qualify under this program both with respect to a definite and demonstrable financial need and academic potential may obtain part-time employment up to a maximum of fifteen hours per week. Applications for work-study are made as part of the general application for financial aid. The Staff Personnel Office also assists students in finding part-time employment other than work-study arrangements while they are on campus. In most cases part-time job placements cannot be made before a student actually arrives in Moscow and has registered. Students who do find it necessary to earn money while attending the university should complete registration and then contact the Staff Personnel Office for such assistance.

Veterans' Benefits for Educational Assistance

A veteran is entitled to educational assistance if he or she has served at least 181 days of active duty, any part of which occurred since January 31, 1955, according to Public Law 89-358. To receive full benefits, a veteran must be pursuing an approved course of study leading to a degree or other professional objective. To be considered full-time, undergraduate students must carry twelve credits or the equivalent, and graduate students must carry nine credits or the equivalent. (See regulation "O-1" in part 3.)

An advisory service is available to veterans, and it is furnished by the

university. Additional information, advice on the benefits, or application forms may be obtained by writing to the veterans' adviser, Office of Student Advisory Services, University of Idaho, Moscow, Id. 83843.

Special Awards

Many awards are made each year in recognition of outstanding achievement in both academic and non-academic pursuits. The listing of specific awards and recipients is included in the annual commencement program. A description of each award may be obtained from the Office of Student Financial Aids.

Recreational, Social, and Extracurricular Activities

The Student Union is the recreational and social center for the university community. Facilities include bowling alleys, billiard tables, music listening rooms, cafeteria, snack bar, ballroom, theater, and meeting and banquet rooms. Dances, art exhibits, speakers and forums, weekend movies, concerts, and games tournaments are scheduled in the Student Union Building during the school year. The twice-weekly campus newspaper, *The Idaho Argonaut,* and the yearbook, *The Gem of the Mountains,* are published by ASUI (Associated Students of the University of Idaho). These publications offer opportunities for those interested in journalism or photography. ASUI (to which every student who pays regular fees belongs) supports drama and music groups, and provides occasions for entertainment and participation. The University of Idaho competes in intercollegiate football, basketball, baseball, track, tennis, swimming, golf, cross country, and wrestling. Extensive intramural athletic programs are available for both men and women under the direction of the Department of Health, Physical Education and Recreation. The ASUI operates an 18-hole golf course adjacent to the campus. Recreational facilities located on the campus include tennis courts, which are lighted for night play, indoor and outdoor handball courts, and swimming pools.

Student Organizations

University of Idaho students may organize or join associations to promote their common interests. There is a large number of student organizations on campus with varied objectives and programs. A list of these organizations, together with names of current officers, is maintained and information concerning them may be obtained from the program director, Student Union. The annual publication of the ASUI, entitled *Student Handbook,* contains a description of current student organizations.

Career Planning and Placement Center

The Career Planning and Placement Center is the central contact agency between all colleges of the university and their students and employers. The center is organized to assist all University of Idaho graduates with their career planning objectives along with giving them assistance in obtaining employment according to their training, ability, and experience. A career

planning library is available at the center for use by all students of the university.

At specific times throughout the year, business, government, industry, and educational institutions send their representatives to the campus for the purpose of interviewing students and graduates. Arrangements for these visits are made with the Career Planning and Placement Center. This service is available to all students purposefully identified with programs of study at the University of Idaho. All candidates registering with the center must be sufficiently well-known by faculty members so that a minimum of two recommendations can be obtained.

For students to make themselves available for this service, they must register with the center in advance. The initial contact with the center must be made by the student. There is no charge for this initial registration. All registration and services are strictly on a voluntary basis.

Alumni Association

The University of Idaho Alumni Association is composed of all graduates, former students, and newly elected honorary alumni. Activities of the 30,000-plus members are led by a full-time director of alumni relations and an elected executive board, including the ASUI president. These leaders, along with district chairmen in Idaho and club officers throughout the country, keep alumni informed of their alma mater, encourage their support of its operation, and apprise university officials of alumni opinions. The Alumni Association honors outstanding graduates by electing them to the Alumni Hall of Fame, selects honorary alumni, honors superior intramural athletes, and presents scholarships to children of alumni. Areas of recent emphasis include utilizing alumni experts on university advisory boards, in forming and building alumni chapters nationally, strengthening liaison with present students, and support of Development Office functions.

Religious Activities

The University of Idaho is served by three campus religious centers: Campus Christian Center, corner of University and Elm; LDS Institute of Religion, 902 Deakin Street; St. Augustine's Roman Catholic Center, corner of Sixth and Deakin. These centers provide opportunities for the study and practice of religion as well as resources in counseling and guidance.

All of Moscow's churches provide opportunities for religious development for University of Idaho students. In addition to the usual services of worship and church school classes, most of the churches help maintain and staff campus-oriented religious centers. Church addresses are readily available in the Moscow phone directory. Church away from home is provided by the local churches of Moscow. A challenge for growth and development of one's religious perspective is offered by the campus religious centers.

General Requirements and Academic Procedures

Several of the regulations in this section were in the process of revision at the time this catalog went to press. Consult the catalog supplement in the official time schedule of classes for changes.

THE FOLLOWING PROCEDURES AND REGULATIONS have been adopted to help students, faculty and staff members, and administrators successfully carry out the overall academic progam of the university. Careful adherence to the items in this part 3 will enable everyone concerned to cooperate effectively. It is the responsiblity of the registration adviser, major professor, or dean to assist students to understand and comply with academic procedures. The registrar assists by checking student records for compliance with the regulations in this catalog section. Students, with the help of faculty advisers, should check their records at each registration to assure that they are systematically and progressively fulfilling their degree requirements. Students are responsible for knowledge of and compliance with academic procedures and standards, but should seek guidance whenever questions arise. An academic provision or standard is waived only when a student successfully petitions the appropriate departmental, college, or university committee.

Regulation "A"—Matriculation

Applicants for enrollment in any course offered by the university for college credit, except correspondence study, extension, and non-matriculated categories, submit certain personal data and credentials covering all previous academic work. (See "Admission to the University" in part 2.) After the university has received these credentials and approved the application, a packet of registration forms is prepared and the applicant's initial registration in the university concludes the matriculation process.

Regulation "B"—Registration

1. **Preparation of Registration Materials.** Registration packets are prepared for new students as described above. They are also prepared for students enrolled in a given semester for the succeeding semester. However, individuals enrolled in the spring semester who plan to enroll in the summer must apply for a packet at least three weeks prior to the opening of summer session. Similarly, students entering the university in the summer who were not enrolled during the spring semester and who plan to continue in the fall semester must apply for a packet at least three weeks prior to the opening of the fall semester. Former University of Idaho students who have not been enrolled in the university for a semester or longer should notify the registrar of their intention to re-register at least one month prior to the opening of the term. Such individuals will be required to submit transcripts from any institutions attended since their last registration at the University of Idaho, and they may also be required to complete a residence

questionnaire. Failure to meet the deadline may cause a delay in completing registration.

2. **Admission to Classes.**

a. Instructors do not admit to class individuals whose names do not appear on the class roster, or anyone for whom they have not signed an "add" card.

b. At the beginning of each semester or other academic session, students, with their adviser's aid, complete a trial study list. The information is then transcribed to the official registration card which is approved by the adviser and is checked by such procedures as the student's college may require. After receiving a class permit for each course to be taken for credit, for zero credit, or as an auditor, the student files the completed registration card with the registrar. After payment of fees, registration is complete and admission to classes is authorized.

3. **Auditing Classes.** Auditing a course consists of attendance without participation or credit. Only lecture classes may be audited.

4. **Registration for Zero Credit.** Any course offered for credit may be taken for zero credit. The implications of zero credit are:

a. Registrants are expected to do the assigned work of the course and attend its sessions. They receive grades on the same basis as the other students and the grades are entered on permanent records.

b. Students enrolled in a course for zero credit may take it on the basis of P or F. This is separate from the "pass-fail option" outlined in regulation "B-11."

c. Courses taken for zero credit do not fulfill requirements.

d. By definition, zero-credit grades have no effect on a student's grade-point average. Neither do they affect academic eligibility, disqualification, or reinstatement.

e. Students enrolled for zero credit count as regular registrants for statistical purposes, such as listing of course enrollments, computing instructors' loads, and determining departmental services.

5. **Nonresident Courses.** Students while in residence are permitted to carry extension or correspondence study courses for college credit only with the prior written approval of their academic dean. Credit for extension or correspondence study courses will not be accepted without this written approval.

6. **Registration for Courses Without Completion of the Prerequisites.** Students who have not completed the stated prerequisites to a course for which they are otherwise eligible may register for the course with the instructor's approval.

7. **Registration of Lower-Division Students in Upper-Division Courses.** All academic programs give priority in the first two years to meeting the

general requirements for the appropriate degree and generally acquiring the foundation for advanced study; therefore, lower-division students shall not take upper-division courses. Exceptions may be made for students who have fulfilled the prerequisites and who are well prepared in their field of study. In such cases, the instructor of the upper-division course concerned may, with the concurrence of the student's adviser and academic dean, authorize the exception.

8. **Registration of Undergraduate Students in Graduate Courses.** Undergraduate students may register in graduate courses under the procedures outlined in the catalog of the Graduate School with the prior written approval of the instructor of the course, the student's adviser, and the dean of the Graduate School.

9. **Registration of Students with Baccalaureate Degrees as Undergraduates.** To register as undergraduates, students with baccalaureate degrees must secure the permission of the dean of the undergraduate college and file a statement with the registrar indicating that they understand that the work will not be classified as graduate work and cannot be used toward a graduate degree or certificate at a later date. (See regulations "J-7-b" and "J-7-c.")

10. **Registration for Accelerated and Other Short Courses.** Students may register for accelerated and other short courses at any time up to and including the starting date of the course without petition.

11. **Pass-Fail Option.**

a. *UNDERGRADUATE STUDENTS.* With the approval of their advisers, undergraduate students who have a cumulative grade-point average of 2.00 or higher are permitted to enroll in one course per semester under this "pass-fail option." (The grade-point requirement is not applicable to students who are taking university-level courses for the first time.) This procedure is separate from taking courses which are regularly graded on the basis of P or F. Undergraduates are not permitted to take the following courses under the pass-fail option: Eng 101 and 201, courses in the student's major subject field, and courses excluded from this option by the academic department in which the student is majoring. (In the case of interdepartmental curricula, e.g., American studies, agribusiness, etc., "academic department" means the departments, colleges, and/or other units involved.) Departments usually exclude courses which are closely related to the major field. A maximum of eighteen credits earned in courses under this regulation may be counted toward a baccalaureate degree. (See regulation "J-5.")

b. *GRADUATE STUDENTS.*

(1) With the approval of their major professor (or adviser in the case of an unclassified student) and the dean of the Graduate School, graduate students may enroll in a limited number of courses under this "pass-fail option." This procedure is separate from taking courses which are regularly graded on the basis of P or F.

(2) Courses which may be taken by graduate students under this regulation are: (a) any course which the student's graduate committee deems not essential to the major field, and (b) any course required to remove a deficiency or to provide background for the student's program, unless the major department stipulates that such deficiency courses must be taken on a regular-grade basis and completed with a grade of A or B.

(3) Of the minimum number of credits required for a degree or professional certificate, no more than three credits in a master's or certificate program or nine in a doctoral program may be taken under this "pass-fail option."

(4) To have a grade of P recorded for a course taken under this regulation, graduate students must earn a grade of C or above. A grade of D will be converted to an F on the student's academic records.

(5) Unclassified students may enroll for courses under this option with the approval of their adviser (if assigned) and the dean of the Graduate School; however, if at a later date an unclassified student is admitted to a degree or certificate program, the above regulations apply and no changes to regular letter grades will be permitted.

c. *ADDS, DROPS, AND CHANGES.* Students may add or drop a pass-fail-option course in the same manner as a regular course, and they may change from pass-fail to regular-grade classification, or vice versa, if they do so prior to the last day to add courses or change course sections. Students may make these changes by securing the approval of their adviser or major professor.

d. *REPORTING OF GRADES.* Instructors are not notified as to which students are enrolled in courses under this pass-fail option. Grades are reported in the same manner as grades in courses taken on regular-grade basis. The registrar is responsible for converting grades of D or above, for undergraduates, or C or above, for graduates, to grades of P on students' academic records.

12. **Registration for Fewer Credits than Authorized.** Students may register for a particular course for fewer credits than the number indicated for the course in the official time schedule of classes (they may also register for zero credit under the conditions set forth in regulation "B-4"); likewise, departments may list courses in the time schedule for fewer credits than the number authorized by this catalog.

Regulation "C"—Changes in Registration

Students may change their registration as provided in the following schedule. All registration changes are effective on the date they are filed with the registrar. Students may not drop a course by simply staying out of class. Petitions to withdraw from courses or from the university cannot be accepted after the start of the last week of a semester.

Semester Schedule for Changes in Registration

See calendar in the front of the catalog for dates. (The schedule for changes during summer sessions is substantially different. See the calendar in the front of the summer bulletin for exact dates.)

DESIRED CHANGE	First two weeks of classes	Third through sixth week of classes	Seventh to last week of the semester
Drop course	File form. No grade recorded	File form. Grade recorded as withdrawal (W).	Through dean's office. Grade recorded as withdrawal (W) or failure (F).
Add course	File form.	File form. Only for accelerated courses or by petition through dean's office. Permission of instructor required.	
Change course section	File form.	By petition through dean's office in special cases only.	
Withdraw from university. (See regulation "G.")	File form. No grade recorded.	File form. Grade recorded as withdrawal (W).	File form. Grade recorded as withdrawal (W) or failure (F).
Change in undergraduate curriculum or major. (Consult the graduate bulletin for procedures applicable to graduate students.)	Anytime. File form. The request to change must be approved by the dean of the college in which the new curriculum is offered. If the new curriculum is in a different college, students must meet the admission requirements of that college. Students must also see the dean of the college they are transferring out of for counseling and information purposes (not for permission to transfer). A cumulative grade-point average of 2.00 or better is normally required to transfer from one college of the university to another; however, any student enrolled in the university may transfer to the General Studies Program by contacting the director of the program (the signatures in this case are only to certify that the student's academic records have been forwarded). The change of curriculum is official when the student files the completed form with the registrar.		

Regulation "D"—Credit

1. **Credit Defined.** Each course is evaluated by a system of semester credit related to time spent in class, laboratory, study/preparation, or field investigation. A credit is expcted to require a total of three clock hours of scholarly activity per week throughout the semester. Ordinarily one hour of class attendance is scheduled for each credit, but any combination of class attendance, laboratory, study/preparation, or field investigation may be arranged. When students are permitted to register for credit in workshops and similar short courses, credit is granted on the basis of one semester credit for each week of full-time scholarly activity required. Exceptions to this policy for undergraduate courses must be approved by the University Curriculum Committee. Exceptions for graduate courses must be approved by the Graduate Council and the University Curriculum Committee.

2. **Credit-Load Limitations Per Semester.**

a. Full-time undergraduate students may register for a maximum of twenty credits per semester. This number may be increased to twenty-two with the approval of the student's academic dean. Registration for more than twenty-two credits must be approved by the Petitions Subcommittee of the Administrative Council (submit petitions via dean's office). The corresponding limitations during the regular eight-week summer session are ten and eleven, respectively. (Also see regulation "J-5.")

b. There is no specified maximum credit limitation during the academic year for students in the Gradate School, except that instructional assistants and graduate assistants on regents' appointment are limited to an average of twelve credits (or equivalent in audits, zero-credit enrollments, etc.) during two successive academic-year semesters. During the regular eight-week summer session the normal credit load for graduate students is eight credits (or equivalent) with a maximum of ten credits. Exceptions to this regulation require the approval of the dean of the Graduate School.

c. Full-time employees of the university may register for a maximum of six credits each semester and three credits during the regular eight-week summer session. Written approval by the employee's department chairman and dean or division head must be attached to the official registration form.

3. **Transfer Credit.** Credit is accepted for work completed in accredited institutions of higher education as provided in the regulations covering the admission of transfer students. (See the section headed "Applicants With Previous College Credit" under "Admission to the University" in part 2; also see regulation "E-4.")

4. **Challenged Courses (Credit by Examination).** Students may challenge courses — earn credit by examination — under the following regulations:

a. No examinations under this regulation may be conducted during the last two weeks of any semester or other academic session.

b. Students are not permitted to challenge a prerequisite course after having completed the advanced course.

c. Credit in courses offered by the College of Law may not be obtained by this procedure.

d. Students must submit evidence to the instructor concerned that they have sufficient knowledge to challenge a course. After students have been granted permission to challenge a course by the instructor and the chairman of the department in which the course is offered, as well as by their academic dean, the examination fee is paid and the completed petition is then filed with the registrar. The registrar checks the student's official record and, if the student is eligible to

take the advanced-credit examination, the instructor will be notified by card to proceed with the examination.

e. Undergraduate students must score C or higher to pass and obtain credit. Graduate students must score B or A to pass and obtain credit. A passing grade is entered as P and is not included in grade-point computations. If students do not meet the foregoing standards, no entry is made on their academic records.

f. Results of the challenged courses must be forwarded to the registrar no later than the beginning of the last week of the semester. In the case of graduate students, the results are sent to the registrar via the chairman of the student's major department and the dean of the Graduate School.

5. **Review and Prerequisite Courses.** Students will not receive credit for courses taken in review or for courses which are prerequisites of courses they have already completed, except as stated in item 1 of regulation "I."

Regulation "E"—Grades

1. **Grading System.**

a. For purposes of reporting and record, the academic work of undergraduate and graduate students is graded as follows: A—superior; B—above average; C—average; D—below average; F—failure; I—incomplete work of passing quality (see regulation "F"); W—withdrawal according to proper procedures while doing passing work or before a definite record to the contrary has been established (see regulation "C"); P—pass (see below).

b. Grades of P (pass) may be reported at the option of the department, on a course-by-course basis, in non-competitive courses, such as practicum, internship, seminar, directed study, and independent study. Grades of P or F are also reported in courses carrying the statement, "Graded on the basis of P or F," in the official course description. In those courses in which P grades are to be used, the method of grading will be made known to the students at the beginning of the semester, and the grading system will be uniform for all students in the course, except as provided in regulation "B-4-b." Grades under the pass-fail option are not affected by this regulation because the conversion of the regular letter grade is made by the registrar after instructors turn in the class rosters.

c. Mid-semester grades in undergraduate courses must also conform to the above regulations. It is permissible to report on the basis of P or F at mid-semester only in courses which have been approved for grading on this basis.

2. **Grades in Graduate Thesis or Dissertation.**

a. The grade of IP (in progress) may be used to indicate at least minimally satisfactory progress in courses 500 (Master's Research and

Thesis) and 600 (Doctoral Research and Dissertation). When the thesis or dissertation is finally accepted, or when a student ceases to work under a particular major professor, the IP grades are to be removed (see below). Grades of IP are considered to represent at least grades of B or P. If in any given semester the major professor considers the student's progress unsatisfactory, an appropriate letter grade should be assigned for that semester.

b. Departments may use on a department-wide basis either the P or F grading system, or regular letter grades, as well as P, when removing the previously-assigned IP grades (e.g., a student who enrolled for six credits in course 500 one semester, four credits another semester, and five credits an additional semester, could have the fifteen credits of IP grades removed with different grades for each of the blocks of credit registered for each semester, such as six credits of A, four credits of B, and five credits of P).

3. **Grades in Law Courses.** For additional provisions applicable to grades in law courses, see the College of Law section in part 4.

4. **Computing Grade-Point Averages.** The following scale of grade points is used in computing grade-point averages for all residence courses attempted at the University of Idaho: A—4, B—3, C—2, D—1, F—0. Grade points are not computed for transfer, correspondence study, extension, advanced placement (including CLEP), credit by examination, or for courses graded on the basis of P or F. However, credits earned at other recognized institutions which are earned subsequent to regular enrollment for at least one semester or summer session at the University of Idaho are computed in the student's University of Idaho cumulative grade-point average on the same basis as credits earned on the Moscow campus. For the purposes of this regulation, "regular enrollment" does not include enrollment as a non-matriculated student. (For regulations covering students who entered the university prior to the 1971-72 academic year, see the applicable catalog issue.)

5. **Raising a Grade by Repeating the Course.** A student who has received a grade of D or F in a course at the university or elsewhere may repeat the course IN RESIDENCE on the University of Idaho campus in an effort to raise the grade, provided a more advanced course for which the first course is a prerequisite has not been completed in the meantime. While all grades received remain on the record, only the grade received the most recent time the course is taken is counted for grade-point purposes. (For regulations covering repeats prior to the 1972-73 academic year, see the applicable catalog issue, and see the College of Law section in part 4 for the exception to this regulation applicable to students in that college.)

6. **Reports of Grades.** Grades are reported to the registrar for all courses at the end of each term and also for undergraduate courses at midsemester. Students are furnished copies of these grade reports.

Regulation "F"—Incompletes

1. An incomplete is assigned at the end of the semester only when the student has been in attendance and has done satisfactory work to a time within three weeks of the close of the semester, or within one week of the close of the summer session. It may not be assigned in the case of withdrawal from the university unless the withdrawal occurs within the last three weeks of the semester. If a final grade of incomplete is recorded, the instructor shall indicate in writing with the class roster what the student must do to remove the deficiency. The instructor shall also indicate with the foregoing written statement what permanent grade is to be entered on the student's academic record in the event that the incomplete is not removed by the applicable deadline.

2. **Removal of Incompletes.** Incompletes should be removed within six weeks after the first day of classes of the semester or summer session in which the student next returns to the university. Incompletes not made up before that date automatically revert to the grade indicated by the instructor with the class roster (see item 1 above) unless the student has previously filed with the registrar a permit-for-extension-of-time card, signed by his or her academic dean and the instructor concerned. If an extension is granted, incompletes not made up before the expiration date automatically revert to the grade indicated by the instructor with the class roster. It is the student's responsibility to see that incompletes are made up before the expiration date. Removal-of-incomplete cards must be received by the registrar prior to these dates. In some cases a student's eligibility to re-register is contingent upon removal of incompletes. In such cases an extension of time for removal of incomplete grades may not be granted; furthermore, if students become academically disqualified (see regulation "L") after removal of the incomplete, their registrations may be cancelled.

3. **Incompletes Received at End of Final Semester.** An incomplete in a required course received by a candidate for a degree or certificate at the end of the semester or summer session in which the requirements for the diploma are otherwise completed reverts immediately to the grade specified by the instructor on the class roster; however, the student is permitted to complete the course work involved within the usual time limit and raise the grade on the permanent record.

4. **Extension Courses.** Incompletes in extension courses must be removed within one year. Incompletes not made up within one year automatically become withdrawals. No extension of time will be granted. Students may register for courses during the allotted time provided that the total load, including the incompletes, does not exceed six semester credits. If during the year students enroll for residence courses, regulation "F-2" becomes applicable.

Regulation "G"—Withdrawal From the University

Students who wish to withdraw from the university should contact the Office of Student Advisory Services (241 University Classroom Center)

where the withdrawal is initiated and further instructions are received for completing the indefinite leave-of-absence card. Grades for students who are withdrawing will be recorded as provided in regulations "C" and "F-1." Petitions to withdraw from the university cannot be accepted by deans after the start of the last week of the semester. The date the indefinite-leave-of-absence card is filed in the office of the student's academic dean is the official date of the withdrawal. (See "Refund of Fees" in the section headed "Fees and Expenses" in part 2.) Students who leave the university without filing an indefinite-leave-of-absence card will receive grades of F in all courses in which they are registered.

Regulation "H"—Final Examinations

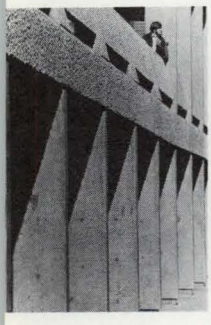
1. Classes continue to meet throughout the last week of each semester or other academic session; however, one or two regular class hours of the last week may be used for final examinations in those courses in which the instructor *or* the department concerned deem a final examination is desirable. In courses having more than one section, the department and the various instructors will determine a uniform policy for all sections of the course. Where examinations common to more than one course or section are needed (7:00 to 9:00 p.m.), they must be scheduled through the Registrar's Office to avoid conflicts.

2. Final grades for each course must be filed with the registrar by the deadline specified in the academic calendar in the front of this catalog.

3. Students who miss final examinations without valid reason receive grades of F in the examinations. Students who are unavoidably absent from final examinations shall present evidence in writing to the instructor concerned to prove that the absence was indeed unavoidable.

4. Instructors, at their discretion and with the concurrence of their departments, may excuse individual students from final examinations when such students have a grade average of A or B in the course. In such instances the A or B shall be assigned as the final grade for the course.

5. Early final examinations are permitted for students who are involuntarily entering any of the armed forces within one month of the last day of a semester (such examinations are authorized at the discretion of the student's academic dean), and for other students, on an individual basis, who clearly demonstrate in writing that the reasons for the early final examination are compelling (such requests require approval by the instructor of the course and also by the chairman of the department and the dean of the college in which the course is offered).



Regulation "I"—Advanced Placement for Undergraduates

1. With the approval of the chairman of the department concerned, an undegraduate student may bypass an elementary course and enroll in a higher vertically-related course. When subject mastery of the bypassed

course is regarded by the department to be essential to the understanding of the advanced course, the student with a grade of C or better in the advanced course is eligible to receive credit and a grade of P for any bypassed courses in the same subject-matter area. The necessary forms must be initiated and forwarded by the department concerned. **Advisers should make sure that students are aware of this opportunity for obtaining advanced-placement credit.**

2. Students who have completed courses at other institutions after bypassing lower vertically-related courses but have not been awarded advanced-placement credit, will be granted such credit upon completion of a yet higher vertically-related course at the University of Idaho.

3. Credit is granted for advanced-placement courses completed in high school in which a rating of 5, 4, or 3 is attained in CEEB advanced-placement tests.

4. The university also grants credit for the successful completion of tests under the College Level Examination Program (CLEP) as approved for specific courses by university departments.

5. Advanced-placement credit granted by other accredited institutions will be honored on transfer to the University of Idaho.

Regulation "J"—General Requirements for Baccalaureate Degrees

Candidates for baccalaureate degrees must fulfill the following requirements. (See the catalog of the Graduate School for the requirements for graduate degrees and certificates. See the College of Law section in part 4 for the requirements for the degree of Juris Doctor.)

1. **Credit Requirements.** For the minimum number of credits required in each degree program, see the curricula of the various degree-granting units in part 4. A minimum of thirty-six credits in courses numbered 300 or above is required for a baccalaureate degree.

2. **Residence Requirements.**

a. After candidates are within forty credits of completing the total number of credits required for their baccalaureate degrees, they must complete in residence, on the University of Idaho campus, a minimum of thirty-two credits. Exceptions are made for study abroad and student exchange programs with the prior approval of the student's academic dean. In addition to the thirty-two residence credits, students may earn credits by correspondence study, extension, advanced placement, credit by examination, or at another senior college or university. NOTE: Students may apply for and be awarded any baccalaureate degree for which the departmental, college, and university requirements, as published in parts 3 and 4, have been fulfilled, without regard to a specified period of enrollment in the curriculum or degree-granting division of the university. The elimination of residence requirements at the de-

partmental and division level was effective for all students who graduated during the 1972-73 academic year and thereafter.

b. Candidates for pre-professional degrees (e.g., B.S.Pre-Med.) which require the completion of professional courses not offered at the University of Idaho must complete their junior year (thirty-two credits) in residence on the University of Idaho campus.

c. For special residence requirements applicable to students studying at adult education centers, see "Summer Sessions and Continuing Education" in part 4.

3. **Subject Requirements.**

a. *ENGLISH*. Eng 101, English Composition, *and* Eng 201, Language and Literature. This six-credit requirement may be satisfied in one or more of the following ways:

(1) Earn the required credits by taking Eng 101 and 201. Credit in the former Eng 2 or 102, or the equivalent of these courses from another recognized institution, satisfies the requirement. When basic English courses taken at another institution result in a smaller number of credits than the six semester credits required here, the transfer student will be referred to the Department of English for a determination of any additional basic course work in English to be completed at the University of Idaho.

(2) Successfully challenge Eng 101 and/or 201 under the procedures for credit by examination outlined in regulation "D-4." When completed in this manner, credit and a grade of P in Eng 101 and/or 201 will be recorded.

(3) Demonstrate equivalent proficiency, as certified to the registrar by the Department of English. The equivalency will be noted on the student's transcript; however, no credit or grade will be awarded.

(4) Bypass Eng 101 and/or 201 under the procedures for advanced placement outlined in regulation "I."

b. *PHYSICAL EDUCATION*. Two activity courses (selected from PE 105, 106, 107, or 108), one credit per course, each course taken during a different academic session, for a total of two credits. It is expected that these courses will be taken during the freshman year; they must be completed prior to graduation. This requirement does not apply to students who are: (1) excused by the university physician, (2) thirty years of age or over, (3) majoring or minoring in physical education, (4) mothers, (5) veterans whose military service was of at least one year's duration, or (6) certified by the Department of Health, Physical Education and Recreation as having demonstrated equivalent proficiency. No credit shall be permitted in connection with such exemptions. Students transferring from other accredited institutions with 0-13 semester credits must complete two activity courses in physical education; those

with 14-25 semester credits must complete one activity course in physical education; those with 26 or more semester credits are not required to take physical education.

4. Grade Requirements. To qualify for the baccalaureate degree, candidates must have a cumulative grade-point average of 2.00 or better for all residence courses attempted at the University of Idaho. See exceptions under regulations "E-4" and "E-5." (For regulations covering students who entered the university prior to the 1971-72 academic year, see the applicable catalog issue.)

5. **Credit Limitations.** A maximum of forty-eight in any combination of credits earned by correspondence study, extension, advanced placement (including CLEP), or credit by examination may be counted toward a baccalaureate degree without petition, and no more than eighteen credits earned under the pass-fail option (see regulation "B-11") may be counted toward a baccalaureate degree.

6. **Assignment of Curricular Requirements (Catalog Issue).** In addition to fulfilling the general university requirements for degrees, as set forth in this regulation "J," candidates must satisfy the particular requirements specified for their curricula as published in part 4. The pertinent requirements are those contained in the catalog issue in effect at the time of or subsequent to the candidate's entry into the university; however, transfer students may elect to satisfy the requirements of the catalog issue which was in effect at the time of entry into the university of the class to which they were assigned on the basis of the number of credits transferred. In any case, the catalog issue designated must have been in effect within seven years of the commencement at which the candidate is to receive the degree.

7. **Second Baccalaureate Degree.**

a. Students may complete the requirements for different majors and concurrently receive two different baccalaureate degrees (e.g., B.A. and B.S.Ed.) from the university upon fulfilling the general university requirements for one degree and the departmental and college subject-matter requirements for each. Students who plan to receive two degrees concurrently should develop a schedule of studies which combines the degree requirements and present it to the dean(s) of the college(s) concerned as early as possible, preferably before the end of the junior year.

b. Students who have earned a baccalaureate degree at the University of Idaho and who wish to complete the requirements for a different major and receive a second baccalaureate degree must earn at least sixteen credits in residence on the University of Idaho campus after the receipt of the first degree and fulfill the departmental and college subject-matter requirements for the second degree. (See regulation "B-9.") Students may return to the university and earn a second degree carrying the same name as one previously granted by the university, so long as the requirements for a different major are satisfied.

c. Students who have a baccalaureate degree from another recog-

nized institution and who wish to earn another baccalaureate degree at the University of Idaho must earn a minimum of thirty-two credits in residence on the University of Idaho campus and complete the departmental and college subject-matter requirements for the degree. (see regulation "B-9.")

Regulation "K"—Academic Honors

1. **Graduation with Honors.** Honors are awarded at graduation on the basis of each student's entire academic record, but are granted only to those who have completed at least the last sixty-four credits in residence at the University of Idaho, except that as many as eight of these credits may be earned by extension, correspondence study, credit by examination, advanced placement, or at another senior college or university. Credits earned in special programs, such as study abroad and student exchange programs, which have the prior approval of the student's academic dean, may be included in the required minimum residence credits. Students attaining an average of 3.30 or higher will be graduated *cum laude*, and those attaining an average of 3.80 or higher will be graduated *summa cum laude*. In the College of Law, honors are based on grades in law courses only. Honors are not awarded with degrees earned in the Graduate School.

2. **Dean's List.** Students who are carrying the specified number of credits and attain the required grade-point average for a given semester are placed on lists prepared for the college deans. These lists are publicized within the university and are distributed to news agencies. The grade-point average and number of credits required by the various degree-granting units are listed below:

College or Program	GPA Required	Minimum Credits
Agriculture	3.30	14
Business and Economics	3.30	14
Education	3.30	14
Engineering	3.30	12
Forestry, Wildlife and Range Sciences	3.00	15
General Studies	3.00	14
Law	3.00	12
Letters and Science	3.30	14
Mines	3.30	14

Regulation "L"—Academic Probation, Disqualification, and Reinstatement

1. **Academic Probation.**

a. At the end of a semester undergraduate students who do not attain the cumulative grade-point average required for their rank (see regulation "L-5") are placed on academic probation for the next semester of enrollment and are referred to the appropriate academic dean for

advisement. The effect of this probationary status is to serve notice that if the student's cumulative record at the end of that next semester in residence is unsatisfactory he or she will be disqualified and ineligible to continue in the university.

b. Students on academic probation who attain a cumulative grade-point average higher than the minimum required for their rank are automatically removed from probation.

c. Students on academic probation who attain a grade-point average of 2.00 or higher during the next or subsequent semester after being placed on probation, but whose cumulative grade-point average is still below the minimum required for their rank, remain on academic probation.

2. **Disqualification.** Students on academic probation will be disqualified at the end of a probationary semester unless the minimum cumulative grade-point average required for their rank, or a semester grade-point average of at least a 2.00, is attained. After being academically disqualified, students must be reinstated in order to re-register.

3. **Reinstatement.**

a. After a disqualification, students may be reinstated (i.e., have their eligibility to continue restored) by petition to and favorable action by their college.

b. After their first disqualification, students may be automatically reinstated by remaining out of the university for at least one semester.

c. Students who have been reinstated may continue to be reinstated with the approval of their dean so long as they attain a 2.00 or better grade-point average for each semester following the first disqualification.

d. Students who attend another institution while disqualified must meet requirements applying to the admission of transfer students in order to re-enter the university.

e. Students who are disqualified and reinstated by their college are reinstated on academic probation.

4. **Dean's Referral.** Undergraduate students who attain a grade-point average below 1.50 during a given semester without dropping below the cumulative grade-point average required for their rank receive a dean's referral. Although this does not affect their eligiblity to register, the students are referred to the appropriate academic dean for advisement.

5. **Academic Probation and Disqualification Cut-Off By Rank.**

Credits Earned	Minimum Cumulative Grade-Point Average
0 to (but not incl.) 33	1.60
33 to (but not incl.) 65	1.80
65 and up	2.00

6. **Registration Pending Removal of Incompletes.** Regulation "F-2" provides that in cases where a student's eligibility to re-register is contingent upon removal of incomplete grades, the student may not be granted an extension of time for such a removal.

7. **Summer Sessions.** Disqualification at the end of a spring semester does not affect a student's eligibility to continue in the immediately ensuing summer, but he or she must secure a reinstatement in order to register in any subsequent term.

8. This regulation "L" does not apply to students in the College of Law or the Graduate School.

Regulation "M"—Attendance

1. **General Attendance.** Class attendance is the responsibility of students. This includes responsibility for making mutually satisfactory arrangements with their instructors regarding course work missed.

2. **Official Absences.**

a. Official absences from classes for recognized activities, field trips, tours, athletics, and similar events, require the prior approval of the appropriate university agent. Students are responsible for making their own advance arrangements with the instructors of the classes which will be missed.

b. A leave of absence from the university may be granted for reasonable cause by the student's academic dean.

c. Students confined in the University Hospital are automatically reported in the *Staff Letter* with the appropriate dates included.

3. **Repeated Absences.** Instructors are responsible for reporting to the registar students who are repeatedly absent from class. A special form is available from departmental and college offices for this purpose. Absences may be considered excessive when their number equals or exceeds the number of credits in a particular course.

Regulation "N"—Class Rating

The following table determines the class rating of undergraduate students:

Class Rating	Credits
Sophomore	94
Junior	26
Senior	60

Regulation "O"—Miscellaneous

1. **Credit Requirements for Full-Time Students.**

a. For purposes other than fees, University of Idaho students in all divisions except the Graduate School must carry twelve credits (or equivalent in audits, zero-credit enrollments, etc.) each semester to be classified as full-time.

b. For fee purposes only, students carrying eight or more semester hours (or equivalent) are considered full-time in all state colleges and universities in Idaho.

c. Students in the Graduate School are considered full-time (1) when registered for nine credits (or equivalent) of course and/or thesis work, (2) when registered for less than nine credits but paying full-time student fees and certified by the major professor and the dean of the Graduate School as being engaged in the equivalent of nine credits of study in the pursuit of course work, research, preparation for examinations, or other activities of an academic nature, or (3) when on regents' appointment as an instructional assistant or graduate assistant.

d. Veterans and war orphans attending the university on the G.I. Bill must carry the following credit loads to be considered by the Veterans' Administration for the benefits indicated (audits do not count; repeats and reviews may be included when the student's adviser certifies that the course is required in the student's curriculum or is needed to remove a deficiency or to provide essential background for the student's program).

Benefits	Undergraduate	Graduate
Full	12 or more	9 or more
Three-fourths	9 - 11	6 - 8
Half	6 - 8	4 - 5
Fees and tuition only	less than 6	less than 4

e. During the regular eight-week summer session, students are considered full-time for fee and other purposes when carrying six or more semester credits (or equivalent).

f. The president, vice president, and senators of the Associated Students of the University of Idaho are considered full-time when paying full-time student fees and carrying at least the following credit loads: president, three semester hours; vice president and senators, six semester hours.

2. **Academic Performance.** At the time this catalog issue went to press, this regulation was in the process of revision. See the catalog supplement in the 1973-74 time schedule of classes for the revised regulation.

3. **Application for Degrees and Certificates.** Candidates for degrees or certificates must, at the beginning of the last semester or summer session in residence, pay the diploma fee and file an application with the dean of the division in which the degree or certificate program is offered. If two degrees are to be received concurrently, separate applications must be filed with the dean(s) of the division(s) concerned. The application must be

filed with the dean after the diploma fee has been paid at the Controller's Office. (See "Fees and Expenses" in part 2.) The last day for filing applications for undergraduate degrees or certificates is the beginning of the third week of the semester or before the beginning of the second week of summer session. The last day for filing applications for advanced or graduate degrees or certificates is the beginning of the fourth week of the semester or before the beginning of the third week of summer session. If applications are received by deans after these dates, there is an additional fee if students wish to receive their diplomas at the close of the semester or summer session. If applications for degrees are transmitted by the dean to the registrar less than one month before the end of the academic session in which graduation requirements are completed, the applications will be held by the registrar and processed with those received at the beginning of the next academic session.

4. **Commencement.** Formal commencement exercises are held only at the close of the spring semester; however, diplomas are also issued at the close of the summer session and the fall semester to such candidates as have completed their graduation requirements at that time. All students who graduate in the summer, fall, or spring are entitled to participate in the annual commencement exercises. Candidates who DO NOT intend to participate in the formal commencement exercises must notify the dean of the division in which the degree or certificate program is offered prior to the close of the academic session in which graduation requirements are completed so that appropriate arrangements can be made. Reservations for caps, gowns, and hoods must be made by the date specified by the registrar. Diplomas are ready about five weeks after the end of the academic session in which graduation requirements are completed.

5. **Limitations on Class Size.** Limitations on class size must have the prior approval of the dean of the college in which the course is offered. If it becomes necessary to limit the size of a class on a regular basis, the limitation must be approved through faculty channels and will be made part of the official catalog description of the course. Any student denied admission to a class may appeal in writing to the academic vice president for a review of the particular circumstances involved.

6. **Students' Right to Change Course Sections.** Students have the right to change from one section of a course for which they are qualified to another section of the same course during the first two weeks of classes so long as the section into which they wish to transfer has not reached the maximum number of students which may be accommodated. (See appeal procedure in 5, above.)

7. **Availability of Instructors' Names.** As a matter of principle, students and their academic advisers and deans have the right to know the names of the instructors who will teach courses and course sections to be offered during the immediately ensuing semester or summer session. Departments are required to submit the names of instructors for all courses and course

sections for publication in the official time schedule of classes. In those instances where it is impossible to determine the teaching assignments of individual members of the instructional staff prior to the deadline for the submission of material for the official time schedule, departments are responsible for making information related to adjustments in teaching assignments generally available to students, advisers, and deans at such time as they occur — before, during, or after registraion.

8. **Confidentiality of Academic and Counseling Records.** As provided in the *Statement of Student Rights*, Section V, information about students contained in academic and counseling records is confidential and may be released only when (a) such release is legally compelled, (b) the student gives written authorization for such release, (c) members of the faculty and staff on board appointment have adequate reasons, as defined by the Faculty, to consult academic records, or (d) individual students are neither identified nor identifiable in statistical summaries on academic records.

9. **Rights Reserved to the University.** The university and its divisions reserve the right to change fees, rules, and the calendar regulating admission and registration, instruction in, and graduation from the university and its various divisions, and to change any other regulations affecting students. Changes shall go into force whenever the proper authorities so determine, and shall apply not only to prospective students but also to those who at that time are matriculated in the university. The university also reserves the right to withdraw or cancel courses at any time, to limit enrollment in courses (see 5, above), to impose additional conditions for special programs, as well as the right not to release a student's records, or any information based upon the records, when the student has failed to discharge any obligation to the university.

General Studies Program

Robert W. Coonrod, Academic Vice President; Francis Seaman, Director (305-C Admin. Bldg.).

THE GENERAL STUDIES PROGRAM was established in 1969 and is administered under the Office of the Academic Vice President in conjunction with the General Studies Coordinating Committee. Students at all levels of competency are permitted to enroll in the program, and general studies is elected by many students in order to explore various academic areas before deciding in which college of the university they should enroll for a degree. Students who wish to major in general studies may develop, in consultation with their adviser, a coherent program of studies and work toward the degree of Bachelor of General Studies, as outlined below. Credits and grade points earned while enrolled in the program may be applied toward any other degree for which they are applicable.

Admission to the Program

New students wishing to enroll in general studies may indicate their choice on the application form for admission to the university. Students who are undecided between two majors offered by one of the university's colleges should enroll as "undeclared" students in that college rather than in general studies. Students currently enrolled in one of the colleges of the university may transfer to general studies by applying to the director.

General Regulations

So that students may have the greatest opportunity to explore various types of subject-matter areas, as well as different types of student programs, there are no requirements during the advisory phase. However, to graduate, a student must either declare as a candidate for the degree of Bachelor of General Studies or transfer to a regular college of the university. In either case he or she must fulfill all of the requirements of the degree, including achieving an over-all grade-point average of 2.00 (C). It is important that students realize that they may remain in the advisory phase of general studies for five semesters only. Furthermore, students should be aware that normally they may not transfer from general studies to some of the university's colleges unless they have a grade-point average of at least 2.00.

Bachelor of General Studies Curriculum

The curriculum leading to the degree of Bachelor of General Studies is designed to provide a maximum of flexibility for undergraduates in planning their programs of studies. Since the only specific subject requirements are the general university requirements in English and physical education, students can plan their programs to the best advantage of their particular educational objectives. This means that students must bear the complete responsibility for their choice of courses. Those who plan wisely have the opportunity to obtain an excellent education; those who plan poorly may

not receive the maximum value from their years on the campus. The key admonition is: Plan your program carefully.

The major thrust of the B.G.S. degree program is general, or non-specialized, education. Although it is true that a student could take his or her work in a very limited number of departments, the intent of this program is to permit great latitude in the choice of subjects so that the students may satisfy their particular objectives.

Major. No major other than "general studies" will be certified on the student's diploma or official transcript. Students who wish to have, or need, a designated major, i.e., for admission to graduate school or for a particular prospective occupation, should pursue a departmental baccalaureate degree (B.A., B.S., etc.). Naturally, a student may select a combination of courses which will be the equivalent of a major, but this will not be officially recognized by the University of Idaho as a major.

Suggestion to Students. Students are advised not to make a firm decision with respect to the B.G.S. degree until the end of the freshman year. During the freshman year, and probably during the sophomore year, students should consider following one of the curricula leading to a departmental baccalaureate degree, deviating from the departmental requirements only where it appears educationally advisable to do so.

It is very important that the student working toward the B.G.S. degree "look ahead" to see in which departments he or she wishes to accumulate the required forty-eight credits in upper-division courses (those numbered 300 and above). Many of these courses have prerequisites which must be completed during the early semesters of the student's undergraduate career. If planning is delayed, it may very well be that a number of courses will be "unavailable" to students because of the number of prerequisites required for taking them.

Degree Requirements. In addition to the general university requirements for the baccalaureate degree, including the required English and physical education activity courses, sufficient electives must be taken to total 128 credits. *A minimum of forty-eight credits must be earned in courses numbered 300 and above*. Not more than forty credits in any one subject field may be counted in the 128 credits.

College of Agriculture

Auttis M. Mullins, Dean (111 Ag. Sc. Bldg.); Don A Marshall, Associate Dean and Director of Resident Instruction; James L. Graves, Associate Dean and Director of the Cooperative Extension Service; Steve E. Zobrisky, Acting Associate Dean and Acting Director of the Agricultural Experiment Station.

THE COLLEGE OF AGRICULTURE is a part of the land-grant system. Pursuant to federal and state legislation, the College of Agriculture was established as a division of the university to provide resident instruction in agriculture on campus; to conduct research in all fields of agriculture that promise to assist in the development of the state resources; and to carry the results of the research and service to all parts of the state. (See the special sections devoted to the Agricultural Experiment Station and the Cooperative Extension Service in part 6.)

Standing and Advantages

The Resident Instruction Section of the Division of Agriculture of the National Association of State Universities and Land-Grant Colleges, through its Committee on Organization and Policy, maintains close liaison through this membership with all colleges of agriculture in the land-grant system. Through annual national and regional meetings and summer workshops, efforts are coordinated to meet the needs of changing agriculture and maintain high professional standards in educating students for the profession of agriculture.

Students in the College of Agriculture are encouraged to obtain a broad education. In each curriculum, minimum requirements are specified in agriculture, in biological, physical, and social sciences, and in humanities to qualify the graduate to enter professional fields in agriculture. At the same time, each curriculum permits students to choose elective courses that will assist in personal growth, help in understanding the environment, and develop communications skills.

Facilities of the College

The facilities for agricultural instruction consist of the Agricultural Science Building, used as a central office, classroom, and laboratory building; Food Science Building; Dairy Science Center; Agricultural Education and Field Crops Building; laboratories in the Life Science Building, Janssen Engineering Building, Buchanan Engineering Laboratory, Agricultural Engineering Building, Veterinary Science Building, and Disease Research Barn; greenhouses; Entomology Building and H. C. Manis Entomology Research Unit; dairy cattle, sheep, swine, and beef cattle barns, Meats Laboratory, Judging Pavilion, poultry brooder, and laying houses. A number of poultry, dairy cattle, beef cattle, sheep, and swine representing several breeds is maintained for instructional and research purposes.

The College of Agriculture and Agricultural Experiment Station at Moscow operate more than 1100 acres of land. Additional acreages of land,

including 1380 acres in other parts of the state, are available and are used for instructional purposes in breeding, production, and applying scientific principles to all fields of agriculture.

Graduate Study

In the College of Agriculture graduate study leading to the master's degree is offered in agricultural economics, agricultural education, animal industries, bacteriology, biochemistry, entomology, food science, plant sciences, soils, and veterinary science.

Graduate study leading to the degree of Doctor of Philosophy is available in agricultural economics (as a concentration under the major in economics), bacteriology, biochemistry, entomology, plant sciences, and soils. Students must fulfill the requirements of the Graduate School and the department in which they study. Consult the catalog of the Graduate School for further information.

General Requirements for Graduation

University Requirements. See general regulation "J" in part 3 for requirements which all students in the university must meet.

General College Requirements. Candidates for the degree of Bachelor of Science in Agriculture must complete a total of 132 semester credits. These credits must include the specific courses and the general subject-matter credits listed in the various curricula outlined below.

Four major curricula leading to the B.S.Ag. degree are offered by the College of Agriculture.

AGRIBUSINESS—with options in agricultural economics, agricultural mechanization, animal industries, food science, and soils.

AGRICULTURAL ECONOMICS

ARICULTURAL EDUCATION

AGRICULTURAL SCIENCE—with options in animal industries, bacteriology, biochemistry, entomology, food science, plant science, soils, and veterinary science.

The general university and college requirements for graduation are listed below for the major curricula. Additional specific requirements for each departmental option are listed following the appropriate curriculum. These departmental requirements are the responsibility of the department in which the student is studying and may be changed or waived by the department without petition.

The general subject matter areas listed in the major curricula outline are defined as follows:

A. *HUMANITIES AND SOCIAL SCIENCES* shall consist of courses in anthropology, English, foreign languages, history, philosophy, political science, psychology, sociology, and speech.

B. *BIOLOGICAL SCIENCES* shall include Biol 201, Introduction to the Life Sciences, 4 credits; and Biol 202, General Zoology, 4 credits; or Biol 203, General Botany, 4 credits. *Note:* Biol 100, Man and the Environment, 4 credits, and Biol 150, Heredity and Man, 2 credits, *may not* be used to satisfy the biological sciences requirement. Credits in bacteriology may be used to satisfy the requirements in biological sciences or agriculture, but the same courses may not be used to satisfy both.

C. *CHEMISTRY* shall consist of a minimum of eight credits in all curricula except agricultural economics in which one additional course in mathematics may be substituted for one course in chemistry. Biochem 205, General Biochemistry, 4 credits, may be used to satisfy part of the chemistry requirement in the agricultural science curriculum.

Curricula

The curricula presented below have been developed to guide the student in the preparation of his or her course of study. A group of core courses is listed for each departmental option. Electives or supporting courses are selected with the approval of the student's adviser.

AGRIBUSINESS (B.S.Ag.)

This major curriculum is designed to prepare students for management responsibilities on farms and in farm-related businesses and enterprises. The following requirements are common to all options:

Course	Credits
AgEc 101 Ag & Its Soc & Econ Environ	3
Ag 400 Seminar	1
Biol 201 Intro to the Life Sciences	4
Biol 202 Gen Zool, *or* 203 Gen Bot	4
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Math 140-141 Coll Alg & Anal Trig	5
Accounting, business, and economics	15
Advanced writing	3
Agricultural economics (may include Econ 251-252, Prin of Economics)	18
Chemistry	8
Humanities and social sciences	14
Physical education activities	2
Speech	2
Major field	20
Agricultural electives	12
Unspecified electives	15
	132

The options available under this curriculum and additional specific requirements are as follows:

A. AGRICULTURAL ECONOMICS OPTION

Designed to prepare students for a variety of business and management type jobs, such as farming, government work, finance, marketing, and others, emphasis is given to economic training and a specialized option of interest to the students. Departmental requirements to fulfill, in part, the general requirements listed above are:

Course	Credits
Acctg 131 Prin of Accounting	3
AgEc 208 Farm & Ranch Management	3
AgEc 219 Marketing Farm Products	3
AgEc 356 Ag Programs & Policies	3
AgEc 391 Ag Business Management	3
Ag 321 *or* Bus 231 Statistics	3-4
Bus 365 Business Law	3
Econ 251-252 Prin of Economics	6

The remaining credits required in the major field are to be selected from the following courses in agricultural economics:

- 332 Econ of World Agric
- 353 Agricultural Prices
- 361 Farm & Nat Resource Appraisal
- 451 Land Resource Econ
- 477 Econ of Dev Countries
- 481 Agric Market Analysis
- 493 Agric Production Econ
- 494 Math Anal Appld to Econ

B. AGRICULTURAL MECHANIZATION OPTION

Designed for students entering agricultural management professions which require a knowledge of engineering technology, the option in agricultural mechanization is administered by the Department of Agricultural Engineering. Departmental requirements to fulfill, in part, the general requirements listed above are:

Course	Credits
Acctg 131 Prin of Accounting	3
AgEc 208 Farm & Ranch Management	3
AgEc 361 Farm & Nat Resource Appraisal	3
AgEc 391 Ag Business Management	3
AgMech 112 Engr Applications in Ag	3

AgMech 305 Agr Machinery & Equipment	2
AgMech 306 Agr Struc & Environ Sys	2-3
AgMech 309 Gas Engines & Tractors	2-3
AgMech 312 Electric Power Application	3
AgMech 315 Irrigation & Drainage	2-3
Bus 324 Sales Management	3
Bus 365 Business Law	3
Econ 251-252 Prin of Economics	6
Soils 205-206 General Soils	4

Note: Engineering courses may be substituted for agricultural mechanization courses upon approval of the student's adviser.

C. ANIMAL INDUSTRIES OPTION

This option is designed for those who may desire to enter any of the various businesses associated with beef, dairy, meats, poultry, sheep, or swine industries. Departmental requirements to fulfill, in part, the general requirements listed above are:

Course	Credits
Acctg 131-132 Prin of Accounting	6
Ag 321 *or* Bus 231 Statistics	3-4
Anl 205 Animal & Avian Nutrition	3
Anl 222 Livestock Brdg & Reprod	3
Anl 450 Proseminar	1
Econ 251-252 Prin of Economics	6
One of the following products courses	3-4
Anl 263 Intro to Meat Science	
Anl 303 Live An Sel & Car Eval	
Anl ID433 Poultry Prod Tech	
FS 259 Food Prod Anal for Qual Cont	
Two of the following production courses	6
Anl 224 Horse Production	
Anl 321 Beef Cattle Science	
Anl 322 Sheep Science	
Anl 323 Dairy Cattle Mgmt	
Anl 326 Swine Science	
Anl 328 Commer Poultry & Egg Prod	

D. FOOD SCIENCE OPTION

Providing scientific and technological training in the principles involved in the procurement, processing, preservation, and distribution of foods and food products, this option is designed to prepare the student for the basic scientific areas of food science and the management responsibilities of raw food product procurement, processing, distribution, and marketing. Departmental requirements to fulfill, in part, the general requirements listed above are:

Course	Credits
Acctg 131-132 Prin of Accounting	6
Ag 321 *or* Bus 231 Statistics	3-4
Bact 402 Food & Appl Microbiology	4
Bus 233 Intro to Computers	3
Bus 311 Intro to Mgmt Theory	3
Bus 365 Business Law	3
Econ 251-252 Prin of Economics	6
FS 101 Intro to Food Science	3
FS 201 Physical Prin of Food Prac	3
FS 204 Chemical Prin of Food Proc	3
FS 259 Food Prod Anal for Qual Cont	4
FS 294 Food Processing I	4
FS 312 Food Plant Equip & Bldg	3
FS 313 Food Plant Sanitation & Insp	3
FS 329 Proseminar	1

E. SOILS OPTION

This option is designed to meet the needs of students who are preparing for a career in agricultural business enterprises. Additional courses in agricultural economics and business are required with a corresponding reduction in other courses. Departmental requirements to fulfill, in part, the general requirements listed above are:

Course	Credits
Acctg 131 Prin of Accounting	3
AgEc 208 Farm & Ranch Management	3
AgEc 219 Marketing Farm Products	3
AgEc 391 Ag Business Management	3
Bus 231 *or* Ag 321 Statistics	3-4
Econ 251-252 Prin of Economics	6
Soils 205-206 General Soils	4
Soils 344 Soil Conservation & Mgmt	3
Soils 435 Soil Physics	3
Soils 446 Soil Fertility	3
Soils 454 Soil Dev & Classification	3

AGRICULTURAL ECONOMICS (B.S.Ag.)

This major curriculum is designed primarily for those who plan professional careers in some phase of agricultural economics, such as teaching, research, extension, or related areas in business and other organizations. The requirements for this curriculum are:

Course	Credits
AgEc 101 Ag & Its Soc & Econ Environ	3
Ag 400 Seminar	1
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Biol 201 Intro to the Life Sciences	4
Biol 202 Gen Zool, *or* 203 Gen Bot	4
Math 140-141 Coll Agl & Anal Trig	5
Accounting, business, and economics	21
Advanced writing	3
Chemistry	8
Humanities and social sciences	14
Physical education activities	2
Speech	2
Major field	20
Agricultural electives	12
Unspecified electives	27
	132

Requirements to fulfill, in part, the general requirements listed above are:

Course	Credits
AgEc 208 Farm & Ranch Management	3
AgEc 219 Marketing Farm Products	3
AgEc 356 Ag Programs & Policies	3
AgEc 493 Agric Production Econ	3
Ag 321 *or* Bus 231 Statistics	3-4
Econ 251-252 Prin of Economics	6
Econ 321 Inter Microecon Anal	3
Econ 372 Inter Macroecon Anal	3
Math 180 Anal Geom & Calc I	4

The remaining credits in the major field are to be selected from the following courses in agricultural economics:

332 Econ of Agric Devel
353 Agricultural Prices

(Continued on next page)

AGRICULTURAL ECONOMICS (cont.)

361 Farm & Nat Resource Appraisal
391 Ag Business Mgmt
451 Land Resource Econ
477 Econ of Dev Countries
481 Agric Market Analysis
494 Math Anal Appld to Econ

AGRICULTURAL EDUCATION (B.S.Ag.)

This curriculum is approved by the State Board for Vocational Education for the preparation of high school vocational agriculture teachers. Graduates who have completed at least twenty credits in agricultural education, and meet the state certificate requirements for a secondary standard teaching certificate, are eligible to teach vocational agriculture in Idaho. The requirements for this curriculum are:

Course	Credits
AgEc 101 Ag & Its Soc & Econ Environ	3
Ag 400 Seminar	1
Biol 201 Intro to the Life Sciences	4
Biol 202 Gen Zool, *or* 203 Gen Bot	4
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Math 140-141 Coll Alg & Anal Trig	5
Advanced writing	3
Chemistry	8
Humanities and social sciences (may include Ed 201 and/or Ed 468)	14
Physical education activities	2
Speech	2
Major field	20
Agricultural electives	40
Unspecified electives	20
	132

AGRICULTURAL SCIENCE (B.S.Ag.)

This curriculum is designed to prepare students for professional careers in agriculture, including production, processing, marketing, distribution, and utilization of food and fiber, as well as in related careers such as extension agents, research workers, and other specialized areas. The following general requirements are common to all options:

Course	Credits
AgEc 101 Ag & Its Soc & Econ Environ	3
Ag 400 Seminar	1
Biol 201 Intro to the Life Sciences	4
Biol 202 Gen Zool, *or* 203 Gen Bot	4
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Math 140-141 Coll Alg & Anal Trig	5
Advanced writing	3
Biology electives	7
Chemistry	11
Humanities and social sciences	14
Physical education activities	2
Speech	2
Major field	20
Agricultural electives	12
Unspecified electives	38
	132

The options available under this curriculum and additional specific requirements for graduation are as follows:

A. ANIMAL INDUSTRIES OPTION

This option is designed to prepare the student for a career in any phase of animal industries (livestock, dairy, poultry, meats). Emphasis is placed on providing a sound scientific background with concentrations in the student's primary area of interest. This option is also recommended for the student who may decide to pursue graduate study in animal industries. Specific departmental requirements to satisfy, in part, the general requirements listed above are:

Course	Credits
Ag 321 Biometry, *or* Math 180 Anal Geom & Calc I	3-4
Anl 305 Principles of Nutrition	3
Anl 306 Applied Animal Nutrition, *or* VS 371 Anatomy & Physiology	4
Anl 422 Animal Breeding	3
Anl 450 Proseminar	1
Anl 451 Endo Physiology, *or* 452 Phys of Reprod & Lactation	3-4
PlSc 341 *or* Biol 351 Gen Genetics	3
One of the following products courses	3-4
Anl 263, Intro to Meat Science	
Anl 303 Live An Sel & Car Eval	
Anl ID433 Poultry Prod Tech	
FS 259 Food Prod Anal for Qual Cont	
VS 462 Meat Insp & Vet Hygiene	
One of the following production courses	3
Anl 224 Horse Production	
Anl 321 Beef Cattle Science	
Anl 322 Sheep Science	
Anl 323 Dairy Cattle Mgmt	
Anl 326 Swine Science	
Anl 328 Commer Poultry & Egg Prod	
VS 474 Animal Disease	

Note: Students concentrating in range livestock management are required to complete FWR 351, Elem of Range Mgmt; and FWR 452, Range Communities.

B. BACTERIOLOGY OPTION

Designed for students who desire professional careers in basic and applied aspects of environmental bacteriology (terrestrial, aquatic, food, dairy, industrial). This option stresses microbial ecology in terms of energy flow in natural systems. Departmental requirements to satisfy, in part, the general requirements listed above are:

Course	Credits
Ag 321 Biometry	3
Bact 250 General Bacteriology	4
Bact 304 Pathogenic Bacteriology	3
Bact 305 Pathogenic Lab	2
Bact 400 Seminar	2
Bact 499 Directed Study	3
Biol 331 General Ecology	3
Chem 103 Intro to Chem, *or* 111 Principles of Chemistry	4-5
Chem 112 Inorg Chem & Qual Anal	5

Chem 253 Quantitative Anal	5
Chem 277-278 Organic Chem I & Lab	4
Chem, 372, 374 Organic Chem II & Lab	4
Phys 113-114-115-116 Gen Phys & Lab	8
Courses strongly recommended:	
Bact 402 Food & Appl Microbiology	4
Bact 425 Soil & Aquatic Microbiology	3
Bact 409 Immunology	3
Bact 410 Immunology Lab	2
Biochem 205 General Biochem	4

Note: Six credits in the biological or physical sciences may be substituted for agriculture courses.

C. BIOCHEMISTRY OPTION

Students completing this option will be prepared for a professional career in biochemistry. Emphasis is placed on the basic sciences to prepare the students for graduate study or a wide variety of positions in colleges and universities, industry, or governmental agencies. Departmental requirements to fulfill, in part, the general requirements listed above are:

Course	Credits
Bact 250 General Bacteriology	4
Bot 311 Pl Phys, *or* Zool 415 Cell Phys	3-4
Chem 112 Inorg Chem & Qual Anal	5
Chem 253 Quantitative Anal	5
Chem 277-278 Organic Chem I & Lab	4
Chem 372, 374 Organic Chem II & Lab	4
Chem 305-306 Physical Chem	6
Chem 307-308 Physical Chem Lab	2
Math 180, 190, 200 Anal Geom & Calc	11
Phys 220, 221, 222 Engr Physics	9

Note: Twenty credits in physical and biological sciences may be substituted for agriculture courses.

D. ENTOMOLOGY OPTION

This option is designed for students who desire professional careers in the basic and applied fields of entomology (insect taxonomy, ecology, physiology, and economic entomology). Departmental requirements to satisfy, in part, the College of Agriculture general requirements for this option are listed below. (Students may also specialize in entomology at the undergraduate level under the invertebrate option of the zoology curriculum in the College of Letters and Science.)

Course	Credits
Ag 321 Biometry	3
*Bact 250 General Bacteriology	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Chem 112 Inorg Chem & Qual Anal	5
Chem 277 Organ Chem I, *or* 275 Carbon Compounds	3
Ent 211 General Entomology	4
Ent 342 Insect Identification	4
*PlSc 303 Plant Pathology	4
Biology electives	11
Physics	3

*Nine credits in forestry may be substituted for agriculture courses.

E. FOOD SCIENCE OPTION

Providing scientific and technological training in the principles involved in the procurement, processing, preservation, and distribution of foods and food products, this option is designed to prepare students for the basic scientific areas of food science, for graduate study, or for a wide variety of positions in industry and governmental agencies as well as for positions in colleges and universities. Departmental requirements to satisfy, in part, the general requirements listed above are:

Course	Credits
Ag 321 Biometry	3
Bact 402 Food & Appl Microbiology	4
Chem 253 Quant Anal	5
FS 101 Intro to Food Science	3
FS 201 Physical Prin of Food Proc	3
FS 204 Chem Prin of Food Proc	3
FS 259 Food Prod Anal for Qual Cont	4
FS 294 Food Processing I	4
FS 329 Proseminar	1
FS 422 Food Chemistry & Anal	3
Math 180 Anal Geom & Calc I	4
Organic chemistry	4
Physics (general)	8

F. PLANT SCIENCE OPTION

This option is designed to prepare students for professional careers in scientific agriculture, such as chemical, seed, and food processing company representatives, technical farm managers, extension agents, and research workers. Departmental requirements to satisfy, in part, the general requirements listed above are:

Course	Credits
Biol 203 General Botany	4
Courses strongly recommended:	
PlSc 102 Plant Sciences in Ag	3
PlSc 104 Plant Sciences Laboratory	2
PlSc 204 Prop & Culture of Ornamental Pl	4
PlSc 303 Plant Pathology	4
PlSc 314 General Genetics	3
PlSc 401 Crop Physiology	3

G. SOILS OPTION

Students completing this option will be prepared for professional or academic careers in soil science. Emphasis is placed on basic sciences in preparation for a wide variety of jobs in industry or government and for graduate study. Departmental requirements to satisfy, in part, the general requirements listed above are:

Course	Credits
Bact 250 General Bacteriology	4
Biol 203 General Botany	4
Bot 311 Plant Physiology	3
Chem 112 Inorg Chem & Qual Anal	5
Chem 253 Quant Anal	5
Chem 277 Organ Chem I, *or* 275 Carbon Compounds	3
Geol 101-102 Physical Geology	4
Math 180 Anal Geom & Calc I	4
Phys 113-114-115-116 Gen Phys & Lab	6-8
Soils 205-206 General Soils	4
Soils 412 Soil Chemistry	4
Soils 425 Soil Microbiology	3
Soils 435 Soil Physics	3

(Continued on next page)

AGRICULTURE SCIENCE (cont.)

Soils 446 Soil Fertility	3
Soils 454 Soil Dev & Classification	3

H. VETERINARY SCIENCE OPTION

Students preparing for admission to a college of veterinary medicine elect this option. After the successful completion of ninety-nine credits, they transfer to a recognized college of veterinary medicine. The successful completion of the first year of study at the college of veterinary medicine (at least thirty-three credits in approved courses) constitutes the senior year toward the B.S.Ag. degree with a major in agricultural science at the University of Idaho. Students under this option must complete their junior year (at least thirty-three credits) in residence on the Moscow campus.

Departmental requirements to satisfy, in part, the general requirements of the agricultural science curriculum are:

Course	Credits
Chem 112 Inorg Chem & Qual Anal	5
Chem 275 Carbon Compounds, *or* 277 Organic Chem I	3
Chem 278 Organic Chem Lab	1
Phys 113-114 Gen Phys	6

Note: Twenty credits in biological and physical science may be substituted for agriculture courses.

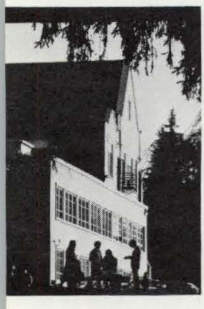
College of Business and Economics

Norman C. Olson, Dean (211-A Admin. Bldg.); Phyllis Veien, Secretary of the College Faculty.

THE COLLEGE WAS ESTABLISHED as a separate professional division of the University in 1925. Long known as the College of Business Administration, the name was changed to the College of Business and Economics in 1969. Its objective is to provide training for young men and women who are preparing for careers in business. Through curriculum changes, the college recognizes forces in the modern business world, such as increased awareness of human factors, need for long-range planning, rapid technological change, and need for flexibility.

The College of Business and Economics provides a sound background in basic principles and in research possibilities which will help graduates as they advance into positions of responsibility. As a part of a state-supported university, founded to train better citizens, the college also aims to give its students an appreciation of the social importance and responsibilities of businessmen.

In addition to instruction in the fundamental principles of business, the College of Business and Economics also offers specific training in the techniques of business where this is feasible; as, for example, in accounting, accounting research techniques, and secretarial practice. In common with the other university schools of business, however, the college avoids extremely specialized instruction in business practices. Since such practices vary greatly among business firms and change rapidly, they can in most cases be learned on the job.



The University of Idaho has three major objectives: teaching, research, and service. Through the Bureau of Business and Economic Research, the college is able to contribute to the advancement of knowledge about our state and its business activities. In addition, faculty members and students have the opportunity to engage in basic research. Modern computer facilities and data processing equipment keep the program ahead of changing business methods.

The college also provides faculty and counsel for continuing education in business matters throughout the state. In cooperation with other state agencies, courses in management and in specialized areas are made available.

Curricula and Degrees Offered

Undergraduate. Majors are offered leading to the degree of Bachelor of Science in Business in the fields of accounting, business and applied science, business and law (combined B.S.Bus.-J.D.), economics, finance, general business, management, marketing, and office administration. Detailed statements of the requirements for these majors are included in the departmental curricula at the conclusion of this section.

Graduate. The Graduate School offers work toward the degrees of Master of Science and Master of Business Administration with majors available both in business and in economics as well as the degree of Doctor of Philosophy with a major in economics (concentration in agricultural economics). Students must fulfill the requirements of the Graduate School and of the department in which they study. Consult the catalog of the Graduate School for further information.

Standing of the College

Fully accredited by the Northwest Association of Secondary and Higher Schools, the College of Business and Economics keeps apace of developments in business training through various organizations and by constant consultation with Idaho businessmen. The quality of the program is attested to by the outstanding achievements of Idaho graduates in all fields of business throughout the nation.

General Requirements for Graduation

University Requirements. See general regulation "J" in part 3 for requirements which all students in the university must meet.

General College Requirements. Candidates for the degree of Bachelor of Science in Business must complete a total of 128 credits, including at least fifty-two credits in courses outside of the College of Business and Economics. Students registered in the college are required to achieve a minimum overall grade-point average of 1.85 for the first two academic years before being permitted to fully pursue upper-division work. Specifically, this means that a student earning an overall average of less than 1.85 for a minimum of sixty credits may not register for more than one upper-division course (those numbered 300 and above) in any one semester until his or her cumulative grade-point average is raised to this minimum level.

A. *BUSINESS AND ECONOMICS CORE REQUIREMENTS.*

Course			Credits
Acctg	131-132	Principles of Accounting	6

(Continued on next page)

Bus 101 Introduction to Business Enterprises	3
Bus 231 Statistics	4
Bus 233 Introduction to Computers	2
Bus 301 Financial Management	3
Bus 311 Introduction to Management Theory	3
Bus 321 Marketing	3
Bus 365 Business Law	3
Econ 251-252 Principles of Economics (or equiv)	6
Economics elective (upper-division)	6
Additional business and economics courses to total fifty-two credits	13

B. *COURSE WORK OUTSIDE OF COLLEGE OF BUSINESS AND ECONOMICS.*

Course	Credits
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Eng 313 *or* 317 Business *or* Technical Writing	3
Math 111-112 Fund of Math, *or* 140 and 112 Coll Alg and Fund of Math, *or* 180 Anal Geom & Calc I	4-8
Sp 131 Fundamentals of Speech	2
Literature	6
Natural science (physical or biological science)	4
Physical education activities	2
Social science electives (select from anthropology, economic geography, history, philosophy, political science, psychology, or sociology)	6
Additional courses outside of the College of Business and Economics to total fifty-two credits	15-19

Curricula

The specific requirements for each major are listed below. Each student is assigned an adviser who assists in the planning of a program through the use of a check sheet; however, the student has the final responsibility for the completion of all requirements. Where business or economics electives are specified, courses numbered 300 or above are required. Students in the advanced Officer Education Program should use the free electives category to permit scheduling of the twelve credits required in such courses during the junior and senior years.

ACCOUNTING (B.S.Bus.)

This curriculum emphasizes cost accounting, corporation accounting, auditing, public accounting, and taxation. Required course work includes the general requirements, plus:

Course	Credits
Acctg 231-232 Interm Accounting	6
Acctg 331-332 Advanced Accounting	6
Acctg 385 Costs: Concepts & Methods	3
Acctg 483 Federal & State Taxes	3
Acctg 486 Costs: Analysis & Controls	3
Acctg 493 Auditing Theory	3
Bus 232 Quant Methods in Business	3
Bus 466 Business Law	3

BUSINESS AND APPLIED SCIENCE (B.S.Bus.)

Because the university offers strong technical programs in agriculture, engineering, forestry, and mining, the College of Business and Eco-

nomics is able to offer instruction in combination with them. The business and applied science major offers an opportunity to combine a major in business with study in one of the technical fields for students who plan to enter a field of business where complete technical preparation is not essential, but where some technical knowledge is highly desirable.

Required course work includes the general requirements, plus:

Course	Credits
Bus 232 Quant Methods in Business	3
Bus 312 Industrial Management	3
Accounting elective	3
*Approved technical electives in agriculture, engineering, forestry, or mining	18

*A list of the courses required in each area may be obtained from the dean of the College of Business and Economics.

BUSINESS AND LAW — COMBINED PROGRAM (B.S.Bus.-J.D.)

Students who wish to prepare both in business and law should register in this curriculum in the College of Business and Economics for their first three years, and in the College of Law for the last three. The B.S.Bus. degree is conferred upon the completion of the required courses at the end of the first four years, and the J.D. at the end of the full six years.

Required course work includes the general requirements, plus:

Course	Credits
Bus 232 Quant Methods in Business	3
Bus 312 Industrial Management	3
Accounting elective	3

plus the completion of ninety-eight credits by the end of the junior year, and the satisfactory completion of the first year of the curriculum in the College of Law (thirty credits).

BUSINESS EDUCATION (B.S.Bus.Ed.)

For this curriculum, see the College of Education section.

ECONOMICS (B.A. or B.S.)

For these curricula, see the College of Letters and Science section.

ECONOMICS (B.S.Bus.)

Students wishing to prepare for professional careers as economists in private business, government service, or teaching should elect this curriculum.

Required course work includes the general requirements, plus:

Course	Credits
Econ 321 Inter Microeconomic Anal	3
Econ 372 Inter Macroeconomic Anal	3
Economics electives (numbered 300 or above)	12
Electives in social sciences (other than economics), geography, psychology, or mathematics, with not more than nine cr in any one field	15

FINANCE (B.S.Bus.)

This curriculum provides an excellent background for the fields of banking, investments, and insurance. The student may elect to concentrate in one of these areas of finance. Required course work includes the general requirements, plus:

Course	Credits
Bus 232 Quantitative Methods in Bus	3
Bus 302 Finan Institutions & Credit	3
Bus 312 Industrial Management	3
Bus 401 Investments	3
Bus 403 Insurance	3
Bus 436 Bus & Econ Fluctuations	3
Econ 409 Public Finance	3
Accounting elective	3

GENERAL BUSINESS (B.S.Bus.)

Those students who prefer all-around preparation in business management to specialization in one field should elect this curriculum. The required course work includes the general requirements, plus:

Course	Credits
Bus 232 Quantitative Methods in Bus	3
Bus 312 Industrial Management	3
Accounting elective	3

MANAGEMENT (B.S.Bus)

Offered in recognition of the requirements of modern business for the development of more effective managerial skills, this program emphasizes the behavioral and quantitative aspects of the planning, organizing, coordinating, analyzing, and evaluating that is inherent in the administrative process. Required course work includes the general requirements, plus:

Course	Credits
Bus 232 Quantitative Methods in Bus	3
Bus 312 Industrial Management	3
Bus 411 Organization Theory	3
Bus 413 Human Relations in Business	3
Bus 414 Management Policy	3
One of the following courses Bus 412 Personnel Management Bus 439 Systems Anal & Simulation Bus 441 Labor Relations	3
Accounting elective	3

MARKETING (B.S.Bus.)

The student who is contemplating a career with consumer or industrial goods manufacturers, retail or wholesale distributors, advertising and marketing research organizations, and firms in real estate should elect this program. Certain modifications of this major may be arranged for students wishing to prepare for advertising. Required course work includes the general requirements, plus:

Course	Credits
Bus 232 Quant Methods in Business	3

(Continued on next page)

MARKETING (cont.)

Bus 312	Industrial Management	3
Bus 323	Principles of Advertising	3
Bus 421	Marketing Problems	3
Bus 422	Mktg Research & Analysis	3
Bus 423	Retail Merchandizing Fund	3
Accounting elective		3

Recommended electives:

Bus 324	Sales Management	3
Bus 424	Retail Merchant Problems	3
Bus 436	Bus & Econ Fluctuations	3

MARKETING: REAL ESTATE (B.S.Bus.)

Required course work includes the general requirements, plus:

Course		Credits
Bus 232	Quant Methods in Business	3
Bus 312	Industrial Management	3
Bus 323	Principles of Advertising	3
Bus 422	Mktg Research & Analysis	3
Bus 461	Real Estate	3
Bus 462	Real Property Appraisal	3
AgEc 361	Farm & Nat Resource Appraisal	3
Accounting elective		3

Recommended electives:

Arch 265	Materials & Methods	3
Arch 376	History of Modern Arch	2
AgEc 451	Land Resource Econ	3
Geog 430	Urban Geography	3
PolSc 276	American Local Govt	3
Psych 100	Intro to Psychology	3
Soc 110	Intro to Sociology	3
Soc 310	Rural Sociology	3
Soc 311	Urban Sociology	3

OFFICE ADMINISTRATION (B.S.Bus.)

This curriculum is designed to equip the student to enter the field of business through secretarial work. Required course work includes the general requirements (with the exception of the upper-division electives in economics), plus:

Course		Credits
OAd 101-102-103	Typewriting I-II-III	6
OAd 115-116	Shorthand I-II	8
OAd 185	Office Machines	2
OAd 271-272	Shorthand III-IV	6
OAd 395-396	Secretarial Procedures	6
Business or economics elective		3

College of Education

Everett V. Samuelson, Dean (301 Educ. Bldg.); Hervon L. Snider, Associate Dean; Barbara Hopkins, Secretary of the College Faculty.

THE COLLEGE OF EDUCATION was organized as an independent unit of the university in 1920. It is the principal teacher-education division and consists of the Department of Education, the Department of Health, Physical Education and Recreation, the Department of Special Education, and the Department of Vocational Teacher Education. Subject fields within these departments include education, business education, guidance and counseling, industrial education, library science, physical education (including health and recreation), special education, and vocational teacher education.

The education of professional personnel for the public schools constitutes a service to the state and its people and to the education profession. One of the first duties of the college is that of assuring that persons applying for admission to a program of preparation for educational service are qualified by preparation and personal attributes for this important work. Once admitted, the student undertakes a program which has as its objective assurance that the candidate has laid the foundation for a broad, general education, has completed a basic study of the professional functions of the teacher, and has made substantial preparation in the subjects to be taught, or in the area in which he or she will serve.

Besides preparing personnel for the schools, the College of Education provides educational leadership for the people of Idaho, to the state's education system, and to the teaching profession through consulting ser-

vices, participation in organizational activities, and research. Preparation is provided in all of the major areas of professional education as it exists today.

Standing of the College

The College of Education is fully accredited by the National Council for the Accreditation of Teacher Education, and the programs of study in education are planned to meet certification requirements in Idaho, those of most other states, and the requirements of the various accrediting agencies, such as the Northwest Association of Secondary and Higher Schools.

Admission Requirements

Admission to the University. For a statement of general admission requirements, see part 2.

Transfer Students. Students who have attended college, whether at another institution or in another division of the university, prior to matriculation in the College of Education, must have a grade-point average of 2.00 (C) or better. The approval of the dean of the College of Education is necessary for the admission of transfer students.

Degrees and Programs Offered

Undergraduate. Baccalaureate degrees offered by this college are the Bachelor of Science in Education, Bachelor of Science in Business Education, and Bachelor of Science in Recreation. See the section headed "Major Curricula" for the programs of studies leading to these degrees.

Graduate. The Graduate School offers work toward advanced degrees in several disciplines of the college. Students must fulfill the requirements of the Graduate School and of the department in which they intend to study. Consult the catalog of the Graduate School for further information.

In the College of Education, graduate programs include a special planned fifth year in teacher education, as well as work toward advanced degrees and certificates. Upon the successful completion of the appropriate programs of studies, the following degrees and certificates are conferred: Master of Science, Master of Education, Master of Arts in Teaching, Professional Certificate in Education, Doctor of Education, and Doctor of Philosophy.

Studies at the master's level are offered in education, business education, distributive education, elementary education, guidance and counseling, industrial education, office occupations education, physical education, school administration, secondary education, special education, trade-technical education, and vocational education.

Sixth-year programs are offered leading to professional certificates in education, guidance and counseling, school administration, school psychology, special education, and vocational education.

Doctoral programs are offered in education, elementary education,

guidance and counseling, school administration, secondary education, and special education.

Teacher Education Program

At the University of Idaho, the preparation of teachers is a cooperative enterprise between the College of Education and other divisions. Coordination is achieved through the Teacher Education Coordinating Committee, which is made up of representatives from the professional and academic areas involved. However, the screening of all applicants for continuance in or admission to the teacher education program is the responsibility of the College of Education, and the dean of the College of Education is the recommending authority for certification.

Students preparing for a career in teaching have the option of completing their bachelor's degree in the College of Education (except for agricultural education, home economics education, and music education) or in the department of their subject major.

Teacher education students have two advisers: one from the subject-matter department and one from the College of Education. When a student identifies teacher education as his or her objective (this could be as early as the freshman year and certainly no later than admission to the teacher education program) the advisers are designated. They plan and approve a program of studies for the student. As long as the approved program is followed, only the student's college adviser is required to sign the registration cards. Changes in the program require the signature of both advisers. Exceptions to this rule are students majoring in a subject-matter area in the College of Education, students in the departments of Agricultural Education and Home Economics, and in the School of Music, who have advisers in their subject-matter areas only.

Admission to the Teacher Education Program. Upon completion of the first semester of the sophomore year, or forty semester credits, all students in the College of Education and all students majoring in other divisions who plan to enter the teacher education program must make application for admission to or continuance in the program of teacher education. A standing committee of the College of Education reviews each applicant's total record and presents its recommendations to the dean. The approval of the dean of the College of Education is required for admission to or continuance in the program. Admission to the teacher education program does not carry with it permission to enroll in senior practicum. Additional procedures and requirements apply as noted elsewhere in this section and as noted in the prerequisites to the specific courses in senior practicum.

Clinical Experience in Teacher Education

The clinical study of teaching and learning theory is given practical application through laboratory experience in both campus and field settings. Teacher trainees have early involvement with school pupils and experienced teachers through short-term laboratory components such as the "January experience," a two-week, full-time observation and participation for fresh-

men elementary education majors in selected schools; semester laboratory components for all students in Ed 201, Introduction to Teaching; and semester campus or field laboratory components for special education majors. Additional clinical experience is provided students as they continue professional studies through simulated teaching situations on campus and through field laboratory components for students of methodology. Culminating clinical teaching experience is provided in the senior practicum or graduate internship.

Senior Practicum

Admission. For admission to senior practicum courses (Ed 430, 431, 432, 435, SpEd 480), each student must have satisfied the following requirements: (1) have been admitted to or continued in the teacher education program; (2) have a grade-point average of at least 2.25; (3) have satisfied the other prerequisites stated in the description of the particular practicum course for which he or she wishes to register; and (4) have applied for admission to senior practicum by the deadline specified, i.e., by December 1 of the school year prior to enrolling for the field experience. Consult the director of clinical experiences in teacher education for more specific information.

The Program. The senior practicum is done in cooperating public schools so that students may obtain experience under typical school conditions. Normally it is scheduled for nine weeks of full-time teaching in centers designated by the College of Education. Students should plan their schedules for the senior year so that a semester will be free for nine weeks of full-time enrollment in the practicum and nine weeks in accelerated courses.

Graduate Practicum and Internship in School Positions

Admission. Admission to the practicum and internship courses is conditioned upon acceptance in a graduate program, approval of the major professor and/or student's committee. Application for placement in the practicum or internship should be submitted by December 1 of the school year prior to enrolling for the field experience.

The Program. Graduate students are provided clinical experience in the study of teaching and learning and in the performance of other school positions through graduate practica and internships (see courses 597 and 598 in the various subject fields in the college).

Teacher Certification

Students who complete the four-year teacher education program at the university are eligible to receive the Idaho Standard Elementary School Certificate, the Standard Secondary School Certificate, the Exceptional Child Certificate, or the Standard Vocational Certificate. Those who complete an approved, planned fifth-year program in teacher education, or an approved master's degree program, are eligible to receive the Advanced Elementary School Certificate or the Advancd Secondary School Certificate. Students who complete the master's or professional certificate pro-

gram in guidance and counseling qualify for the Idaho Pupil Personnel Services Certificate. Students may qualify for the Idaho School Librarian Certificate by completing the requisite courses in library science.

Procedures. The college in which the student is enrolled initiates the application for teacher certification. The subject-matter adviser and the professional education adviser each sign the necessary forms and forward them to the dean of the College of Education who works with the registrar to get the necessary supporting credentials and forwards the materials to the proper certification office. The College of Education maintains a record of all students recommended for teacher certification, and it is understood that recommendations concerning a student's competence are made by the department in which the skills and concepts are taught.

The College of Education reserves recommendations for certification to students who have completed four years of preparation and hold a bachelor's degree.

General Requirements for Graduation

University Requirements. See general regulation "J" in part 3 for the general university requirements for graduation.

College Requirements. All candidates for the baccalaureate degree in the College of Education must complete a total of 128 semester credits, of which at least thirty-six must be in upper-division courses. A minimum grade-point average of at least 2.00 is required in all specified professional courses and in the major secondary-school teaching field. The following uniform course requirements apply to all undergraduate teacher education students in the college (see the major curriculum in recreation for the special requirements applicable to that program):

A. *GENERAL STUDIES (42 credits minimum).* In order to apply toward this requirement, courses must be other than education and be selected from among the humanities, social sciences, and natural sciences. Credits earned in these fields to satisfy the teaching major or teaching minor may apply if they do not deal primarily with the methodology, procedures, or materials of teaching. Each of the following areas must be represented as indicated.

1. *English (12 credits),* including composition and literature.

2. *Social Science (9-12 credits),* including at least one course in American history or American government. Majors in special education and students preparing to teach at the secondary-school level must complete a minimum of nine credits in this area; students preparing to teach at the elementary-school level must complete a minimum of twelve.

3. *Science-Mathematics (12-14 credits),* including biological, earth, or physical science courses requiring laboratory work. Majors in special education and students preparing to teach at the secondary-school level must complete a minimum of twelve credits in laboratory science and/or mathematics; students preparing to teaching at the ele-

mentary-school level are required to include Math 135-136, Number System and Its Structure, and eight additional credits from two or more areas of natural science.

B. *OTHER TEACHER EDUCATION REQUIREMENTS (25-26 credits):*

Course	Credits
Ed 201 Introduction to Teaching	2
Ed 314 Strategies for Teaching	2-3
*Ed 430 *or* 431 *or* 432 *or* SpEd 480 Practicum	9
Ed 445 Proseminar in Teaching	1
Ed 468 Contemporary Education	3
Psych 100 Introduction to Psychology	3
Psych 205 *or* 206 *or* 421 *or* Ed 415 Developmental *or* Educational Psychology	3
Sp 131 Fundamentals of Speech, *or* 151 Voice, Diction, and Oral Interpretation	2

*Students preparing to teach art or physical education in secondary schools may substitute three credits in Ed 435 for three of the nine credits in Ed 431.

Major Curricula

Students in the College of Education must complete a major curriculum which leads to a degree granted by the college (B.S.Ed., B.S.Bus.Ed. or B.S.Rec.). These major curricula (with the degree goal identified) are listed below.

Careful distinction should be made between a student's "major curriculum" and any additional "teaching majors" or "teaching minors" required. These supplementary teaching majors and minors are listed after this section.

AGRICULTURAL EDUCATION (B.S.Ag.)

For this curriculum, see the College of Agriculture section.

BUSINESS EDUCATION (B.S.Bus.Ed.)

This major is for students whose primary interest is in teaching basic business subjects and economics. Required course work includes the general requirements for students preparing to teach at the secondary level, plus:

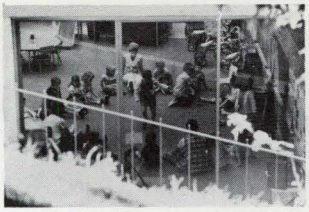
Course	Credits
Acctg 131-132 Principles of Accounting	6
Bus 301 Financial Management	3
Bus 365 Business Law	3
BusEd 491-492 Teaching Bus Ed I-II	6
Econ 251-252 Principles of Economics	6
Eng 313 Business Writing	3
Geog 140 Economic Geography	3
OAd 103 Typewriting III (may be waived by examination)	2
OAd 185 Office Machines	2
One of the following sequences	6
Acctg 231-232 Interm Acctg	
Bus 302 Financial Institutions & Credit and 401 Investments	
Bus 411 Organization Theory and 412 Personnel Management	
Econ 321 Interm Micro Analysis and 372 Interm Macro Analysis	
Accounting, business, or econ electives	9

DISTRIBUTIVE EDUCATION (B.S.Bus.Ed.)

Students electing this major should consult the distributive education adviser concerning state requirements for the vocational education certificate. Required course work includes the general requirements for the student preparing to teach at the secondary level, plus:

Course	Credits
Acctg 131 Principles of Accounting	3
Bus 321 Marketing	3
Bus 323 Advertising	3
Bus 324 Sales Management	3
Bus 423 Retail Merchandising Fund	3
BusEd 493 Teaching Distributive Ed	3
BusEd 497 Coordination Techniques	3
Econ 251 Principles of Economics	3
VocEd 322 Vocational Guidance	3

(Continued on next page)



DISTRIBUTIVE EDUCATION (cont.)

VocEd 351 Principles of Vocational Ed	2
VocEd 461 Occupational & Job Analysis	3

Plus the completion of a 20-credit teaching minor, or the following:

Additional requirements for a sixty-credit concentration

Econ 252 Principles of Economics	3
Eng 313 Business Writing	3
VocEd 200 Seminar, *or* 499 Directed Study	3
VocEd 481 Foundations of Vocational Ed	2
Electives (approved by distributive education teacher educator)	9

ELEMENTARY EDUCATION (B.S.Ed.)

Required course work includes the general requirements for students preparing to teach at the elementary level, plus:

Course	Credits
Ed 320 Prim Lang Arts Meth, *or* 322 Interm Lang Arts Meth	3
Ed 326 Elem School Mathematics Ed	3
Ed 421 Elem School Social Studies Meth	2
Ed 444 Elem School Science Meth	2
Music and/or art electives (non-methods)	3

Plus five credits from among the following:

Ed 275 Elem School Art Meth	2
Ed 434 Children's Literature	3
MusT 381 (Ed 381) Elem School Mus Meth	3
PE 252 Elem School Physical Education	2
PE 316 Elem School Health Materials	2

And the satisfactory completion of one of the following options:

A. One twenty-credit, single-subject or composite teaching minor and one fifteen-credit, single-subject teaching minor.

B. One thirty-credit, single-subject, teaching major.

C. One forty-credit composite teaching major.

HOME ECONOMICS EDUCATION (B.S.H.Ec.)

For this curriculum, see the College of Letters and Science section.

INDUSTRIAL EDUCATION (B.S.Ed.)

Required course work includes the general requirements for students preparing to teach at the secondary level, plus:

Course	Credits
AgMech 101 Oxy-Acetylene Welding	1
AgMech 107 Arc Welding	1
AgMech 309 Gas Engines & Tractors	3
Engr 101 Engineering Graphics	2
IEd 130 Basic Electricity	4
IEd 131 Basic Electronics	4
IEd 140 Woodwork I	3
IEd 250 General Metals	3
IEd 251 Plastics	2
IEd 253-254 Materials & Proc Lab I-II	2
IEd 310 Maintenance of Tools & Equip	3
IEd 420 Eval in Industrial Education	3
IEd 451 School Shop Planning & Admin	3
IEd 462 Industrial Ed Curriculum	3
IEd 472 Industrial Ed Methods	3

Plus either of the following options:

A. Five additional credits in approved shop courses and the satisfactory completion of one twenty-credit teaching minor.

B. Twenty additional credits in approved shop courses. Students electing this option are required to specialize in one or two technical areas of shopwork and earn at least twelve credits in each area of specialization. Areas available are: electricity-electronics, metals, drafting, and wood. Consult the chairman of Industrial Education for the list of approved courses that may be applied toward each area.

OFFICE OCCUPATIONS EDUCATION (B.S.Bus.Ed.)

Students whose primary interest is in teaching secretarial and clerical subjects and wish to qualify for vocational certification should elect this major. Consult the office occupations education adviser concerning state requirements for the vocational education certificate. Required course work includes the general requirements for students preparing to teach at the secondary level, plus:

Course	Credits
Acctg 131-132 Principles of Accounting	6
Bus 301 Financial Management	3
Bus 365 Business Law	3
BusEd 491-492 Teaching BusEd I-II	6
BusEd 497 Coordination Techniques	3
Econ 251-252 Principles of Economics	6
Eng 313 Business Writing	3
Geog 140 Economic Geography	3
OAd 103 Typewriting III (may be waived by examination)	2
OAd 116 Shorthand II (may be waived by examination)	4
OAd 185 Office Machines	2
OAd 271-272 Shorthand III-IV	6
OAd 395 Secretarial Procedures	3
VocEd 322 Vocational Guidance	3
VocEd 351 Principles of Vocational Ed	2
VocEd 461 Occupational & Job Analysis	3
Business or economics electives	6

PHYSICAL EDUCATION: MEN (B.S.Ed.)

Required course work includes the general requirements (including Zool 119) for students preparing to teach at the secondary level, plus:

Course	Credits
Ed 323 Health Education Methods	3
PE 105 Square & Social Dance	1
PE 108 Swimming (may be waived by proficiency examination)	0-1
PE 126 Weight Training & Conditioning	1
PE 139 Gymnastics	2
PE 141 Wrestling	1
PE 142 Tumbling & Floor Exercise	2
PE 150 General Hygiene	3
PE 243 Highly Organized Games	2
PE 271 Interpretations	3
PE 387 Intramural & Athl Officiating	3

PE 418	Physiology of Exercise	3
PE 419	Human Kinesiology	3
PE 424	Adapted Physical Education	2
PE 427	Meth & Materials in Phys Ed	2
PE 481	Tests & Measurements	3
PE 496	Organization & Administration	3
Electives in lifetime sports		2

Plus the satisfactory completion of one twenty-credit teaching minor (*not* including coaching).

Note: In exceptional cases, students who wish to complete a teaching major in a second field may have the above list of departmental requirements reduced to thirty credits with the approval of the departmental head.

PHYSICAL EDUCATION: WOMEN (B.S.Ed.)

Required course work includes the general requirements (including Zool 119) for students preparing to teach at the secondary level, plus:

Course		Credits
Ed 323	Health Education Methods	3
PE 105	Dance	1
PE 108	Swimming (through proficiency required for prereq to 138)	0-1
PE 110	Health Issues	2
PE 111	Fundamentals of Movement	2
PE 112	Dance Techniques	1
PE 115	Team Sports Backgrounds	2
PE 116-117	Indiv Sports Backgrounds	4
PE 138	Swimming, *or* 266 Aquatic Instructors Course	2
PE 139	Gymnastics	2
PE 226	Offic Women's Sports (sec. A)	1
PE 271	Interpretations	3
PE 288	First Aid	2
PE 321	Theory & Tech of Teaching Dance	2
PE 322	Teaching Individual Sports	2
PE 323	Teaching Team Sports	2
PE 418	Physiology of Exercise	3
PE 419	Human Kinesiology	3
PE 424	Adapted Physical Education	2
PE 427	Meth & Materials in Phys Ed	2
PE 481	Tests & Measurements	3
PE 496	Organization & Administration	3

Plus the satisfactory completion of one twenty-credit teaching minor, or a twenty-credit option in an activity area (see below) to complete a sixty-credit major in physical education.

A. SPORTS OPTION

PE 106	Conditioning	1
PE 299	*or* 499 Directed Study	1-3
PE 497	Sports & Athletic Problems	3

Plus courses from the following to total twenty credits for the option:

Ed 428	Audio-Visual Aids	3
PE 106	Adv Badminton & Tennis	1-2
PE 106	Adv Gymnastics	1-2
PE 107	Adv Hockey & Volleyball	1-2
PE 107	Adv Basketball & Softball	1-2
PE 226	Offic Women's Sports (sec. B)	1
PE 252	Elem School Physical Ed	2
PE 254	Camp Leadership	2
PE 326	Drill Team	1
PE 348	Athletic Injuries	2
Psych 455	Psych of Motivation	3

B. DANCE OPTION

Art 101	*or* 102 Survey of Art	2
MusH 100	Music Appreciation	3
PE 105	Modern Dance	1
PE 105	Square & Social Dance	1
PE 113	Problems in Dance Composition	1-2
PE 220	Rhythms for Children	2
PE 320	Labanotation	1
PE 325	Dance Production	2

Plus six cr from the following:

PE 105	Ballet or Jazz	1
PE 105	Adv Folk Dance	1
PE 299	*or* 499 Directed Study	1-3
PE 326	Drill Team	1
RadTV 282	Intro to TV Production	3
RadTV 322	Ed Uses of Radio & TV	2
RadTV 488	Cinematography for TV	3
ThA 105	Basics of Performance	2
ThA 266	Creative Dramatics	2

C. AQUATICS OPTION

Elect twenty credits from the following:

Ed 428	Audio-Visual Aids	3
PE 108	Scuba	1
PE 108	Synchronized	1
PE 108	Adv Synchronized	1-2
PE 108	Diving	1
PE 108	Life Saving	1
PE 108	Adv Swimming	1-2
PE 266	Aquatic Instructor's Course	2
PE 299	*or* 499 Directed Study	1-3
PE 325	Dance Production	2
PE 326	Drill Team	1
PE 497	Sports & Athletic Problems	3
Psych 455	Psych of Motivation	3

D. GYMNASTICS OPTION

PE 105	Modern Dance	1
PE 105	Ballet	1
PE 105	Modern Jazz	1
PE 106	Modern Gymnastics	1
PE 106	Adv Gymnastics	1-2
PE 106	Conditioning	1
PE 113	Problems in Dance Composition	1-2
PE 226	Offic Women's Sports (sec. B)	1
PE 299	*or* 499 Directed Study	1-3
PE 320	Labanotation	1
PE 326	Drill Team	1

Plus courses from the following to total twenty credits for the option:

Ed 428	Audio-Visual Aids	3
PE 325	Dance Production	2
PE 348	Athletic Injuries	2
PE 497	Sports & Athletic Problems	3
Psych 455	Psych of Motivation	3

PHYSICAL EDUCATION: ELEMENTARY (B.S.Ed.)

Required course work includes the general requirements (including Zool 119) for students preparing to teach at the elementary level, plus:

Course		Credits
PE 105, 107, 108	Activities	3
PE 111	Fundamentals of Movement	2
PE 139	Gymnastics, *or* 142 Tumbling & Floor Exercises	2
PE 220	Rhythms for Children	2
PE 252	Elem School Physical Education	2
PE 264	Recreational Music	1
PE 271	Interpretations	3
PE 288	First Aid	2

(Continued on next page)

PHYSICAL EDUCATION: ELEMENTARY (cont.)

PE 424 Adapted Physical Education	2
PE 496 Organization & Administration	3

Additional Courses for Women

PE 110 Health Issues	2
PE 115 Team Sports Backgrounds	2
PE 116 *or* 117 Indiv Sports Backgrounds	2
PE 322 Teaching Individual Sports	2
PE 323 Teaching Team Sports	2

Additional Courses for Men

PE 106 Individual & Dual Sports	1
PE 150 General Hygiene	3
PE 243 Highly Organized Games	2
PE 387 Intramural & Athletic Officiating	3

Physical Education Electives

Select ten credits from among the following courses:

PE 261 Recreational Arts & Crafts	2
PE 316 Elem School Health Materials	2
PE 321 Theory & Tech of Tching Dance	2
PE 329 Leadership in Recreation	2
PE 419 Human Kinesiology	3
PE 427 Meth & Materials in Phys Ed	2
PE 467 Phys Ed. & Rec for Handicapped	3

Electives for Elementary Certification

Students who expect to teach physical education at the elementary level should take the following courses:

ED 320 Prim Lang Arts Meth, *or* 322 Interm Lang Arts Meth	3
Ed 326 Elem School Mathematics Meth	3
Ed 421 Elem School Social Studies Meth	2
Ed 444 Elem School Science Meth	2

RECREATION (B.S.Rec.)

This curriculum is primarily for students interested in careers in leadership, supervision, or management of recreation parks or youth-serving agencies. Majors in recreation satisfy the College of Education general requirements and the requirements of the Department of Health, Physical Education and Recreation by taking the following courses:

Course	Credits
Anthr 110 Intro to Phys Anthr & Arch	3
Arch 483 Recreation Planning, *or* Geog 447 Recreational Geography	2-3
Biol 100 Man & the Environment	4
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Eng 313 Business Writing	3
English elective (literature)	3
FWR 487 Forest Recreation	3
Geog 100 Man's Physical Environment	4
Geol 101-102 Physical Geology & Lab	4
PE 243 Highly Organized Games	2
PE 254 Camp Leadership	3
PE 260 Man & Leisure	3
PE 261 Recreational Arts & Crafts	2
PE 264 Recreational Music	1
PE 271 Interp of PE, Health, & Rec	3
PE 288 First Aid	2
PE 329 Leadership in Recreation	2
PE 387 Intramural & Athl Officiating	3
PE 486 Prog Planning & Rec Centers	3
PE 494 Community Recreation	3
PE 495 Recreation Internship	9
Physical education activities (must include swimming and dance)	6
PolSc 101 American Government	3
Psych 100 Intro to Psychology	3
Psych 206 Developmental Psychology	3
RadTV 141 Intro to Rad-TV Broadcasting	3
Soc 110 Intro to Sociology	3
Sp 131 Fundamentals of Speech, *or* 151 Voice, Diction, & Oral Interpretation	2
ThA 101 Introduction to the Theatre	2
Recreation option or approved minor	20
Electives to complete 128 cr for the degree	—

Options are available in the following areas:

A. Recreation program development.

B. Youth agencies.

C. Therapeutic recreation.

D. Commercial recreation.

E. Park recreation.

Consult the head of the Department of Health, Physical Education and Recreation for the specific course requirements for each of the above options.

SECONDARY EDUCATION (B.S.Ed.)

Required course work includes the general requirements for students preparing to teach at the secondary level, plus one course in special methods applicable to secondary schools (Ed 315, 316, 317, 318, 319, 323, 341, or another approved special methods course), and the satisfactory completion of one of the options below:

A. Two thirty-credit teaching majors.

B. One forty-credit teaching major and one twenty-credit teaching minor.

C. One thirty-credit teaching major with one twenty-credit and one fifteen-credit teaching minor.

D. One sixty-credit teaching major.

SPECIAL EDUCATION (B.S.Ed.)

Required course work includes the general requirements, plus the satisfactory completion of the required courses and one of the options listed below.

Required Courses	Credits
SpEd 190 Special Education Laboratory	2-6
SpEd 375 Ed of Exceptional Children	3
SpEd 477-478 Tching the Mentally Retarded	6
SpEd 487 Sp Correction for Class Tchers	3
PE 467 Phys Ed & Rec for Handicapped	3
Pysch 301 The Exceptional Individual, *or* 311 Abnormal Psychology, *or* 481 Mental Deficiency	3

A. ELEMENTARY OPTION

Course	Credits
Ed 320 Prim Lang Arts Meth, *or* 322 Interm Lang Arts Meth	3
Ed 326 Elem School Mathematics Meth	3

Ed 421 Elem School Social Studies Meth	2
Ed 444 Elem School Science Meth	2
Music and/or art (non-methods)	3

Plus five credits from the following:

Ed 275 Elem School Art Methods	2
Ed 434 Children's Literature	3
MusT 381 (Ed 381) Elem School Mus Meth	3
PE 252 Elem School Phys Ed	2
PE 316 Elem School Health Materials	2

B. SECONDARY OPTION

Completion of an approved secondary special methods course and one twenty-credit academic teaching minor.

C. DOUBLE MINOR OPTION

Completion of one approved twenty-credit and one approved fifteen-credit teaching minor.

TECHNICAL EDUCATION (B.S.Ed.)

Required course work includes the general requirements for students preparing to teach at the secondary level, plus:

Course	Credits
Engr 101 Engineering Graphics	2
IEd 130 Basic Electricity	4
IEd 131 Basic Electronics	4
IEd 140 Woodwork I	3
IEd 250 General Metals	3
IEd 310 Maint of Tools & Equipment	3
IEd 365 Industrial Supervision	2
IEd 450 Industrial Safety	3
IEd 451 School Shop Planning & Admin	3
IEd 462 Industrial Ed Curriculum	3
IEd 472 Industrial Ed Methods	3
Psych 316 Industrial Psychology	3
Technical area of specialization (electricity, electronics, drafting, wood, or metals)	15-18

Students completing less than sixty credits in technical education and closely-related courses must complete one twenty-credit teaching minor.

TRADE AND INDUSTRIAL EDUCATION (B.S.Ed.)

Required course work includes the general requirements for students preparing to teach at the secondary level, plus:

Course	Credits
VocEd 270, 370, 470 Tech Competence	30
VocEd 322 Vocational Guidance	3
VocEd 351 Principles of Voc Ed	2
VocEd 420 Evaluation in Voc Ed	3
VocEd 450 Industrial Safety	3
VocEd 451 School Shop Planning & Admin	3
VocEd 461 Occupational & Job Analysis	3
VocEd 462 Voc Ed Curriculum	3
VocEd 472 Voc Ed Methods	3
VocEd 480 Advanced Tech Competency	1-6
VocEd 481 Foundations of Voc Ed	2
VocEd 497 Coordination Techniques	3
VocEd 499 Directed Study (or approved electives)	3-9

Students completing less than sixty credits in trade and industrial education or closely-related courses must complete one twenty-credit teaching minor.

VOCATIONAL-TECHNICAL EDUCATION (B.S.Ed.)

Required course work includes the general requirements for students preparing to teach at the secondary level, plus:

Course	Credits
VocEd 270, 370, 470 Tech Competence	30
VocEd 322 Vocational Guidance	3
VocEd 351 Principles of Voc Ed	2
VocEd 420 Evaluation in Voc Ed	3
VocEd 450 Industrial Safety	3
VocEd 451 School Shop Planning & Admin	3
VocEd 461 Occupational & Job Analysis	3
VocEd 462 Voc Ed Curriculum	3
VocEd 472 Voc Ed Methods	3
VocEd 480 Advanced Tech Competency	1-6
VocEd 481 Foundations of Voc Ed	2
VocEd 497 Coordination Techniques	3
VocEd 499 Directed Study (or approved electives)	3-9

Students completing less than sixty credits in vocational-technical education or closely-related courses must complete one twenty-credit teaching minor.

Teaching Majors and Minors

THE VARIOUS teaching majors and teaching minors required to accompany several of the curricula listed in the previous section are outlined below. Since the College of Education reserves the right to approve or disapprove the content of all proposed teaching majors and minors, students should confer closely with their college advisers and with advisers in the academic departments concerned in the selection of these courses.

AGRICULTURAL EDUCATION

The major in agricultural education is offered only in the major curriculum leading to the Bachelor of Science in Agriculture (see College of Agriculture section of the catalog). A teaching minor in agricultural education is not offered.

ANTHROPOLOGY

A teaching major in anthropology is not offered.

15-CREDIT ANTHROPOLOGY TEACHING MINOR

Course	Credits
Anthr 110 Intro to Phys Anthr & Arch	3
Anthr 120 Intro to Social Anthropology	3
Anthr 225 Aboriginal North Am Indian, *or* 325 Indians of Idaho	3
Approved anthropology electives	6

ART

A. 30-CREDIT ART TEACHING MAJOR

Course	Credits
Art 101-102 Survey of Art	4
Art 111-112 Drawing I	4
Art 121-122 Design I	4
Art 211-212 Drawing II	4
Additional art courses selected from among those listed under the options in design, sculpture, or painting in the B.A. curriculum in art in the College of Letters and Science section of this catalog	14

B. ART TEACHING MINORS

Select fifteen to twenty credits from among the art courses listed above. At least twenty credits are required for art to be certified as a secondary school teaching field.

ART AREA

40 CREDIT COMPOSITE TEACHING MAJOR

Course	Credits
Art 101-102 Survey of Art	4
Art 111-112 Drawing I	4
Art 121 Design I	2
Approved art electives	10
HEc 113 Art	3
HEc 314 Weaving	3
HEc 326 Housing & Home Furnishings	3
HEc 426 Hist of Interiors & Furniture	3
IEd 290 Industrial Arts Crafts	2
Photo 281-282 Intro to Photography	6

BACTERIOLOGY

See Biological Sciences.

BIOLOGICAL SCIENCES

A. 40-CREDIT COMPOSITE TEACHING MAJOR

Course	Credits
Bact 250 General Bacteriology	4
Biol 201 Intro to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Biol 351-352 General Genetics & Lab	4
Biol 361 Biological Literature	1
Bot 311 Plant Physiology, *or* Zool 415 Cell Physiology	3-4
Bot 425 Developmental Plant Anatomy	4
Zool 323 Compar Vert Embryology, *or* 324 Compar Vert Anatomy	4
Approved electives from bacteriology, biology, botany, entomology, or zoology	4-5

B. 24-CREDIT COMPOSITE TEACHING MINOR

Course	Credits
Biol 201 Intro to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Biol 351-352 General Genetics & Lab	4
Biol 361 Biological Literature	1
Plus one of the following courses Bot 311-312 Plant Phys & Lab Bot 425 Developmental Plant Anatomy Zool 323 Compar Vert Embryology Zool 324 Compar Vert Anatomy Zool 415 Cell Physiology	4-5

BIOLOGY

See Biological Sciences.

BOTANY

See Biological Sciences.

BUSINESS EDUCATION

The major in business education is offered only in the major curriculum leading to the degree of Bachelor of Science in Business Education as outlined in the previous section.

20 CREDIT BOOKKEEPING TEACHING MINOR

Course	Credits
Acctg 131-132 Principles of Accounting	6
Bus 365 Business Law	3

BusEd 491 Teaching Business Educ I 3
Econ 251-252 Principles of Economics 6
OAd 103 Typewriting III 2

CHEMISTRY

Note: See the physics and mathematics prerequisites for the chemistry courses listed below.

A. 30-CREDIT CHEMISTRY TEACHING MAJOR

Course	Credits
Chem 111 Principles of Chemistry	4
or 103 Intro to Chemistry	(4-5)
Chem 112 Inorg Chem & Qual Analysis	5
Chem 253 Quantitative Analysis	5
Chem 277-278 Organic Chem I & Lab	4
Chem 372 Organic Chemistry II	3
Chem 305-306 Physical Chemistry	6
Chem 480 Elements of Biochemistry	3

B. CHEMISTRY TEACHING MINORS

The teaching minor in chemistry may be fifteen or twenty credits. For secondary-school teacher certification, twenty credits is required.

Course	Credits
Chem 111 Principles of Chemistry	4
or 103 Intro to Chemistry	(4-5)
Chem 112 Inorg Chem & Qual Analysis	5
Chem 275, 278 Carbon Compounds & Lab	4
Chem 302-303 Prin of Phys Chem & Lab	4
Chem 480 Elements of Biochemistry	3

COACHING: MEN

A teaching major in coaching is not offered.

20-CREDIT TEACHING MINOR IN COACHING

Male students majoring or having a teaching major in an academic field outside the Department of Health, Physical Education and Recreation may elect this coaching minor. Students majoring or having a teaching minor in the Department of Health, Physical Education and Recreation cannot elect this coaching minor.

Course	Credits
Ed 428 Audio-Visual Aids	3
PE 126 Weight Training & Conditioning	1
PE 141 Wrestling	1
PE 271 Interpretations	3
PE 348 Athletic Injuries	2
PE 387 Intramural & Athl Officiating	3
PE 497 Sports & Athletic Problems	3
Four credits selected from the following	4
PE 139 Gymnastics	
PE 266 Aquatic Instructor's Course	
PE 341, 342, 343, 344 Coaching Meth	

DANCE

A teaching major in dance is not offered.

20-CREDIT DANCE TEACHING MINOR

Course	Credits
Art 101 *or* 102 Survey of Art	2
MusH 100 Music Appreciation	3
PE 105 Square & Social Dance	1
PE 105 Dance (folk and modern)	2
PE 112 Dance Techniques	1
PE 113 Problems in Dance Composition	2
PE 220 Rhythms for Children	2
PE 320 Labanotation	1
PE 321 Theory & Tech of Teaching Dance	2
PE 325 Dance Production	2
Two credits selected from the following	2
PE 105 Dance (advanced folk, ballet, and jazz)	
PE 111 Fundamentals of Movement	
PE 113 Problems in Dance Composition	
PE 499 Directed Study	
RadTV 282 Intro to TV Production	
RadTV 322 Ed Uses of Radio & TV	
RadTV 488 Cinematography for TV	
ThA 105 Basics of Performance	
ThA 266 Creative Dramatics	

DISTRIBUTIVE EDUCATION

The major in distributive education is offered only in the major curriculum leading to the degree of Bachelor of Science in Business Education as outlined in the previous section. A teaching minor in distributive education is not offered.

EARTH SCIENCE

40-CREDIT COMPOSITE TEACHING MAJOR

Course	Credits
Geog 100 Man's Physical Environment	4
Geog 140 Economic Geography	3
Geog 250 World Regional Geography	3
Geog 362 United States & Canada	3
Geog 380 Cartography	3
Geog 401 Atmospheric Environment	3
Geol 101-102 Physical Geology & Lab	4
Geol 106-107 Historical Geology & Lab	4
Geol 211 Ancient Life	4
Geol 255 Mineralogy	2
Geol 265 Lithology	2
Geol 335 Geomorphology	3
Plus two approved credits; the following are recommended	2
Geog 427 Dec-Making in Resource Mgmt	
Geog 455 Asia	
Geol 301 Field Geology & Report Wrtg	
Geol 345 Structural Geology	

ENGLISH

Note: Eng 101 and 201 or former 102 do not count toward the major in English or a teaching major or minor in English.

A. 30-CREDIT ENGLISH TEACHING MAJOR

In addition to Eng 101 and 201, required course work includes:

Course	Credits
Eng 267-268 *or* 277-278 Survey	6
Eng 401 *or* 402 Comp for Teachers	3
Eng 435 *or* 436 Shakespeare	3
Eng 438 *or* 455 *or* 456 Eighteenth Century	3
Eng 441 *and* 442 *or* 443 Linguistics	6
Eng 452 *or* 453 *or* 454 Seventeenth Century	3
Eng 464 *or* 465 *or* 466 Nineteenth Century	3
Eng 471 *or* 472 American Literature	3

B. 30- OR 40-CREDIT COMPOSITE ENGLISH TEACHING MAJOR

In addition to Eng 101 and 201, required course work includes:

Course	Credits
Eng 267-268 *or* 277-278 Survey	6
Eng 401 *or* 402 Comp for Teachers	3
Eng 435 *or* 436 Shakespeare	3
Eng 438 *or* 452 *or* 453 *or* 454 *or* 455 *or* 456 Seventeenth *or* Eighteenth Century	3
Eng 441 Descriptive Linguistics	3
Eng 464 *or* 465 *or* 466 Nineteenth Century	3

(Continued on next page)

ENGLISH (cont.)

Eng 471 *or* 472 American Literature	3
Approved electives from English (not including Eng 101 or 201), journalism, speech or theatre arts	6-16

C. 20-CREDIT ENGLISH TEACHING MINOR

In addition to Eng 101 and 201, required course work includes:

Course	Credits
Eng 267-268 *or* 277-278 Survey	6
Eng 401 Composition for Teachers	3
Eng 435 *or* 436 Shakespeare	3
Eng 464 *or* 465 Nineteenth Century	3
Eng 471 *or* 472 American Literature	3
Approved English elective	2

D. 15-CREDIT ENGLISH TEACHING MINOR

In addition to Eng 101 and 201, required course work includes:

Course	Credits
Eng 267-268 *or* 277-278 Survey	6
Eng 401 Composition for Teachers	3
Eng 464 *or* 465 Nineteenth Century	3
Eng 471 *or* 472 American Literature	3

E. 15-CREDIT COMPOSITE ENGLISH TEACHING MINOR

This composite teaching minor is limited to students majoring in elementary education. In addition to Eng 101 and 201, required course work includes:

Course	Credits
Eng 267-268 *or* 277-278 Survey	6
Eng 401 Composition for Teachers	3
Approved electives from English (not including Eng 101 or 201), journalism, speech, or theatre arts	6

ENTOMOLOGY

See Science.

FRENCH

Basic language courses taken in high school or elsewhere may be evaluated for college equivalencies as part of this teaching major and minor. Consult the Department of Foreign Languages and Literatures for policies on advanced placement.

A. 30-CREDIT FRENCH TEACHING MAJOR

Course	Credits
FL 101-102 Elementary French	8
FL 201-202 Intermediate French	8
FL 301-302 Adv Fr Grammar & Comp	6
FL 303-304 French Culture & Inst	6
FL 413 French for Teachers	2

Additional preparation in the French courses listed in the catalog is recommended.

B. 20-CREDIT FRENCH TEACHING MINOR

Course	Credits
FL 101-102 Elementary French	8
FL 201-202 Intermediate French	8
Approved French elective (FL 301-302 is especially recommended)	4

Note: A minor in French of less than twenty credits is not acceptable.

GENERAL SCIENCE

See Science.

GENERAL SOCIAL SCIENCE

See Social Science.

GEOGRAPHY

A. 30-CREDIT GEOGRAPHY TEACHING MAJOR

Course	Credits
Geog 100 Man's Physical Environment	4
Geog 140 Economic Geography	3
Geog 250 World Regional Geography	3
Geog 265 Cultural Geography	3
Geog 362 United States & Canada	3
Geog 364 Idaho & Pacific Northwest	3
Geog 401 Atmospheric Environment	3
Geog 455 Asia	3
Geog 466 Political Geography	3
Approved geography elective (Geog 427 recommended)	2

B. 20-CREDIT GEOGRAPHY TEACHING MINOR

Course	Credits
Geog 100 Man's Physical Environment	4
Geog 140 Economic Geography	3
Geog 250 World Regional Geography	3
Geog 265 Cultural Geography	3
Geog 362 United States & Canada	3
Geog 427 Dec-Making in Resource Mgmt	3
Approved geography elective (Geog 455 recommended)	1

GEOLOGY

A teaching major in geology is not offered.

20-CREDIT GEOLOGY TEACHING MINOR

Course	Credits
Geol 101-102 Physical Geology & Lab	4
Geol 106-107 Historical Geology & Lab	4
Geol 211 Ancient Life	4
Geol 255 Mineralogy	2
Geol 265 Lithology	2
Plus four credits from the following	4
Geol 301 Field Geology & Report Wrtg	
Geol 335 Geomorphology	
Geol 345 Structural Geology	

GERMAN

Basic language courses taken in high school or elsewhere may be evaluated for college equivalencies as part of this teaching major and minor. Consult the Department of Foreign Languages and Literatures for policies on advanced placement.

A. 30-CREDIT GERMAN TEACHING MAJOR

Course	Credits
FL 121-122 Elementary German	8
FL 221-222 Intermediate German	8
FL 321-322 Adv German Grammar & Comp	6
FL 327-328 Survey of German Literature	6
FL 433 German for Teachers	2

Additional preparation in the German courses listed in the catalog is recommended.

B. 20-CREDIT GERMAN TEACHING MINOR

Course	Credits
FL 121-122 Elementary German	8
FL 221-222 Intermediate German	8
Approved German electives (FL 321-322 is especially recommended)	4

Note: A minor in German of less than twenty credits is not acceptable.

GUIDANCE AND COUNSELING

An undergraduate major is not offered in guidance and counseling. Students who wish to qualify for guidance and counseling may qualify as teachers in any subject area and enroll in guidance and counseling programs later in graduate school. Those definitely planning to become counselors should seek an adviser from the guidance faculty. Generally a major in psychology and a minor in sociology/anthropology or a major in sociology/anthropology and a minor in psychology is the preferred undergraduate preparation for counseling candidates. The current prerequisites for graduate work in guidance and counseling are contained in a psychology minor.

HEALTH EDUCATION

A teaching major in health education is not offered.

20-CREDIT HEALTH EDUCATION TEACHING MINOR

Students minoring in health education who plan to apply for teacher certification must include a course in anatomy or physiology in their science sequence.

Course	Credits
Bact 254 Public Health & Hygiene	3
Ed 323 Health Education Methods	3
PE 150 General Hygiene, *or* 110 Health Issues	2-3
PE 288 First Aid	2
Psych 205 Developmental Psychology	3
Six or seven credits from the following	6-7
HEc 270 Nutrition	
Psych 311 Abnormal Psychology	
Soc 220 Marriage	
Soc 320 The Family	

HISTORY

A. 30-CREDIT HISTORY TEACHING MAJOR

Course	Credits
Hist 101-102 History of Civilization	6
Hist 111-112 Intro to U.S. History	6
American government	3
Additional history courses	15

Note: In selecting the fifteen credits in courses offered by the Department of History, balance them as closely as feasible to an equal number of credits in the history of the Old World and the history of the New World. Students who will also have a teaching minor in English are urged to take at least six credits in English history as a part of this teaching major.

Students seeking secondary-school certification from the state of Idaho are urged to get it in social studies rather than history. For this purpose, they should also take, in addition to the above, at least three credits in geography, sociology, economics, or anthropology.

B. HISTORY TEACHING MINORS

The teaching minor in history may be fifteen or twenty credits; however, for Idaho secondary-school certification, a minimum of twenty is required. All courses must be in history. Follow the history teaching major (above) in selecting courses. Students who will also have a teaching major in English are urged to take at least six credits in English history as a part of the twenty credits required in the history minor.

HOME ECONOMICS EDUCATION

The major in home economics education is offered only in the major curriculum leading to the Bachelor of Science in Home Economics (see College of Letters and Science section of the catalog). A teaching minor in home economics education is not offered.

INDUSTRIAL EDUCATION

The major in industrial education is offered only under the major curriculum outlined in the previous section.

20-CREDIT TEACHING MINOR IN INDUSTRIAL EDUCATION

For certification to teach industrial education, a teaching minor must contain at least twenty credits, including not less than fifteen credits distributed among and including each of the areas of metals, wood, drafting, and electricity-electronics. The remainder may be in allied or related areas. No substitution will be permitted for any of the courses required below.

Course	Credits
Engr 101 Engineering Graphics	2
IEd 130 Basic Electricity	4
IEd 140 Woodwork I	3
IEd 250 General Metals	3
IEd 310 Maintenance of Tools & Equip	3
IEd 462 Industrial Ed Curriculum	3
IEd 472 Industrial Ed Methods	3

JOURNALISM

A teaching major in journalism is not offered.

20-CREDIT JOURNALISM TEACHING MINOR

Course	Credits
Comm 120 Mass Comm in a Free Society	2
Jour 221 News Writing	2
Jour 222 Reporting	3
Jour 354 News Editing	3
Jour 405 Superv High School Publications	2
Jour 455 Hist of Mass Communications	3
Journalism electives	5

LATIN

Basic language courses taken in high school or elsewhere may be evaluated for college equivalencies as part of this teaching major and minor. Consult the Department of Foreign Languages and Literatures for policies on advanced placement.

A. 30-CREDIT LATIN TEACHING MAJOR

Course	Credits
FL 161-162 Elementary Latin	8
FL 261-262 Intermediate Latin	8
FL 361-362 Adv Latin Grammar & Comp	6

(Continued on next page)

LATIN (cont.)

FL 365-366 Survey of Latin Literature	6
FL 467 Latin for Teachers	2

Additional preparation in the Latin courses listed in the catalog is recommended.

B. 20-CREDIT LATIN TEACHING MINOR

Course	Credits
FL 161-162 Elementary Latin	8
FL 261-262 Intermediate Latin	8
Approved Latin electives (FL 361-362 is especially recommended)	4

Note: A minor in Latin of less than twenty credits is not acceptable.

LIBRARY SCIENCE

A teaching major in library science is not offered.

LIBRARY SCIENCE TEACHING MINORS

The teaching minor in library science may be either fifteen or twenty credits. This teaching minor will qualify the student for the Idaho school librarianship credential. Since library science is not a teaching field, the teacher-librarian who must qualify for a standard Idaho teacher's certificate will need to develop a second teaching minor in addition to his or her teaching major.

Course	Credits
LibSc 420 Classification & Cataloging	4
LibSc 421 Selection of Books	3
LibSc 422 Use of the School Library	2
LibSc 423 Reference in School Libraries	3
Library science electives	3-8

MATHEMATICS

A. 40-CREDIT MATHEMATICS TEACHING MAJOR

Course	Credits
Math 180, 190, 200 Anal Geom & Calc	11
Math 184 Elements of Linear Algebra	2
Math 186 Theory of Numbers	3
Math 300 Math for Teachers, *or* 490 Intro to Set Theory	3
Math 320 Probability & Statistics, *or* 451 Prob Theory & Math Statistics	3
Math 390 Postulational Geometry	3
Math 461 Higher Algebra	3
Math 471 Advanced Calculus	3
Additional mathematics courses numbered above 200	9

B. 30-CREDIT MATHEMATICS TEACHING MAJOR

Course	Credits
Math 180, 190, 200 Anal Geom & Calc	11
Math 184 Elements of Linear Albebra	2
Math 186 Theory of Numbers	3
Math 300 Math for Teachers, *or* 490 Intro to Set Theory	3
Math 320 Probability & Statistics, *or* 451 Prob Theory & Math Statistics	3
Two courses from the following	6
Math 390 Postulational Geometry	
Math 461 Higher Algebra	
Math 471 Advanced Calculus	
One additional mathematics course numbered above 200	2

C. 20-CREDIT MATHEMATICS TEACHING MINOR

Course	Credits
Math 180, 190 Anal Geom & Calc I-II	8
Math 186 Theory of Numbers	3
Math 300 Mathematics for Teachers	3
Math 320 Probability & Statistics, *or* 451 Prob Theory & Math Statistics	3
One of the following courses	3
Math 205 Intro to Computer Prog	
Math 390 Postulational Geometry	
Math 461 Higher Algebra	

D. 15-CREDIT MATHEMATICS TEACHING MINOR

Course	Credits
Math 180 Anal Geom & Calc I	4
Math 184 Elem of Linear Algebra	2
Math 186 Theory of Numbers	3
Math 300 Mathematics for Teachers	3
One of the following courses	3
Math 190 Anal Geom & Calc II	
Math 205 Intro to Computer Prog	
Math 320 Probability & Statistics	
Math 390 Postulational Geometry	

MUSIC EDUCATION

The majors in music education are offered only in the major curricula leading to the degree of Bachelor of Music (see School of Music section of this catalog).

20-CREDIT MUSIC TEACHING MINOR

Course	Credits
MusA 387 Conducting	2
MusC 141, 142 Musicianship & Music Lit and Theory of Music I, *or* MusC 121-122 Elements of Music Theory	8
MusC 133 Theory Keyboard Laboratory	1
MusH 321-322 Music in Western Civ, *or* two courses from the following	4-6
MusH 144 History of Music I	
MusH 243 History of Music II	
MusH 244 History of Music III	
MusH 411 Music in the Medieval World	
MusH 412 Music in the Renaissance	
MusH 413 Music in the Baroque Era	
MusH 414 Rococo & Pre-Classical Music	
MusH 415 Viennese Classical Period	
MusH 416 Music in the Romantic Era	
MusH 417 Late 19th-Century Music	
MusH 418 Music in the 20th Century	
MusT 381 Elem School Music Methods, *or* 385 Choral Music in the Sec School, *or* 386 Instr Music in the Sec School	2-3
Applied performance elective	1
Electives to total 20 cr for the teaching minor selected from the following	0-2
MusA 145-146 Piano Class	
MusA 147-148 Voice Class	
MusA 265, 365 Chamber Ensemble	
MusA 388 Conducting	
MusT 251 String Instrument Tech	
MusT 252 Reed Instrument Tech	
MusT 253 Brass Instrument Tech	
MusT 254 Flute & Percussion Tech	
MusT 382 Elem School Music Meth II	
MusT 383 Principles of Music Teaching	

OFFICE OCCUPATIONS EDUCATION

The major in office occupations education is offered only in the major curriculum leading to the degree of Bachelor of Science in Business Education as outlined in the previous section.

21-CREDIT OFFICE OCCUPATIONS EDUCATION TEACHING MINOR

Course	Credits
BusEd 491 Teaching Business Educ I	3

Eng 313 Business Writing	3
OAd 103 Typewriting III	2
OAd 185 Office Machines	2
OAd 271-272 Shorthand III-IV	6
OAd 313 Office Management	2
OAd 395 Secretarial Procedures	3

OFFICER EDUCATION

TEACHING MINORS

The teaching minor may consist of either fifteen or twenty credits in approved courses from aerospace studies, military science or naval science.

PHYSICAL EDUCATION

Also see: Coaching, Dance, Health Education, and Recreation.

The majors in physical education are offered only under the major curricula outlined in the previous section.

TEACHING MINORS IN PHYSICAL EDUCATION

Students minoring in physical education are required to pass a proficiency examination in swimming. Those who plan to apply for teacher certification must also take anatomy or physiology, as well as health education. These requirements may be met by taking PE 108, Swimming, Zool 119, Human Anatomy & Physiology, and Ed 323, Health Education Methods.

The general university requirement in physical education activity courses is waived for majors and minors in this field.

A. 20-CREDIT MINOR FOR SECONDARY LEVEL: WOMEN

Course	Credits
PE 111 Fundamentals of Movement	2
PE 112 Dance Techniques	1
PE 115 Team Sports Backgrounds	2
PE 116 *or* 117 Indiv Sports Backgrounds	2
PE 139 Gymnastics	2
PE 271 Interpretations	3
PE 321 Theory & Tech of Teaching Dance	2
PE 322 Teaching Individual Sports	2
PE 323 Teaching Team Sports	2
PE 427 Meth & Materials in Phys Ed	2

Recommended electives:

PE 252 Elem School Physical Ed
PE 288 First Aid
PE 419 Human Kinesiology

B. 20-CREDIT MINOR FOR SECONDARY LEVEL: MEN

Course	Credits
Ed 323 Health Education Methods	3
PE 126 Weight Training & Conditioning	1
PE 139 Gymnastics	2
PE 141 Wrestling	1
PE 142 Tumbling & Floor Exercise	2
PE 243 Highly Organized Games	2
PE 271 Interp of Phys Ed, Health, & Rec	3
PE 427 Methods & Materials in Phys Ed	2
PE 496 Organization & Administration	3
Physical education elective	1

C. 20-CREDIT MINOR FOR ELEMENTARY LEVEL

Course	Credits
PE 111 Fundamentals of Movement	2
PE 115 Team Sports Backgrounds	2
PE 116 *or* 117 Indiv Sports Backgrounds	2
PE 139 Gymanstics	2
PE 150 General Hygiene, *or* 110 Health Issues	2-3
PE 220 Rhythms for Children	2
PE 252 Elem School Physical Education	2
PE 271 Interpretations	3
PE 427 Methods & Materials in Phys Ed	2

Recommended elective:

PE 264 Recreational Music

PHYSICAL SCIENCE

40-CREDIT COMPOSITE TEACHING MAJOR

This is a forty-credit composite teaching major consisting of courses in chemistry, geology, and physics. It must include at least eighteen credits in chemistry or physics and a minimum of eight credits in each of these two fields. A teaching minor in mathematics is recommended to accompany this teaching major.

Course	Credits
Chem 111 Prin of Chemistry, *or* 103 Intro to Chemistry	4-5
Chem 112 Inorg Chem & Qual Analysis	5
Chem 275 Carbon Compounds	3
Geol 101-102 Physical Geology & Lab	4
Phys 220-221-222 Engineering Physics	9
Phys 411-412 Physical Instrumentation	5
Additional courses in chemistry, geology, or physics to complete distribution required above	9-10

Recommended electives:

Chem 302 Prin of Physical Chem
Chem 480 Elements of Biochemistry

PHYSICS

Electives specified in the following programs require approval by the adviser from the Department of Physics.

Math 180, 190, and 200 are prerequisites to the required physics courses.

A. 30-CREDIT PHYSICS TEACHING MAJOR

Course	Credits
Phys 220-221-222 Engineering Physics	9
Phys 321 Analytical Mechanics	3
Phys 341 Electricity & Magnetism	3
Phys 360 Intro to Modern Physics	3
Approved electives in physics, including at least two credits of lab work	12

B. 20-CREDIT PHYSICS TEACHING MINOR

Course	Credits
Phys 220-221-222 Engineering Physics	9
Phys 360 Intro to Modern Physics	3
Approved electives in physics, including at least two credits of lab work	8

POLITICAL SCIENCE

A. 30-CREDIT POLITICAL SCIENCE TEACHING MAJOR

The distribution of credits among the five fields below must be as follows: (1) 12-15 credits in American government and political process, including PolSc 101, American Government; and (2) 15-18 credits in the other four fields, includ-

(Continued on next page)

POLITICAL SCIENCE (cont.)

ing at least 3 credits in each field. Courses listed in more than one field may be counted in only one of those fields. Substitutions in specific courses may be made with the consent of the adviser. All thirty credits must be in political science courses; however, note that six credits in U.S. history are also required for certification in this field.

	Credits
American Government and Political Process	
PolSc 101 American Government	3
Plus nine-twelve credits from the following:	
PolSc 105 Elements of Pol Science	3
PolSc 152 Politics & Pollution	1
PolSc 153 Politics & Peace	1
PolSc 154 Politics & the Economy	1
PolSc 275 Amer State Government	3
PolSc 276 Amer Local Government	3
PolSc 428 Amer Political Thought	3
PolSc 431 Political Parties	3
PolSc 432 The Legislative Process	3
PolSc 433 Public Opinion & Elec Behav	3
PolSc 434 Interest Groups	3
PolSc 451 Pres & Admin Dec-Making	3
PolSc 452 Admin Law & Regulation	3
PolSc 467 Constitutional Law	3
PolSc 469 The Judicial Process	3
PolSc 493-494 Sem in Urban Studies	2-4
Comparative Government and Politics	
At least three credits from the following:	
PolSc 285 Systems of Parl Democracy	3
PolSc 286 Authoritarian Pol Systems	3
PolSc 446 The Chinese Empire	3
PolSc 483-484 Developing States	3-6
PolSc 485 African Political Systems	3
International Relations	
At least three credits from the following:	
PolSc 153 Politics & Peace	1
PolSc 237 International Politics	3
PolSc 341 World Politics	3
PolSc 438 Conduct of Amer For Policy	3
PolSc 440 Prin of Inter Law & Org	3
PolSc 443 Contemp Far East Politics	3
Public Administration and Public Law	
At least three credits from the following:	
PolSc 451 Pres & Admin Dec-Making	3
PolSc 452 Admin Law & Regulation	3
PolSc 454 Admin Org & Behavior	3
PolSc 467 Constitutional Law	3
PolSc 469 The Judicial Process	3
Political Thought	
At least three credits from the following:	
PolSc 425 Western Pol Thought	3
PolSc 426 Recent Pol Thought	3
PolSc 428 American Pol Thought	3

B. TEACHING MINOR IN POLITICAL SCIENCE

The teaching minor in political science may be fifteen or twenty credits, but only the latter will satisfy the requirements for teacher certification at the secondary-school level. Six credits of U.S. history are also required for certification in this field.

Course	Credits
PolSc 101 American Government	3
Three additional credits in American government (see the list of courses in American government and political process under the teaching major above)	3
Three credits in comparative government (see the list of courses in comparative government and politics under the teaching major above)	3
Approved political science courses selected from those listed under the teaching major	6-11

PSYCHOLOGY

A. 30-CREDIT PSYCHOLOGY TEACHING MAJOR

The basic objective of this teaching major is to provide the undergraduate student with preparation which leads to teaching psychology in secondary schools, and/or to undertake graduate work in several related areas. Though psychology is certifiable, it is desirable to present two teaching minors in standard secondary-school subjects. At least a teaching minor in sociology/anthropology is recommended for those anticipating graduate work in guidance and counseling and school psychology. A second teaching major in lieu of two teaching minors is acceptable preparation. The composite teaching majors (e.g., social science or science), if elected as a second teaching major, should meet the forty-credit requirement.

Course	Credits
Psych 100 Intro to Psychology	3
Psych 201-202 General Exper Psych	8
Psych 205 Developmental Psychology	3
Psych 311 Abnormal Psych, *or* 320 Social Psych, *or* 461 Psych of Personality	3
Psych 317 Intro to Stat for Behav Sci	3
Psych 400 Seminar	3
Psych 441 Physiological Psych, *or* 444 Sensation & Perception, *or* 445 Psych of Motivation	3
Psych 490 Psychology of Learning	3
Psychology elective (Guid 420 and 460 are recommended for students planning to pursue graduate work in guidance and counseling)	1

B. 20-CREDIT PSYCHOLOGY TEACHING MINOR

Course	Credits
Psych 100 Intro to Psychology	3
Psych 201 General Exper Psych	4
Psych 205 Developmental Psych	3
Psych 317 Intro to Stat for Behav Sci	3
Psych 490 Psychology of Learning	3
Approved psychology electives	4

RECREATION

The major in recreation is offered only under the major curriculum outlined in the previous section.

20-CREDIT RECREATION TEACHING MINOR

Course	Credits
PE 105 Square & Social Dance	1
PE 252 Elem School Physical Education	2
PE 254 Camp Leadership	3
PE 271 Interpretations	3
PE 329 Leadership in Recreation	2

Plus three credits from the following:

PE 226	Officiating Women's Sports	1
PE 387	Intramural & Athl Officiating	3
PE 486	Program Planning for Rec Cent	3
PE 494	Community Recreation	3

Additional Courses for Women

Six credits selected from the following:

PE 105	Dance	1
PE 108	Swimming	1
PE 115	Team Sports Backgrounds	2
PE 116-117	Indiv Sports Backgrounds	2-4
PE 139	Gymnastics	2

Additional Courses for Men

Six credits from the following:

PE 126	Weight Training & Conditioning	1
PE 138	Swimming	1
PE 139	Gymnastics	2
PE 141	Wrestling	1
PE 142	Tumbling & Floor Exercise	2
PE 244	Life Saving	1

RUSSIAN

Basic language courses taken in high school or elsewhere may be evaluated for college equivalencies as part of this teaching major or minor. Consult the Department of Foreign Languages and Literatures for policies on advanced placement.

A. 30-CREDIT RUSSIAN TEACHING MAJOR

Course		Credits
FL 171-172	Elementary Russian	8
FL 271-272	Intermediate Russian	8
FL 371-372	Adv Russian Grammar & Comp	6
FL 498	Russian Proseminar (or equiv)	8

Additional preparation in Russian seminars or directed study is recommended.

B. 20-CREDIT RUSSIAN TEACHING MINOR

Course		Credits
FL 171-172	Elementary Russian	8
FL 271-272	Intermediate Russian	8
	Approved Russian electives (FL 371-372 is especially recommended)	4

Note: A minor in Russian of less than twenty credits is not acceptable.

SCHOOL ADMINISTRATION

No undergraduate major or minor is offered in school administration. Students who are planning to go into this specialized field must first complete an undergraduate program, preferably with a teaching major in social science, obtain a bachelor's degree and teaching experience, then enter the Graduate School to pursue a program leading to an advanced degree in school administration.

SCIENCE

A. 40-CREDIT COMPOSITE TEACHING MAJOR

Courses for this composite teaching major may be selected from bacteriology, biology, botany, chemistry, entomology, physical geography, geology, physics, and zoology. A minimum of eighteen credits is required in biological sciences, chemistry, earth sciences, or physics. These eighteen credits are to be selected from among the courses listed in the teaching minors in these fields. This composite teaching major is recommended only for students who plan to teach at the junior-high-school level.

B. 20-CREDIT COMPOSITE TEACHING MINOR

Required course work consists of approved courses from the fields listed above. At least eight credits must be in laboratory courses. This 20-credit composite teaching minor may be taken only by majors in elementary education.

SOCIAL SCIENCE

A. 40-CREDIT COMPOSITE TEACHING MAJOR

Courses for this composite teaching major may be selected from anthropology, economics, geography (excluding physical geography), history, philosophy, political science, and sociology. At least eighteen of the required forty credits must be from history, including at least nine credits in American history. At least three credits are required in each of the following fields: American government, economics, geography, and sociology or anthropology.

B. 20-CREDIT COMPOSITE TEACHING MINOR

Required course work consists of approved courses from the fields listed above. This composite minor must include at least three credits in American history or American government and is limited to students who are majoring in elementary education.

SOCIOLOGY

A teaching major in sociology is not offered.

15-CREDIT SOCIOLOGY TEACHING MINOR

Course		Credits
Soc 110	Intro to Sociology	3
Soc 230	Social Problems	3
	Approved sociology electives	9

SOCIOLOGY/ANTHROPOLOGY

A teaching major in sociology/anthropology is not offered.

20-CREDIT SOCIOLOGY/ANTHROPOLOGY TEACHING MINOR

Course		Credits
Anthr 110	Intro to Phys Anthr & Arch *or* 120 Intro to Social Anthr	3
Anthr 225	Aboriginal North Am Indian, *or* 325 Indians of Idaho	3
Soc 110	Intro to Sociology	3
Soc 230	Social Problems	3
	Approved electives in anthropology and sociology	8

SPANISH

Basic language courses taken in high school or elsewhere may be evaluated for college equivalencies as part of this teaching major and minor. Consult the Department of Foreign Languages and Literatures for policies on advanced placement.

(Continued on next page)

SPANISH (cont.)

A. 30-CREDIT SPANISH TEACHING MAJOR

Course	Credits
FL 181-182 Elementary Spanish	8
FL 281-282 Intermediate Spanish	8
FL 381-382 Adv Spanish Grammar & Comp	6
FL 383-384 Hispanic Culture & Inst	6
FL 493 Spanish for Teachers	2

Additional preparation in the Spanish courses listed in the catalog is recommended.

B. 20-CREDIT SPANISH TEACHING MINOR

Course	Credits
FL 181-182 Elementary Spanish	8
FL 281-282 Intermediate Spanish	8
Approved Spanish electives (FL 381-382 is especially recommended)	4

Note: A minor in Spanish of less than twenty credits is not acceptable.

SPECIAL EDUCATION

The major in special education is offered only under the major curriculum outlined in the previous section.

20-CREDIT SPECIAL EDUCATION TEACHING MINOR

Course	Credits
SpEd 190 Special Education Lab	2
SpEd 375 Educ of Exceptional Children	3
SpEd 477 Teaching the Mentally Retarded	3
SpEd 487 Speech Correction Methods	3
Approved special education electives	9

Note: This minor is designed for individuals preparing to work in fields ancillary to special education. It is not intended for those individuals interested in teaching the exceptional child.

SPEECH

A. 30-CREDIT SPEECH TEACHING MAJOR

Course	Credits
Sp 109 Intercoll Forensics, *or* 262 Parliamentary Law & Procedure	1-2
Sp 131 Fundamentals of Speech	2
Sp 232 Informative Speech	3
Sp 331 Persuasive Speech	3
Sp 362 Discussion & Conference Methods	2
Sp 370 Speech & Social Control	3
Sp 391 Propaganda & Public Opinion	2
Sp 421 Intro to Rhetorical Theory	3
Sp 422 British Public Address, *or* 424 American Public Address	3
Sp 480 General Semantics, *or* 488 Theory in Communication	3
Additional courses in speech	4-5

B. SPEECH TEACHING MINORS

The teaching minor in speech may be fifteen or twenty credits; however, twenty credits is required for certification in speech at the secondary-school level. Select courses from those specified for the speech teaching major.

THEATRE ARTS

A. 30-CREDIT THEATRE ARTS TEACHING MAJOR

Course	Credits
ThA 102 Stage Makeup	1
ThA 105 Basics of Performance	2
ThA 163 Technical Production	4
ThA 271 Play Analysis	3
ThA 272 Intermediate Acting	3
ThA 362 Costume for the Stage	3
ThA 420 Production Management	3
ThA 471-472 Directing	6
Approved theatre arts electives	5

B. THEATRE ARTS TEACHING MINORS

The teaching minor in theatre arts may be fifteen or twenty credits. For secondary-school teacher certification, twenty credits are required.

Course	Credits
ThA 102 Stage Makeup	1
ThA 105 Basics of Performance	2
ThA 163 Technical Production	4
ThA 271 Play Analysis	3
ThA 362 Costume for the Stage	3
ThA 420 Production Management	3
ThA 471 Directing	3
Approved theatre arts elective	1

THEATRE ARTS-SPEECH

40-CREDIT COMPOSITE TEACHING MAJOR

Course	Credits
Sp 109 Intercollegiate Forensics	1
Sp 151 Voice, Diction & Oral Interp	2
Sp 232 Informative Speech	3
Sp 262 Parliamentary Law & Procedure	2
Sp 331 Persuasive Speech	3
Sp 362 Discussion & Conference Methods	2
Sp 440 Speech for Teachers	3
Sp 480 General Semantics, *or* 488 Theory in Communication	3
ThA 102 Stage Makeup	1
ThA 105 Basics of Performance	2
ThA 163 Technical Production	4
ThA 362 Costume for the Stage	3
ThA 420 Production Management	3
ThA 471-472 Directing	6
Approved electives in theatre arts and speech	2

TRADE AND INDUSTRIAL EDUCATION

The major in trade and industrial education is offered only in the major curriculum leading to the B.S.Ed. degree as outlined in the previous section. A teaching minor in trade and industrial education is not offered.

VOCATIONAL-TECHNICAL EDUCATION

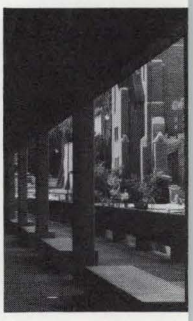
The major in vocational-technical education is offered only in the major curriculum leading to the B.S.Ed. degree as outlined in the previous section. A teaching minor in vocational-technical education is not offered.

ZOOLOGY

See Biological Sciences.

College of Engineering

H. Sidwell Smith, Dean (131 Janssen Engr. Bldg.); George R. Russell, Assistant Dean and Secretary of the College Faculty; Weldon R. Tovey, Assistant Dean.



THE COLLEGE OF ENGINEERING has as its purpose to provide an educational experience which will afford maximum opportunity for qualified students to develop into useful citizens and well-educated professional engineers. To this end, the instructional and inspirational facilities of the entire university are available to students of the College of Engineering.

The Engineering Profession

The engineering profession is concerned with utilizing scientific principles to create useful and economic works for the benefit of mankind. The engineer's talents are used in many ways: design, construction, and operation of public works and utilities systems; planning, construction, and operation of industrial processes and equipment; application of technical products; and planning and execution of systems needed for the support of all human activity such as food production, transportation, and control of man's environment. Many engineers hold responsible management positions. Engineers are key members of the interdisciplinary teams which are needed to solve the complex technical, economic, and social problems of the modern world.

The engineering profession recognizes that social, economic, political, and cultural, as well as technical considerations are involved in most of the works in which the modern engineer is engaged. A part of an engineer's education is devoted to humanistic-social studies to help him or her to relate the technical preparation received to the world today and to enhance the engineer's role as an educated, responsible citizen.

To qualify as an engineer one usually undertakes a four-year college program leading to a Bachelor of Science (B.S.) degree in one of the major branches of engineering practice. Bachelor of Science graduates may either go directly into engineering employment or proceed to graduate study to pursue a given area of interest in depth. The technology of engineering includes an exceedingly wide range of subject matter which can be explored only to a limited extent in an undergraduate program. A rapidly-increasing number of students undertake graduate study for better preparation in a specific field before entering practice.

All states require that engineers engaged in work affecting public health and welfare be licensed or registered. This requires a qualifying examination in fundamentals of engineering, usually taken upon completion of undergraduate study, and a period of practical experience followed by a second qualifying examination in the practice of engineering. Many industries, while not legally required to use registered engineers, encourage registration as evidence of professional stature of their engineering employees.

Engineering Aptitudes

Those likely to succeed in engineering are students of serious purpose, will-

ing to do consistently hard work, and with high school records that show marked ability in mathematics, physics, and chemistry. Equally important are: (1) ability to visualize in three dimensions the parts of a structure or the operation of a machine or device; (2) facility in the use of written and spoken English; and (3) possession of those desirable personal attributes which enable one to inspire associates and assistants to work together effectively. Without these qualifications, the chances for a successful career are poor. Aptitude for mathematics and science is important because an engineer's job is the practical application of science.

If the above qualifications and aptitudes are lacking, it is not advisable to undertake the study of engineering. A desire or ability to tinker with machines, to make things with one's hands, or to operate machinery is helpful but not enough. Students with these aptitudes only should consider the desirability of vocational or technical institute training in preference to professional engineering.

Although engineering has been traditionally practiced by men, there are many opportunities for women. An increasing number of young women are entering the profession. Several are enrolled at the University of Idaho.

Preparation and Admission

To enter a regular college course in engineering, the student should have completed four years of high school with three units of English, four units of mathematics, three units of natural science, including one unit of physics and one unit of chemistry, and two units of social science. A student may be admitted with less than the above, but the deficiency must be made up before he or she can progress very far in a college engineering course. Deficiencies can be made up readily by attending summer sessions; this is strongly recommended to avoid delay in progress due to a lack of prerequisites. A statement of admission requirements is included in part 2 of this catalog.

Students who comtemplate entering the College of Engineering with advanced standing from junior colleges or other institutions should include as many freshman and sophomore requirements listed in the curricula as possible. Calculus, physics, and the various engineering science courses are prerequisites to many advanced courses and their omission will delay graduation.

A junior engineering student must have at least a 2.00 grade-point average before being permitted to register in upper-division courses offered by the College of Engineering.

Scholarships and Awards

Many scholarships and awards are available to engineering students and prospective students. See "Financial Aids" and "Special Awards" in the student services section of part 2 for more information.

Courses of Study and Degrees

The College of Engineering includes the degree-granting departments

of Agricultural, Chemical, Civil, Electrical, and Mechanical Engineering. Each department offers courses in the major phases of engineering pertinent to its particular field. Careful attention is given to curriculum content and educational philosophy to keep all programs attuned to the rapidly-changing concepts and technology of engineering. All curricula are accredited by the Engineers Council for Professional Development.

First degree, four-year programs lead to the Bachelor of Science in all departments, i.e., Bachelor of Science in Agricultural Engineering, Bachelor of Science in Chemical Engineering, Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering, or Bachelor of Science in Mechanical Engineering.

The Bachelor of Science programs are designed to prepare the student either for immediate entry into the profession as an engineer-in-training or for graduate study. All freshmen take the same program; the sophomore program is the same for all departments with the exception of two courses which are specified by the departments. The student may postpone a final decision on a branch of study until as late as the beginning of the junior year with little, if any, consequence, thus allowing ample opportunity for professional orientation. The junior and senior years are devoted to application of basic principles in the various field of practice. Interdepartmental activities are designed to lead the student to an awareness of the interrelationship among all practice fields in the execution of modern complex engineering work.

The impact of the vast technological development of recent years has resulted in an increasing interaction between society and engineering. Recognition of this fact has led to emphasis on subjects in the humanities and social sciences. A program leading concurrently to a Bachelor of Arts degree in the College of Letters and Science and a Bachelor of Science degree in one of the engineering branches can be arranged by extending the humanistic and social science studies. Such double degree programs normally require five years to complete and are subject to the provisions of regulation "J-7" (Second Baccalaureate Degree) in part 3 of this catalog.

Courses of study leading to the degrees of Master of Science (M.S.) or Master of Engineering (M.Engr.) are offered in agricultural, chemical, civil, electrical, and mechanical engineering. The M.S. is also offered in nuclear engineering. The departments of Agricultural, Chemical, Civil, and Electrical Engineering offer work leading to the degree of Doctor of Philosophy (Ph.D.). The requirements for graduate degrees are outlined in the catalog of the Graduate School.

Honors Program

An honors program in engineering is available to qualified students. It provides an opportunity for the exceptionally-able undergraduate student to cultivate his or her talents through additional challenge and stimulation. Honors students have an opportunity to pursue their degree field in greater depth or to pursue related and interdisciplinary studies. The program is flexible to meet the interests of individual students.

Students may enter the honors program as early as the first semester of the freshman year; normally entry will be at the second semester of the freshman year or during the sophomore year. Students must achieve a 3.00 or better grade-point average each term to remain in the program.

Entrance to the program is gained upon application and acceptance by the College of Engineering Honors Committee. Further information may be obtained from the dean.

Faculty

The faculty is the key to the quality of the engineering program. The facutly of each department and their individual academic backgrounds are noted in other sections of the catalog. With few exceptions, the faculty members hold advanced engineering degrees; fifty percent hold the Ph.D. degree; recognition in such publications as *Who's Who in America, Who's Who in the West, Who's Who in Engineering,* and *American Men of Science* is common.

A distinguishing feature of the faculty is a unique blend of academic and practical experience. Many of the faculty have extensive experience in practice and bring this experience into the classroom. This is very valuable in preserving balance between theoretical and practical aspects of engineering.

Facilities

The teaching and research facilities of the College of Engineering are among the finest in the country.

Work is centered in the block-square engineering complex which includes the Allen S. Janssen Engineering Classroom Building and the J. E. Buchanan, J. Hugo Johnson, and Henry F. Gauss Engineering Laboratories. These facilities are supplemented by the agricultural engineering and isotope laboratories at other locations on the campus. In total, more than 175,000 square feet of floor space are available for the special use of the College of Engineering.

Of special interest is the J. E. Buchanan Engineering Laboratory. This laboratory, costing $2 1/4 million to construct and equip, was completed in 1968. It houses all of the chemical and civil engineering laboratories and part of the agricultural and electrical engineering laboratories. It also includes the regional materials laboratory of the Idaho Department of Highways.

The laboratories include the most modern equipment for teaching and research. Some of the equipment is of advanced design found in only a few institutional laboratories.

Work with the computer is required of all engineering students. The university's IBM 360 40 digital computer is used for classroom and research problems. Various types of analog computers are available in the engineering laboratories.

Standing and Advantages

The University of Idaho College of Engineering is a fully-accredited, recognized center for undergraduate and graduate engineering education. Since 1896, when it granted its first degrees, the college has awarded over 3,500 bachelor's degrees in engineering. Its graduates are spread throughout the world. The large number of firms and agencies from throughout the country who send interviewers to the campus each year seeking to hire Idaho engineering graduates attests to the reputation of the University of Idaho engineering program.

The size of the college is near the median of engineering colleges in the country. It is not so large that importance of the student as an individual is lost; it is large enough to support the faculty and facilities needed for top quality education.

Balanced attention is given to both undergraduate and graduate programs. New concepts and knowledge resulting from the graduate program feed into the undergraduate program to keep it up to date. Undergraduate students have an opportunity to personally observe graduate projects to help them ascertain their interest in graduate work so that the student is better prepared and more soundly motivated if he does proceed to graduate work.

Requirements for Graduation

Each of the five degree curricula requires a total of 128 semester credits.

FIRST AND SECOND YEAR COURSES COMMON TO ALL CURRICULA

Courses	Credits
Chem 111 Principles of Chemistry	4
Chem 114 General Chemistry	4
EE 200 Systems & Circuits	3
Engr 101 Engineering Graphics	2
Engr 120-121 Engineering Analysis & Design I-II	4
Engr 131 Digital Computer Programming	2
ES 211 Introduction to Mechanics	4
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Math 180, 190, 200 Analytic Geometry & Calculus I, II, III	11
Math 310 Ordinary Differential Equations	3
Phys 221 Engr Physics II—Electricity & Magnetism	3
Phys 222 Engr Physics III—Wave Motion	3
Physical education activities	2
Electives from humanistic-social science	6

The curriculum beyond the freshman and sophomore courses common to all curricula for each department is summarized below. Each curriculum contains various electives to be arranged in consultation with the student's adviser in accordance with the student's interest and consistent with current department and college policies. The electives are intended to provide flexibility in the student's program. Undesignated electives will usually be

taken in a field of study other than the student's major. Courses such as Math 140-141, Phys 111, etc., which are taken to remove deficiencies, may not be used to fulfill minimum elective requirements.

AGRICULTURAL ENGINEERING (B.S.Ag.E.)

First and Second Years	Credits
Courses common to all curricula	57
ES 221 Dynamics of Rigid Bodies	2
Agric or biol science elective	3
Undesignated elective	1
Third and Fourth Years	
AgE 342 Agricultural Engr Analysis	3
AgE 351 Hydrology	3
AgE 352 Fund of Irrigation & Drainage	4
AgE 372 Agricultural Machines	3
AgE 449 Elem of Structural Engr	4
AgE 461 Environmental Systems	3
AgE 462 Materials Handling & Proc	3
AgE 471 Energy Conversion in Ag Systems	2
AgE 491-492 Seminar	0
Ag 321 Biometry	3
EE 314 Electronics & Control Systems	4
ES 320 Fluid Mechanics	3
ES 321 Thermodynamics & Heat Transfer	3
ES 340 Mechanics of Materials	3
Agric or biol science elective	3
Humanistic-social science electives	9
Technical electives	9
Undesignated electives	3

CHEMICAL ENGINEERING (B.S.Ch.E.)

First and Second Years	Credits
Courses common to all curricula	57
ChE 200 Sophomore Seminar	0
Chem 277 Organic Chemistry I	3
Chem 372 Organic Chemistry II	3
Third and Fourth Years	
ChE 323 Material & Energy Balances	3
ChE 330 Stage-wise Operations	3
ChE 344 Automatic Process Control	3
ChE 423 Reactor Kinetics & Design	3
ChE 430-431 Trans & Rate Process I-II	7
ChE 453 Chem Process Anal & Design	3
*ChE 454 Chem Process Anal & Design	3
ChE 491-492 Seminar	0
Chem 305-306 Physical Chemistry	6
Chem 307-308 Physical Chemistry Lab	2
Econ 251 Principles of Economics	3
EE 314 Electronics & Control Systems	4
ES 320 Fluid Mechanics	3
ES 321 Thermodynamics & Heat Transfer	3
Engineering science elective	3
Mathematics elective	3
Humanistic-social science electives	7
Technical elective	3
Undesignated elective	3

*Approved technical elective may be substituted for ChE 454.

CIVIL ENGINEERING (B.S.C.E.)

First and Second Years	Credits
Courses common to all curricula	57
CE 211 Engineering Measurements	4
ES 221 Dynamics of Rigid Bodies	2
Third and Fourth Years	
CE 322 Hydraulics	4
CE 342 Theory of Structures	4
CE 345 Structural Design	3
CE 357 Mech Properties of Materials	3
CE 372 Transportation Engineering	4
CE 382 Engineering Economy	2
CE 431 Sanitary Engineering	4
CE 460 Soil Mechanics	3
CE 491-492 Seminar	0
ES 320 Fluid Mechanics	3
ES 321 Thermodynamics & Heat Transfer	3
ES 340 Mechanics of Materials	3
Approved basic science elective	3
Technical electives (at least one mathematics-oriented course)	14
Humanistic-social science electives	9
Undesignated electives	3

ELECTRICAL ENGINEERING (B.S.E.E.)

First and Second Years	Credits
Courses common to all curricula	57
EE 201 Transients in Linear Systems	4
Math 184 Elements of Linear Algebra	2
Third and Fourth Years	
EE 300 Linear Circuit Analysis	3
EE 310 Electronics I	5
EE 320 Energy Conversion I	5
EE 330 Electromagnetic Theory	5
EE 391 Junior Seminar	0
EE 410 Electr II, *or* 420 Ener Conv II	3
EE 440 Digital Systems Engineering	3
EE 470 Control Systems	5
EE 480-481 Principles of Design	6
EE 491-492 Senior Seminar	0
Phys 360 Intro to Modern Physics	3
Humanistic-social science electives	9
Technical electives	6
Engineering science electives	6
Undesignated electives	6

MECHANICAL ENGINEERING (B.S.M.E.)

First and Second Years	Credits
Courses common to all curricula	57
ES 221 Dynamics of Rigid Bodies	2
ME 261 Engineering Materials	4
Third and Fourth Years	
Econ 251 Principles of Economics	3
EE 314 Electronics & Control Systems	4
ES 320 Fluid Mechanics	3

ES 321	Thermodynamics & Heat Transfer	3	
ES 340	Mechanics of Materials	3	
ME 253	Materials Processing	3	
ME 320	Fluid Mechanics Lab	1	
ME 322	Applied Thermodynamics	4	
ME 324	Mechanical Design I	3	
ME 390	Mech Engr Anal, *or* ES 402 Appl Num Methods, *or* elective in math	3	
ME 425	Mechanical Design II	4	
ME 426	Mechanical Systems Design	2	
ME 445	Heat Transfer	4	
ME 472	Mechanical Vibrations	4	
ME 491-492	Seminar	0	
	Approved basic science elective	3	
	Humanistic-social science electives	6	
	*Technical electives	12	

*At least nine of the twelve credits of technical electives must be selected from approved courses in mechanical engineering.

College of Forestry, Wildlife and Range Sciences

John H. Ehrenreich, Dean (201 Forestry, Wildlife and Range Sciences Bldg.); Hugo H. John, Associate Dean.

PROFESSIONAL EDUCATION leading to a degree in forestry was instituted at the University of Idaho in 1909. To the initial curriculum in forest management have been added those in wood utilization (1914), range management (1917), wildlife management (1942), and fishery management (1951). These programs have been administered by a department, 1909-1917; by the School of Forestry, 1917-1953; by the College of Forestry, 1953-1963; and, beginning in 1963, by the College of Forestry, Wildlife and Range Sciences.

The academic objective of the college is to provide its students with opportunities to become better prepared for lives of responsibility and fulfillment and to acquire competence for entry into professional careers in resource science and management. Each of the curricula offered by the college, therefore, assures the student an acquaintance with the physical, biological, and social sciences and the humanities. This establishes a broad basis of general education and at the same time provides the student with the preparation needed for the scientific-professional courses dealing with the use of forest and range lands and related resources.

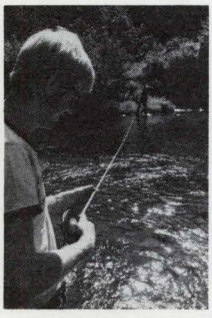
Advantages of Location

The University of Idaho is ideally located for the training of students in the several professional fields described below. The state of Idaho is comprised largely of forest and range lands and a variety of vegetational types is close at hand for study. Virgin and cut-over forested areas extend from the ponderosa pine type in southern Idaho to the mixed coniferous and famous white pine types of northern Idaho. Range lands used by domestic livestock and big game occupy extensive areas within the state. These grazing lands vary from spring-fall and winter ranges in the sagebrush-grass and bunchgrass to summer ranges in several of the forested zones. Also within the forest and range lands are found hundreds of lakes and streams and extensive wilderness areas, all of which provide habitat for game birds, fish, and furbearers.

The values derived from these resources include wood products of all types, cattle and sheep in great numbers, abundant wildlife of many species, game fishes of world renown, water for domestic use, power and irrigation, and ex-

tensive recreational areas. These natural study areas and resources are available for directed effort of the student in preparing for the profession.

In addition, the preparation of timber products for consumption constitutes the second most important industry in Idaho. Large sawmills, pulp plants, logging camps, and numerous woodworking plants are located throughout the area. These operations provide facilities for study of nearly every phase of the wood products industries. Production of range livestock creates a business enterprise of major importance in the state. Students have an opportunity to study this business on nearby ranches.



Facilities

The college moved into a new $3,500,000 building in 1971. The Forestry, Wildlife and Range Sciences Building brings together the faculty, the classrooms and laboratories, the scientific equipment, and plant and animal collections necessary for the highest quality instruction. Supporting courses for students in this college are offered in modern, well-equipped classrooms and laboratories of the seven other colleges of the university.

A tract of some 7,000 acres of forest land located about twenty-five miles from the campus is used as a demonstration and experimental area. A forest nursery of forty acres is maintained for the production of planting stock for reforestation, erosion control, wildlife food and cover, and windbreak plantings, as well as for student training purposes. Shattuck Arboretum, with over sixty species of trees, is maintained on campus for studies in dendrology and silviculture. A permanent summer camp is located on the shore of Payette Lake in the mountains of west-central Idaho. Furthermore, the forest and range lands, which comprise ninety percent of the state's area, constitute a vast natural laboratory for students in all aspects of the college's curriculum.

Standing of the College

The Society of American Foresters, founded in 1900, is the professional organization of foresters in the United States. In order to promote high professional standards in forestry education, the society, in cooperation with the various regional accreditation associations, periodically rates the forestry schools of the United States. After careful examination, taking into consideration the adequacy of instruction, personnel, financial support, facilities, success of alumni, and many other factors, each school is given a rating of "accredited" or "not accredited." Forestry education at the University of Idaho has always received accredited status. This accreditation assures the student that high quality education is provided in all divisions of the university and guarantees an unexcelled professional preparation at both the undergraduate and graduate levels in this college.

Admission Requirements

General. For a statement of admission requirements, see part 2 of this catalog.

Transfer Students. Students who propose to complete a portion of their

undergraduate studies at a junior college, or elsewhere, before entering the University of Idaho, should follow as closely as possible one of the programs for the first two years as set forth in the pages immediately following. A student whose program does not closely approximate this one will find it impossible to graduate in a total of four years. Transfer to the university before the end of the sophomore year is usually to the student's advantage. Correspondence with the dean of the college should be initiated not later than April 1 of the year in which the student wishes to transfer.

Total time to graduation will also be extended if summer camp, in those curricula which require it, is not completed at the end of the sophomore year. Students planning to elect one of these curricula, who have been unable to transfer earlier, may report directly to summer camp for their initial registration in the university. Students who transfer directly to summer camp must complete a minimum of one additional semester in residence at the University of Idaho before credit in summer camp courses will validated for transfer to another institution. Enrollment in summer camp may be limited to the capacity of the camp facilities and equipment available. The university may exercise its prerogative to refuse surplus applications.

Undergraduate Program

The undergraduate curricula are designed to provide both a general and a professional education. During the first two years, all students in the college follow schedules which are essentially alike. The objective in these years is to give the student a good foundation in the biological, physical, and social sciences and in speaking and writing skills.

For the third and fourth years, each student chooses a curriculum concerned with the field of resource management which is of particular interest. The curricula are: forest resources (in which the student has a further choice among options which emphasize management, business, or science), range resources, wildlife-fishery resources, and wood utilization (with options in forest products or science-engineering).

The schedule of studies for each of the above curricula is so arranged as to provide for a high degree of commonness among them, in both content and orientation, as well as a measure of concentration in the subject matter peculiar to their respective professional requirements. Flexibility and individuality of programs is provided not only by the choice among the curricula but also by the number of elective credits included in each of them. It is intended that, by judicious use of these elective opportunities, the student will augment the breadth of his or her education. Provision is also made for advanced military training leading to a commission in the Army, Air Force, Navy, or Marine Corps, if desired.

The knowledge required to manage and utilize effectively all of the forest, range, wildlife, and fishery resources is so extensive that no one can completely master it in four years. This is the reason for the separation of the college's overall program into the various curricula. The field of resource management corresponding to each curriculum has attained professional status, that of forestry being the oldest and most mature among them. Others, like range, wild-

life, and fishery management, though younger, are growing rapidly and attracting considerable attention.

A discussion of career opportunities in the fields of natural resource management for which the college prepares its graduates is contained in a publication which may be obtained by writing to the dean of the College of Forestry, Wildlife and Range Sciences.

Graduate Program

Programs leading to advanced degrees are offered in each of the fields represented by the undergraduate curricula of the college. Both the master's and the doctor's degree, with emphasis on the conduct of a research project and the preparation of a thesis or dissertation, are available. A non-thesis master's degree, intended primarily for candidates with professional experience, may also be obtained.

Excellent facilities and opportunities are afforded for study and research in the subject-matter areas in which graduate work is offered. Research in the college is organized through the Forest, Wildlife and Range Experiment Station, which includes on its staff all members of the college faculty. Research is also supported by the Cooperative Wildlife Research Unit and the Cooperative Fishery Unit. Most of the graduate research in the college is carried on as part of the program of the experiment station.

Assistantships and fellowships are available to assist highly qualified students in their graduate programs. Funding is obtained from a variety of state, federal, and private agencies.

More complete information on graduate studies may be secured by writing the dean of the Graduate School and requesting the catalog of that division.

Requirements for Graduation

University Requirements. See regulation "J" in part 3 for general university requirements for degrees.

College Requirements. A total of 136 semester credits is required for the degree of Bachelor of Science in Forestry. A minimum cumulative grade-point average of 2.00 in all courses attempted in the College of Forestry, Wildlife and Range Sciences is required for graduation. Specific course requirements are set forth below for each curriculum.

The faculty of the College of Forestry, Wildlife and Range Sciences may grant substitutions and waivers of the requirements specified below. Thus, for a student with special aptitudes or interests, a program can be devised which will effect a combination of established curricula, provide a foundation for advanced study or research, or meet other acceptable and well-defined career objectives.

All elective selections are subject to the approval of the faculty adviser and the dean. Of the indicated electives, at least twelve credits are to be chosen from approved social science humanities courses.

Summer Camp or Summer Employment Requirements. Students who elect the forest resources or range resources curricula are required to complete the eight-credit course program offered at summer camp. They are expected to complete this requirement before commencing the technical-professional course work of their upper-division program.

Students who elect the wood utilization or wildlife-fishery curricula are expected to complete at least one summer of experience in employment deemed by the faculty to be appropriate to their respective professional career objectives or they may elect to take the summer camp course.

FIRST AND SECOND YEAR COURSES COMMON TO ALL CURRICULA

Course	Credits
Biol 201 Introduction to the Life Sciences	4
Biol 203 General Botany	4
Chem 111 Principles of Chemistry	4
Eng 101 English Composition	3
Eng 201 Language & Literature	3
FWR 101 Forestry Orientation	1
Math 180 Analytic Geometry & Calculus I	4
Physical education activities	2

FOREST RESOURCES (B.S.For.)

A. MANAGEMENT OPTION

First and Second Years	Credits
Courses common to all curricula	25
Bot 241 Systematic Botany	3
CE 218 Elem Surveying & Photogrammetry	3
Econ 251-252 Principles of Economics	6
FWR 221 Silvics	3
FWR 294 Models for Resource Decisions I	3
Communications elective	2
Computer elective	2
Geography *or* geology (physical)	4
Electives	13
Forestry Summer Camp	
FWR 300 Forest Resource Measurements	4
FWR 301 Wildland Ecology	4
Third and Fourth Years	
Eng 317 Tech & Engr Report Writing	3
FWR 307 Biometry	3
FWR 314 Fish & Wildlife Population Ecol	3
FWR 320 Dendrology	3
FWR 331 Intro to Wood Technology	3
FWR 351 Elem of Range Management	3
FWR 424 Silviculture	3
FWR 434 Forest Engr & Harvesting	3
FWR 474 Mensuration	3
FWR 476 Forest Regulation & Finance	3
FWR 483 Economics of Conservation	3
FWR 484 Forest Policy & Administration	3
FWR 494 Models for Resource Decisions II	3
Soils 205 General Soils	3
Multiple-use course	2
Protection course	2
Electives	18

B. BUSINESS OPTION

First and Second Years	
Courses common to all curricula	25
Bot 241 Systematic Botany	3
CE 218 Elem Surveying & Photogrammetry	3
Econ 251-252 Principles of Economics	6
FWR 221 Silvics	3
FWR 294 Models for Resource Decisions I	3
Communications elective	2
Computer elective	2
Geography *or* geology (physical)	4
Electives	13
Forestry Summer Camp	
FWR 300 Forest Resource Measurements	4
FWR 301 Wildland Ecology	4
Third and Fourth Years	
Acctg 395 Fundamentals of Accounting	4
Bus 231 *or* FWR 307 Statistics	3-4
Bus 311 Intro to Management Theory	3
Bus 312 Industrial Management	3
Eng 317 Tech & Engr Report Writing	3
FWR 331 Intro to Wood Technology	3
FWR 424 Silviculture	3
FWR 434 Forest Engr & Harvesting	3
FWR 474 Mensuration	3
FWR 476 Forest Regulation & Finance	3
FWR 483 Economics of Conservation	3

(Continued on next page)

FOREST RESOURCES (cont.)

FWR 484 Forest Policy & Administration . . . 3
FWR 494 Models for Resource Decisions II . . . 3
Electives . . . 24

C. SCIENCE OPTION
First and Second Years

Courses common to all curricula . . . 25
Biol 202 General Zoology . . . 4
Bot 241 Systematic Botany . . . 3
Chem 112 Inorg Chem & Qual Anal . . . 5
Econ 251-252 Principles of Economics . . . 6
FWR 221 Silvics . . . 3
FWR 294 Models for Resource Decisions I . . . 3
Communications elective . . . 2
Computer elective . . . 2
Geography *or* geology (physical) *or* organic chemistry . . . 4
Electives . . . 7

Forestry Summer Camp

FWR 300 Forest Resource Measurements . . . 4
FWR 301 Wildland Ecology . . . 4

Third and Fourth Years

FWR 307 Biometry . . . 3
Professional courses . . . 15
Quantitative sciences . . . 7
Natural sciences . . . 17
Electives . . . 22

RANGE RESOURCES (B.S.For.)

First and Second Years **Credits**

Courses common to all curricula . . . 25
Biol 331 General Ecology . . . 3
Bot 241 Systematic Botany . . . 3
Chem 275 Carbon Compounds . . . 3
CE 218 Elem Surveying & Photogrammetry . . . 3
Econ 251 Principles of Economics . . . 3
Econ 252 Prin of Econ, *or* AgEc 208 Prin of Farm & Ranch Mgmt, *or* AgEc 391 Ag Business Mgmt . . . 3
FWR 294 Models for Resource Decisions I . . . 3
Geol 101 Physical Geology . . . 4
Soils 205 General Soils . . . 3
Communications elective . . . 2
Computer elective . . . 2
Electives . . . 7

Forestry Summer Camp

FWR 300 Forest Resource Measurements . . . 4
FWR 301 Wildland Ecology . . . 4

Third and Fourth Years

Anl 305 Principles of Nutrition . . . 3
Anl 321 *or* 322 Beef *or* Sheep Science . . . 3
Bot 311 Plant Physiology . . . 3
Bot 432 Plant Ecology . . . 3
Eng 317 Tech & Engr Report Writing . . . 3
FWR 307 Biometry . . . 3
FWR 314 Fish & Wildlife Population Ecol . . . 3
FWR 351 Elem of Range Management . . . 3
FWR 370 Prin of Forest Management . . . 2
FWR 452 Range Communities . . . 3
FWR 453 Range Methods & Techniques . . . 3
FWR 454 Range Improv & Mgmt Planning . . . 3
FWR 483 Economics of Conservation, *or* AgEc 451 Land Resource Economics . . . 3
FWR 494 Models for Resource Decisions II . . . 3
Soils 454 Soil Devel & Classification . . . 3
Electives . . . 20

WILDLIFE-FISHERY RESOURCES (B.S.For.)

First and Second Years **Credits**

Courses common to all curricula . . . 25
Biol 202 General Zoology . . . 4
Biol 331 General Ecology . . . 3
Chem 275 Carbon Compounds . . . 3
Econ 251-252 Principles of Economics . . . 6
Phys 113-114 General Physics . . . 6
Sp 131 Fundamentals of Speech . . . 2
Geography *or* geology (physical) . . . 4
Electives . . . 15

Third and Fourth Years

Biol 351 General Genetics . . . 3
Biol 442 Biological Evolution . . . 3
FWR 307 Biometry . . . 3
FWR 314 Fish & Wildlife Population Ecol . . . 3
FWR 351 Elem of Range Mgmt, *or* 370 Prin of Forest Mgmt . . . 2
FWR 411 Ichthyology, *or* Zool 484 Invertebrate Zoology . . . 3
FWR ID413 Fish Ecology . . . 2
FWR 415 Limnology . . . 3
FWR 442 Fish & Wildlife Management . . . 3
FWR 448 Wildlife Ecology . . . 2
FWR 483 Economics of Conservation . . . 3
FWR 495 Fish & Wildlife Seminar . . . 1
Zool 416 Mammalian Physiology . . . 4
Zool 482 Nat Hist of Birds, *or* 483 Nat Hist of Mammals . . . 3
Electives . . . 30

WOOD UTILIZATION (B.S.For.)

A. FOREST PRODUCTS OPTION
First and Second Years **Credits**

Courses common to all curricula . . . 25
Bot 241 Systematic Botany . . . 3
Chem 275 Carbon Compounds . . . 3
CE 218 Elem Surveying & Photogrammetry . . . 3
Econ 251-252 Principles of Economics . . . 6
FWR 221 Silvics . . . 3
FWR 294 Models for Resource Decisions I . . . 3
Phys 113-114 General Physics . . . 6
Communications elective . . . 2
Computer elective . . . 2
Electives . . . 12

Third and Fourth Years

Acctg 395 Fundamentals of Accounting . . . 4
Bus 311 Intro to Management Theory . . . 3
Bus 312 Industrial Management . . . 3
Eng 317 Tech & Engr Report Writing . . . 3
FWR 307 Biometry . . . 3
FWR 331 Intro to Wood Technology . . . 3
FWR 370 Prin of Forest Management . . . 2
FWR 434 Forest Engr & Harvesting . . . 3

FWR 436 Biological Properties of Wood	3
FWR 437 Physical Properties of Wood	3
FWR 438 Chemical Properties of Wood	3
FWR 464 Forest Pathology	2
FWR 474 Mensuration	3
FWR 483 Economics of Conservation	3
FWR 494 Models for Resource Decisions II	3
FWR 496 Forest Products Seminar	1
Electives	23

B. SCIENCE-ENGINEERING OPTION

First and Second Years

Courses common to all curricula	25
Chem 114 General Chemistry	4
Chem 277, 278 Organic Chem I & Lab	4
Econ 251-252 Principles of Economics	6
FWR 221 Silvics	3
FWR 294 Models for Resource Decisions I	3
Math 190 Anal Geom & Calc II	4
Phys 220-221 Engr Physics I-II	6
Communications elective	2
Computer elective	2
Electives	9

Third and Fourth Years

Chem 372 Organic Chemistry II	3
ES 211 Intro to Mechanics	2
ES 340 Mechanics of Materials	3
Eng 317 Tech & Engr Report Writing	3
FWR 307 Biometry	3
FWR 331 Intro to Wood Technology	3
FWR 370 Prin of Forest Management	2
FWR 434 Forest Engr & Harvesting	3
FWR 436 Biological Properties of Wood	3
FWR 437 Physical Properties of Wood	3
FWR 438 Chemical Properties of Wood	3
FWR 464 Forest Pathology	2
FWR 474 Mensuration	3
FWR 483 Economics of Conservation	3
FWR 494 Models for Resource Decisions II	3
FWR 496 Forest Products Seminar	1
Electives	25

College of Law

Albert R. Menard, Dean (101 Law Bldg.).

THE COLLEGE OF LAW was established as a college of the University of Idaho in 1909. It is the only school devoted to the study of law in the state of Idaho. The college is a member of the Association of American Law Schools and is approved by the Council of the Section of Legal Education and Admissions to the Bar of the American Bar Association.

Purpose of the College

The role of the College of Law is to educate students for the legal profession with its many facets and its involvement with the whole range of society. The curriculum is designed to provide instruction in basic principles generally applicable in the United States, rather than to focus on matters of local importance only. The responsibilities assumed by the professional man or woman are emphasized, as are ethical problems. The study of law, while essential to individuals who intend to practice, also serves as a valuable asset to those who desire to pursue positions of leadership in government or business.

Methods of instruction are adapted to development in each student of his or her highest potential and vary with the professor and the course. Basically, instruction is accomplished by way of the case system, a study of the actual decisions of appellate courts, supplemented by selected readings which provide insight into the nature of judicial and legislative process. Problem and seminar methods are utilized in advanced courses. Stress is placed upon techniques which encourage individual initiative and develop perceptive and communicative powers. Clinical training in the third year provides contact with clients who have legal problems. Law changes rapidly, so mere accumulation of information is subordinated to the more important ends of individual development and training

in scientific habits of thought. The atmosphere and situation of the College of Law, now housed in a new building, enable the faculty to concentrate upon attention to the individual student.

Admission to the Bar

A degree from the University of Idaho College of Law satisfies the legal educational prerequisite for the taking of any bar examination in the United States. However, pre-legal requirements may vary slightly and inquiry should be made of the secretary of the bar examiners in the state in which the applicant intends to practice to determine the existence of special requirements.

Pre-Legal Work

The subject matter of pre-legal education is in general less important than the quality of work done and the caliber of the professors under whom the work is taken. Students preparing to enter law school should avoid courses which are not demanding and take those which will develop their powers of analytical thought. Intensive work will enable them to acquire the intellectual discipline and experience necessary for success in law school. Students should aspire to a critical appreciation of values and of political, economic, and social institutions: they should stress understanding, not just knowledge, in their studies. Words are the tools of the lawyer and a major undergraduate objective in the selection both of courses and of activities outside the classroom should be development of the ability to communicate orally and in writing.

Usually an undergraduate major in one of the social sciences or in business administration is best but students with other backgrounds ranging from agriculture to engineering or physics are accepted. While study of accounting is not a prerequisite for admission to the College of Law, it is highly recommended that pre-law students gain some understanding of the fundamentals of this area. As a general rule, the introductory course on a college level is quite sufficient and any further study of accounting should be undertaken only if the student has rather specifically defined career objectives, such as the holding of a CPA certificate as well as a law degree. Another useful skill is the ability to operate a typewriter with reasonable speed and accuracy.

Pre-law advisers are generally available to guide students in selecting courses within the particular college or university which will meet these objectives. The faculty of the College of Law is also available for consultation or assistance in program planning.

Requirements for Admission

Applicants for admission must have a bachelor's degree from an accredited four-year college or university. Their cumulative grade-point average must place them in the upper one-half of the college class and they should present a Law School Admission Test score which is well above the national median.

Exceptions will be made to the requirement of a bachelor's degree in rare instances and admission extended to carefully selected students who

demonstrate unusual capacity for legal study on the basis of their college record (above 3.25) and LSAT score (above 625) *and* who are enrolled in "combined degree programs" which will award the student a bachelor's degree upon the successful completion of the first year of law study. The combined degree program must include ninety-eight semester credits of undergraduate work before the taking of any law school work. Such programs are found in the College of Letters and Science and the College of Business and Economics at the University of Idaho. Interested students should consult the appropriate materials for these colleges elsewhere in this catalog. Combined programs also exist at present at the College of Idaho and Northwest Nazarene College. Certain other institutions may also agree to grant the necessary bachelor's degree after one year of law study. Students not at the University of Idaho should consult appropriate individuals at their undergraduate college to determine if a bachelor's degree from such institution may be earned in this manner and to be sure that they will meet all needed requirements before entering the College of Law. It is not wise to make long-range plans relying on admission to the College of Law as a combined-degree student since only one or two individuals each year are able to meet the standards for this category of admission.

The Law School Admission Test is required of all applicants. This test is given by the Educational Testing Service at a large number of places throughout the United States in October, December, February, April, and July, at a cost fixed by that organization. Arrangements for taking the test must be made by the individual applicant directly with the Educational Testing Service in advance of the dates set for the test. The exact dates and places for the test, application blanks, and a bulletin of information about the test may be obtained by writing directly to Law School Admission Test, Educational Testing Service, Box 944, Princeton, New Jersey 08540, or to the College of Law, University of Idaho. Applicants cannot be assured of consideration unless they take the test no later than the December administration preceding the fall semester in which they desire admission.

Registration with the Law School Data Assembly Service of the Educational Testing Service is required of those applicants who have taken all or their last pre-legal work at any institution of higher learning other than the University of Idaho. Instructions concerning registration and an application blank for the purpose are contained in the same bulletin which describes the Law School Admission Test or may be secured separately from the College of Law or the Educational Testing Service.

Procedure for Admission

Applicants from the University of Idaho. Applicants, including combined degree program students in their junior year, who have taken the last year or more of their pre-legal work at the University of Idaho, must: (1) secure from the office of the dean of the College of Law a personnel form, complete it, and return it to the College of Law, together with a check for the mandatory $10.00 evaluation fee; and (2) take the Law School Admission Test and have sent to the College of Law a score report. These actions

should be taken and admission applications to the College of Law completed by mid-January preceding the beginning of the fall semester in which the applicant plans to take any law courses.

It is not necessary for applicants in this category to register with the Law School Data Assembly Service or order transcripts sent to the College of Law, since transcripts will be secured directly from the University's Registrar's Office. Applicants in this category will be notified by letter when their admission to the College of Law has been approved.

Applicants from Other Colleges and Universities. Applicants who have taken all or their last pre-legal work at any institution of higher learning other than the University of Idaho must: (1) secure from the dean of the College of Law a personnel form and an application form, complete them and return them to the College of Law together with a check for the mandatory $10.00 evaluation fee; (2) take the Law School Admission Test and have sent to the College of Law a score report; and (3) register with the Law School Data Assembly Service of the Educational Testing Service, directing that the file and analysis which that agency prepares be forwarded to the College of Law. Transcripts required by the instructions on the registration blank of the Law School Data Assembly Service should be forwarded to that service promptly but additional copies need not be sent to the College of Law until a specific request is made for them.

An opinion concerning admissibility will be given to applicants in this category after receipt by the College of Law of the personnel and application blanks, the evaluation fee, the LSAT score from the Educational Testing Service, and the file, with analysis, from the Law School Data Assembly Service. Further instructions on the remaining steps which must be taken to convert this opinion, if favorable, into an admission will be given with the letter transmitting the opinion, and will require the filing of additional information with the University Admissions Office and the forwarding of official transcripts. If the applicant is determined to be admissible and then complies with the additional instructions sent, he or she will receive credentials permitting registration from the Admissions Office. Applicants will be saved much inconvenience if all their credentials are received in sufficient time for the settlement of any question through correspondence. Applications should be initiated no later than December prior to the fall term in which the individual intends to register.

Admission to Advanced Standing

Students who have previously studied law in a law school which is either a member of the Association of American Law Schools or is approved by the American Bar Association may be admitted only if they are in complete good standing and eligible to continue in the school in which previously registered and if, in the opinion of the Committee on Admissions, academic performance at that institution warrants such action. Usually the committee requires substantially above a 2.50 grade-point average on all law courses undertaken. There must also be space available to accommodate the student, and this has not existed in some years. When space is

available, priority is accorded transfer applicants who are residents of Idaho. If entrance by transfer is granted, the number of credits to be recognized from the previous institution is determined by the dean of the College of Law in each individual case. The last twenty-six credits of law must be completed in residence at the University of Idaho.

Non-Degree Candidates

Students who are not admitted as candidates for the Juris Doctor degree are not accepted by the College of Law.

Combined Degree Programs

Joint programs exist with the College of Letters and Science and the College of Business and Economics which permit a student to secure the degree of Bachelor of Arts, Bachelor of Science, or Bachelor of Science in Business and the degree of Juris Doctor in a total of six years under certain limited and unusual circumstances. The student registers for the first three years in the College of Letters and Science or the College of Business and Economics and completes at least ninety-eight semester hours' work as prescribed by those colleges. During these three years, no law courses can be taken. In the spring semester of the third year, the student must apply for admission to the College of Law. Only those students whose outstanding college grade record (3.25 or higher) and Law School Admission Test score (625 or higher) indicate they are unusually well-qualified for law study will be accepted with only three years of undergraduate work. If admitted to the College of Law, the fourth year of study consists of the required first year courses of the College of Law curriculum. If all first year courses are satisfactorily completed, the student receives the appropriate bachelor's degree from the undergraduate college at the end of his or her fourth year. After two more years of study, the student receives the degree of Juris Doctor.

Fees

Students in the College of Law pay an additional $100.00 per semester over the fees applicable to students in other divisions of the university. This added $100.00 is not charged to students who were in continuous enrollment in the College of Law prior to the 1972-73 academic year.

Honor System

Students in the College of Law are required to participate in the honor system and to sign the honor code which places responsibility for observation of the rules of the college directly on the individual. Examinations are not supervised. Violations of this code are referred to an honor court composed of senior and junior law students.

Academic Requirements

After a student has received final grades on the courses undertaken in

the first two semesters of enrollment in the College of Law, he or she must have attained a cumulative weighted grade-point average of 2.00 on all hours of law study without regard to their number, and must maintain this average or better for the remaining period of law study. If the cumulative weighted grade-point average on all law courses undertaken, computed after filing of grades for these first two semesters or at the close of any semester thereafter, is less than 2.00, the student will be placed on scholastic suspension and will not be eligible to register for further study in the College of Law unless reinstated by the law faculty upon petition.

Grading System

A. Grades shall be awarded on the basis of A, A-, B+, B, B-, C+, C, C-, D+, D, D-, F; provided, however, that by resolution the law faculty may designate any course, or courses, to be graded on the basis of P or F.

B. Grade-point averages shall be computed by assigning the following numerical point values per semester hour: A — 4.00; A- — 3.67; B+ — 3.33; B — 3.00; B- — 2.67; C+ — 2.33; C — 2.00; C- — 1.67; D+ — 1.33; D — 1.00; D- — 0.67; F (or "fail" under the pass-fail basis) — 0.00. The cumulative grade-point average is the quotient of total points assigned, divided by total hours undertaken, except that courses in which marks of I, W, or P (pass) have been given shall be disregarded in the computation. All other courses shall be included even if they have been repeated.

C. The grading system described in subsections A and B above shall be effective, beginning with the first year class entering the College of Law in the fall of 1971, but only for the purposes of determining: (1) eligibility for continuing study in the College of Law; (2) compliance with requirements for the Juris Doctor degree; and (3) class rankings within the College of Law. For classes entering prior to that time, it shall be effective only for the purpose of determining class rank within the College of Law; and the grading system for all other purposes shall omit pluses and minuses, with the numerical point values per semester hour being: A — 4.00; B — 3.00; C — 2.00; D — 1.00; F — 0.00.

Requirements for Graduation

The degree of Juris Doctor (J.D.) will be awarded to students who complete six semesters of study or its equivalent in time in residence in an accredited college of law and secure eighty-four semester hours of law credit with a grade-point average of 2.00 (C) on all work undertaken. All eighty-four semester hours offered for the degree must be completed within a total period of six calendar years from the time of initial matriculation to the completion of degree work. The last twenty-six semester credits of law must be completed in residence at the University of Idaho unless a waiver is granted by the law faculty upon petition. Students admitted to the College of Law with advanced standing must maintain the same average on all work taken here as that required for graduation. The courses of the first year are required for graduation.

Curriculum

The course of study covers three academic years. The prescribed first year is required of all students. Students in the second and third years normally take approximately fourteen to fifteen semester credits each semester from the courses listed. No part of the curriculum may be taken in advance of approval of admission to an accredited college of law and students not in the University of Idaho College of Law may register for a course offered by the college only with the permission of the dean and the instructor. Such courses cannot be credited toward a law degree and do not qualify a student to take bar examinations.

REQUIRED FIRST-YEAR LAW COURSES

	Credits
505-506 Procedure I-II	6
507-508 Property I-II	6
509-510 Torts I-II	5
511 Fundamentals of Public Law	2
512 Criminal Law & Its Administration	3
513-514 Contracts I-II	6
515-516 Legal Writing I-II	2
	30

SECOND-YEAR LAW COURSES

Fourteen to sixteen hours each semester chosen from the following:

Course	Credits
605 Constitutional Law	4
607 Administrative Law	3
608 Labor Law	2
609 Federal Courts	3
620 Business Associations	4
623 Commercial Paper	2
624 Sales and Products Liability	3
626 Creditor's and Debtor's Rights	3
630 Taxation I	3
641 Wills, Estates, and Trusts	3
642 Natural Resources	3
643 Environmental Law	2
645 Community Property	2
650 Evidence	4
652 Remedies and Restitution	3
656 Appellate Court	1-2
663 Family Law	2

THIRD-YEAR LAW COURSES

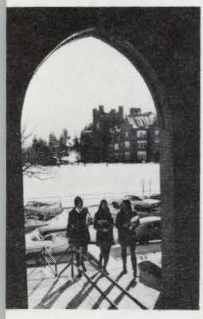
Thirteen to fifteen hours each semester chosen from the following courses not previously taken:

Course	Credits
607 Administrative Law	3
608 Labor Law	2
609 Federal Courts	3
610 Antitrust & Trade Reg	3
611 Municipal Corporations	2
612 Legislation	2
622 Corporate Securities	3
625 Secured Transactions	2
626 Creditor's and Debtor's Rights	3
627 Business Planning	3
631 Taxation II	2
632 Estate Planning	4
642 Natural Resources	3
643 Environmental Law	2
644 Land Use Planning	2
645 Community Property	2
652 Remedies and Restitution	3
653 Criminal Procedure	3
654 Practice Court I	1
655 Practice Court II	1
660 Conflict of Laws	3
661 Jurisprudence	2
662 Legal Practice	1
663 Family Law	2
681 Legal Aid	2
682 Law Review	1-2
683 Legal Research	1-4

College of Letters and Science

Elmer K. Raunio, Dean (114 Admin. Bldg.); John L. McMullen, Assistant Dean; Elizabeth E. Stevenson, Assistant Dean; Earl J. Larrison, Secretary of the College Faculty.

THE COLLEGE OF LETTERS AND SCIENCE is the oldest division of the university, having been established in 1900. The objectives of the college are to provide a liberal and professional education in the arts and sciences, to advance knowledge through research and scholarship, and to perform service to the university at large, the state, and the nation.



Departments and Programs of Instruction

Included within the College of Letters and Science are the departments of Art/Architecture, Biological Sciences, Chemistry, English, Foreign Languages and Literatures, History/Philosophy, Home Economics, Journalism, Mathematics, Physics, Political Science, Psychology, Radio/Television, Speech, Sociology/Anthropology, and Theatre Arts. The School of Music also functions as a department of the college, and the departments of Journalism, Radio/Television, and Speech have combined to form the School of Communication. Cooperating departments from other divisions include the departments of Bacteriology/Biochemistry, Economics, Geography, and Naval Science, as well as the College of Law. The foregoing departments of the college offer nearly one hundred curricula and curricular options leading to baccalaureate degrees, as well as graduate study leading to master's and doctor's degrees.

Undergraduate. See "Major Curricula" in this section for the undergraduate programs available in the College of Letters and Science.

Graduate. The Graduate School offers work toward advanced degrees in many disciplines of the college. Currently work leading to a master's degree is available in the fields of anthropology, architecture, art, biological sciences, biology, botany, chemistry, English, French, German, history, home economics, interior design, mathematics, music, philosophy, physical sciences, physics, political science, psychology, social sciences, sociology, Spanish, theatre arts, and zoology. The degree of Doctor of Philosophy is available in botany, chemistry, history, mathematics, physics, political science, and zoology. For the specific degrees available, see the list of advanced and graduate programs in part 1. An interinstitutional doctoral program with a major in home economics (family and child development) is also offered.

Non-Degree. A non-degree program is offered in which each student's course of study is worked out to meet his or her special needs. The program is intended primarily for students who (1) do not plan to obtain degrees at the University of Idaho, (2) plan to transfer to other institutions, or (3) have objectives which are not provided for by any of the established curricula in the college.

Interdisciplinary Studies. Students who have broad educational goals which necessitate work in several disciplines or departments may present an interdisciplinary curriculum for the B.A. or B.S. degree. For details, see the program in interdisciplinary studies.

Preparatory Programs in Medicine and Dentistry. Pre-medical and pre-dental programs are offered in the college and are presently administered by the Pre-Medical Studies Committee. For baccalaureate programs in these fields, see "Major Curricula" in this catalog section.

Environmental Sciences. The university does not offer a specific degree program in environmental sciences; however, students who wish to prepare themselves for careers in this field should consult the L & S dean's office about the possibility of developing an appropriate plan of studies under the major in interdisciplinary studies.

Museology. The college offers an unusual opportunity to juniors and above to become acquainted with museums and museum work. Courses in museology serve as museum appreciation courses for the general student regardless of his major field and as an introduction to museum work for the student who plans to enter this field professionally.

Admission to the College

Students who expect to enter the College of Letters and Science should plan their high school electives carefully, both to lay the foundation for their general education which will be continued in the university, and to ensure that they are adequately prepared to begin their study at the college level. Students should select subjects in English, foreign language, social sciences, natural sciences, mathematics, and fine arts which will provide a well-rounded preparation for further study. For a statement of general admission requirements, see part 2 of this catalog. Graduates of four-year, accredited high schools ordinarily are eligible for admission to the College of Letters and Science.

Regular Enrollment in a Program of Studies

A student in the College of Letters and Science must enroll in a regular program unless he or she is attending on a part-time basis (seven-credit maximum), or is admitted to a non-degree program. Except for the two-year program in pre-dental studies, and the one- and two-year programs in pre-nursing studies, a regular program is one that leads to a degree which the college offers. However, it is not necessary to select a major curriculum until the beginning of the junior year. This permits the undecided student to take courses in a wide range of fields in order to more wisely choose a major.

Teacher Education Program

Students in the College of Letters and Science who are preparing for secondary-school teaching should consult the information on the Teacher

Education Program in this part 4 (following the College of Mines section below).

General Requirements for Graduation

Each student working toward a baccalaureate degree from the College of Letters and Science must satisfactorily complete a total of 128 semester credits (unless a higher number is specified in the particular curriculum), including at least thirty-six credits in courses numbered 300 and above, the all-university requirements in English and physical education (see regulation "J" in part 3), and the college and departmental requirements for the degree sought. The college requirements applicable to the B.A. and B.S. degrees are listed below. The requirements for the various professional degrees (i.e., B.Arch., B.F.A., B.Mus., B.N.S., B.Phys., B.S.H.Ec., B.S.Pre-Dent., and B.S.Pre-Med.) are listed below in the section headed "Major Curricula." The college B.A. and B.S. requirements do not apply to these professional degrees.

College Requirements for the B.A. and B.S. Degrees

Objectives. The college requirements for the B.A. and B.S. degrees are designed to insure a broad, liberal education through the attainment of the following objectives: (1) proficiency in written and spoken English; (2) appreciation of great literature, music, and art; (3) knowledge of the development of man, his social and economic institutions, and his rights and responsibilities as a citizen; (4) perspective of American culture in the world at large; (5) sense of historical perspective; (6) acquaintance with moral, ethical, and aesthetic values; (7) familiarity with scientific thought and method; (8) ability to use and interpret basic mathematical concepts; (9) understanding of ecology; and (10) a continuing attitude of intellectual curiosity.

Requirements for the Bachelor of Arts Degree

Humanities (12 credits minimum). At least four courses, including two from each of the following categories: (1) literature, philosophy, and courses which treat theatre arts or speech as literature; and (2) courses which deal with the history or appreciation of art, architecture, music, speech, or theatre arts.

Science (9 credits minimum). At least three courses (including one or more laboratory courses) to be taken in two or more of the following areas, one of which is to be in either of the first two categories: (1) life sciences, (2) physical sciences, (3) mathematics, and (4) approved courses dealing with science.

Social Sciences (9 credits minimum). At least three courses to be taken in two or more of the following fields: (1) anthropology, (2) economics, (3) geography, excluding physical geography and cartography, (4) history, (5) political science, (6) psychology, excluding Psych 205-206 and 421, and the more physiologically-oriented courses, (7) social science, and (8) sociology.

Foreign Language (0 to 16 credits). The basic requirement is proficiency in one foreign language equivalent to that gained by the completion of four semesters of college courses (through the intermediate level). This requirement may be satisfied by the completion of either of the following options: (1) sixteen credits or four high-school units in one foreign language, or (2) twelve credits in one foreign language, plus one three-credit course in literature translated from the same language. The twelve credits may be satisfied by three high-school units in one foreign language.

Requirements for the Bachelor of Science Degree

Humanities (9 credits minimum). At least three courses, including one course in literature, philosophy, or courses which treat theatre arts or speech as literature, plus one course which deals with the history or appreciation of art, architecture, music, speech, or theatre arts.

Science (same as the science requirement for the B.A. degree).

Social Sciences (same as the social science requirement for the B.A. degree).

Progress in Satisfying These Requirements. Students must take a program that results in substantial progress toward the fulfillment of the preceding requirements by the end of the sophomore year. In particular, students seeking the B.A. degree must take courses in fulfillment of the foreign-language requirement as early as possible. If they cannot do this during the first semester, they must immediately take a course that can be used in partial fulfillment of the science-mathematics requirement.

Major Curricula

Selection of a Major. Each student should select a major curriculum not later than the beginning of the junior year. Lower-division students who have not decided upon a major may remain in a "general" classification which permits them to explore a variety of possible major fields of study.

Major Requirements. The departmental requirements are stated under the respective curricula (arranged in alphabetical order in this section).

AMERICAN STUDIES (B.A.)

Note: At least thirty credits of the total for the program and at least fifteen credits of the electives must be courses numbered 300 and above.

General requirements for the B.A. degree, plus:

Course	Credits
American literature *or* American history (primary area)	18
American literature *or* American history (secondary area)	9
English literature (if primary area is American literature) *or* European history (if primary area is American history)	6
Elective courses in American civilization (any three of the following) Anthr 120 Intro to Social Anthr Econ 435 Amer Economic Development Geog 362 United States & Canada Phil 425 American Philosophy PolSc 428 Amer Political Thought	9
Elective courses selected from the following (no more than nine credits in any one area and at least one course from *four* of the following areas: political science, economics, geography, sociology-anthropology, philosophy)	12

(Continued on next page)

AMERICAN STUDIES (cont.)

Anthr 120 Intro to Social Anthr
Anthr 225 Aboriginal N Amer Indian
Anthr 322 Racial & Ethnic Relations
Anthr 325 Indians of Idaho
Anthr 435 North Amer Prehistory
Arch 155 Intro to Architecture
Arch 376 History of Modern Arch
Arch 467-468 Intro to City Planning
Comm 120 Mass Comm in a Free Society
Econ 251-252 Principles of Econ
Econ 430 Regional Economics
Econ 435 Amer Economic Development
Econ 441 Labor Economics
Geog 265 Cultural Geography
Geog 362 United States & Canada
Geog 430 Urban Geography
Geog 466 Political Geography
Inter 493-494 Urban Studies
Jour 455 History of Mass Comm
Jour 491 Law of Mass Comm
Jour 492 Jour & Public Opinion
MusH 410 Historical Survey of Jazz
Phil 201 Ethics
Phil 415-416 Contemp Philosophy
Phil 425 American Philosophy
PolSc 101 American Government
PolSc 275 Amer State Government
PolSc 276 Amer Local Government
PolSc 428 Amer Political Thought
PolSc 431 Political Parties
PolSc 432 The Legislative Process
PolSc 434 Interest Groups
PolSc 438 Conduct of Amer For Policy
PolSc 467 Constitutional Law
Psych 320 Social Psychology
RelSt 323 Religion & Society
Soc 130 Social Problems
Soc 310 Rural Sociology
Soc 311 Urban Sociology
Soc 411 Contemporary Soc Theory
Soc 430 Social Control
Sp 424 Amer Public Address

ANTHROPOLOGY (B.A.)

General requirements for the B.A. degree, plus:

Course	Credits
Anthr 110 Intro to Phys Anthr & Arch	3
Anthr 120 Intro to Social Anthr	3
Anthr 402 History of Anthr Theory	3
Eng 441 Descriptive Linguistics	3
Psych 317 Intro to Statistics for the Behav Sc	3
Soc 110 Intro to Sociology	3
Soc 411 Contemp Sociological Theory	3
Anthropology electives (upper-division)	15
Related fields to include at least three courses selected from among the following: Econ 490 Comp Economic Systems; Geog 140 Economic Geography; Hist 465 Social & Cul Hist of Europe; Hist 466 Social & Cul Hist of Europe; Museo 301 Intro to Museology; Phil 411 Phil of the Social Sciences; PolSc 285 Systems of Parl Democracy; PolSc 286 Authoritarian Pol Systems; Psych 320 Social Psychology; Psych 461 Psych of Personality; Soc 320 Marriage & the Family; Soc 321 The Community; Soc 420 Social Stratification; Soc 421 Population & Human Ecology	15

ARCHITECTURE (B.Arch.)

A five-year professional curriculum divided into two parts: the pre-professional (first two years) and the professional (remaining three years). A cumulative grade-point average of 2.50 in all required courses in art and architecture in the two pre-professional years is required for admission to the professional program. Grades are subject to faculty review and any probation, if granted, shall be at the discretion of the faculty. The 2.50 average must be maintained in all such courses in order to remain in good standing in the department.

Course	Credits
Arch 155-156 Intro to Architecture	8
Arch 255-156 Architectural Design I	6
Arch 257-258 Landscape Arch I	6
Arch 263 Programs & Systems I	3
Arch 265-266 Materials & Methods	6
Arch 275-276 Hist of Ancient & Med Arch	4
Arch 355-356 Architectural Design II	8
Arch 363 Programs & Systems II	2
Arch 365-366 Building Technology I	8
Arch 375-376 Hist of Ren & Mod Arch	4
Arch 455-456 Architectural Design III	8
Arch 465-466 Building Technology II	8
Arch 467-468 Intro to City Planning	6
Arch 473-474 Seminar: Research Methods	4
Arch 475-476 Architectural Design IV	10
Arch 485-486 Building Technology III	4
Arch 495-496 Professional Practice I-II	6
Art 111-112 Drawing I	4
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Eng 317 Tech & Engr Report Writing	3
Math 140-141 Coll Alg & Anal Trig	5
Math 180 Anal Geom & Calc I (or one of the following options): Ag 321 Biometry; Bus 231 Statistics; Bus 439 Systems Anal & Simulation; Math 184 and 440 Linear Algebra (a sequence); Math 184 and 461 Linear & Higher Algebra (a sequence); Phil 211 Logic; Psych 317 Intro to Stat for Behav Sci	4-5
Phys 113-114 General Physics	6
Physical education activities	2
Electives to total 160 credits for the degree (at least four credits must be from art and twelve credits must be from at least two of the following fields: anthropology, economics, geography, history, philosophy, political science, psychology, and sociology)	29

ART (B.A.)

General requirements for the B.A. degree, plus:

Course	Credits
Art 101-102 Survey of Art	4
Art 111-112 Drawing I	4
Art 121-122 Design I	4
Art 211-212 Drawing II	4
Art 231-232 Painting I	6
Art 301-302 History of Painting	6
Three courses from the following	12
Art 223-224 Graphic Design I	
Art 233-234 Water Color I	
Art 241-242 Sculpture I	
Art 261-262 Ceramics I	
Art 351-352 Printmaking	

Plus completion of option A, B, C, or D below:

A. DESIGN OPTION

Course	Credits
Art 223-224 Graphic Design I	4
Art 323-324 Graphic Design II	4
Art 351-352 Printmaking	4
Art 423-424 Graphic Design III	6
Art 497 Proseminar	4
Bus 323 Principles of Advertising	3
Water color electives	4

B. SCULPTURE OPTION

Course	Credits
Art 261-262 Ceramics I	4
Art 341-342 Sculpture II	6
Art 351-352 Printmaking	4
Art 441-442 Sculpture III	6
Art 497 Proseminar	4

Note Sculpture option students shall include Art 241-242, Sculpture I, in their art elective program.

C. PAINTING OPTION

Course	Credits
Art 233-234 Water Color I	4
Art 331-332 Painting II	6
Art 335-336 Comp. *or* 221-222 Design II	4-6
Art 431-432 Painting III	6
Art 497 Proseminar	4

Note: Art 351-352, Printmaking, and 411-412, Drawing III, are recommended electives for painting option students.

D. ART EDUCATION OPTION (B.A. Degree)

Course	Credits
Art 391 *or* 392 Crafts in Art Education, *or* 361 Ceramics, *or* 371 Jewelry, *or* HEc 314 Weaving	2-3
Art 497 Proseminar	4
Ed 314 Strategies for Teaching	2
Ed 319 Sec School Art Methods	2
Ed 431 *or* 431 and 435 Practicum	9
Ed 445 Proseminar in Teaching	1
Ed 468 Contemporary Education	3
Psych 206 *or* 421 *or* Ed 415 Developmental or Educational Psychology	3
Plus courses chosen from the following or other approved art electives	10
Art 233-234 Water Color I	
Art 261-262 Ceramics I	
Art 331-332 Painting II	

Note: Students electing option D take Psych 100, Intro to Psych, and at least one course in either American history or American government as part of the general college requirement in social science.

ART (B.F.A.)

Course	Credits
Art 101-102 Survey of Art	4
Art 111-112 Drawing I	4
Art 121-122 Design I	4
Art 211-212 Drawing II	4
Art 231-232 Painting I	6
Art 301-302 History of Painting	6
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Two courses from the following	4
Arch 275 History of Ancient Arch	
Arch 276 History of Medieval Arch	
Arch 375 History of Renaissance Arch	
Arch 376 History of Modern Arch	
Approved art electives	10
Literature electives	3
Physical education activities	2
Science electives	8
Social science electives	12

Plus completion of option A, B, or C as listed under the B.A. degree in art, or option D below. B.F.A. students in option B (sculpture) and C (painting) are required to take 4 cr of Art 499, Directed Study, in their major.

D. ART EDUCATION OPTION (B.F.A. Degree)

Requirements are the same as listed under the art education option for the B.A. degree except that B.F.A. option D students include, as a part of the twelve-credit B.F.A. requirement in social science, Psych 100 and 205 or 206 or 421, and at least one course in either American history or American government.

BACTERIOLOGY (B.S.)

General requirements for the B.S. degree, plus:

Course	Credits
Bact 250 General Bacteriology	4
Bact 304 Pathogenic Bacteriology	3
Bact 305 Pathogenic Bacteriology Lab	2
Bact 400 Seminar	2
Bact 409 Immunology	3
Bact 410 Immunology Lab	2
Bact 499 Directed Study	3
Biol 201 Intro to the Life Sciences	4
Biol 202 Gen Zool, *or* 203 Gen Bot	4
Chem 103 Intro to Chemistry, *or* 111 Principles of Chemistry	4-5
Chem 112 Inorganic Chem & Qual Anal	5
Chem 253 Quantitative Analysis	5
Chem 277, 278 Organic Chem I & Lab	4
Chem 372, 374 Organic Chem II & Lab	4
Eng 317 Tech & Engr Report Writing	3
Math 140, 141 Coll Alg & Anal Trig	5
Phys 113-114-115-116 Gen Phys & Lab	8
Electives (upper-division), which may include any of the following strongly recommended courses	10
Bact 402 Food & Appld Microbiology	

(Continued on next page)

BACTERIOLOGY (cont.)

Bact 414 Clinical Lab Methods
Bact 425 Soil & Aquatic Micro
Biol 351-352 Gen Genetics & Lab
Chem 480 Elements of Biochemistry
Chem 481-482 Biochemistry

BACTERIOLOGY: MEDICAL TECHNOLOGY (B.S.)

General requirements for the B.S. degree, plus:

Course	Credits
Bact 250 General Bacteriology	4
Bact 304 Pathogenic Bacteriology	3
Bact 305 Pathogenic Bacteriology Lab	2
Bact 400 Seminar	2
Bact 409 Immunology	3
Bact 410 Immunology Lab	2
Bact 414 Clinical Lab Methods	4
Biol 201 Intro to the Life Sciences	4
Biol 202 General Zoology	4
Chem 103 Intro to Chemistry, *or* 111 Principles of Chemistry	4-5
Chem 112 Inorganic Chem & Qual Anal	5
Chem 253 Quantitative Anal	5
Chem 275, 278 Carbon Compounds & Lab, *or* 277, 278 Organic Chem I & Lab	4
Eng 317 Tech & Engr Report Writing	3
Math 111 Fundamentals of Math, *or* 140, 141 Coll Alg & Anal Trig	4-5

Plus completion of either of the following options:

OPTION A: Twelve months' hospital training in an approved school of medical technology, under a recognized, qualified clinical pathologist is required to qualify for registration with the American Society of Clinical Pathologists. A maximum of thirty-two semester credits can be obtained, following the junior year, for the satisfactory completion of this work in a hospital accredited by the ASCP. Under this plan the student becomes a candidate for the B.S. degree when the internship is completed. Students electing option A must consult the head of the Department of Bacteriology and Biochemistry before the end of their freshman year.

OPTION B: Those students who wish to receive the B.S. degree in the bacteriology: medical technology option B may do so by completing thirty-two credits during the senior year in courses approved by the major adviser and the head of the Department of Bacteriology and Biochemistry. In addition, twelve months' hospital training in an approved school of medical technology, under a recognized, qualified clinical pathologist is required to qualify for registration with the American Society of Clinical Pathologists.

BIOLOGY (B.A. or B.S.)

General requirements for either the B.A. or B.S. degree, plus the following courses (electives are to be chosen in consultation with the departmental adviser).

Course	Credits
Bact 250 General Bacteriology	4
Biol 201 Intro to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Biol 351, 352 General Genetics & Lab	4
Biol 361 Biological Literature	1
Bot 311-312 Plant Physiology & Lab	5
Bot 425 Developmental Plant Anatomy	4
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chem & Qual Anal	5
Chem 275, 278 Carbon Compounds & Lab	4
Math 140, 141 Coll Alg & Anal Trig	5
Zool 323 Com Embry, *or* 324 Anatomy	4
Zool 415 Cell Physiology	4

BOTANY (B.A. or B.S.)

General requirements for either the B.A. or B.S. degree, plus the following courses (electives are to be chosen in consultation with the departmental adviser).

Course	Credits
Biol 201 Intro to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Biol 351, 352 General Genetics & Lab	4
Biol 361 Biological Literature	1
Bot 311-312 Plant Physiology & Lab	5
Bot 425 Developmental Plant Anatomy	4
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chem & Qual Anal	5
Chem 253 Quantitative Analysis	5
Chem 277, 278 Organic Chem I & Lab	4
Chem 372, 374 Organic Chem II & Lab	4
Math 140, 141 Coll Alg & Anal Trig	5
Math 180 Analytic Geom & Calc I	4
Phys 113-114-115-116 Gen Phys & Lab	8

CHEMISTRY (B.S.)

General requirements for the B.S. degree, plus:

Course	Credits
Chem 103 Intro to Chemistry	4-5
or Chem 111 Principles of Chemistry	(4)
Chem 112 Inorganic Chem & Qual Anal	5
Chem 253 Quantitative Analysis	5
Chem 277, 372 Organic Chem I, II	6
Chem 278, 376 Organic Chem Lab	3
Chem 305-306 Physical Chemistry	6
Chem 307-308 Physical Chem Lab	2
Chem 409 Proseminar	1
Engr 131 Digital Computer Programming	1-2
or Math 205 Intro to Computer Prog	(3)
Math 180, 190, 200 Anal Geom & Calc	11
Phys 220, 221, 222 Engr Phys	9

This is a sub-minimal curriculum for students wishing to enter the profession of chemistry, but will provide a suitable foundation in chemistry for students who intend to enter secondary-school teaching or medicine.

CHEMISTRY: PROFESSIONAL OPTION (B.S.)

Note: Students who complete this curriculum will be certifiable to the American Chemical Society.

General requirements for the B.S. degree, plus:

Course	Credits
Chem 103 Intro to Chemistry	4-5
or Chem 111 Principles of Chemistry	(4)
Chem 112 Inorganic Chem & Qual Anal	5
Chem 253 Quantitative Analysis	5
Chem 277, 372 Organic Chem I, II	6
Chem 278, 376 Organic Chem Lab	3
Chem 305-306 Physical Chemistry	6
Chem 307-308 Physical Chem Lab	2
Chem 454 Instrumental Analysis	4
Chem 463, 464 Inorganic Chem & Lab	4
Engr 131 Digital Computer Programming	1-2
or Math 205 Intro to Computer Prog	(3)
FL 121-122 Elementary German	8
or 171-172 Elementary Russian	(8)
Math 180, 190, 200 Anal Geom & Calc	11
Phys 220, 221, 222 Engr Phys	9

Plus two additional chemistry courses having Chem 306 as a prerequisite, or an alternate upper-division course in mathematics or physics in combination with an approved chemistry course.

CHEMISTRY: TECHNICAL LITERATURE OPTION (B.S.)

General requirements for the B.S. degree, plus:

Course	Credits
Chem 103 Intro to Chemistry	4-5
or Chem 111 Principles of Chemistry	(4)
Chem 112 Inorganic Chem & Qual Anal	5
Chem 277, 372 Organic Chem I, II	6
Chem 278, 376 Organic Chem Lab	3
Chem 305-306 Physical Chemistry	6
Chem 307-308 Physical Chem Lab	2
Chem 409 Proseminar	1
Chem 441 Chemical Literature	1
Chem 463 Inorganic Chemistry	3
Engr 131 Digital Computer Programming	1-2
or Math 205 Intro to Computer Prog	(3)
Eng 317 Tech & Engr Report Writing	3
FL 101-102 Elementary French	8
or 171-172 Elementary Russian	(8)
FL 121-122 Elementary German	8
FL 223-224 Scientific German	8
or 271-272 Intermediate Russian	(8)
Math 180, 190, 200 Anal Geom & Calc	11
Phys 220, 221, 222 Engr Phys	9
or Phys 113-114-115-116 Gen Phys & Lab	(8)

CHEMISTRY: TECHNOLOGICAL OPTION (B.S.)

General requirements for the B.S. degree, plus:

Course	Credits
Acctg 131 Principles of Accounting	3
Bus 231 Statistics	4
Bus 321 Marketing	3
Bus 365 Business Law	3
Chem 103 Intro to Chemistry	4-5
or Chem 111 Principles of Chemistry	(4)
Chem 112 Inorganic Chem & Qual Anal	5
Chem 253 Quantitative Analysis	5
Chem 277, 372 Organic Chem I, II	6
Chem 278 Organic Chem Lab	1
Chem 305-306 Physical Chemistry	6
Chem 307-308 Physical Chem Lab	2
Chem 409 Proseminar	1
Chem 441 Chemical Literature	1
Chem 463 Inorganic Chemistry	3
Econ 251-252 Principles of Economics (may be used for part of the general requirements in social science)	6
Eng 317 Tech & Engr Report Writing	3
Engr 131 Digital Computer Programming	2
or Math 205 Intro to Computer Prog	(3)
Math 180, 190, 200 Anal Geom & Calc	11
Phys 220, 221, 222 Engr Phys	9

With the addition of one year of German or Russian, Chem 376, 454, 464, and two additional upper-division chemistry courses having Chem 306 as a prerequisite, this degree will be certifiable to the American Chemical Society.

CLASSICAL STUDIES (B.A.)

General requirements for the B.A. degree, plus:

Course	Credits
Art 101 Survey of Art	2
Eng 111 Literature of Western Civ	3
FL 161-162 Elementary Latin (or equiv)	8
FL 261-262 Intermediate Latin (or equiv)	8
FL 341-342 Elementary Greek (or equiv)	8
FL 363 Survey of Classical Origins	3
Phil 101 Intro to Philosophy	3
Additional Latin courses numbered above 262	12
Plus five courses from the following:	
Anthr 330 World Prehistory	3
Arch 275 History of Ancient Arch	2
Arch 276 History of Medieval Arch	2
Arch 375 History of Renaissance Arch	2
Eng 442 Transformational Grammar	3
FL 305 Survey of French Literature	3
FL 327 Survey of German Literature	3
FL 373 Russian Lit in Translation	3
FL 385 Survey of Spanish Literature	3
Hist 441-442 Greek & Roman History	6
Phil 309 History of Ancient Phil	3
Sp 421 Intro to Rhetorical Theory	3
ThA 467 The Theatre	3

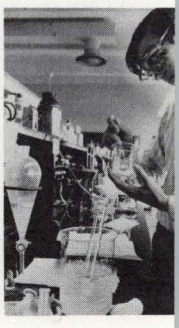
Note: FL 441-442 Intermediate Greek, is a recommended elective.

ECONOMICS (B.A. or B.S.)

Note: Credits earned in mathematics beyond the stated mathematics requirements will be accepted in satisfaction of the elective requirement in areas other than economics.

General requirements for either the B.A. or B.S. degree, plus:

Course	Credits
Acctg 131-132 Principles of Accounting	6
Bus 231 Statistics	4
Econ 251-252 Principles of Economics	6
Econ 321 Interm Microeconomic Analysis	3
Econ 372 Interm Macroeconomic Analysis	3
Math 111-112 Fund of Math, *or* 140-141 Coll Alg & Anal Trig, *or* 180 Anal Geom & Calc I	4-8
Upper-division credits in economics	18
Upper-division credits from anthropology, geography, history, philosophy, political science, psychology, or sociology (see note above)	15



ENGLISH (B.A.)

Note: Recommended preparation includes Eng 111-112, Literature of Western Civilization, or 175, Intro to Literature.

Courses taken to satisfy the 33-credit departmental requirement in English must be numbered 267 or above, *excluding* Eng 313 and 317. Where specific courses are listed with the area requirements, the department may approve equivalencies.

General requirements for the B.A. degree, plus:

Course	Credits
Eng 267-268 Survey of English Literature	6
Eng 435 *or* 436 Shakespeare	3
American literature (selected from among Eng 277-278, 427, 471, 472, 473, 474, or 476, or equiv)	9
English electives, including one course each from five of the areas below	15
Middle Ages — Eng 433, 434	
Renaissance and 17th Century — Eng 437, 451, 452, 453	
Restoration and 18th Century — Eng 421, 438, 455, 456	
Nineteenth Century — Eng 442, 464, 465, 466	
Literary Criticism — Eng 495 (strongly recommended)	
Linguistics — Eng 441, 442, 443, 496	
Courses in related fields approved by the chairman of English	20

FRENCH (B.A.)

General requirements for the B.A. degree, plus:

Course	Credits
FL 101-102 Elem French (or equiv)	8
FL 201-202 Interm French (or equiv)	8
Upper-division courses in French lang	20
A second foreign language (elementary and intermediate, or equiv)	16
Related fields (as approved by chairman)	20

GEOGRAPHY (B.A. or B.S.)

General requirements for either the B.A. or B.S. degree, plus:

Course	Credits
Geog 100 Man's Physical Environment	4
Geog 140 Economic Geography	3
Geog 250 World Regional Geography	3
Geog 265 Cultural Geography	3
Geog 380 Cartography	3
Geog 490 Trends in Geography	3
Geol 101, 102 Physical Geol & Lab	4
Geography electives (upper-division)	18
Courses in related fields approved by the Department of Geography	20

GERMAN (B.A.)

General requirements for the B.A. degree, plus:

Course	Credits
FL 121-122 Elem German (or equiv)	8
FL 221-222 Interm German (or equiv)	8
Upper-division courses in German lang	20
A second foreign language (elementary and intermediate, or equiv)	16
Related fields (as approved by chairman)	20

HISTORY (B.A.)

Note: Recommended preparation should include at least six credits from introductory courses in any two other social sciences. The choice of specific courses in each group below must be approved by the student's adviser from the Department of History.

General requirements for the B.A. degree, plus:

Course	Credits
Lower-division history courses selected from the following	12
Hist 101-102 History of Civ	
Hist 111-112 Intro to U.S. History	
Hist 271-272 History of England	
Upper-division history courses	20
Related fields	20

HISTORY (B.S.)

Note: Students expecting to take graduate work in history are strongly urged to take the B.A. rather than the B.S. degree.

Recommended preparation should include at least six credits from introductory courses in any two other social sciences. The choice of specific courses in each group below must be approved by the student's adviser from the Department of History.

General requirements for the B.S. degree, plus:

Course	Credits
Lower-division history courses selected from among the following	12
Hist 101-102 History of Civ	
Hist 111-112 Intro to U.S. History	
Hist 271-272 History of England	
Upper-division history courses	20
Related fields	20
Plus any combination of the following	12
Any foreign language (high-school foreign language may be substituted at the rate of four cr per year)	
FL 313-314 Mod French Lit in Trans	
FL 323-324 German Lit in Trans	
FL 363-364 Surv of Classical Origins	
FL 373-374 Russian Lit in Trans	
FL 393-394 Spanish Lit in Trans	
Eng 487-488 Modern European Lit	

HOME ECONOMICS (B.S.H.Ec.)

Course	Credits
Bact 250 General Bacteriology, *or* 254 Public Health & Hygiene	3-4
Chem 102 Chem & the Citizen, *or* 103 Intro to Chem, *or* 111 Principles of Chem, *or* Phys 101 Fund of Phys Sc	3-5
Eng 101 English Composition	3
Eng 201 Language & Literature	3
HEc 109 Intro to Home Economics	0
HEc 113 Art	3
HEc 123 Textiles	3
HEc 124 Clothing	3
HEc 229 Clothing Analysis	2
HEc 270 Nutrition	3
HEc 271 Foods	3
HEc 272 Food Management	2
HEc 326 Housing & Home Furnishings	3
HEc 334 Child Development	3

HEc 340 Family Relations	3
HEc 346 Principles of Home Mgmt	2
HEc 347 *or* 349 Home Management	3
HEc 448 Consumer Education	3
HEc 470 Problems in Nutrition	3
Psych 100 Intro to Psychology	3
Soc 110 Intro to Sociology	3
Zool 119 Human Anatomy & Physiology	5
Physical education activities	2
Social science elective	3

Plus one of the following options:

A. GENERAL HOME ECONOMICS OPTION

Course	Credits
Foreign language or humanities	7-9

B. JOURNALISM OPTION

Course	Credits
Jour 221 News Writing	2
Jour 222 Reporting	3
Jour 354 News Editing	3
Jour 432 Magazine Article Writing	2
Jour 472 Principles of Public Relations	3
Electives from journalism, photography, or radio-TV	7

C. BUSINESS OPTION

Course	Credits
Acctg 131-132 Principles of Accounting	6
Bus 321 Marketing	3
Econ 251-252 Principles of Economics	6
Business electives	6

HOME ECONOMICS EDUCATION (B.S.H.Ec.)

Course	Credits
Bact 250 General Bacteriology	4
Chem 103 Intro to Chem, *or* 111 Prin of Chem, *or* Phys 101 Fund of Phys Sc	4
Eng 101 English Composition	3
Eng 201 Language & Literature	3
HEc 109 Intro to Home Economics	0
HEc 113 Art	3
HEc 123 Textiles	3
HEc 124 Clothing	3
HEc 229 Clothing Analysis	2
HEc 242 Household Equipment	3
HEc 270 Nutrition	3
HEc 271 Foods	3
HEc 272 Food Management	2
HEc 326 Housing & Home Furnishings	3
HEc 334 Child Development	3
HEc 340 Family Relations	3
HEc 346 Principles of Home Mgmt	2
HEc 347 *or* 349 Home Management	3
HEc 448 Consumer Education	3
HEc 470 Problems in Nutrition	3
Psych 100 Intro to Psychology	3
Soc 110 Intro to Sociology	3
Sp 131 Fundamentals of Speech	2
Zool 119 Human Anatomy & Physiology	5
Biological science electives	3
Humanities electives	3
Physical education activities	2
Social science electives	3

Plus one of the following options:

A. TEACHING OPTION

Course	Credits
Ed 201 Introduction to Teaching	2
HEc 352 Methods in Teaching Home Ec	3
HEc 455 Problems in Teaching Homemaking & Adult Education	3
HEc 457 Student Teaching	9
Psych 206 Developmental Psychology	3
VocEd 351 Principles of Vocational Ed	2
VocEd 497 Coordination Techniques	3

Plus approved courses for a second teaching field.

B. EXTENSION OPTION

All courses in option A, except VocEd 497 and HEc 457, plus:

Course	Credits
AgEd 348 Extension Methods	2

HOME ECONOMICS: FOOD AND NUTRITION (B.S.H.Ec.)

Course	Credits
Anl 305 Principles of Nutrition	3
Bact 250 General Bacteriology	4
Chem 103 Intro to Chem, *or* 111 Prin of Chem	4-5
Chem 112 Inorganic Chem & Qual Anal	5
Eng 101 English Composition	3
Eng 201 Language & Literature	3
HEc 109 Intro to Home Economics	0
HEc 270 Nutrition	3
HEc 271 Foods	3
HEc 272 Food Management	2
HEc 346 Principles of Home Management	2
HEc 470 Problems in Nutrition	3
HEc 471 Dietetics	4
HEc 472 Investigation of Foods	3
Psych 100 Intro to Psychology	3
Soc 110 Intro to Sociology	3
Zool 119 Human Anatomy & Physiology	5
Physical education activities	2
Social science electives	6

Plus one of the following options:

A. DIETETICS AND INSTITUTIONAL MANAGEMENT OPTION

Course	Credits
Acctg 131 Principles of Accounting	3
Bus 412 Personnel Management	3
Chem 275 Carbon Compounds	3
Chem 480, 483 Elem of Biochemistry & Lab	4
Econ 251 Principles of Economics	3
Ed 314 Strategies for Teaching	2-3
HEc 113 Art	3
HEc 123 Textiles	3
HEc 334 Child Development	3
HEc 482 Quantity Cookery	3
HEc 483 Institution Administration	4
HEc 485 Institution Food Buying	2
Recommended but not required:	
HEc 124 Clothing	3
HEc 347 *or* 349 Home Management	3
HEc 487 Dietetics Practicum	8

(Continued on next page)

HOME ECONOMICS: FOOD AND NUTRITION (cont.)

B. FOOD AND NUTRITION RESEARCH OPTION

Course	Credits
Bact 402 Food & Applied Microbiology	4
Chem 253 Quantitative Analysis	5
Chem 277, 278 Organic Chem I & Lab	4
Chem 372, 374 Organic Chem II & Lab	4
Math 140, 141 Coll Alg & Anal Trig	5
Math 180 Anal Geometry & Calc I	4
Plus at least fifteen credits selected from the following:	
Ag 321 Biometry	3
Biochem 431 Chem & Phys of Vitamins	3
Biol 201 Intro to the Life Sciences	4
Chem 481-482, 483 Biochem & Lab	8
Eng 317 Tech & Engr Report Writing	3
Proficiency of one foreign language equivalent to completion of FL 201-202, Interm French, *or* FL 221-222, Interm German	8
HEc 113 Art	3
HEc 123 Textiles	3
HEc 124 Clothing	3
HEc 334 Child Development	3
HEc 347 Home Mgmt House Residence	3
Math 190, 200 Anal Geom & Calc II, III	7

HOME ECONOMICS: CLOTHING TEXTILES AND DESIGN (B.S.H.Ec.)

Course	Credits
Art 101-102 Survey of Art	4
Bus 323 Principles of Advertising	3
Chem 103 Intro to Chem, *or* 111 Prin of Chem, *or* Phys 101 Fund of Phys Sc	4-5
Eng 101 English Composition	3
Eng 201 Language & Literature	3
HEc 109 Intro to Home Economics	0
HEc 113 Art	3
HEc 123 Textiles	3
HEc 124 Clothing	3
HEc 229 Clothing Analysis	2
HEc 270 Nutrition	3
HEc 271 Foods	2
HEc 314 Weaving	3
HEc 324 Flat Pattern Study	3
HEc 326 Housing & Home Furnishings	3
HEc 334 Child Development, *or* 234 Intro to Child Development	2-3
HEc 340 Family Relations, *or* 346 Prin of Home Mgmt, *or* Soc 320 The Family	2-3
HEc 413 Textile Design	2
HEc 423 Advanced Textiles	3
HEc 448 Consumer Education	3
Psych 100 Intro to Psychology	3
Soc 100 Intro to Sociology	3
Physical education activities	2
Science electives	8
Social science electives	3

Plus one of the following options:

A. CLOTHING OPTION

Course	Credits
HEc 327 Tailoring	3
HEc 329 Hist of Costume & Textiles	3
HEc 424 Original Design	3
HEc 429 Soc-Psych Aspects of Clothing	2

B. INTERIORS OPTION

Course	Credits
HEc 426 Hist of Interiors & Furnishings	3
HEc 428 Family Housing	2

HOME ECONOMICS: CHILD DEVELOPMENT (B.S.H.Ec.)

Course	Credits
Anthropology elective (approved)	3
Bact 250 Gen Bact, *or* 254 Public Health & Hygiene	3-4
Ed 275 Elem School Art Meth, *or* MusT 381 Elem School Music Meth I	2
Ed 303 Kindergarten Education	3
Ed 434 Children's Literature	3
Eng 101 English Composition	3
Eng 201 Language & Literature	3
HEc 109 Intro to Home Economics	0
HEc 113 Art	3
HEc 123 Textiles, *or* 124 Clothing, *or* 229 Clothing Analysis	2-3
HEc 234 Intro to Child Development	2
HEc 270 Nutrition	3
HEc 271 Foods, *or* 170 Family Nutrition & Meal Mgmt	2-3
HEc 334 Child Development	3
HEc 340 Family Relations	3
HEc 346 Principles of Home Mgmt	2
*HEc 347 *or* 349 Home Management	3
HEc 434 Preschool Participation	6-9
HEc 435 Hist & Phil of Child Development	2
HEc 448 Consumer Education	3
Psych 100 Intro to Psychology	3
Psych 205 Developmental Psychology	3
Psychology (approved courses)	3-6
Sp 131 Fundamentals of Speech	2
Zool 119 Human Anatomy & Physiology	5
Humanities electives	9
Physical education activities	2
Science electives	2-4
Social science electives	6

Plus one of the following options:

A. Merrill-Palmer Institute.

B. Pacific Oaks Program.

C. Bank Street College.

D. Approved electives in sociology-social work.

E. Additional major in the College of Education.

*Recommended elective.

HOME ECONOMICS: CHILD DEVELOPMENT (B.A.)

General requirements for the B.A. degree, plus:

Course	Credits
Ed 303 Kindergarten Education	3
Ed 434 Children's Literature	3
HEc 113 Art	3
HEc 234 Intro to Child Development	2

HEc 270	Nutrition	3
HEc 334	Child Development	3
HEc 340	Family Relations	3
HEc 346	Principles of Home Management	2
HEc 433	Preschool Resources	2
HEc 434	Preschool Participation	6-9
HEc 435	Hist & Phil of Child Devel	2
HEc 436	Cur Theories in Child Devel	3-4
HEc 448	Consumer Education	3
Psych 100	Intro to Psychology	3
Psych 205	Developmental Psychology	3
Sp 131	Fundamentals of Speech	2
Zool 119	Human Anatomy & Physiology	5

Plus one of the following options:

A. Merrill-Palmer Institute.

B. Pacific Oaks Program.

C. Bank Street College.

D. Approved electives in sociology-social work.

E. Additional major in the College of Education.

INTERDISCIPLINARY STUDIES (B.A. or B.S.)

A student may present a curriculum not included among the ones listed elsewhere in this catalog provided the program is focused toward meeting the student's particular educational goal by combining the offerings of two or more major departments. The program normally is developed and presented during the sophomore year. It must be approved by: (a) at least one faculty member from each of the participating departments of the university, one of which must be in the College of Letters and Science, (b) the chairman of one of the L & S departments involved, and (c) the L & S Committee on Interdisciplinary Studies. The College of Letters and Science requirements for either the B.A. or B.S. degree apply. This program requires a minimum of 128 credits, of which at least 50 credits must be in courses numbered 200 or above, including a minimum of 36 credits in courses numbered 300 or above. It is recommended, however, that majors in interdisciplinary studies complete at least 50 credits in upper-division courses.

Interested students should consult the L & S dean's office for referral to the chairman of the Interdisciplinary Studies Committee for further information about this program.

INTERIOR DESIGN (B.F.A.)

Course		Credits
Arch 155-156	Intro to Architecture	8
Arch 255-256	Architectural Design I	6
Arch 263	Programs & Systems I	3
Arch 265-266	Materials & Methods	6
Arch 275-276	Hist of Ancient & Med Arch	4
Arch 359-360	Interior Design I	6
Arch 363	Programs & Systems II	2
Arch 369-370	Interiors & Materials	6
Arch 375-376	Hist of Ren & Mod Arch	4
Arch 459-460	Interior Design II	6
Arch 469-470	Interiors & Materials II	4
Arch 473-474	Seminar in Research Meth	4
Art 102	Survey of Art	2
Art 111-112	Drawing I	4
Eng 101	English Composition	3
Eng 201	Language & Literature	3
Eng 317	Tech & Engr Report Writing	3
HEc 123	Textiles	3
HEc 314	Weaving	2
HEc 326	Housing & Home Furnishings	3
Math 111-112	Fund of Math (or higher math)	8
Soc 110	Intro to Sociology	3
Physical education activities		2
Electives (including at least eleven credits from art and nine credits from at least two of the following fields: anthropology, economics, geography, history, philosophy, political science, psychology and sociology)		33

Recommended art electives:

Art 223-224	Graphic Design I	4
Art 233-234	Water Color I	4
Art 241-242	Sculpture I	4
Art 351-352	Printmaking	4

JOURNALISM (B.A. or B.S.)

See School of Communication following this College of Letters and Science section.

LANDSCAPE ARCHITECTURE (B.L.Arch.)

Course		Credits
Arch 155-156	Intro to Architecture	8
Arch 257-258	Landscape Architecture I	6
Arch 263	Programs & Systems I	3
Arch 275	History of Ancient Arch	2
Arch 276	History of Medieval Arch	2
Arch 285-286	Landscape Construction I-II	6
Arch 292	Plant Mat & Planting Design I	2
Arch 357-358	Landscape Architecture II	6
Arch 363	Programs & Systems II	2
Arch 375	History of Renaissance Arch	2
Arch 376	History of Modern Arch	2
Arch 392	Plant Mat & Planting Design II	2
Arch 457-458	Landscape Architecture III	6
Arch 467-468	Intro to City Planning	6
Arch 483	Park & Recreation Planning	2
Arch 484	Regional Landscape Planning	2
Art 111-112	Drawing I	4
Biol 201	Intro to the Life Sciences	4
Biol 203	General Botany	4
Biol 331	General Ecology	3
Eng 101	English Composition	3
Eng 201	Language & Literature	3
FWR 487	Forest Recreation	3
Geog 265	Cultural Geography	3
Geog 447	Recreational Geography	3
Geol 101, 102	Physical Geology & Lab	4
Geol 335	Geomorphology	3
Math 111-112	Fundamentals of Math (or higher mathematics)	8

(Continued on next page)

LANDSCAPE ARCHITECTURE (cont.)

PolSc 276 American Local Government	3
Psych 100 Intro to Psychology	3
Physical education activities	2
Electives to total 136 credits for the degree, of which at least two credits must be from art and twelve must be from at least two of the following fields: anthropology, economics, geography, history, philosophy, political science, psychology, and sociology	24

LATIN (B.A.)

General requirements for the B.A. degree, plus:

Course	Credits
FL 161-162 Elem Latin (or equiv)	8
FL 261-262 Interm Latin (or equiv)	8
Upper-division courses in Latin	20
A second foreign language (elementary and intermediate, or equiv)	16
Related fields (as approved by chairman)	20

LATIN AMERICAN STUDIES (B.A.)

General requirements for the B.A. degree, including Spanish for the foreign language requirement, plus:

Course	Credits
FL 384 Hispanic Cul & Institutions	3
FL 387-388 Survey of Span-Am Lit. *or* 487-488 Contemporary Span-Am Lit	6
Geog 359 Mexico & Middle America	3
Geog 360 South America	3
Hist 435 Colonial Latin America	3
Hist 438 Mexico Since Indep. Cent Am & Carib. *or* 430 Nat Latin Am	3
Plus at least six of the following courses (or the optional courses listed above):	
Anthr 320 Peoples of the World	3
Anthr 330 World Prehistory	3
*Econ 477 Econ of Devel Countries	3
Eng 111-112 Lit of Western Civ	6
FL 386 Survey of Spanish Lit	3
*Geog 466 Political Geography	3
Hist 440 Inter-Amer Relations	3
Hist 465-466 Soc & Cul Hist of Europe	6
Phil 411 Phil of the Social Sciences	3
PolSc 438 Conduct of Amer For Policy	3
PolSc 440 Prin of Inter Law & Org	3
*PolSc 483 Modernization & Pol Change	3

*Students are strongly urged to elect those courses marked with an asterisk and to take Hist 101-102 (History of Civilization)in their freshman year.

LAW—COMBINED PROGRAM (B.A.-J.D. or B.S.-J.D.)

The B.A. or B.S. degree will be awarded to candidates who complete ninety-eight credits by the end of the junior year (including all general requirements for the B.A. or B.S. and twelve credits in courses numbered 300 or above with the approval of their adviser); as well as the thirty credits in the first year of the law curriculum. Upon satisfactory completion of the law curriculum (see College of Law in the section immediately preceding the College of Letters and Science), the degree of Juris Doctor will be conferred. Students in this combined program enroll in the College of Letters and Science for their first three years and in the College of Law for the final three years.

MATHEMATICS (B.A. or B.S.)

General requirements for either the B.A. or B.S. degree, plus:

Course	Credits
Phys 220, 221, 222 Engr Phys I, II, III (to acquaint the student with an area in which mathematics is applied; upon the approval of the department, substitution of other courses to meet this objective may be allowed)	9
Math 180, 190, 200 Anal Geom & Calc	11
Math 184 Elements of Linear Algebra	2
Math 186 Theory of Numbers (may be waived by department)	3
Math 461 Higher Algebra	3
Math 471 Advanced Calculus	3
Math 462 Higher Algebra, *or* 472 Advanced Calculus	3
Mathematics electives in courses numbered above 300, at least six credits of which are in courses numbered above 401 (Math 300, 320, 331, and 332 may not be applied toward this requirement)	12

MATHEMATICS, APPLIED (B.S.)

General requirements for the B.S. degree, plus:

Course	Credits
Engr 131 Digital Computer Prog	2
Math 180, 190, 200 Anal Geom & Calc	11
Math 184 Elements of Linear Algebra	2
Math 186 Theory of Numbers (may be waived by department)	3
Math 205 Intro to Computer Programming	3
Math 471 Advanced Calculus	3
Plus one of the following options:	

A. STATISTICS OPTION

Course	Credits
Ag 321 Biometry	3
Ag 406 Statistical Research Methods	3
Math 451-452 Problem Theory & Math Stat	6
At least two courses selected from the following: Ag 507 Experimental Design; Math 370 Numerical Analysis; Math 440 Linear Algebra; Math 472 Advanced Calculus; Math 499 Directed Study	6
Approved electives in fields where statistics is applied (not to be in applied statistics courses)	6

B. COMPUTER-PROGRAMMING OPTION

Course	Credits
Math 305 Computer Org & Programming	3
Math 310 Ordinary Diff Equations	3
Math 370 Numerical Analysis	3
Math 440 Linear Algebra	3
At least two courses selected from the following	6
Ag 321 Biometry	
Math 315 Vector Calculus	
Math 420 Intro to Complex Variables	
Math 451 Prob Theory & Math Stat	
Math 452 Prob Theory & Math Stat	
Math 472 Advanced Calculus	
Math 481 Fourier Analysis	
Math 482 Advanced Applied Math	

MUSIC AND MUSIC EDUCATION (B.A. or B.Mus.)

See School of Music following this College of Letters and Science section.

NAVAL SCIENCE (B.N.S.)

Course	Credits
Hist 456 Recent Times	3
Math 180, 190 Anal Geom & Calc I, II	8
Math 205 Computer Programming, *or* Bus 233 Intro to Computers	3
NS 101-102 Naval Ship Systems I-II	6
NS 201-202 Seapower & Maritime Affairs	2
NS 301-302 Navigation & Operations I-II	6
NS 401 Naval Weapons I	3
NS 406 Naval Mgmt & Leadership	3
Phys 113-114 General Physics	6
Phys 115 *or* 116 Gen Physics Lab	1
PolSc 438 Conduct of Am Foreign Policy	3

The naval science student must complete at least eighty percent of the requirements toward another university degree, as approved by the dean of the college concerned.

A student in naval science who concurrently qualifies for both the B.N.S. degree and another university degree will be awarded only the other university degree.

The awarding of the B.N.S. degree is administered through the College of Letters and Science; however, the academic records of the student concerned remain with the college in which he or she is registered for the regular baccalaureate degree.

PHILOSOPHY (B.A. or B.S.)

Note: Students who intend to do graduate work are advised to take the Bachelor of Arts degree.

The electives in philosophy and related fields are to be selected with the approval of the chairman of Philosophy.

General requirements for either the B.A. or B.S. degree, plus:

Course	Credits
Phil 201 Ethics	3
Phil 211 Logic	3
Phil 309 History of Ancient Philosophy	3
Phil 310 History of Modern Philosophy	3
Philosophy electives (upper-division)	15
Related fields (humanities, social sciences, and sciences)	20

PHYSICS (B.A.)

General requirements for the B.A. degree, plus:

Course	Credits
Chem 103 Intro to Chemistry, *or* 111 Principles of Chemistry	4-5
Chem 112 Inorganic Chem & Qual Anal, *or* 114 General Chemistry	4-5
Math 180, 190, 200 Anal Geom & Calc	11
Phys 220, 221, 222 Engr Phys I, II, III	9
Phys 321-322 Analytical Mechanics	6
Phys 341-342 Electricity & Magnetism	6
Phys 360 Intro to Modern Physics	3
Phys 498 Research	1
Additional upper-division physics courses (at least three credits of lab and excluding Phys 304 and 314)	12
Mathematics (upper-division)	6

PHYSICS (B.S.)

General requirements for the B.S. degree, plus:

Course	Credits
Chem 103 Intro to Chemistry, *or* 111 Principles of Chemistry	4-5
Chem 112 Inorganic Chem & Qual Anal, *or* 114 General Chemistry	4-5
Math 180, 190, 200 Anal Geom & Calc	11
Phys 220, 221, 222 Engr Phys I, II, III	9
Phys 321-322 Analytical Mechanics	6
Phys 341-342 Electricity & Magnetism	6
Phys 360 Intro to Modern Physics	3
Phys 498 Research	1
Additional upper-division physics courses (at least three credits of lab and excluding Phys 304 and 314)	18
Mathematics (upper-division)	6

PHYSICS (B.Phys.)

Course	Credits
Chem 103 Intro to Chemistry, *or* 111 Principles of Chemistry	4-5
Chem 112 Inorganic Chem & Qual Anal, *or* 114 General Chemistry	4-5
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Math 180, 190, 200 Anal Geom & Calc	11
Phys 220, 221, 222 Engr Phys I, II, III	9
Phys 321-322 Analytical Mechanics	6
Phys 341-342 Electricity & Magnetism	6
Phys 351 Elem Quantum Mechanics	3
Phys 360 Intro to Modern Physics	3
Phys 411 Physical Instrumentation	3
Phys 431 Thermodynamics & Kinetic Theory	3
Phys 443 Optics	3
Physics courses (upper-division, excluding Phys 304 and 314)	3
Mathematics (upper-division)	11
Physical education activities	2

(Continued on next page)

PHYSICS (cont.)

Social science electives (anthropology, economics, history, philosophy, political science, or sociology)	6
Plus the equivalent of one year of a modern foreign language (French, German, Italian, or Russian).	

POLITICAL SCIENCE (B.A.)

General requirements for the B.A. degree, plus:

Course	Credits
PolSc 105 Elements of Political Science	3
PolSc 425 Western Political Thought	3
PolSc 426 Recent Political Thought	3
Introductory courses in other social sciences	6
Additional political science courses numbered 150 or above, including at least fourteen credits in upper-division courses)	20
Related fields (upper-division)	20

Note: The choice of specific electives must be approved by the department chairman.

POLITICAL SCIENCE (B.S.)

General requirements for the B.S. degree, plus:

Course	Credits
Math 111 Fundamentals of Math, *or* 140 Coll Alg, *or* 180 Anal Geom & Calc I	3-4
PolSc 105 Elements of Political Science	3
PolSc 425 Western Political Thought	3
PolSc 426 Recent Political Thought	3
Introductory courses in other social sciences	6
Additional political science courses numbered 150 or above, including at least fourteen credits in upper-division courses and PolSc 435, Political Research Methods & Approaches	20
Upper-division courses in related fields (six of these credits—which may include a maximum of three lower-division credits—must be in courses dealing either with research methods in the behavioral sciences, statistics, data processing, or computer programming, e.g., Ag 321, 406, AgEc 494, Bus 231, 232, Econ 432, Phil 411, 412, Psych 317, 418, Soc 410, 411)	20

Note: The choice of specific electives must be approved by the department chairman.

PRE-DENTAL STUDIES (Two-Year Program)

Students planning to apply to a college of dentistry after completing the minimum of two years of college pre-dental education should follow the schedule of courses listed below. (Students not having high school chemistry take Chem 103 in place of Chem 111.)

Course	Credits
Biol 201 Intro to the Life Sciences	4
Biol 202 General Zoology	4
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chem & Qual Anal	5
Chem 277, 278 Organic Chem I & Lab	4
Chem 372, 376 Organic Chem II & Lab	5
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Math 140, 141 Coll Alg & Anal Trig	5
Phys 113-114-115-116 Gen Phys & Lab	8
Social science electives	6
Physical education activities	2
Electives	3
Recommended elective: Foreign language	8

PRE-DENTAL STUDIES (B.S.Pre-Dent)

Students in the four-year pre-dental program satisfy the requirements of the pre-medical curriculum (see below), except that the senior-year option A for pre-dental students reads as follows: Option A — Completion of the first year of dental study at an approved college of dentistry.

PRE-MEDICAL STUDIES (B.S.Pre-Med.)

Students not having high school chemistry take Chem 103 in place of Chem 111. Where electives are specified in the first three years, the following are suggested: Math 180, 190, 200, Analytic Geom & Calc I, II, III, and Phys 220, Engineering Physics I.

FIRST THREE YEARS

Course	Credits
Biol 201 Intro to the Life Sciences	4
Biol 202 General Zoology	4
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chem & Qual Anal	5
Chem 253 Quantitative Analysis	5
Chem 277, 278 Organic Chem I & Lab	4
Chem 372, 376 Organic Chem II & Lab	5
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Math 140, 141 Coll Alg & Anal Trig *or* 111-112 Fundamentals of Math	5-8
Phys 113-114-115-116 Gen Phys, *or* 221, 222 Engr Physics II, III	6-8
Zool 323 Comp Vertebrate Embryology	4
Zool 324 Comp Vertebrate Anatomy	4
Physical education activities	2
Social science electives	6
Electives to complete 96 credits for the first three years	11-18
Recommended elective: Foreign language	14-16

SENIOR YEAR

Completion of either of the options below:

Option A — Completion of the first year of medical study at an approved college of medicine.

Option B — Completion of sufficient credits to total 128, including at least thirty-six credits in courses numbered 300 or above, and at least twelve of these upper-division credits must be in the social sciences and/or humanities. One course in mathematics or statistics beyond Math

111-112 or 140-141. Suggested senior-year electives:

Biol 351 *or* PlSc 314 General Genetics	3
Chem 305-306, 307-308 Physical Chem & Lab, *or* 302, 303 Prin of Physical Chem & Lab	4-8
Chem 481-482 *or* 480 Biochemistry	3-6
Zool 416 Mammalian Physiology	4
Zool 481 Ichthyology, *or* 488 Parasitology, *or* 489 Herpetology, *or* 315 General Physiology	3-4

PRE-NURSING STUDIES

Admission to a school of nursing involves meeting satisfactorily its entrance requirements, acceptable scholastic records or a satisfactory score on the nursing admission test, and possession of personal qualifications essential for effective nursing. Requirements of the institution to which the individual will transfer should be investigated by the student to assure inclusion of courses which meet those requirements.

The following programs are suggested for students who plan to transfer to a school of nursing.

ONE-YEAR AND ONE SUMMER PROGRAM

Course	Credits
Bact 250 General Bacteriology	4
Biol 100 Man & the Environment	4
Chem 103 Intro to Chemistry, *or* 111 Principles of Chemistry	4-5
Chem 114 General Chemistry, *or* 275, 278 Carbon Compounds & Lab	4
Eng 101 English Composition	3
Eng 201 Language & Literature	3
HEc 270 Nutrition	3
PE 288 First Aid	2
Psych 100 Intro to Psychology	3
Soc 110 Intro to Sociology	3
Sp 131 Fundamentals of Speech	2
Humanities electives	2
Physical education activities	2
	39-40

TWO-YEAR PROGRAM

Course	Credits
Bact 250 General Bacteriology	4
Biol 100 Man & the Environment	4
Chem 103 Intro to Chemistry, *or* 111 Principles of Chemistry	4-5
Chem 114 General Chemistry, *or* 275, 278 Carbon Compounds & Lab	4
Eng 101 English Composition	3
Eng 201 Language & Literature	3
HEc 270 Nutrition	3
Psych 100 Intro to Psychology	3
Psych 311 Abnormal Psychology	3
Soc 110 Intro to Sociology	3
Sp 131 Fundamentals of Speech	2
Zool 119 Human Anatomy & Physiology	5
Humanities and social science electives (at least six credits in each field)	21
Physical education activities	2
	64-65

Electives strongly recommended for those students who have completed the electives above:

HEc 334 Child Development	3
HEc 340 Family Relations	3

PRE-PHYSICAL THERAPY (B.S.)

General requirements for the B.S. degree, plus the following courses (electives are to be chosen in consultation with the adviser):

Course	Credits
Biol 201 Intro to the Life Sciences	4
Biol 202 General Zoology	4
Chem 103 Intro to Chemistry, *or* 111 Principles of Chemistry	4
Chem 114 General Chemistry	4
Math 140, 141 College Alg & Anal Trig	5
PE 111 Fundamentals of Movement	2
PE 252 Elementary School Phys Ed	2
PE 419 Human Kinesiology	3
PE 424 Adaptive & Corrective Phys Ed	2
Phys 113-114-115-116 Gen Phys & Lab	8
Psych 100 Intro to Psychology	3
Psych 205-206 Developmental Psychology	6
Psych 301 Exceptional Individual	3
Psych 311 Abnormal Psych, *or* Guid 420 Principles & Practices in Guidance	3
Psych 461 Psych of Personality	3
Zool 119 Human Anatomy & Physiology	5
Zool 324 Comp Vertebrate Anatomy	4

PSYCHOLOGY (B.A. or B.S.)

Note: The alternatives for the mathematics requirements will be determined on the basis of high school mathematics courses and aptitude scores in consultation with departmental advisers. Alternatives in the major area and related courses should be selected in consultation with the departmental adviser. It is recommended that credits in upper-division courses in the major be kept reasonably close to the college minimum of twenty.

General requirements for either the B.A. or B.S. degree, plus:

Course	Credits
Biol 201 Intro to the Life Sciences	4
Biol 202 General Zoology	4
Psych 100 Intro to Psychology	3
Psych 201-202 General Experimental Psych	8
Psych 441 Physiological Psych, *or* 444 Sensation & Perception, *or* 455 Psych of Motivation	3
Psych 311 Abnormal Psych, *or* 320 Social Psych, *or* 461 Psych of Personality	3
Psych 317 Stat for Behavioral Sciences	3
Psych 490 Psych of Learning	3
Psych 498 History & Systems of Psych	3
Mathematics (minimum)	3

RADIO-TELEVISION (B.A. or B.S.)

See School of Communication following this College of Letters and Science section.

SOCIOLOGY (B.A. or B.S.)

Recommended preparation includes at least six

SOCIOLOGY (cont.)

credits from introductory courses in any two other social sciences.

General requirements for either the B.A. or B.S. degree, plus the following courses (electives must receive the approval of the head of the Department of Sociology/Anthropology):

Course	Credits
Anthr 110 Intro to Phys Anthr & Arch	3
Anthr 120 Intro to Social Anthr	3
Psych 317 Intro to Stat in the Behav Sci *or* comparable intro statistics course	3
Soc 110 Intro to Sociology	3
Soc 230 Social Problems	3
Soc 410 Intro to Social Research	3
Soc 411 Contemp Sociological Theory	3
Sociology electives (upper-division)	14
Related fields, including one of the following	17
Hist 433 Soc & Cul Hist of U.S.	
Hist 434 Soc & Cul Hist of U.S.	
Hist 465 Soc & Cul Hist of Europe	
Hist 466 Soc & Cul Hist of Europe	
Phil 309 Hist of Ancient Philosophy	
Phil 310 Hist of Modern Philosophy	
PolSc 426 Recent Political Thought	

SPANISH (B.A.)

General requirements for the B.A. degree, plus:

Course	Credits
FL 181-182 Elem Spanish (or equiv)	8
FL 281-282 Interm Spanish (or equiv)	8
Upper-division courses in Spanish lang	20
A second foreign language (elementary and intermediate, or equiv)	16
Related fields (as approved by chairman)	20

SPEECH (B.A. or B.S.)

See School of Communication following this College of Letters and Science section.

THEATRE ARTS (B.A. or B.S.)

The selection of courses in related fields within either option must be approved by the head of the department.

General requirements for either the B.A. or B.S. degree, plus:

Courses	Credits
ThA 102 Stage Makeup	1
ThA 105 Basics of Performance	2
ThA 150 Convocation (each term)	0
ThA 163 Technical Production	4
ThA 190 Theatre Practice I	4
ThA 264 Stage Lighting	4
ThA 271 Play Analysis	3
ThA 272 Intermediate Acting	3
ThA 362 Costume for the Stage	3
ThA 407-408 Styles of Acting	3-6
ThA 420 Production Management	3
ThA 467-468 The Theatre	6
ThA 471-472 Directing	6

Plus completion of either of the options below:

A. ACTING-DIRECTING OPTION

Course	Credits
ThA 106 Basics of Performance	2
ThA 305 Stage Movement	3
ThA 306 Advanced Acting	3
Courses in related fields	20

B. TECHNICAL THEATRE OPTION

Course	Credits
ThA 108 Intro to Media	2
ThA 320 Advanced Stage Lighting	2
ThA 364 Scene Design & Tech Problems	3
Courses in related fields	20

THEATRE ARTS (B.F.A.)

General requirements for the B.S. degree *and* the core and other courses applicable to either of the options listed under the requirements for the B.A. or B.S. in theatre arts (see above), plus the following additional requirements.

Note: Courses listed below which satisfy the foregoing requirements may be counted toward those requirements.

A. ACTING-DIRECTING OPTION

Course	Credits
Art 101 Survey of Art	2
Eng 111-112 Literature of Western Civ	6
Eng 267 *or* 268 Survey of English Lit	3
Eng 277 *or* 278 Survey of American Lit	3
Eng 335 Shakespeare for Non-majors	3
FL 363 Survey of Classical Origins	3
Hist 101-102 History of Civilization	6
Hist 271 *or* 272 History of England	3
Hist 441 Greek & Roman History, *or* 445 Medieval Europe	3
MusH 100 Music Appreciation	3
Physical education (two credits each of dance and fencing taken in the freshman and sophomore years)	4
Psych 100 Intro to Psychology	3
Psych 205 *or* 206 Developmental Psych	3
Soc 110 Intro to Sociology, *or* 230 Social Problems	3

B. TECHNICAL THEATRE OPTION

Course	Credits
*Arch 155-156 Intro to Architecture	6
*Arch 275 History of Ancient Arch	2
*Arch 276 History of Medieval Arch	2
*Arch 375 History of Renaissance Arch	2
Art 101-102 Survey of Art	4
Art 111-112 Drawing I	4
Art 121-122 Design I	4
Art 211-212 Drawing II	4
Art 223-224 Graphic Design I	4
Hist 101 History of Civilization	3
**HEc 123 Textiles	3
**HEc 124 Clothing	3
**HEc 324 Flat Pattern Study	3
**HEc 327 Tailoring	3
**HEc 424 Original Design	3
*IEd 140 Woodwork I	3
*IEd 170 Machine Woodwork	3
*IEd 315 Industrial Design	2

MusH 100 Music Appreciation	3
MusH 128 Intro to Opera	2
Phil 101 *or* 103 Intro to Philosophy	3
Phil 121 Philosophy of the Arts	3
Physical education (two credits each of dance and fencing taken in the freshman and sophomore years)	4
Soc 110 Intro to Sociology	3

*Not taken by students concentrating in costuming.

**Taken by students concentrating in costuming.

ZOOLOGY (B.A. or B.S.)

General requirements for either the B.A. or B.S. degree, plus the following courses (electives are to be chosen in consultation with the departmental adviser).

Course	Credits
Biol 201 Intro to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Biol 351, 352 General Genetics & Lab	4
Biol 361 Biological Literature	1
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chem & Qual Anal	5
Chem 253 Quantitative Analysis	5
Chem 277, 278 Organic Chem I & Lab	4
Chem 372, 374 Organic Chem II & Lab	4
Math 140, 141 Coll Alg & Anal Trig	5
Math 180 Anal Geom & Calc I	4
Phys 113-114-115-116 Gen Phys & Lab	8

Plus one of the following options:

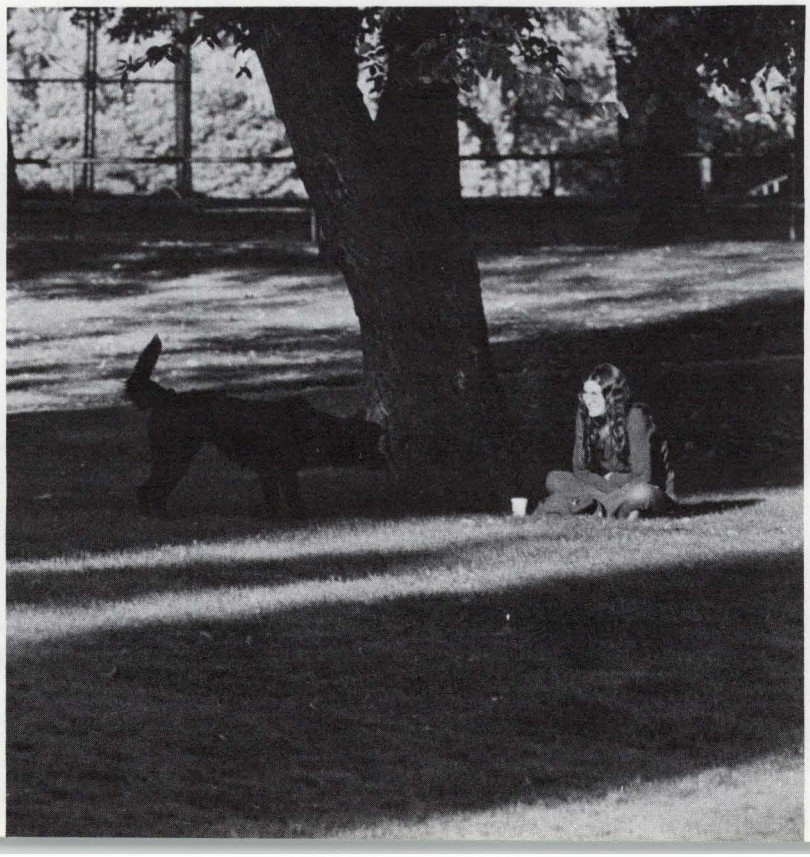
A. VERTEBRATE OPTION

At least one course from each of the following groups:

Zool 415 Cell Physiology, *or* 416 Mammalian Physiology	4
Zool 323 Comp Vert Embryo, *or* 324 Comp Vert Anat, *or* 427 Vert Hist & Organ	4
Zool 484 Invert Zool, *or* 488 Parasitology, *or* Ent 211 General Ent	3-5
Zool 481 Ichthyology, *or* 482 Nat Hist of Birds, *or* 483 Nat Hist of Mammals, *or* 489 Herpetology	3

B. INVERTEBRATE OPTION

Ent 211 General Entomology	4
Ent 342 Insect Identification	4
Ent 484 Insect Anatomy & Physiology	4
Ent ID498 Insect Morphogenesis	3
Zool 415 Cell Physiology	4
Zool 484 Invertebrate Zoology	5
Ent 442 Immature Insects, *or* Zool 436 Limnology, *or* Zool 487 Protozoology, *or* Zool 488 Parasitology	3



School of Communication of the College of Letters and Science

Elmer K. Raunio, Dean of the College of Letters and Science; Don H. Coombs, Director of the School of Communication (212 Univ. Classroom Ctr.).

THE ACADEMIC DISCIPLINES and services in the field of communication were brought together under the School of Communication in 1972. The school functions as an administrative unit of the College of Letters and Science and consists of the departments of Journalism, Radio/Television, and Speech, as well as the subject fields of communications and photography, and the Division of Broadcast Services.

The School of Communication provides professional preparation in communication fields and also functions as a multi-departmental academic unit of the College of Letters and Science for the purpose of offering liberal studies for students in other fields. The school's objectives are: (1) to provide a means for greater integration of the broader communications area; (2) to open up areas for imaginative curricular development and synthesis, including graduate training and research; (3) to bring the various areas into closer relationship and cooperation; and (4) to provide students with the best possible education and training for their chosen professional fields.

Curricula

The School of Communication offers curricula in journalism, radio-television, and speech leading to the degrees of Bachelor of Arts or Bachelor of Science, and, cooperatively with the Department of Theatre Arts, the degree of Master of Arts in Teaching Theatre Arts-Speech.

Students in this school must satisfy the general College of Letters and Science requirements for either the B.A. or B.S. degree, plus the specific departmental requirements listed below. (Consult the graduate catalog for the requirements for the M.A.T.Th.A.-Sp. degree.)

JOURNALISM (B.A.)

General L & S requirements for the B.A. degree, plus the completion of one of the following options:

A. NEWS-EDITORIAL OPTION

Note: Students electing this option may count no more than thirty-two credits in journalism courses toward the bachelor's degree.

Course	Credits
Bus 323 Principles of Advertising, *or* Jour 370 Advertising Media	2-3
Comm 120 Mass Comm in a Free Society	2
Jour 221 News Writing	2
Jour 222 Reporting	3
Jour 354 News Editing	3
Jour 423 Public Affairs Reporting	3
Jour 455 History of Mass Communications	3
Jour 491 Law of Mass Communications	2
Jour 496 Proseminar	2
Plus any three of the following:	
Jour 215 Photojournalism, *or* Photo 281 Intro to Photography	2-3
Jour 224 Lettering & Layout	2
Jour 366 Advertising Copy & Layout	3
Jour 432 Magazine Article Writing	2
Jour 433 Interp Contemporary Affairs	2
Jour 445 Media Internship	1-5
Jour 472 Principles of Public Relations	3
Jour 492 Journalism & Public Opinion	2
Economics electives	6
History electives	6
Literature electives	6
Political science electives	6
Sociology electives	6
Upper-division electives in anthropology, economics, English, geography, history, philosophy, political science, psychology, sociology, speech, or theatre arts	15

B. ADVERTISING OPTION

Course	Credits
Bus 321 Marketing	3
Bus 323 Principles of Advertising	3
Bus 421 Marketing Problems	3
Comm 120 Mass Comm in a Free Society	2
Econ 251-252 Principles of Economics	6
Jour 221 News Writing	2
Jour 224 Lettering & Layout	2
Jour 366 Advertising Copy & Layout	3
Jour 370 Advertising Media	2
Jour 496 Proseminar	2
RadTV 287 Station Writing	2
RadTV 493 Commercial Broadcasting	3
Plus at least three of the following:	
Bus 231 Statistics	4
Bus 422 Marketing Research & Anal	3
Jour 362 Retail Advertising	2
Jour 445 Media Internship	1-5
Jour 472 Principles of Public Relations	3
Jour 491 Law of Mass Communications	2
Jour 492 Journalism & Public Opinion	2
Upper-division electives in anthropology, art, economics, English, geography, history, philosophy, political science, psychology, sociology, speech, or theatre arts	15

C. RADIO-TELEVISION NEWS OPTION

Course	Credits
Bus 323 Principles of Advertising, *or* Jour 370 Advertising Media	2-3
Comm 120 Mass Comm in a Free Society	2
Jour 221 News Writing	2
Jour 222 Reporting	3
Jour 423 Public Affairs Reporting	3
Jour 455 History of Mass Communications	2
Jour 491 Law of Mass Communications	2
Jour 496 Proseminar	2
RadTV 285 Announcing I	2
RadTV 287 Station Writing	2
RadTV 488 Cinematography for Television	3
RadTV 494 Radio-Television News	3
Plus at least three of the following:	
Jour 215 Photojournalism, *or* Photo 281 Intro to Photography	2-3
Jour 433 Interp Contem Affairs	2
Jour 445 Media Internship	1-5
Jour 492 Journ & Public Opinion	2
RadTV 141 Intro to Radio-TV Brdctg	3
RadTV 253 Recording & Brdctg Tech	3
RadTV 282 Intro to TV Products	3
RadTV 493 Commercial Broadcasting	3
Economics electives	6
History electives	6
Literature electives	6
Political science electives	6
Sociology	6
Upper-division electives in anthropology, economics, English, geography, history, philosophy, political science, psychology, sociology, speech, or theatre arts	15

JOURNALISM (B.S.)

General requirements for the B.S. degree, plus the course requirements under one of the options for the B.A. degree in journalism (see above), and the completion of at least twenty credits in a specialized subject-matter area (or a logical combination of related courses) which will constitute a minor. The minor program must be worked out with an adviser in the minor field and approved by the chairman of the Department of Journalism.

Students electing either the news-editorial option or the radio-television news option (options A and C under the B.A. in journalism) may substitute six upper-division credits in the minor for six credits of the fifteen upper-division credits in anthropology, economics, English, geography, history, philosophy, political science, psychology, sociology, speech, or theatre arts. In the event that the minor is one of these fields, nine of the fifteen credits must be in subjects listed other than the minor.

Students electing the advertising option (option B under the B.A. in journalism) may substitute six upper-division credits in the minor for six of the twelve upper-division credits in anthropology, art, economics, English, geography, history, philosophy, political science, psychology, sociology, speech, or theatre arts. In the event that the minor is one of these fields, six of the twelve credits must be in subjects listed other than the minor.

RADIO-TELEVISION (B.A. or B.S.)

General L & S requirements for either the B.A. or B.S. degree, plus:

Course	Credits
Comm 120 Mass Comm in a Free Society	2
Jour 491 Law of Mass Communications	2
RadTV 141 Intro to Rad-TV Broadcasting	3
RadTV 253 Rec & Broadcasting Tech	3
RadTV 282 Intro to TV Production	3
RadTV 287 Station Writing	2
RadTV 322 Ed Uses of Radio & TV	2
RadTV 488 Cinematography for TV	3
RadTV 491 Announcing II	2
RadTV 492 Advanced TV Production	3
RadTV 493 Commercial Broadcasting	3
RadTV 494 Radio-TV News	3
Additional courses in communications and/or theatre arts	10
Advertising electives	2-3
Speech electives	2
Literature electives	6
Social science electives	6

In addition to the above, candidates for the B.S. degree are required to complete at least twenty credits in a specialized subject-matter area (or a logical combination of related courses) which will constitute a minor. The minor program must be worked out with an adviser in the minor field and approved by the department chairman.

SPEECH (B.A.)

General L & S requirements for the B.A. degree, plus the following courses (electives must be approved by the student's adviser):

Course	Credits
Sp 109 Intercoll Forensics, *or* 262 Parliamentary Law & Procedure	1-2
Sp 131 Fundamentals of Speech	2

(Continued on next page)

SPEECH (cont.)

Sp	232	Informative Speech 3
Sp	331	Persuasive Speech 3
Sp	362	Discussion & Conference Methods 2
Sp	370	Speech & Social Control 3
Sp	391	Propaganda & Public Opinion 2
Sp	421	Intro to Rhetorical Theory 3
Sp	422	*or* 424 Public Address 3
Sp	480	General Semantics, *or* 488 Theory in Communication 3
Additional credits in speech (to total thirty credits) 4-5		
Related fields 20		

SPEECH (B.S.)

General L & S requirements for the B.S. degree, plus one of the following options (electives must be approved by the student's adviser):

A. RHETORIC & PUBLIC ADDRESS OPTION

Course			Credits
Sp	109	Intercollegiate Forensics	1
Sp	111	*or* 112 Great Speakers	2
Sp	131	Fundamentals of Speech	2
Sp	209	Argumentation	3
Sp	232	Informative Speech	3
Sp	262	Parliamentary Law & Procedure . . .	2
Sp	331	Persuasive Speech	3
Sp	362	Discussion & Conference Methods	2
Sp	391	Propaganda & Public Opinion	2
Sp	421	Intro to Rhetorical Theory	3
Sp	422, 424	Public Address	6
Sp	488	Theory in Communication	3
Related fields (including at least six credits each in history and political science, and three credits in philosophy) 28			

B. SPEECH COMMUNICATION OPTION

Emphasis in public relations, business communication, language arts, or general communication.

Course			Credits
Sp	131	Fundamentals of Speech	2
Sp	362	Discussion & Conference Methods	2
Sp	370	Speech & Social Control	3
Sp	391	Propaganda & Public Opinion	2
Sp	421	Intro to Rhetorical Theory	3
Sp	480	General Semantics	3
Sp	488	Theory in Communication	3
Additional courses in speech 8-14			

Plus courses in English, business, communications, philosophy, or behavioral sciences to bring the total to sixty credits.

School of Music of the College of Letters and Science

Elmer K. Raunio, Dean of the College of Letters and Science; Floyd H. Peterson, Director of the School of Music (206 Music Bldg.); Norman R. Logan, Secretary of the Music Faculty.

A DEPARTMENT OF MUSIC was established at the University of Idaho in 1893. The School of Music was organized as an administrative unit within the College of Letters and Science in 1969 and has the following objectives: (1) to prepare musicians for professional careers in teaching, performance, composition, musical scholarship, and related fields; (2) to encourage the best in musical environment for the university and the state of Idaho; and (3) to conduct and disseminate research in the various fields of music.

Students in the school learn through performance, listening, analysis, and creation. Curricular emphasis is on the understanding of musical style and techniques of all eras, including the present, and on achieving balance between the aesthetic and the practical.

The School of Music provides professional preparation in music and also functions as an academic department in the College of Letters and Science for the purpose of offering liberal studies in music for students in other fields.

The University of Idaho is accredited by the Northwest Association of Secondary and Higher Schools and the National Council for the Accredi-

tation of Teacher Education. As a full member of the National Association of Schools of Music, the standards of the School of Music are in accordance with those set by the association.

Facilities

The Music Building houses faculty studio-offices, instrumental and vocal facilities, a record and score library, classrooms, a music education materials center, a record and tape listening center, a recital hall, and student lounges. A second building containing private practice facilities is nearby. In addition, complete recording and radio-television facilities are maintained on the campus. All equipment is maintained by professional staff. The school has two performance pipe organs and provides organ and grand piano practice instruments for students taking private lessons in these areas.

Performance Opportunities

The performing organizations in the School of Music are the University Symphony Orchestra, Idaho Chamber Orchestra, Concert Choir (Vandaleers), Band (two sections of Wind Ensemble, plus Concert Band, Vandal Marching Band, three sections of Jazz Lab Band, and pep bands), Chorus (University Singers and Women's Chorus), Opera Workshop, Collegium Musicum, Brass Choir, Percussion Ensemble, and numerous smaller ensembles — Madrigal Singers, string quartets, woodwind and brass quintets, etc. These groups are open to all students, and majors in areas other than music comprise as much as one-half of the membership in some of the organizations. In addition to their many concerts on campus, several of these groups participate in tours of Idaho and the Northwest.

Transfer Students

Because the various curricula in the School of Music are planned in continuity with basic courses taken during the first year, students planning to major in this school at the University of Idaho are strongly advised to enter the university as freshmen. Students transferring from other institutions with preparation differing from the university pattern may be admitted to an appropriate curriculum in music or music education; however, it may be necessary for such students to take more than the minimum number of credits for a degree.

Concerts and Recitals

The School of Music presents an annual series of concerts and recitals which includes faculty artists, outstanding students, student and faculty performing groups, and guest musical attractions. In addition, there is a regular series of daytime concerts in the Music Building. Most concerts are open to the public without charge; however, a small admission fee is charged for special events, such as opera and performances by certain visiting groups.

Financial Aids

Information about scholarships and financial aids for music students may be obtained from the director of student financial aids.

Curricula

The School of Music offers curricula leading to the degrees of Bachelor of Music, Bachelor of Arts, Master of Music, Master of Arts, and Master of Arts in Teaching Music.

The Bachelor of Music degree is offered with majors in vocal or instrumental performance, composition, instrumental music education, vocal music education, or a combination of vocal and instrumental music education. It is a professional music degree and is the normal precedent for graduate work in music.

The Bachelor of Arts is offered with majors in applied music (performance), music history and literature, and music theory. The B.A. emphasizes a broad liberal education and is neither professionally oriented nor the normal route to certification for public school music teaching.

General and specific requirements for the undergraduate curricula are listed below. Recommended four-year curriculum sequences are available from the office of the School of Music. Consult the catalog of the Graduate School for requirements for the M.A., M.Mus., or the M.A.T.Mus. degrees.

General Requirements for All B.A. and B.Mus. Degrees

Keyboard Proficiency. Minimum keyboard proficiency for all music majors is met by satisfactory completion of MusC 133, Theory Keyboard Laboratory. Certain curricula may have additional requirements which are included in the School of Music Handbook. Students should confer with their adviser for specific requirements appropriate to their curriculum.

Academic Junior Standing (AJS). Each major in the School of Music must be admitted into AJS by the music faculty before he or she will be permitted to enroll in music courses at the 300 level. Normally, this occurs during the first semester of the sophomore year. Transfer students may not be admitted into AJS until twelve hours have been completed at the university, during which time the student was enrolled as a major in the School of Music; however, a transfer student may enroll in 300-level courses before being admitted to AJS if the normal sequence of courses would justify this procedure.

Upper-Division Standing (UDS). For an undergraduate to enroll in MusA 301, he or she must have passed the requirements of the major area; this involves a special jury examination and demonstrates the successful completion of the fundamentals of the student's major area of performance and the ability to continue improving in a manner which will lead to the performance requirements of the degree and the major emphasis.

Convocation. Majors in the School of Music are required to attend a specified number of musical events as a part of their musical development.

In order to certify this attendance, registration in MusX 140, Convocation, is required during every semester until the requirement is fulfilled. It is a graduation requirement that all B.A. and B.Mus. candidates receive a passing grade in MusX 140 for seven semesters of their residence at the University of Idaho. Students will not be admitted to academic junior standing until they have passed three semesters of convocation (admittance to AJS normally occurs after the first semester of the sophomore year). Transfer students are expected to enroll in MusX 140 during their first registration, and to receive a passing grade in a specified number of semesters (to be determined when the student's program is set up).

BASIC REQUIREMENTS FOR THE B.A. DEGREE IN MUSIC

Course	Credits
Eng 101 English Composition	3
Eng 201 Language & Literature	3
MusC 133 Theory Keyboard Laboratory	1
MusC 141 Musicianship & Music Literature	4
MusC 142, 241, 242 Theory of Music I, II, III	11
MusC 341 Twentieth-Century Music Theory & Literature	4
MusH 144, 243, 244 History of Music I, II, III	6
MusX 140 Convocation (seven semesters)	0
Physical education activities	2
Humanities (L & S humanities requirement, plus courses from art, architecture, dance, literature, or theatre arts	18
Science (L & S science requirement)	9-12
Social science (L & S social science requirement, plus additional social science courses)	12
Foreign language (L & S foreign language requirement)	0-16

Note: Of the minimum of 128 credits required for the B.A. degree, at least seventy-eight credits must be in courses *outside* of the School of Music.

MUSIC: APPLIED MUSIC (B.A.)

Basic requirements for the B.A. degree in the School of Music, plus:

Course	Credits
MusA 101 and/or 301 (2 cr each semester) Indiv Instr	16
MusA 490 Senior Recital	0
One of the following courses	2
MusC 323 Tonal Counterpoint	
MusC 324 Modal Counterpoint	
MusC 325 Composition	
MusC 327 Instrumentation	
MusH Special period course to be selected from MusH 410 through 418	
Electives to total 128 cr for the degree	--

MUSIC: HISTORY AND LITERATURE (B.A.)

Basic requirements for the B.A. degree in the School of Music, plus:

Course	Credits
MusA 101 and/or 301 (1 cr each semester) Indiv Instr	8
MusC 323 *or* 324 Tonal *or* Modal Counter	2
MusC 327 Instrumentation	2
MusH Special period courses to be selected from MusH 410 through 418	4
Music history electives	2
Electives to total 128 cr for the degree	--

MUSIC: THEORY (B.A.)

Basic requirements for the B.A. degree in the School of Music, plus:

Course	Credits
MusA 101 and/or 301 (1 cr each semester) Indiv Instr	8
MusC 323, 324 Tonal & Modal Counterpoint	4
MusC 325 Composition	2
MusC 327 Instrumentation	2
MusC 427 Orchestration	2
Electives to total 128 cr for the degree	--

BASIC REQUIREMENTS FOR THE B.MUS. DEGREE

Course	Credits
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Physical education activities	2
Large performance ensembles — to be selected from MusA 103, 104, 105, 106, 303, 304, 305, or 306 (registration is normally required during the first two years of residence; registration in some performance ensemble, large or small, is required throughout the student's first eight semesters)	4
Elective ensembles — from MusA 265, 266, 280, 365, 366, or 480 (additional large-ensemble credits may be elected from MusA 103, 104, 105, 106, 303, 304, 305, or 306 to satisfy this requirement)	2
MusA 101 Individual Instruction (major area)	12
MusC 133 Theory Keyboard Laboratory	1
MusC 141 Musicianship & Music Literature	4
MusC 142, 241, 242 Theory of Music I, II, III	12
MusH 321-322 Music in Western Civ, *or* 243-244 History of Music II, III and a 2-cr music history elective	6
MusX 140 Convocation (seven semesters)	0

MUSIC: INSTRUMENTAL PERFORMANCE (B. Mus.)

Basic requirements for the B.Mus. degree, plus the specific requirements in either of the sections below. It is strongly recommended that instrumentalists elect literature or pedagogy courses appropriate to their major fields.

A. KEYBOARD

Course	Credits
MusA 101 Indiv Instr (secondary fields)	4
MusA 301 Indiv Instr (major)	12
MusA 387 Conducting (recommended)	0-2
MusA 490 Senior Recital	0
Additional elective ensemble performing groups	2
MusH 431 and/or 432 Piano Literature	2-4
MusT 433 Piano Pedagogy	2
Courses acceptable toward the L & S general requirements for the B.A. degree (not counting courses in music, physical education, or Eng 101, 201)	26
Additional music electives (to be selected from courses in the 300-499 series in the following proportions: MusA, 0-6 cr; MusC, 6-12 cr; MusH, 4-12; MusT, 0-6 cr; MusX, 0-6 cr)	18
Electives to total 128 cr for the degree	--

B. ORCHESTRAL INSTRUMENTS OR GUITAR

Course	Credits
MusA 101 Indiv Instr (secondary fields)	0-4
MusA 301 Indiv Instr (major)	12
MusA 265, 266, 365, 366 Ensemble	2
MusA 387 Conducting	2
MusA 490 Senior Recital	0
Additional elective ensemble performing groups	2
Courses acceptable toward the L & S general requirements for the B.A. degree (not counting courses in music, physical education, or Eng 101, 201)	26
Additional music electives (to be selected from courses in the 300-499 series in the following proportions: MusA, 0-6 cr; MusC, 6-12 cr; MusH, 6-12 cr; MusT, 0-6 cr; MusX, 0-6 cr)	24
Electives to total 128 cr for the degree	--

MUSIC: VOCAL PERFORMANCE (B.Mus.)

Basic requirements for the B.Mus. degree, plus:

Course	Credits
MusA 101 Indiv Instr (secondary fields)	4
MusA 301 Indiv Instr (major)	12
MusA 387 Conducting	2
MusA 490 Senior Recital	0
Additional elective ensemble performing groups	2
MusH 435 Solo Vocal Literature	2
MusT 437 Vocal Pedagogy	2
Foreign language (two yrs of one language or one yr each of two languages)	16
Courses acceptable toward the L & S general requirements for the B.A. degree, not counting courses in music, physical education, or Eng 101, 201; however, ThA 105, 272, and 407 may be counted toward this requirement	10
Additional music electives (to be selected from courses in the 300-499 series in the following proportions: MusA, 0-4 cr; MusC, 6-12 cr; MusH, 6-12 cr; MusT, 0-4 cr; MusX, 0-4 cr)	18
Electives to total 128 cr for the degree	--

MUSIC: COMPOSITION (B.Mus.)

Basic requirements for the B.Mus. degree, plus:

Course	Credits
*MusA 101 Indiv Instr (piano)	0-4
MusA 387 Conducting	2
MusT 251, 252, 253, 254 Instr Techniques	4
MusC 323, 324 Tonal & Model Counterpoint	4
MusC 325 Composition	2
MusC 327 Instrumentation	2
MusC 427 Orchestration	2
Additional composition (from MusC 200 and/or 400)	6
Courses acceptable toward the L & S general requirements for the B.A. degree (not counting courses in music, physical education, or Eng 101, 201)	26
Additional music electives (to be selected from courses in the 300-499 series in the following proportions: MusA, 0-4 cr; MusC, 4-8 cr; MusH, 6-12 cr; MusT, 0-4 cr; MusX, 0-6 cr)	14
Electives to total 128 cr for the degree	--

*Competence at the piano should be viewed as an essential tool of the composer.

MUSIC EDUCATION: VOCAL (B.Mus.)

Basic requirements for the B.Mus. degree, plus:

Course	Credits
MusA 101 Indiv Instr (secondary fields)	5-9
MusA 301 Indiv Instr (major)	2-4
MusA 387 Conducting	2
Additional elective ensemble performing groups	2
MusT 381 Elementary School Music Methods	3
MusT 383 Principles of Music Teaching	3
MusT 385 Choral Music in the Sec Schools	2
MusX 283 Diction for Singers	2
Ed 201 Introduction to Teaching	2
Ed 314 Strategies for Teaching	2
Ed 432 Practicum: Music Teaching	9
Ed 445 Proseminar in Teaching	1
Psych 100 Intro to Psychology	3
Psych 205 or 206 Developmental Psych, *or* 421 Educational Psych	3
Additional electives in English and/or literature	6
Social science electives	6
Science and/or mathematics electives	8
Additional music electives (to be selected from courses in the 300-499 series in the following proportions: MusA, 0-4 cr; MusC, 2-6 cr; MusH, 2-6 cr; MusT, 0-4 cr; MusX, 0-4 cr)	8
Electives to total 128 cr for the degree	--

MUSIC EDUCATION: INSTRUMENTAL (B.Mus.)

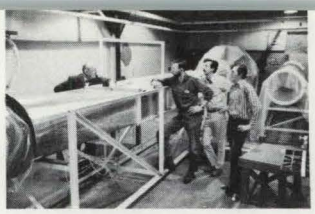
Basic requirements for the B.Mus. degree, plus:

Course	Credits
MusA 101 Indiv Instr (secondary fields)	5-9
MusA 301 Indiv Instr (major)	2-4
MusA 387 Conducting	2
Additional elective ensemble performing groups	2
MusT 251, 252, 253, 254 Instr Techniques	4
MusT 381 Elementary School Music Methods	3
MusT 383 Principles of Music Teaching	3
MusT 386 Instr Music in the Sec Schools	2
Ed 201 Introduction to Teaching	2
Ed 314 Strategies for Teaching	2
Ed 432 Practicum: Music Teaching	9
Ed 445 Proseminar in Teaching	1
Psych 100 Intro to Psychology	3
Psych 205 or 206 Developmental Psych, *or* 421 Educational Psych	3
Additional electives in English and/or literature	6
Social science electives	6
Science and/or mathematics electives	8
Additional music electives (to be selected from courses in the 300-499 series in the following proportions: MusA, 0-4 cr; MusC, 2-6 cr; MusH, 2-6 cr; MusT, 0-4 cr; MusX, 0-4 cr)	8
Electives to total 128 cr for the degree	--

MUSIC EDUCATION: VOCAL-INSTRUMENTAL (B.Mus.)

Basic requirements for the B.Mus. degree, plus:

Course	Credits
MusA 101 Indiv Instr (secondary fields)	5-9
MusA 301 Indiv Instr (major)	2-4
MusA 387 Conducting	2
Additional elective ensemble performing groups	2
MusT 251, 252, 253, 254 Instr Techniques	4
MusT 381 Elementary School Music Methods	3
MusT 383 Principles of Music Teaching	3
MusT 385 Choral Music in the Sec Schools	2
MusT 386 Instr Music in the Sec Schools	2
Ed 201 Introduction to Teaching	2
Ed 314 Strategies for Teaching	2
Ed 432 Practicum: Music Teaching	9
Ed 445 Proseminar in Teaching	1
Psych 100 Intro to Psychology	3
Psych 205 or 206 Developmental Psych, *or* 421 Educational Psych	3
Additional electives in English and/or literature	6
Social science electives	6
Science and/or mathematics electives	8
Additional music electives (to be selected from courses in the 300-499 series in the following proportions: MusA, 0-4 cr; MusC, 2-4 cr; MusH, 2-4 cr; MusT, 0-4 cr; MusX, 0-4 cr)	8
Electives to total 128 cr for the degree	--



College of Mines

Rolland R. Reid, Dean (206 Mines Bldg.); Joseph Newton, Assistant Dean, Donald F. Clifton, Secretary of the College Faculty.

THE COLLEGE OF MINES (then called "School of Mines") was created in 1917 as an administrative unit of the university. There are three academic departments and two other administrative divisions in the college: Department of Mining Engineering and Metallurgy, Department of Geology, Department of Geography, Bureau of Mining Research, and Cart-O-Graphics.

The college is concerned with all aspects of earth science and technology, and the course and curricular offerings have expanded considerably since the college was founded. Following is a list of the academic degrees that have been conferred in our various disciplines; the date following each is the year in which this degree was first conferred. Mining engineering (B.S. 1918, M.S. 1918, Ph.D. 1972); metallurgy, until 1934 (B.S. 1922, M.S. 1920); metallurgical engineering (B.S. 1935, M.S. 1936); geology (B.S. 1921, M.S. 1922, Ph.D. 1964); geological engineering (B.S. 1935, M.S. 1940); geography (B.S. 1958, M.S. 1968); hydrology (M.S. 1970).

In addition to the advanced degrees listed above, the Graduate School offers work leading to these three degrees: Master of Arts in Teaching Geography, Master of Arts in Teaching Earth Science, and Master of Natural Science with a major in earth science. The Graduate School also specifies the requirements for three professional degrees: Engineer of Mines, Metallurgical Engineer, and Geological Engineer.

The College of Mines offers a very broad spectrum of courses but they all pertain to the earth, to man, and his environment. *Geology*, the "science of the earth" is, to some extent, basic to the other disciplines; it is such a broad subject, however, that most geologists specialize in one branch, paleobotany, petrology, etc. *Geological engineering* is the application of engineering principles to related geologic problems such as location of roads, damsites, and reservoirs. *Hydrology* is concerned with water; surface water, underground water, and water in the atmosphere. Much work is underway on pollution control and land-use planning.

Mining engineering involves more than just the technical processes of removing rock and ore from the earth's surface; for example, rock mechanics, geology of ore deposits, valuation of mineral deposits, mineral economics, and mine ventilation; very important also are mine pollution control and land reclamation techniques. *Metallurgy* is concerned with extracting metals from their ores and producing the myriad shapes of metals and alloys that are used in industry; today much work is being done on two problems: (1) the development of metallurgical processes that will eliminate pollution of air and water, and (2) a search for practical methods of recycling scrap metal.

Geography focuses upon resources, settlement, regional development,

and planning to integrate social, physical, and engineering sciences into effective appraisals of man-earth problems. Geography also specializes in cartography (map making) including computerized techniques. In addition, the department is involved in training social studies teachers for the public schools.

The Bureau of Mining Research conducts research on applied problems in the areas of our academic disciplines. This permits our staff to become involved with current problems in the mineral industry and provides a research atmosphere for our students. Major objectives are: (1) to act as a liaison between the academic and industrial worlds, and (2) to meet the needs of the people of the state as represented by the various departments of state and local governments.

Cart-O-Graphics offers design, drafting, and reproduction services for maps and other graphics to illustrate research reports and other publications. The Cart-O-Graphic Laboratory serves the region and state in addition to the university. The laboratory also provides a proving ground for students specializing in cartography.

Equipment and Facilities

Mining Engineering. Facilities and equipment include a rock mechanics and geophysical laboratory equipped with polariscope, strain recorder, electrical resistivity and magnetic units; and other instruments for stress-strain studies of rock structures. Mine surveying instruments, ventilation apparatus, and other mining engineering tools are available. Illustrative material includes maps, drawings, films, and slide collections illustrating mining methods and practices. The greatest assets for laboratory or graduate studies in mining engineering, however, are the deep mines in the Coeur d'Alene district. Mining students who are interested in practical investigations or basic research can usually arrange to gather necessary data at the best source — an operating mine.

Metallurgical Engineering. The extractive metallurgy laboratories are equipped for class instruction and research in ore dressing and process metallurgy. Equipment includes crushers, ball mills, pulverizers, screens and screen shakers, flotation machines, leaching equipment, and various other concentrating machines including a Carpco induced-roll magnetic separator and a high-intensity electrostatic separator. Equipment is available for modern instrumental analysis as well as wet chemical and fire assaying.

Physical metallurgy includes the metallography laboratory with facilities for polishing and etching metals, alloys, minerals, and ceramic materials for macroscopic and microscopic examination, a variety of microscopes for visual examination of specimens, and a metallograph, cameras, and darkroom for photographic works. The X-ray diffraction laboratory is equipped to handle a large variety of problems in metallurgy, ceramics, and minerology, such as identification of alloy phases and minerals, texture studies, and phase diagram determinations. Other equipment includes

melting furnaces, forging hammer, and rolling mill for specimen preparation, heat treating and thermal analysis furnaces, physical and mechanical test instruments, and ceramics fabrication equipment.

Geology and Geological Engineering. Laboratories are maintained for work in all of the basic courses, with large study collections of fossils, rocks, minerals, crystal models, ore suites, thin sections, polished sections, and topographic and geologic maps.

Equipment used in advanced courses includes rock sawing and polishing facilities, binocular microscopes, reflection and polarizing microscopes, photomicrographic appartus, X-ray diffraction and fluorescence equipment, and an atomic absorption spectrophotometer. The electron microprobe of the Idaho Bureau of Mines and Geology is available to advanced students. Also available are several computers, resistivity survey equipment, hammer seismograph, soil drilling and sampling kits, and water-level recorders.

Research laboratories are equipped for work in applied geochemistry, photogeologic analysis and design, engineering geology, and soil testing. Facilities for research in hydrology are also available in other divisions of the university.

Geography. The library maintains a special collection of some 50,000 maps, and the department has extensive holdings of maps and air photos. The geography faculty and students maintain a multi-instrument complex of eight meteorological stations. A computer and calculator are also available for class use. Extensive modern cartographic equipment, a drafting room, and a darkroom are housed in the department; students are taught photograph interpretation, map compilation, model building, air brush work, darkroom techniques, computer mapping, and other computer applications.

Museum. The Idaho College of Mines has a unique art collection — the Peschel collection, which was given on a permanent loan basis to the college by the heirs of William M. Peschel who lived for many years at Lewiston, Idaho. This contains a number of prints and water colors illustrating the parade uniforms worn by mining officials and workers in Germany about the seventeenth century. In addition to the illustrations, the collection contains a number of the ceremonial axes and canes which were carried by these officials.

Scholarships and Loan Funds

Students having a high academic standing in high school or college should refer to the "Financial Aids" section in part 2 of this catalog. The Hecla-Bunker Hill Scholarships are available to College of Mines students, but not exclusively to them. The following are exclusively for College of Mines students: Newmont Mining Co. — two scholarships which pay $1000 each year for four years (open only to entering freshmen in mining engineering or metallurgical engineering); Mineral Industries Education Foundation — five scholarships which pay $500 each year for four years (open only to entering freshmen in mining engineering

or metallurgical engineering); ASARCO Foundation—one $750 scholarship (open to a currently enrolled sophomore or junior); Idaho Mining Memorial Scholarship (open to entering students); A. E. Larson Scholarships (open to currently enrolled students); W. W. Staley Scholarship (open to currently enrolled students in mining engineering); out-of-state tuition waivers (open to new students who are not residents of Idaho); Albert Hall Featherstone Scholarships (open to currently enrolled graduate students); the Laney and J. J. Day loan funds are restricted to College of Mines students. For further information, write to the Office of Student Financial Aids, University of Idaho.

Teacher Education Program

Students in the College of Mines who are preparing for secondary-school teaching should consult the information about the Teacher Education Program immediately following this College of Mines section of the catalog.

General Requirements and Undergraduate Curricula

University Requirements. See general regulation "J" in part 3 for the all-university requirements for graduation.

Electives. A list of acceptable electives may be consulted in the office of each head of department and adviser in the college. Electives must be approved by the head of department or the adviser involved.

Curricula. Unless otherwise specified, each of the following programs of study requires 128 credits and includes the departmental and general requirements as set forth above.

GEOGRAPHY (B.S.Geog.)

Course	Credits
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Geog 100 Man's Physical Environment	4
Geog 140 Economic Geography	3
Geog 250 World Regional Geography	3
Geog 265 Cultural Geography	3
Geog 380 Cartography	3
Geog 490 Trends in Geography	3
One 3-cr geography elective to be selected from each of the following series: 401-422, 430-449, 450-469	9
Additional approved electives in geography	9
Econ 251-252 Prin of Econ; *or* Geol 101-102 Phys Geol & Lab, and either Phys 101 Fund of Phys Sci, *or* Phys 113, 115 Gen Phys & Lab	6-8
One yr college-level foreign lang; *or* Engr 131 Digital Comp Prog *and* one of the following: Ag 321 Biometry, Bus 231 Statistics, Psych 317 Intro to Statistics	4-8
Physical education activities	2
Approved electives in related fields	24
Approved electives to total 128 cr for the degree	--

GEOGRAPHY (B.A. or B.S.)

See these curricula in the College of Letters and Science section.

GEOLOGY (B.S.Geol.)

Course	Credits
Ag 321 Biometry	3
Biol 100 Man & the Environment, *or* 201 Intro to the Life Sciences	4
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chem & Qual Anal	5
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Geog 380 Cartography	3
Geol 101, 102 Physical Geology & Lab	4
Geol 106, 107 Historical Geology & Lab	4
Geol 211 Ancient Life, *or* 417 Advanced Paleontology	3-4
Geol 255 Mineralogy	2
Geol 265 Lithology	2
Geol 301 Field Geol & Report Writing	6
Geol 335 Geomorphology	3
Geol 345 Structural Geology	3
Geol 365 Igneous & Metamorphic Rocks	2
Geol 425 Sedimentology	2
Geol 426 Stratigraphy	2
Geol 465 Optical Mineralogy	2

(Continued on next page)

GEOLOGY (cont.)

Math 140, 141 Coll Alg & Anal Trig	5
Math 180 Anal Geom & Calc I	4
Phys 113-114-115-116 Gen Phys & Lab *or* 220, 221, 222 Engr Phys I, II, III (*or* upper-div courses in biological sciences with perm of adviser)	8-9
Physical education activities	2
Humanities and/or social sc electives	12

Plus one course in computer programming, the equivalent of one year of college-level study of a foreign language, and approved electives to complete the total of 128 credits for the degree.

GEOLOGICAL ENGINEERING (B.S.Geol.E.)

Course	Credits
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chem & Qual Anal, *or* 114 General Chemistry	4-5
Chem 305-306 Physical Chemistry	6
CE 112 Elementary Surveying	2
CE 382 Engineering Economy	2
Econ 251 Principles of Economics	3
Engr 120-121 Engr Anal & Design I-II	4
Engr 131 Digital Computer Programming	2
ES 211 Intro to Mechanics	4
ES 221 Dynamics of Rigid Bodies	2
ES 320 Fluid Mechanics	3
ES 340 Mechanics of Materials	3
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Geol 101, 102 Physical Geology & Lab	4
Geol 106, 107 Historical Geology & Lab	4
Geol 255 Mineralogy	2
Geol 265 Lithology	2
Geol 301 Field Geol & Report Writing	6
Geol 335 Geomorphology	3
Geol 345 Structural Geology	3
Geol 365 Igneous & Metamorphic Rocks	2
Geol 425 Sedimentology	3
Geol 435 Engineering Geology	3
Math 180, 190, 200 Anal Geom & Calc	11
Math 310 Ordinary Diff Equations	3
Phys 221, 222 Engr Physics, *or* 113-114-115-116 Gen Phys & Lab	6-8

The following courses are recommended electives for those students wishing to specialize in the areas indicated.

Mineral Exploration

Geol 475 Mineral Deposits	4
Geol 476 Explorational Geology, *or* 485 Geochemical Exploration	3
Min 101 Elements of Mining I	2
Min 401 Rock Mechanics	3

Construction

CE 460 Soil Mechanics	3
Geol 436 Geological Engr Design	3
Min 101 Elements of Mining I, *or* 301 Mining Engineering I	2
Min 401 Rock Mechanics	3

Hydrogeology

AgE 351 Hydrology	2
CE 460 Soil Mechanics	3
Geol 436 Geological Engr Design	3
Geol 409 Ground Water	2

The minimum number of credits required for the degree is 134.

METALLURGICAL ENGINEERING (B.S.Met.E.)

Course	Credits
ChE 323 Material & Energy Balances	2
Chem 111 Principles of Chem	4
Chem 112 Inorganic Chem & Qual Anal, *or* 114 General Chem	4-5
Chem 305-306 Physical Chem	6
EE 200 Systems & Circuits	3
EE 314 Electronics & Control Systems	4
Engr 101 Engineering Graphics	2
Engr 120-121 Engr Analysis & Design	4
Engr 131 Digital Computer Programming	2
ES 211 Intro to Mechanics	4
ES 320 Fluid Mechanics	3
ES 321 Thermodynamics & Heat Transfer	3
ES 340 Mechanics of Materials	3
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Eng 317 Tech & Engr Report Writing, *or* 313 Business Writing	3
Geol 101, 102 Physical Geology & Lab	4
Math 180, 190, 200 Anal Geom & Calc	11
Math 310 Ordinary Diff Equations	3
Met 102 Materials & Their Manufacture	1
Met 201 Elements of Material Science	3
Met 305 Structure of Solids	3
Met 308 Intro to Metallurgic Thermo	2
Met 403 Intro Extractive Metallurgy	3
Met 410 Metallurgical Lab	2
Met 412 Mechanical Metallurgy	3
Met 413 Physical Metallurgy I	3
Met 414 Materials Engineering	2
Min 101 Elements of Mining	2
Phys 221, 222 Engr Physics II, III	6
Physical education activities	2
Mathematics elective (one upper-division course) or equiv	3
Electives, including at least sixteen credits in approved humanities and social science	21-22

MINING ENGINEERING (B.S.Min.E.)

Note: Approved field experience, appropriate summer employment, or an applied course in mine surveying and geologic mapping is required before graduation.

Course	Credits
Chem 111 Principles of Chem	4
Chem 114 General Chemistry	4
CE 112 Elementary Surveying	2
EE 200 Systems & Circuits	3
EE 314 Electronics & Control Systems, *or* 324 Electrical Machinery	3-4
Engr 101 Engineering Graphics	2
Engr 120-121 Engr Analysis & Design	4
Engr 131 Digital Computer Programming	2
ES 211 Intro to Mechanics	4
ES 320 Fluid Mechanics	3
ES 321 Thermodynamics & Heat Transfer	3

ES 340 Mechanics of Materials	3
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Eng 317 Engr & Tech Report Writing, *or* 313 Business Writing	3
Geol 101, 102 Physical Geology & Lab	4
Geol 202 Mineralogy & Petrology	4
Geol 345 Structural Geology	3
Math 180, 190, 200 Anal Geom & Calc	11
Math 310 Ord Diff Eq, *or* approved upper-division math course, *or* substitute	3
Met 201 Elements of Material Science	3
Min 101, 102 Elements of Mining I, II	4
Min 352 Mine Management	3
Min 391 Mining Principles	3
Min 401 Rock Mechanics	3
Min 470 Mine Services	3
Phys 221, 222 Engr Physics II, III	6
Physical education activities	2
Technical electives from the department, one course of which may be outside the department from the following Ag 321 Biometry Bus 412 Personnel Management CE 468 Engr Prop of Soil ES 402 Applied Numerical Meth Geol 435 Engr Geology Geol 475 Mineral Deposits Geol ID485 Geochemical Exploration Math 320 Probability & Statistics ME 473 Applied Stress Analysis	9
Mathematics elective (one course beyond algebra and trigonometry or equivalent, i.e., Ag 321, ES 402, Math 320)	2-4
Electives, including at least sixteen credits in approved humanities and social science	21

Teacher Education Program

Everett V. Samuelson, Dean, College of Education (301 Educ. Bldg.); H. H. Caldwell, Chairman, Teacher Education Coordinating Committee, 1972-73.

THE PREPARATION OF TEACHERS is a cooperative enterprise between the College of Education and other divisions of the university. However, the screening of all applicants for admission to, or continuance in, the Teacher Education Program is the responsibility of the College of Education, and the dean of the College of Education is the recommending authority for certification.

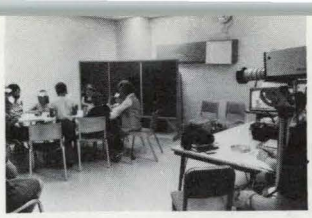
Students preparing for a career in teaching have the option of completing their bachelor's degree in the College of Education (except for agricultural education, home economics education, and music education) or in the department of their subject major.

Admission to the Program

Upon completion of the first semester of the sophomore year, or forty semester credits, all teacher-education students must make application for admission to, or continuance in, the Teacher Education Program. A standing committee of the College of Education reviews each applicant's total record and presents its recommendations to the dean of that college. The approval of the dean of the College of Education is required for admission to, or continuance in, the program. Admission to the Teacher Education Program does not carry with it permission to enroll in senior practicum. Additional procedures and requirements apply, as noted in the information under "Senior Practicum" in the College of Education section of this catalog, and as noted in the prerequisites to specific courses in senior practicum.

Advising

Teacher education students have two advisers: one from the subject-matter department and one from the College of Education. When a student



identifies teacher education as his or her objective (this could be as early as the freshman year and certainly no later than admission to the teacher education program) the advisers are designated. They plan and approve a program of studies for the student. So long as the approved program is followed, only the student's college adviser is required to sign the registration cards. Changes in the program require the signature of both advisers. Exceptions to this rule are students majoring in a subject-matter area in the College of Education, students in the departments of Agricultural Education and Home Economics, and in the School of Music, who have advisers in their subject-matter areas only.

Certification for Secondary-School Teaching

Students admitted to the Teacher Education Program who are enrolled in a department or college not offering major studies in teacher education normally satisfy the requirements for the Idaho Standard Secondary-School Certificate by including the twenty-credit core listed below as electives in their program for the baccalaureate degree and by completing one of the following options: (1) one sixty-credit teaching major; (2) one forty-credit teaching major and one twenty-credit teaching minor; (3) one thirty-credit teaching major and one twenty-credit teaching minor; (4) two thirty-credit teaching majors; or (5) one forty-five credit teaching major. (See "Teaching Majors and Minors" at the conclusion of the College of Education section.)

20-Credit Core. Developmental or Education Psychology, 3 cr (Psych 205 or 206 or 421 or Ed 415); Strategies for Teaching, 2 cr (Ed 314); Special Methods, 2 cr (Ed 315, 316, 317, 318, 319, 323, 341, or another approved special methods course); Proseminar in Teaching, 1 cr (Ed 445); Practicum, 9 cr (Ed 431 or another approved practicum course); Contemporary Education, 3 cr (Ed 468). *Note:* Psych 100, Intro to Psychology, is the prerequisite for Psych 205, 206, and 421; however, in most programs this course may be counted among the general requirements in social sciences.

Exceptions. Teacher education students majoring in the College of Education, the Department of Agricultural Education, the Department of Home Economics, or the School of Music have slightly different requirements. See the curricula for these fields in their appropriate college sections.

Procedures. The college in which the student is enrolled initiates the application for teacher certification. The subject-matter adviser and the professional education adviser each sign the necessary forms and forward them to the dean of the College of Education. He, in turn, works with the registrar to get the necessary supporting credentials and forward the material to the proper certification office. The College of Education maintains a record of all students recommended for teacher certification, and it is understood that recommendations concerning a student's competence are made by the department in which the skills and concepts are taught.

The College of Education reserves recommendations for certification to students who have completed four years of preparation and hold a bachelor's degree.

Center for Native American Development

Jack R. Ridley, Director (Center for Native American Development, 730 Deakin Ave.).

THE CENTER FOR NATIVE AMERICAN DEVELOPMENT was established in 1972 to conduct research and offer course instruction in current Native American affairs. Supporting courses and directed study are also available through the center for all students in the university.

The overall objective of the center is to enhance the knowledge and managerial skills of Native Americans through teaching, research, and service. In addition, the center provides an avenue for greater awareness and understanding about the Native American of today.

Graduate School

Ronald W. Stark, Dean and Coordinator of Research (111 Morrill Hall); Edgar H. Grahn, Associate Dean and Secretary of the Graduate Faculty; R. Bruce Higgins, Executive Assistant and Assistant Coordinator of Research.

THE GRADUATE SCHOOL was formally organized in 1925 but the University of Idaho has offered advanced degrees for over seventy-five years with the first master's degree awarded in 1897. The Graduate School encompasses seven colleges and more than fifty departments and subject areas. This coverage of all regular disciplines and professional fields provides in one location a wide variety of academic work. Enrollments are large enough to provide the critical mass of students and faculty necessary for graduate programs and yet sufficiently small to permit close faculty-student relationships. Interdepartmental cooperation is an important factor on the Idaho campus which is also the research center for the state.

Degree programs are offered in eighty-one areas for the master's degree and in thirty for the doctoral degree. Specific degree offerings are given in the catalog of the Graduate School, which also provides detailed information about the Graduate School, appointments, financial aids, library, research facilities, and procedures. Further information is provided in the "Information Bulletin for Theses and Dissertations." Forms to assist students in recording their progress are supplied by the office of the graduate dean on request.

Cooperative Programs

The university participates in a number of cooperative arrangements in the state and region to extend resources and take advantage of special facilities.

Cooperative Graduate Center in Boise. The University of Idaho is among the cooperating institutions of higher education offering graduate courses to qualified students at the Cooperative Graduate Center in Boise. Infor-

mation and course offerings may be obtained through the Division of Continuing Education, Office of Higher Education, 413 Idaho Street, Boise, Idaho 83702.

Washington State University. The University of Idaho and Washington State University, to utilize unique areas of knowledge of each institution, operate a cooperative course program. Courses available on either campus are identified in part 5 and offerings are listed in the current time schedule of classes.

National Reactor Testing Station. The University of Idaho conducts a graduate program at the NRTS at Idaho Falls, Idaho, in cooperation with the Idaho operations office of the Atomic Energy Commission. The program is administered through a resident director of the university. It is possible for students qualifying for this program to earn a master's degree in the physical sciences, mathematics, engineering, business, or computer science. It is also possible for a student holding a master's degree to complete residence requirements and examinations on-campus for the PhD. degree and to complete the research work for this degree at the NRTS site.

AWU Program. The university is a member of Associated Western Universities, which is a cooperative venture of certain institutions to make use of special facilities located in the area. Financial support is available for students and faculty to spend periods of time, up to one year, at a number of the laboratories of the Atomic Energy Commission to pursue research projects.

Interinstitutional Doctoral Program. Under the auspices of the Western Interstate Commission for Higher Education and in cooperation with Oregon State University, the degree-granting institution, it is possible to obtain the Doctor of Philosophy degree with a major in home economics in the area of child development and family relations.

Undergraduate Enrollment in Graduate Studies (Partial Enrollment)

A senior in residence who is within twelve credits of completing the requirements for the baccalaureate degree, and who meets the requirements for admission to the Graduate School, as set by the university and the department concerned, may apply for admission to partial enrollment in the Graduate School. A course registration plan designating undergraduate and graduate courses is submitted with the application for admission on a form provided.

Admission in advance of registration permits certain courses to be designated for graduate credit. Capable students can thus begin graduate work at an earlier date than would otherwise be possible. Qualified seniors will normally be in their last semester when applying for partial enrollment. In some cases, a maximum of two semesters of partial enrollment may be desirable in order to permit study of courses in sequence.

Seniors in 500's Courses

A senior with at least a 3.00 grade-point average may enroll in one course a semester at the 500's level with permission of the instructor and the dean of the Graduate School (dean's signature on the undergraduate registration card is required). Credits so earned while a senior are for undergraduate purposes and may not be offered later for an advanced degree. No undergraduate student may enroll in the cooperative graduate courses offered with Washington State University.

Master's Degrees

A minimum of thirty credits is required for a master's degree but some additional work may be stipulated in individual cases because of particular objectives or the need for additional background. Of the minimum of thirty credits required for a master's degree, at least eighteen credits must be in courses numbered 500 and above (exceptions are made for certain degrees). Remaining courses may be in the 400's; 300's level courses may be offered only in supporting fields, not in the major (certain degrees permit exceptions). Courses numbered in the 100's and 200's may not be used to fulfill the requirements for a master's degree. Credits in course 500 (Research and Thesis) may not be applied toward a non-thesis degree.

At least fifteen credits of the minimum credits required for a master's degree must be completed on the Moscow campus. The remaining fifteen credits may be completed at the Boise Cooperative Graduate Center or by a combination of Boise Cooperative Graduate Center credits and up to a combined total of eight credits earned in another graduate school, University of Idaho extension courses administered by the Division of Continuing Education of the state Office of Higher Education, or, subject to sufficient documentation and certification, extension credits from other institutions which are accepted toward graduate credit by the institution offering the courses.

All credits submitted to meet the requirements for a master's degree must have been earned within six consecutive years prior to the end of the academic term in which the degree is completed.

A foreign language is not a general requirement for a master's degree and it is considered that any needed proficiency has been developed much earlier in the student's academic career. However, some departments may require completion of a language examination or course work as a degree requirement. If so, it is listed as a deficiency on the study program.

Doctoral Degrees

The Graduate School awards the degree of Doctor of Philosophy in recognition of high achievement in scholarly and research activity. The degree of Doctor of Education is given for high scholarly attainment and in recognition of the completion of academic preparation for professional practice. Candidates for either degree meet the same requirements for residence, candidacy, and final examinations, but the degrees differ in require-

ments for professional experience and intermediate examinations. The foreign language requirement for the Ph.D. degree is a departmental option. Both degrees require the completion of a dissertation, although the nature of this work differs for each.

Fifth-Year Program of Teacher Education

This year of study provides an opportunity for strengthening teaching competence and for specialized study. All courses taken in this category will be recorded on the graduate transcript as "fifth year."

A person admitted to the fifth year of teacher education must have a baccalaureate degree from an accredited college or university and must have met minimum standard certification requirements of the state of Idaho. The fifth year of teacher education is to be completed following a period of at least one year of initial teaching experience. The teacher may complete the period of study during an academic year or through summer sessions.

Professional Degrees in Engineering

As a form of recognition for recipients of bachelor's degrees from the University of Idaho, professional degrees are offered in several fields. The degrees may be granted to graduates of the College of Engineering or the College of Mines after five years of appropriate professional experience, one year of which is in responsible charge, upon submission of an acceptable thesis.

Professional Certificates

Two-year graduate programs are available leading to professional certificates in education, guidance and counseling, school administration, school psychology, special education, and vocational education. These programs are intended to meet the needs of students who desire to follow an organized program of graduate work beyond the master's degree, but who may not wish to pursue a doctoral program. Programs encompass the preparation specified by the appropriate professional organization. General Graduate School procedures are followed.

Continuing Education, Summer Sessions, and Special Programs

James L. Black, Regional Director of Continuing Education (103 Adult Ed. Bldg.); Paul F. Kaus, Director of Summer Sessions and Special Programs (103 Adult Ed. Bldg.).

CONTINUING EDUCATION is administratively separate from the Office of Summer Sessions and Special Programs. However, since the programs share office facilities and work in close cooperation, they are described together in this section of the general catalog.

Continuing Education Programs

The Division of Continuing Education of the Office of Higher Education is a statewide agency with its headquarters in Boise. The division is responsible for field service administration of most off-campus adult continuing education programs offered anywhere in the state. Regional directors are located at Moscow (northern), Boise (southwest), and Pocatello (southeast), with addresses as follows:

Northern Regional Director
Division of Cont. Educ.
c/o University of Idaho
Moscow, Idaho 83843

Southwest Regional Director
Division of Cont. Educ.
c/o Boise State College
Boise, Idaho 83707

Southeast Regional Director
Division of Cont. Educ.
c/o Idaho State University
Pocatello, Idaho 83201

Inquiries about the programs indicated below may be addressed to the regional director of the Office of Higher Education in care of any of the three institutions. Note that each of these three regional directors may establish courses and programs for any of the three institutions in the state and are not confined to programs offered via the institution where they are housed.

The north Idaho regional director also serves as the University of Idaho representative in the supervision of programs offered anywhere in the state. In this capacity, the north Idaho regional director works directly with the regional director at Boise and Pocatello when University of Idaho courses are involved.

Extension Courses. Persons interested in enrolling in extension courses should contact the regional director as indicated above. Schedules of course offerings are developed near the beginning of each semester and summer session by each regional office. Most of the courses meet in the evenings in local communities. A separate catalog of extension courses is not issued, but, under appropriate circumstances, almost any course listed in this catalog may be offered by extension. Generally the requirements are that there be a qualified and approved instructor, appropriate classroom and other instructional facilities, and a minimum of twelve qualified students. More than twelve students may be required if there are extra costs associated with the course such as instructor travel, facilities rent, etc.

Most higher education institutions including the University of Idaho restrict the amount of extension credit that is applicable toward a degree. Since the acceptability of this type of credit varies among institutions, and to some extent within institutions for specific degree programs, individuals attempting to apply extension credit toward either undergraduate or graduate degrees should check with their own college or university. For University of Idaho general requirements on the acceptability of extension credits, see general academic regulation "J-5" in part 3.

Specific procedures for enrolling in extension courses are available from each of the regional directors. While there is some variation among the three institutions of higher education in the state, generally requirements for enrolling in an extension course are the same as required for enrolling in courses offered on campus. Extension students are required to provide registration and application data. Students currently enrolled in an institution of higher education should not additionally enroll in an extension course without first having received approval of their academic dean in their home institution. Extension course grades are not computed in grade-point averages at U. of I.

Correspondence Study. Many University of Idaho courses are also offered through correspondence study. Each course parallels its campus counterpart in content and credits and may be started at any time with one year for completion. As is true of extension courses, most institutions limit the amount of correspondence study applicable toward a degree. For University of Idaho limitations, see general academic regulation "J-5" in part 3. A student currently enrolled at an institution of higher learning should receive permission from his or her dean before registering for a correspondence study course. Correspondence grades are not computed in the student's grade-point average at the University of Idaho.

For a bulletin which contains further information on procedures, registration blanks, and a complete listing of college, high school, and non-credit courses, contact the Correspondence Study Office, University of Idaho, Moscow, Id. 83843.

Coeur d'Alene Adult Education Center. Subject to annual approval and sufficient student interest, University of Idaho resident credit courses are available in a summer program offered at Coeur d'Alene. Other limiting factors include the availability of qualified instructors and appropriate instructional facilities and materials. As indicated, the center offers resident credit. To the extent that appropriate courses are available, students may complete all the work required for a baccalaureate degree with the exception of sixteen of the last forty credits. After a candidate is within forty credits of completing the total number of credits required for the degree, he or she must complete in residence on the University of Idaho campus a minimum of sixteen credits (practicum, internship, and similar courses may not be computed among the minimum of sixteen to be earned on the Moscow campus). Of the remaining twenty-four credits, a maximum of eight credits may be taken by correspondence study, extension, advanced placement, credit by examination, or at another senior college or university.

Individuals interested in enrolling in a summer program at Coeur d'Alene may contact the Office of the North Idaho Regional Director of Continuing Education, University of Idaho, Moscow, Id. 83843.

Conferences, Workshops, and Short Courses. In addition to the credit programs reported above, each of the three regional directors assists in setting up short courses, workshops, and conferences. Such instructional programs are often concentrated into one-, two-, or three-day periods and normally require registration fees or outside funding to cover the costs. The type of programs that may be offered is almost limitless, and individuals interested in specific types of short courses are encouraged to contact the regional director of continuing education in their own area. Often, if interest is expressed by one or two individuals in a specific short course, the regional director is able to determine by surveys and other means whether there is sufficient additional interest to schedule the program.

Summer Sessions

An eight-week summer session is scheduled each year, normally starting about the second week in June. In addition, pre- and post-session courses may be offered through the Special Programs Office, some of them on a self-supporting basis. During the eight-week session, many courses are accelerated into one-, two-, or

three-week concentrated sessions, thus allowing students to complete a course in less than the full eight weeks. Many recreational and cultural activities are scheduled through the Summer Recreation Office, as well as programs presented through the School of Music and the Department of Theatre Arts. Special programs for high school age students are also available in the areas of journalism, music, computer programming, and several others.

Academic regulations included in this catalog are applicable during the summer session. Individuals interested in enrolling are invited to write the Office of Summer Sessions for a copy of the summer bulletin which is published each year in late February or early March. The bulletin contains complete information needed to register for the summer session.

Special Programs

The Special Programs Office offers a variety of educational programs including some specific programs that are offered off campus. A special effort is made to avoid duplication of programs offered by the statewide Division of Continuing Education.

Intersession, Pre-Session, and Post-Session Programs. The Special Programs Office is authorized to offer programs on a self-supporting basis during the break between semesters (December-January) as well as other periods of time when the university is not regularly in session, such as the period between commencement and the start of the summer session and the period between the close of summer session and the opening of fall semester. Generally, students are allowed to register and earn credit at the rate of one credit per week during these periods. For example, a student may register for one three-credit course offered during a three-week period of time, attending class three to four hours per day. This would be a full load during such an accelerated period.

Individuals interested in enrolling during one of the special sessions should contact the Special Programs Office. Normally, twelve students are required to offer a course. Surveys of student interest in specific courses are conducted continuously with the intent of announcing programs about one month prior to the session. In order to guarantee enrollments, students may be required to register and pay fees in advance through the Special Programs Office.

NRTS Education Program. The undergraduate portion of the education program at the National Reactor Testing Station at Idaho Falls is supervised by the Special Programs Office. The graduate portion of the same program is supervised by the Graduate School. The program offers resident credit with enrollment generally limited to contractor employees of the Atomic Energy Commission. Courses are offered each semester, but no summer program is scheduled.

Applicants must meet requirements for admission to the University of Idaho. If appropriate courses are available, students may complete all of the work required for a baccalaureate degree at the NRTS Education Center with the exception of sixteen of the last forty credits. After a candidate is within forty credits of completing the total number of credits required for the degree, he or she must complete in residence on the University of Idaho campus a minimum of sixteen credits (practicum, internship, and similar courses may not be

computed among the minimum of sixteen to be earned on the Moscow campus). Of the remaining twenty-four credits, a maximum of eight credits may be taken by correspondence study, extension, advanced placement, credit by examination, or at another senior college or university.

The program is administered by a resident director at Idaho Falls. For further information on specific courses available, write NRTS Education Program, P.O. Box 1845, Idaho Falls, Id. 83401.

NRTS Certificate Program. Students enrolled at the NRTS Education Center who complete a specific series of courses with a grade-point average of 2.00 or better and who pass an examination in the field of concentration may be awarded the "Certificate of General Proficiency in (name of field)." Students who maintain a grade-point average of 2.75 or better are exempted from the final examination. The program of studies leading to each certificate generally requires between twenty-four and thirty-three hours of course work. Each certificate has been approved by the appropriate subject matter department at the university and by the University Curriculum Committee.

The certificate program should not be confused with the degree program. The program represents a limited amount of specialization in a restricted and specified series of courses. The significance of the certificate is dependent on its acceptance and support by the contractor employer at the NRTS site and other individuals.

Credit earned while enrolled in the certificate objective may also be applied toward a degree if the candidate is otherwise eligible under regular university requirements.

Real Estate Certificate Program. The Real Estate Certificate Program is offered cooperatively with the College of Business and Economics, the Idaho Real Estate Commission, and the Idaho Association of Realtors. The program is not a college credit program, but instead offers units leading toward a fundamental or advanced certificate. The program is designed for licensed salesmen and brokers or those seeking such licensng. Permission may be granted to others to enroll.

Courses are offered in various Idaho communities where it is determined that there are sufficient students, a qualified instructor, and adequate facilities. Most courses meet in the evenings, although some are scheduled in concenterated short courses. The program is developed near the beginning of each semester by personnel of the Idaho Real Estate Commission, Statehouse, Boise, Id. 83702. Individuals interested in enrolling may write to the commission for a copy of the schedule.

Permanent records of the program are maintained in both the Idaho Real Estate Commission Office at Boise and in the Special Programs Office on the University of Idaho campus.

Instructional Short Courses, Workshops, and Conferences. The Special Programs Office is authorized to offer short courses, workshops, and other short-short-term programs on the Moscow campus. Note that such programs offered in other locations throughout the state are normally sponsored through the Division of Continuing Education of the Office of Higher Education. Under certain unique circumstances, the Special Programs Office may offer non-credit programs off campus if the Division of Continuing Education cannot sponsor the program.

Many of these short concentrated instructional programs depend on user fees for support, but public funding may be possible for specific types of programs.

Often programs in this framework are offered in concentrated one- or two-day sessions. Courses may be offered in nearly any subject field or a combination of fields if there is university expertise available and a sufficient number of individuals to make the offering of the course practical. Since the offering of this type of program is dependent on requests from individuals or groups, anyone interested in such an educational program is urged to contact the Special Programs Office. If a single request is received, an effort will be made to determine the number of other individuals who may be interested. Once established, the program is normally publicized by direct mailings to individuals, and through newspaper and other news announcements.

Officer Education Program

Ralph J. Neuhaus, Chairman, Officer Education Affairs Committee (301 Faculty Office Bldg.); Col. Daniel L. Miller, Head, Department of Military Science (103 Memorial Gymnasium); Lt. Col. J. A. Magee, Jr., Head, Department of Aerospace Studies (106-A Adult Ed. Bldg.); Capt. Jack R. Voorhees, Head, Department of Naval Science (101 Navy Bldg.).

THE OFFICER EDUCATION PROGRAM (OEP) is offered at the University of Idaho by the departments of Aerospace Studies (Air Force OEP), Military Science (Army OEP), and Naval Science (Navy-Marine OEP).

The purpose of OEP is to prepare selected students to serve as commissioned officers in the Air Force, Army, Navy, and Marine Corps. This program constitutes the largest single source of trained officers for both the reserves and regular forces. Successful completion of requirements for both a baccalaureate degree and OEP study programs leads to a commission in the armed forces.

General Information

The three OEP departments offer, on a selective basis, four-year and two-year OEP programs. Under the provisions of present laws, the three services offer scholarships to selected students each year in a nation-wide screening and testing program. The financial assistance that is provided in conjunction with these OEP scholarships includes, tuition, books, and all standard fees listed in the catalog, except room and board. In addition, students receive subsistence pay of $100.00 per month. Both the Army and Air Force offer two-, three-, and four-year scholarships with similar financial benefits, and the Army also offers one-year scholarships. The Navy offers four-year and two-year scholarships. Non-scholarship students receive $100.00 per month during their final two years of OEP instruction only. Uniforms and textbooks for all OEP courses are provided at no cost.

Students who qualify, and who plan to enter flight training as military pilots after being commissioned, may apply for participation in the flight instruction program offered locally by each OEP department. Successful completion of this program meets most requirements for a private pilot's license.

Information concerning the specific courses in aerospace studies, military science, and naval science may be found in part 5. Each program is further explained below. Further inquiries are welcomed and should be addressed to the respective OEP office.

Aerospace Studies

The Air Force OEP program provides specialized education to students who desire to become Air Force officers.

Both a four-year program and a two-year program are offered. The four-year program consists of both the general military course (two years) and the professional officer course (two years) and may be completed in either three or four years. The two-year program consists of only the professional officer course. The two-year program is designed for undergraduate or graduate students who desire to take Air Force OEP during their last two years at the university. Students who are interested in the two-year program should apply to the Department of Aerospace Studies no later than March 31 of the year in which they plan to enter the program. Students not presently enrolled at the university but who plan to enroll for their last two years are also eligible.

General Military Course. The general military course consists of four semesters of general military education and corps training. Students explore the causes of present world conflicts as they affect the security of the United States, study the composition and roles of U.S. defensive forces, and participate in corps training.

Professional Officer Course. The professional officer course consists of four semesters of professional officer education, which entails a study of the growth and development of aerospace power, astronautics and space operations, professionalism, leadership, and management.

In addition to the on-campus studies, all students in the four-year program must complete a four-week period of off-campus, pre-commissioning training during the summer at an Air Force base. This field training is normally accomplished before entering the professional officer course. Students applying for the two-year program must participate in a six-week summer field training course prior to entering the two-year program. Participants in field training courses are paid for the time they spend in training. Travel to and from the base is paid, and food, lodging, medical care, and uniforms are furnished at no cost.

Military Science

Army OEP is basically a study in leadership and management, applicable to both a civilian or military career. During the first year, students are instructed in the fundamentals of leadership and management, and, in the sophomore year, in applied leadership and management. In the advanced course (junior and senior years), the student progresses to advanced leadership and management and participates in seminars in the same field of study. At the end of the junior year, students attend a six-

week summer camp at an Army post where those leadership and management principles learned in the OEP classroom are put into actual practice. Pay is approximately $400.00. Once enrolled in OEP, students become eligible for three-, two-, or one-year scholarships which pay all tuition, books, and fee costs, plus $100.00 monthly. Successful completion of the program leads to a commission as a second lieutenant in the U.S. Army.

Two-Year Program. Specifically designed for the junior college student, but available to others, is a two-year program of study in which students initially attend a six-week encampment in lieu of the first two years of college OEP. This is followed by the study of advanced leadership and management and seminars in the junior and senior years of college or university work.

Naval Science

The Navy-Marine OEP offers two programs leading to a commission in the Navy or the Marine Corps. The two programs are the Navy-Marine scholarship program for scholarship students and the Navy-Marine college program for students entering the university without a scholarship. While entry into the two programs normally occurs in the freshman year, selected students may enter either program after completion of the sophomore year. The difference in financial aid is the primary distinction between the two programs. Students in either program take the same twenty hours of professional courses taught by naval officers and are free to choose their major field of study. Following graduation, a broad variety of duty assignments awaits the newly-commissioned naval officer, including nuclear submarines, surface ships, and naval aviation. Assignments in the Navy Supply Corps and the Civil Engineering Corps are also available. A limited number of graduates continue in graduate education programs, including medicine. Students who have elected the Marine option are commissioned as second lieutenants, U.S. Marine Corps.

Navy-Marine Scholarship Program. Application for this program is normally made during the fall of the student's senior year of high school or freshman year of college. Initial selections are based on college entrance examination scores and high school academic performance. A student in this program participates in three summer training cruises of six to eight weeks' duration. Payment during these training cruises is received at one-half the rate of commissioned officer's pay. The first and third cruises are afloat cruises aboard ships of the Pacific or Atlantic Fleet and may include cruises to foreign shores. During the second cruise students are assigned to naval aviation for three weeks, followed by three weeks at a naval amphibious base.

Navy-Marine College Program. This program is for the non-scholarship student and for the student who desires to compete for a Navy scholarship after entering the university. Application for this program is made directly to the head of the Department of Naval Science. Students receive their uni-

forms and naval science textbooks at no cost and begin receiving monthly subsistence pay of $100.00 per month at the commencement of the junior year. This program requires one summer training cruise of six to eight weeks' duration during the summer following the junior year. The cruise is an afloat cruise of the same type and with the same rate of pay as described for the scholarship program.

Marine Corps Option. Students enrolled in either of the above programs who desire a Marine Corps commission may apply for the Marine Corps option during their first two years in college. Students taking this option enroll in classes on Marine Corps subjects during their junior and senior years and participate in one cruise conducted at the Marine Corps School at Quantico, Virginia.

Two-Year Program. Navy-Marine scholarship and college program applicants entering the program after completion of their sophomore year will be required to attend a naval science institute at a selected Navy-Marine OEP university during the summer between their sophomore and junior years. At the naval science institute they will study the material taken by the four-year candidates during their freshman and sophomore years. On completion of the naval science institute, candidates return to the university and complete the junior and senior years of the naval science curriculum, thus meeting the requirement of twenty hours of naval science professional courses. Candidates in the two-year program will participate in one afloat cruise between their junior and senior years. Applications must be submitted early in the second semester of the sophomore year.

Course Numbering System and Key to Abbreviations and Symbols

SUBJECT FIELDS IN THIS SECTION are listed in alphabetical order. Courses within certain subject fields are presented in subgroups. For example, in the foreign language course section all French courses are together, all German courses are together, etc.

Numbering Plan

Courses numbered 010-099 are high-school-level courses carrying no credit; those numbered 100-299 are lower-division courses primarily for undergraduates; 300-499 are upper-division courses primarily for advanced undergraduates, fifth-year students, and graduates; courses numbered 500 and above are intended for and are restricted to graduate students (see general regulation "B-8" in part 3 for the exception to this rule).

Letter Designations with Numbers

Certain course numbers also include letters preceding the arabic number, e.g., R101, X100, etc:

C — offered by correspondence study only.

ID — cooperative course with Washington State University offered at the University of Idaho and available to WSU students.

N — offered in the National Science Foundation program only.

R — offered only in the educational program of the National Reactor Testing Station at Idaho Falls.

WS — cooperative course with Washington State University offered at WSU and available to University of Idaho students.

X — offered by extension only.

Subtitled Courses

An "s" in parentheses between the number and title of a course indicates that the course may be offered under the main title and/or with an appended subtitle, e.g., "Seminar" and/or "Seminar in the History of the Pacific Northwest." The specific area normally will be listed in the time schedule as a separate section of the main course.

Credit Designations

Immediately following each course title, the number of credits authorized is shown in parentheses. Typical designations are:

(3 cr) — three semester credits (for courses with more than one number, e.g., 101-102-103, the three credits apply to each number).

(1-3 cr) — one to three semester credits.

(3 cr; 2 cr) — three credits first semester; two credits second semester.

(1-3 cr, max 3) — one to three credits during any academic session, and

the course may be repeated until the maximum of three credits has been earned.

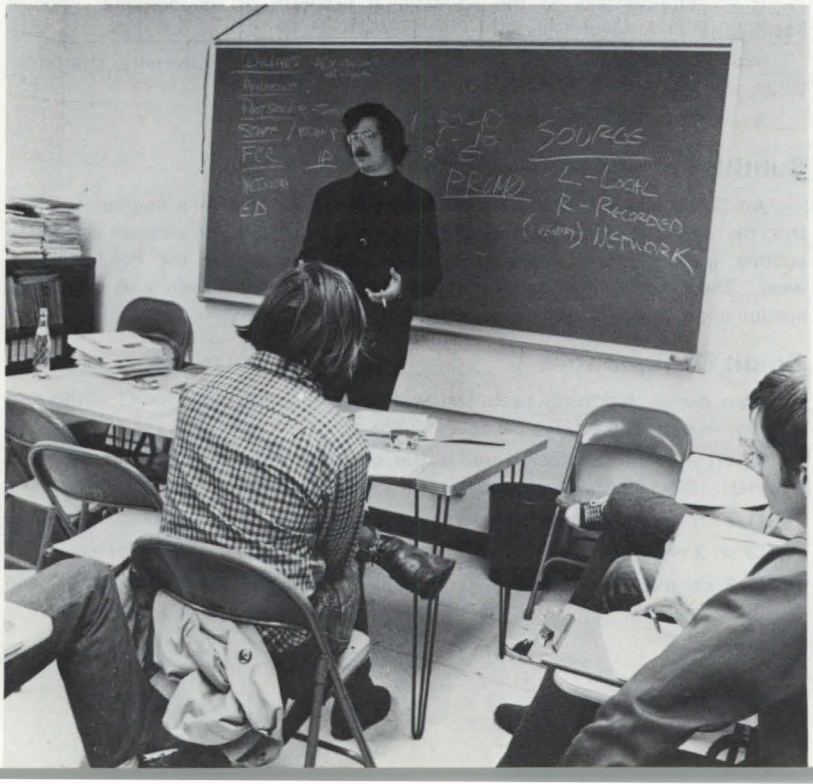
(3 cr, max 12) — three credits during any academic session, and the course may be repeated until the maximum of twelve credits has been earned (for a course with more than one number, e.g., 301-302, the maximum is overall and applies to the combined numbers).

(cr arr) — credits to be arranged (may be repeated for credit without restriction as to maximum).

(1-3 cr, max arr) — one to three credits during any academic session, and the course may be repeated without restriction as to maximum.

Other Abbreviations

Alt/yrs — offered alternate years (the academic year to be offered is usually shown)
Coreq — co-requisite
Cr — credit
Dem — demonstration
Disc — discussion
Div — division
Equiv — equivalent
Grad — graduate
Hr — hour
Jr — junior
Lab — laboratory
Lec — lecture
Max — maximum
Perm — permission of instructor
Perm of dept — permission of the department or subject-field chairman
Prereq — prerequisite
Rec — recitation
Soph — sophomore
Wk — week
Yr — year



Accounting

Bruce P. Budge, Dept. Chairman (209-G Admin. Bldg.). Professors Budge, Clark; Associate Professor Reynolds; Assistant Professor Jones; Lecturer Utzman.

ADVANCED PLACEMENT: Courses in this subject field which are vertical in content are: 131-132-231-232-331-332.

Acctg **131-132 Principles of Accounting** (3 cr). Accounting for individual proprietorships, partnerships, corporations. Two lec and one 2-hr lab per wk. Also offered by correspondence study.

Acctg **200** (s) **Seminar** (cr arr). Prereq: perm.

Acctg **231-232 Intermediate Accounting** (3 cr). Content, construction, and interpretation of financial statements; corporation accounting. Also offered by correspondence study. Prereq: 132.

Acctg **281 Financial and Administrative Accounting** (3 cr). For non-majors; not open for credit to majors. Structure of accounting theory, using information in financial statements, accounting for management control, and in making decisions. Prereq: 132.

Acctg **299** (s) **Directed Study** (cr arr). Prereq: perm.

Acctg **331-332 Advanced Accounting** (3 cr). Acctg 331: partnerships, fiduciary, estate, trust, government, and institutional accounting. Acctg 332: installment sales, agency, branch, consolidation, mergers, and holding company accounting; foreign currencies and price-level changes. Prereq: 232.

Acctg **385 Costs: Concepts and Methods** (3 cr). Methods of specific order, process, and standard costing, overhead allocation, joint product costing. Prereq: 132.

Acctg **395 Fundamentals of Accounting** (4 cr). Primarily for students in the M.B.A. program. Financial statements, limitation of data, partnership and corporate accounting, financial and cost analysis, and interpretation. Prereq: perm.

Acctg **400** (s) **Seminar** (cr arr). Prereq: perm.

Acctg **483-484 Federal and State Taxes** (3 cr). Acctg 483: income tax laws; tax liability; returns. Acctg 484: estate, inheritance, gift tax laws; social security, unemployment, excise and use taxes; special problems. Prereq: 132.

Acctg **486 Costs: Analysis and Controls** (3 cr). Cost analysis and control methods as a basis for planning, cost control, and decisions.

Acctg **R490 Advanced Accounting Problems** (3 cr). Problems in professional examinations given by the American Institute of Certified Public Accountants; problem analysis and development of working papers. Prereq: perm.

Acctg **491 Accounting Theory** (3 cr). History; major areas of controversy in principles and theories.

Acctg **493 Auditing Theory** (3 cr). Nature, importance, and basis of the audit theory; standards and procedures.

Acctg **499** (s) **Directed Study** (cr arr). Prereq: perm.

Acctg **501** (s) **Seminar** (cr arr). Prereq: perm.

Acctg **502** (s) **Directed Study** (cr arr). Prereq: perm.

Acctg **586 Costs: Relevance, Measurement, and Applications** (3 cr). Development of cost control. Prereq: perm.

Afro-American Studies

Siegfried B. Rolland, Coordinator (311-B Admin. Bldg.).

AfrAm **103 Introduction to Black Culture** (2 cr). See SocSc 103.

AfrAm **200** (s) **Seminar** (cr arr). Prereq: perm.

AfrAm **299** (s) **Directed Study** (cr arr). Prereq: perm.

AfrAm **322 Racial and Ethnic Relations** (3 cr). See Anthr 322.

AfrAm **327 Black Literature** (3 cr). See Eng 327.

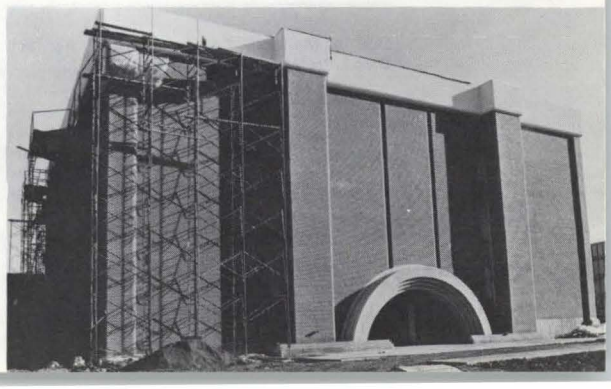
AfrAm **400** (s) **Seminar** (cr arr). Prereq: perm.

AfrAm **427 Peoples of Africa** (3 cr). See Anthr 427.

AfrAm **432 The Negro in American History** (3 cr). See Hist 432.

AfrAm **485 African Political Systems** (3 cr). See PolSc 485.

AfrAm **499** (s) **Directed Study** (cr arr). Prereq: perm.



Aerospace Studies

J. A. Magee, Jr., Dept. Head (106-B Adult Ed. Bldg.). Professor Magee; Assistant Professors Davis, Winchester.

AS **101-102 U.S. Military Forces in the Contemporary World I** (1 cr). AS 101: doctrine, mission, and organization of USAF. AS 102: aerospace defense; general purpose, support, and tactical forces; review of Army, Navy, and Marine Corps forces. Two hrs per wk; one 1-day field trip each semester.

AS **200** (s) **Seminar** (cr arr). Prereq: perm.

AS **201-202 U.S. Military Forces in the Contemporary World II** (1 cr). AS 201: role of the military in U.S. policies; theories and nature of war; Soviet strategies and policies. AS 202: Chinese strategies and policies; U.S. defense policies. Two hrs per wk; one 1-day field trip each semester.

AS **299** (s) **Directed Study** (cr arr). Prereq: perm.

AS **301-302 Growth and Development of Aerospace Power** (3 cr). History of development of airpower and USAF; review of characteristics and problems of space programs and systems. Four hrs per wk; two 2-day field trips each semester.

AS **400** (s) **Seminar** (cr arr). Prereq: perm.

AS **401-402 Concepts of Air Force Leadership** (3 cr). AS 401: general concepts of leadership applied to USAF situations; military justice. AS 402: management concepts applied to USAF situations. Four hrs per wk; one 2-day field trip each semester.

AS **465 Air Force Flight Instruction Program** (0 cr). Open to cadets who qualify to become Air Force pilots. Ground school, plus 36 1/2 hrs of flying time (20 dual; 16 1/2 solo). Cadets receive private pilot's license upon meeting FAA requirements. Prereq: 301-302.

AS **499** (s) **Directed Study** (cr arr). Prereq: perm.

Agriculture

Don A Marshall, Coordinator (111 Ag. Sci. Bldg.). Professors Everson, Marshall.

Ag **200** (s) **Seminar** (cr arr). Prereq: perm.

Ag **203 Environmental Pollution** (3 cr). Same as Inter 203. How man pollutes his environment; intro to the complete spectrum of environmental disturbance to provide basis for more specialized study; emphasis on preventive needs; includes guest lectures by invited experts.

Ag **299** (s) **Directed Study** (cr arr). Prereq: perm.

Ag **321 Biometry** (3 cr). Same as FWR 307 and InfSc 321. Statistical analysis of biological data, probability distributions, regression, correlation, enumeration data, linear models, analysis of variance, elementary design, and interpretation of results. Two lec and one 2-hr lab per wk. Prereq: Math 111 or 140 or perm.

Ag **400** (s) **Seminar** (cr arr). Prereq: perm.

Ag **406 Statistical Research Methods** (3 cr). Same as InfSc 406. Biometrical principles used to analyze and interpret research problems; analysis of variance, correlation, multiple regression, covariance, principles of experimental design. Prereq: 321 or perm.

Ag **499** (s) **Directed Study** (cr arr). Prereq: perm.

Ag **501** (s) **Seminar** (cr arr). Prereq: perm.

Ag **502** (s) **Directed Study** (cr arr). Prereq: perm.

Ag **503** (s) **Workshop** (cr arr). Prereq: perm.

Ag **507 Experimental Design** (3 cr). Same as InfSc 507. Methods of constructing and analyzing designs for experimental investigations; analysis of designs with unequal subclass numbers; concepts of blocking randomization and replication; confounding in factorial experiments; incomplete block designs; response surface methodology. Prereq: 406 or equiv.

Ag **510 Professional Problems** (1-4 cr, max 4). Primarily for students in the M.Ag. program. Professional paper required. Prereq: perm.

Ag **597** (s) **Practicum** (cr arr). Prereq: perm.

Ag **598** (s) **Internship** (cr arr). Prereq: perm.

Ag **599** (s) **Research** (cr arr). Prereq: perm.

Agricultural Economics

Richard W. Schermerhorn, Dept. Head (109 Ag. Sci. Bldg.). Professors Lindeborg, Marousek, Schermerhorn, Withers; Associate Professors Araji, Long, Michalson, Sargent; Associate Extension Professor and Extension Agricultural Economist Early; Assistant Professors Godfrey, Hamilton.

AgEc **101 Agriculture and Its Social and Eco-**

nomic Environment (3 cr). History of agriculture and man; agricultural industry and its relation to the social and economic problems of the U.S. and the world; factors affecting production and marketing of agricultural products. Also offered by correspondence study.

AgEc **208 Principles of Farm and Ranch Management** (3 cr). Decision-making for the farm operator who seeks maximum profits; application of economic principles and farm records to such decisions; methods of comparing alternative farming combinations and practices. Also offered by correspondence study.

AgEc **219 Marketing Farm Products** (3 cr). Marketing functions, agencies and services, demand, supply, cost and price theories. Also offered by correspondence study.

AgEc **332 Economics of Agricultural Development** (3 cr). Problems associated with the economics of major agricultural areas of the world; development of agriculture and economic growth.

AgEc **353 Agricultural Prices** (3 cr). Factors affecting farm commodity prices; production cycles; price variability and analysis. Prereq: Econ 252.

AgEc **356 Agricultural Programs and Policies** (3 cr). Development of national and state economic policies and programs applied to agriculture; current price, income and credit policies; evaluation of success or failure in accomplishing objectives.

AgEc **361 Farm and Natural Resource Appraisal** (3 cr). Methods; factors affecting the value of land and related resources; valuations for loans, sale, assessment, condemnation, and other purposes; procedures used by government and commercial agencies. Two 1-day field trips.

AgEc **391 Agricultural Business Management** (3 cr). Economic theory of the firm; application to management of agricultural processing and service firms; accounting, statistics, and efficiency studies for problem-solving. Prereq: 6 cr in economics or agricultural economics.

AgEc **451 Land Resource Economics** (3 cr). Land utilization, characteristics, and classification; agricultural, forest, and mineral lands; factors affecting land use; ownership and tenure, taxation, values, credit, and government policies. Also offered by correspondence study.

AgEc **477 Economics of Developing Countries** (3 cr). See Econ 477.

AgEc **481 Agricultural Market Analysis** (3 cr). Markets and market structures; types of competition and market power with implications for producers of farm products. Prereq: 219 or perm.

AgEc **493 Agricultural Production Economics** (3 cr). Economic theory related to agricultural production at the enterprise, firm, and industry levels.

AgEc **494 Mathematical Analysis Applied to Economics** (3 cr). Quantitative methods in relating mathematical analysis to economic theory; statistical techniques applied to economic activities. Prereq: perm.

AgEc **500 Master's Research and Thesis** (cr arr).

AgEc **501** (s) **Seminar** (cr arr). Prereq: perm.

AgEc **502** (s) **Directed Study** (cr arr). Prereq: perm.

AgEc **507 Research Methodology** (3 cr). Same as Econ 507. Theoretical background on the scientific method applied to economic research; organization, procedures, reporting, and evaluation of research. Prereq: perm.

AgEc **508 Problems in Production Economics Research** (3 cr). Objectives and techniques; application of probability models and their evaluation employing a number of econometric techniques. Prereq: 493 or perm.

AgEc **509 Dynamics of Agricultural Business Management** (3 cr). Economic analysis and operations research methods; procurement, processing, and marketing integrated within competitive and non-competitive economic models; major areas of risks and uncertainties. Prereq: perm.

AgEc **521 Advanced Microeconomic Theory** (3 cr). See Econ 521.

AgEc **522 Advanced Aggregate Economics** (3 cr). See Econ 522.

AgEc **523 Advanced Monetary Theory** (3 cr). See Econ 523.

AgEc **524 Theory of Economic Development** (3 cr). Same as Econ 524. Macro-dynamic theory as it relates to economic growth; conditions for and process of economic development and its significance to new areas and underdeveloped regions.

AgEc **525 Econometrics** (3 cr). Same as Econ 525. Mathematical formulation of theoretical economic models which serve as the basis for empirical investigations of economic behavior. Prereq: perm.

AgEc **551 Economics of Natural Resource Development** (3 cr). Allocation of natural resources over time and among uses; welfare economics and benefit cost analysis; valuation of extra-market goods; problems of social organization. Prereq: perm.

AgEc **599** (s) **Research** (cr arr). Prereq: perm.

AgEc **600 Doctoral Research and Dissertation** (cr arr). For students concentrating in agricul-

tural economics under the doctoral program in economics.

AgEc **601** (s) **Seminar** (cr arr). Prereq: perm.

AgEc **602** (s) **Directed Study** (cr arr). Prereq: perm.

AgEc **603** (s) **Independent Study** (cr arr). Prereq: perm.

Agricultural Education

Dwight L. Kindschy, Dept. Head (201-A Ag. Educ. Bldg.). Professor Kindschy; Associate Professors Haynes, Lawrence; Assistant Professor Shane.

AgEd **200** (s) **Seminar** (cr arr). Prereq: perm.

AgEd **203** (s) **Workshop** (cr arr). Prereq: perm.

AgEd **299** (s) **Directed Study** (cr arr). Prereq: perm.

AgEd **348 Extension Methods** (2 cr). Methods used in the field by county agents, college faculty members, extension specialists, and teachers of vocational agriculture. Also offered by correspondence study.

AgEd **351 Principles of Vocational Education** (2 cr). Same as VocEd 351. History, meaning, aims, administration, and place in the schools. Also offered by correspondence study.

AgEd **352 Beginning Methods** (2 cr). Problems, methods, and materials.

AgEd **400** (s) **Seminar** (cr arr). Prereq: perm.

AgEd **403** (s) **Workshop** (cr arr). Prereq: perm.

AgEd **453 Advanced Methods and Curricula** (3 cr). Continuation of 352. Prereq: sr standing.

AgEd **454 Methods of Teaching Farm Shop** (2 cr). Application of efficient organization and management practice in teaching farm mechanics.

AgEd **457 Adult Agricultural Education Methods** (2 cr). Methods in organizing and conducting young farmer and adult farmer classes.

AgEd **458 Supervision of the FFA** (2 cr). Includes community work and other problems not covered in 453.

AgEd **460 Practice Teaching** (1-9 cr, max 9). Students may complete four weeks of practice teaching prior to registration in the fall and be allowed to register for this course as a part of their academic program for the semester without penalty. Prereq: 352 and perm of dept.

AgEd **470 Proseminar** (1 cr, max 2).

AgEd **499** (s) **Directed Study** (cr arr). Prereq: perm.

AgEd **500 Master's Research and Thesis** (cr arr).

AgEd **501** (s) **Seminar** (cr arr). Prereq: perm.

AgEd **502** (s) **Directed Study** (cr arr). Prereq: perm.

AgEd **503** (s) **Workshop** (cr arr). Prereq: perm.

AgEd **557 Problems in Teaching Vocational Agriculture** (1-3 cr, max 9). Methods and new developments; may include attendance at summer conference. Consult the summer bulletin for special emphasis. Prereq: perm.

AgEd **561 Adult Programs in Agriculture** (1-6 cr, max 6). Philosophy, development, and status of adult education; current subject matter and organization in relation to progressive adult programs in Idaho and the Northwest.

AgEd **562 Advanced Methods in Farm Mechanics** (1-6 cr, max 6). Objectives, teaching methods, and current trends in farm mechanics programs in high schools and adult classes.

AgEd **583 Program Planning in Vocational Agriculture** (1-6 cr, max 6). Emphasis on preparation of off-farm agricultural occupations.

AgEd **597** (s) **Practicum** (cr arr). Prereq: perm.

AgEd **598** (s) **Internship** (cr arr). Prereq: perm.

AgEd **599** (s) **Research** (cr arr). Prereq: perm.

Agricultural Engineering

Delbert W. Fitzsimmons, Dept. Chairman (326 Buchanan Engr. Lab.). Professors Bloomsburg, Corey, Fitzsimmons, Martin; Associate Professors Dixon, Moden, Williams; Assistant Professors Busch, Molnau.

AgE **200** (s) **Seminar** (cr arr). Prereq: perm.

AgE **241 Introduction to Agricultural Engineering** (1 cr). Survey of the field; applications of engineering principles to agricultural problems. One 2-hr lab per wk.

AgE **299** (s) **Directed Study** (cr arr). Prereq: perm.

AgE **342 Agricultural Engineering Analysis** (3 cr). Methods of analyzing and solving engineering problems; original approaches; dimensional analysis, similitude, approximation, and numerical methods; use of analog

and digital computers in solving selected problems. Two lec and one 2-hr lab per wk. Prereq: Engr 131, Math 190.

AgE **351 Hydrology** (2-3 cr). Basic meteorologic and weather analysis; principles of evaporation, infiltration, and ground-water flow; analysis of precipitation and runoff; snowmelt relationships. Two lec, or two lec and one 2-hr lab per wk.

AgE **352 Fundamentals of Irrigation and Drainage** (3-4 cr). Irrigation consumptive use, methods, distribution, pumping, structures; surface and subsurface drainage; water rights and water resource developments. Three lec, or three lec and one 3-hr lab per wk.

AgE **372 Agriculture Machines** (3 cr) (472). Operation and functional requirements; force analysis; power transmission; man-machine relations; efficiency, safety, and economic considerations. Two lec and one 3-hr lab per wk. Prereq: ES 340.

AgE **449 Elements of Structural Engineering** (4 cr). Design of steel and timber members and connections, reinforced concrete beams, slabs, columns, and footings. Prereq: ES 340.

AgE **454 Drainage Theory** (2 cr). Fluid mechanics of saturated flow through soils; intro to unsaturated flow; procedures for and construction of subsurface drains; reclamation of saline and alkali soils. Prereq: ES 320.

AgE **458 Open Channel Hydraulics** (3 cr). Hydraulics of uniform and varied flow in open channels with fixed and movable beds.

AgE **461 Environmental Systems** (3 cr). Analysis and synthesis of environmental control systems for animal production, crop storage, and plant growth; farmstead planning; waste management. Coreq: ES 321.

AgE **462 Electric Power and Processing** (3 cr). Selection of electric motors and controls; wiring; drying, cooling, and conditioning of agricultural materials; materials handling and storage systems. Two lec and one 3-hr lab per wk.

AgE **471 Energy Conversion in Agricultural Systems** (2-3 cr). Principles and applications in agricultural systems; performance characteristics of energy sources, their limitations, instrumentation requirements, and economic considerations; the internal combustion engine and power transmission. Two lec, or two lec and one 3-hr lab per wk. Prereq: ES 321.

AgE **474 Fluid Power and Control Systems** (2 cr). Engineering design, analysis, and testing of basic fluid power and control systems; fluid power sources, fluid motors, basic circuit components and their symbols, and circuit design; agricultural machinery applications. One lec and one 3-hr lab per wk.

AgE **491-492 Seminar** (0 cr). Professional aspects of the field. Graded on the basis of P or F. Prereq: sr standing.

AgE **499** (s) **Directed Study** (cr arr). Prereq: perm.

AgE **500 Master's Research and Thesis** (cr arr).

AgE **501** (s) **Seminar** (cr arr). Prereq: perm.

AgE **502** (s) **Directed Study** (cr arr). Prereq: perm.

AgE **541 Measurement and Control Techniques** (3 cr). Methods and instruments used in research; electronic instrumentation; design of control systems and electronic measurement of physical quantities encountered in agricultural research.

AgE **551 Advanced Hydrology** (3 cr). Hydrologic processes as they relate to water control; methods of evaluating distribution factors; precipitation, runoff, evaporation, transpiration, and infiltration.

AgE **WS552 Advanced Theory of Irrigation Water Requirements** (3 cr). Energy balance and consumptive use of water; influence of farm and project irrigation system design criteria, management, and efficiencies.

AgE **ID555 Natural Channel Flow** (2-3 cr). Hydraulics of non-uniform flow in irregular channels, unsteady flow, flow routing, and density currents.

AgE **ID558 Fluid Mechanics of Porous Materials** (3 cr). Statics and dynamics of multiflow systems in porous materials; properties of porous materials, steady and unsteady flow.

AgE **562 Environmental Systems Design** (3 cr). Analysis and design of structures and environmental systems for livestock production, crop processing, and storage.

AgE **589 Water Resources Seminar** (1 cr). See Inter 589.

AgE **600 Doctoral Research and Dissertation** (cr arr).

AgE **601** (s) **Seminar** (cr arr). Prereq: perm.

AgE **602** (s) **Directed Study** (cr arr). Prereq: perm.

AgE **603** (s) **Independent Study** (cr arr). Prereq: perm.

Agricultural Mechanization

Delbert W. Fitzsimmons, Chairman, Dept. of Agricultural Engineering (326 Buchanan Engr. Lab.). Professors Corey, Fitzsimmons, Martin;

Associate Professors Dixon, Haynes, Williams; Assistant Professor Busch.

AgMech **101 Oxy-Acetylene Welding** (1 cr). Principles of operation, use, and care of oxy-acetylene welding and cutting equipment. One 3-hr lab per wk. Prereq: perm.

AgMech **107 Arc Welding** (1 cr). Principles of operation, use, and care of arc welding equipment. One 3-hr lab per wk. Prereq: perm.

AgMech **112 Engineering Applications in Agriculture** (3 cr). Engineering principles and their applications in agriculture, farm machinery and tractors, buildings, materials handling, processing irrigation, and drainage.

AgMech **115 Graphical Representations** (1 cr). Lettering, drafting procedures, orthographic projection, pictorial drawings, sketching, mechanical and agricultural drawings, graphical representations, drawing reproduction methods. One 3-hr lab per wk.

AgMech **302-303 Agricultural Education Shop I-II** (3 cr). Primarily for agricultural education students. AgMech 302: care and use of farm shop tools and equipment. AgMech 303: selection and operation of farm power units and machinery; service and repair of engines, electric motors, and machinery. One lec and two 3-hr labs per wk. Prereq: perm.

AgMech **305 Agricultural Machinery and Equipment** (2-3 cr). Application, operation characteristics, adjustments, servicing, and care of farm equipment; materials of construction, heat treatment, power transmission, and hydraulic systems. Two lec, or two lec and one 2-hr lab per wk.

AgMech **306 Agricultural Structures and Environmental Systems** (2-3 cr). Requirements and planning of farm buildings; materials of construction, loads on buildings, design of beams and columns, analysis of insulation and ventilation for environmental control. Two lec, or two lec and one 3-hr lab per wk.

AgMech **309 Gas Engines and Tractors** (2-3 cr). Construction and operation of internal combustion engines; application to small farm type engines and tractors, carburetion, valve timing, ignition, cooling, lubrication, and fuels; servicing and repair of stationery engines and farm tractors. Two lec, or two lec and one 2-hr lab per wk.

AgMech **312 Electric Power Application** (3 cr). Heat, light and power; circuits and wiring; selection of motors and controls; use of electricity for lighting, refrigeration, and ventilation. Two lec and one 2-hr lab per wk.

AgMech **315 Irrigation and Drainage** (2-3 cr). Irrigation, water resources, current irrigation developments, water rights, conveyance and measurement, pumps and pumping, soil-water-plant relationships, irrigation methods, surface and sub-surface drainage. Two lec, or two lec and one 3-hr lab per wk.

AgMech **400** (s) **Seminar** (cr arr). Prereq: perm.

AgMech **499** (s) **Directed Study** (cr arr). Prereq: perm.

Animal Industries

Jack E. McCroskey, Dept. Head (215 Ag. Sci. Bldg.). Professors Christian, Dahmen, McCroskey, Mullins, Petersen, Ross; Associate Professors Bull, Davis, Frederiksen, Hodgson, Sasser, Sauter; Associate Professor and Extension Specialist Hemstrom; Assistant Professors Howes, Jacobs, Thacker; Assistant Professor and Extension Specialist Meyer; Instructors Gibson, Gregory, Slyter, Steele, Woodruff; Extension Specialists Cleveland, Fiez, Gilbert, Miller, Wells.

Anl **109 Principles of Animal Science** (4 cr). Scope and potential of the livestock industry; types and breeds of livestock and poultry; inheritance, physiology, nutrition, management and classification, and grading of their products. Three lec and one 2-hr lab per wk.

Anl **152 Livestock Management Practices** (2 cr). Management practices in the production, exhibition, and marketing of livestock and poultry. Two 2-hr labs per wk. Graded on the basis of P or F.

Anl **205 Animal and Avian Nutrition** (3 cr). Nutrients, their metabolism, requirements, and application in ration formulation for animals and birds. May not be used for major credit by animal industries agricultural science majors.

Anl **WS212 Dairy Cattle Traits** (2 cr). WSU AS 212. Evaluating form and function in dairy cattle; measurement of production and evaluation of type.

Anl **222 Livestock Breeding and Reproduction** (3 cr). May not be used for major credit by animal industries agricultural science majors. Application of principles of genetics and reproductive physiology in livestock improvement, fertility, systems of mating, and selection techniques.

Anl **224 Horse Production** (3 cr) (324). Physiology, anatomy, and function of the horse as related to nutrition, breeding, and conformation; practical horse management and training. Enrollment limited to 36 students. Two lec and one 2-hr lab per wk; one 1/2-day field trip.

Anl **263 Introduction to Meat Science** (3 cr). Same as FS 263. Basic meats course; inspection, slaughter, processing, and factors which affect the quality and palatability of meat. Two lec and one 3-hr lab per wk; one 1-day field trip.

Anl **299** (s) **Directed Study** (cr arr). Prereq: perm. Graded on the basis of P or F.

Anl **303 Live Animal Selection and Carcass Evaluation** (3 cr) (203). Evaluation and selection of breeding and market animals; genetic, nutritional, and physiological factors influencing growth, development, and quality of meat animals; visual and objective appraisal. One lec and two 3-hr labs per wk; three 1-day and four 1/2-day field trips or equiv time.

Anl **304 Advanced Live Animal Selection and Carcass Evaluation** (3 cr). Live animal and carcass evaluation of beef, sheep, and swine. Students participate in live animal-meat evaluation contests. One lec and two 3-hr labs per wk; four 1-day and four 1/2 day field trips in addition to contests or equiv time.

Anl **305 Principles of Nutrition** (3 cr). Proteins, carbohydrates, fats, minerals and vitamins; physiology of digestion, absorption and metabolism of nutrients, and the relationship of enzymes and hormones in these phenomena. Prereq: Biochem 205 or organic chemistry.

Anl **306 Applied Animal Nutrition** (4 cr). Applying the principles of nutrition to feeding domestic animals and poultry; evaluating feedstuffs, comparisons of feeds and animal requirements. One 1-day field trip. Three lec and one 2-hr lab per wk.

Anl **ID308 Incubation and Hatchery Management** (2 cr). Alt/yrs 73-74. Avian embryonic development, physiology, nutrition, and morphology factors influencing hatchability, incubation methods, and hatchery management. One 1-day field trip.

Anl **321 Beef Cattle Science** (3 cr). Breeding, feeding, management, and marketing of commercial and purebred cattle.

Anl **322 Sheep Science** (3 cr). Alt/yrs 74-75. Breeding, feeding, management, marketing of commercial and purebred sheep; wool studies. Two lec and one 2-hr lab per wk.

Anl **323 Dairy Cattle Management** (3 cr). Operation of modern large dairy farms. Two lec and one 2-hr lab per wk.

Anl **326 Swine Science** (3 cr). Breeding, feeding, and management of swine, application of the sciences of nutrition, physiology, and genetics to the development of efficient swine enterprises.

Anl **328 Commercial Poultry and Egg Production** (3 cr). Alt/yrs 74-75. Modern housing, equipment, labor-saving and efficiency factors in flock management, production costs and returns. One 1-day field trip. Two lec and one 2-hr lab per wk.

Anl **334 Meat Technology** (3 cr). Same as FS 334. Fabricating and pricing of wholesale and retail cuts of meat; technology of fresh and processed meat; sausage making; quality control. Two lec and one 3-hr lab per wk. Prereq: 263 or FS 263.

Anl **403** (s) **Workshop** (cr arr). Normally offered in nutrition, breeding, products, and management. Graded on the basis of P or F. Prereq: perm.

Anl **410 Production and Processing Practices** (1 cr, max 2). Livestock, dairy, and poultry production; processing practices and facilities. One 7-day field trip or equiv time. Graded on the basis of P or F.

Anl **WS413 Physiology of Lactation** (3 cr). Alt/yrs 73-74. WSU AS 413. The endocrine system and the physiology of milk secretion, including bovine mammary anatomy, development, endocrine control, and synthesis of milk. Prereq: VS 371.

Anl **WS415 Animal Nutrition Laboratory** (1 cr). WSU AS 415. Quality control, proximate analysis, and other lab methods related to nutritional experiments with animals. Three hrs of lab per wk. Prereq: 305.

Anl **421 Population Genetics** (3 cr). Same as Genet 421. Gene frequency analysis: effects of natural and artificial selection on the genetic composition of populations; inheritance of quantitative characters; concepts of heritability; effects of inbreeding and outbreeding on populations. Prereq: Genet 314 or equiv.

Anl **422 Animal Breeding** (3 cr). Same as Genet 422. Application of genetic principles to the improvement of farm animals; effects of inbreeding, outbreeding, assortative, and disassortative mating on animal populations; selection for economically important traits; heritability; genetic correlations; use of selection indexes. Prereq: Genet 314 or equiv.

Anl **WS425 Animal Growth** (2 cr). Alt/yrs 74-75. WSU AS 422. Comparative mechanisms of the anatomical, physiological, and biochemical processes in growth and development of animals. Prereq: 305, Genet 314.

Anl **WS426 Animal Adaptation** (2 cr). Alt/yrs 74-75. WSU AS 423. Comparative mechanisms of the anatomical, physiological, biochemical, and behavioral processes in the adaptation of animals. Prereq: 305, Genet 314.

Anl **ID433 Poultry Products Technology** (3 cr). Alt/yrs 74-75. Processing, grading, packing, and storing of eggs and poultry; factors influencing quality and product utilization. One 1-day field trip. Two lec and one 2-hr lab per wk.

Anl **450 Proseminar** (1 cr, max 2). Special topics in animal industries.

Anl **451 Endocrine Physiology** (3 cr). Same as Zool 417. Structure and physiology of glands of internal secretion and their hormonal effects on processes of growth, development, metabolism, and production of vertebrates.

minor emphasis on invertebrates. Prereq: Biol 202 and organic chemistry or biochemistry or perm.

Anl **452 Physiology of Reproduction and Lactation** (3 cr). Physiology of reproduction of animals; structure, growth, development, and physiology of the mammary gland. Prereq: Biol 202 and organic chemistry or biochemistry or perm.

Anl **453 Physiology of Reproduction and Lactation Laboratory** (1 cr). Lab in reproduction and the structure, growth, development, and physiology of the mammary gland. One 3-hr lab per wk. Prereq: 452 or Zool 411 (may be concurrent).

Anl **ID454 Artificial Insemination** (1 cr). Techniques and procedures of semen collection, processing, evaluation, and insemination. One 3-hr lab per wk. Prereq: 452 or Zool 412 (may be concurrent). Graded on the basis of P or F.

Anl **ID457 Physiology and Endocrinology of Early Pregnancy** (2 cr). Physiology and endocrinology of pregnancy detection in domestic animals, laboratory animals, and man. One lec and one 3-hr lab per wk. Prereq: 451 or 452 or Zool 411 and perm.

Anl **499** (s) **Directed Study** (cr arr). Prereq: perm. Graded on the basis of P or F.

Anl **500 Master's Research and Thesis** (cr arr). Graded on the basis of P or F.

Anl **501** (s) **Seminar** (cr arr). Prereq: perm.

Anl **502** (s) **Directed Study** (cr arr). Prereq: perm.

Anl **503** (s) **Workshop** (cr arr). Prereq: perm.

Anl **511 Animal Nutrition** (3 cr). Biochemical and physiological aspects of nutrition of higher animals and man; function and metabolism of nutrients. Prereq: perm.

Anl **512 Energy Metabolism** (3 cr). Energy utilization dealing with techniques of calorimetry; biochemistry of intermediary energy transfers; effects of environmental factors of energy exchanges; estimation of the energy value of feeds for animals. Prereq: perm.

Anl **ID513 Microbiology and Physiology of Ruminant Nutrition** (3 cr). Physiology and microbial aspects of ruminant digestion and their influence on the metabolism of extraruminal tissues; interpretation of nutritive requirements in terms of rumen microbial activities; evaluation of research techniques. Prereq: perm.

Anl **514 Physiology of Non-Ruminant Nutrition** (3 cr). Physiology of digestion, absorption, and metabolism of nutrients in mononutritive requirements and nutritive interrelationships. Prereq: perm.

Anl **ID&WS520 Seminar in Animal Physiology** (1 cr, max arr). WSU AS 520. Current developments in animal physiology.

Anl **522 Statistical Genetics** (3 cr). Same as Genet 522. Statistical techniques used in population genetics research; methods of estimating heritability, genetic correlations, and phenotypic correlation; construction of selection indexes; mating systems; genetic homeostatis. Prereq: perm.

Anl **WS526 Advanced Reproduction** (4 cr). Alt/yrs 74-75. WSU AS 526. Physiology of sexual maturation; gametogenesis; sexual cycle; fertilization; embryonic development; physiological, chemical, and immunological characterization of hormones of reproduction. Prereq: 452 or equiv.

Anl **551 Advanced Endocrine Physiology** (3 cr). Biochemical and physiological properties of hormones; lab techniques in experimental endocrinology. Two lec and one 2-hr lab per wk. Prereq: 451, Chem 482.

Anl **552 Experimental Reproductive Physiology** (3 cr). Lab techniques used in physiology of reproduction research; comparative and differential fertility; effect of endocrine deficiencies and excesses on fertility and sterility; experimental control of reproduction in farm animals. Prereq: 451, Zool 412.

Anl **ID573 Meat Science** (3 cr) (572). Same as FS 573. Biochemical, histological, microbiological, and physiological properties of meat; their application to meat research. One lec and two 3-hr labs per wk.

Anl **WS596 Advanced Topics** (1-2 cr. max arr). WSU AS 598. Recent research in various disciplines of animal science.

Anl **597** (s) **Practicum** (cr arr). Prereq: perm.

Anl **598** (s) **Internship** (cr arr). Prereq: perm.

Anthropology

Roderick Sprague, Head, Dept. of Sociology/Anthropology (101 Graduate Center). Professor Sprague; Assistant Professors Lane, Rice.

PREREQUISITE: Ordinarily three credits in lower-division courses in anthropology are required for registration in upper-division courses in this field; exceptions by permission.

Anthr **109 Archaeology for the Amateur** (3 cr). Intro to archaeological field methods, elementary analysis, and interpretation of local finds. Six 1-day field trips.

Anthr **110 Introduction to Physical Anthropology and Archaeology** (3 cr). Theories,

methods, and findings as they relate to human paleontology, prehistory, and racial types.

Anthr **120 Introduction to Social Anthropology** (3 cr). Theories, methods, and findings as they relate to human culture, social organization, and language.

Anthr **200** (s) **Seminar** (cr arr). Prereq: perm.

Anthr **203** (s) **Workshop** (cr arr). Prereq: perm.

Anthr **223 Western Ranching Culture** (3 cr). Cultural ecology of livestock ranching; sheepmen, cattlemen, settlers. Prereq: 120.

Anthr **224 The Basque People** (3 cr). Ethnohistory of the Basque Country, Latin America, and the Western United States. Also offered by correspondence study. Prereq: 120.

Anthr **225 Aboriginal North American Indian** (3 cr). Origins, physical types, languages, and cultures of native populations of the Americas. Also offered by correspondence study.

Anthr **299** (s) **Directed Study** (cr arr). Prereq: perm.

Anthr **320 Peoples of the World** (3 cr). Societies of Eurasia, Africa, Americas, Australia, and Islands of the Pacific. Prereq: 120.

Anthr **321 Culture and Personality** (3 cr). Theories, methods, and findings of the interrelationship between the individual and his culture.

Anthr **322 Racial and Ethnic Relations** (3 cr). Same as Soc 322 and AfrAm 322. Racial, ethnic, and minority groups; their special problems in the U.S. Also offered by correspondence study.

Anthr **325 Indians of Idaho** (3 cr). Aboriginal American Indian societies of northwestern North America; emphasis on Idaho. Three 1-day field trips.

Anthr **330 World Prehistory** (3 cr). Prehistoric cultures of Old and New Worlds; techniques of excavation; methods of archaeological analysis.

Anthr **400** (s) **Seminar** (cr arr). Prereq: perm.

Anthr **401 Anthropological Field Methods** (1-8 cr, max 8). Supervised field training in archaeology and/or social anthropology.

Anthr **402 History of Anthropological Theory** (3 cr). Schools of anthropological method and theory in a developmental sequence. Prereq: 120, 320, 420.

Anthr **403** (s) **Workshop** (cr arr). Prereq: perm.

Anthr **420 Ethnological Issues** (3 cr). Contemporary theoretical debates in cultural ecology, ethnography, kinship, and political and economic anthropology. Prereq: 120, 320.

Anthr **421 Belief Systems of Simpler Societies** (3 cr). Theories, methods, and findings of comparative anthropological study; emphasis on religion.

Anthr **424 Seminar in Basque Studies** (3 cr). Reading and/or speaking knowledge of Basque, French, or Spanish recommended but not required. Prereq: 224.

Anthr **ID425 Contemporary North American Indian** (3 cr). Acculturation and current state of American Indian societies; emphasis on U.S. and Canada. Three 1-day field trips.

Anthr **427 Peoples of Africa** (3 cr). Same as AfrAm 427. Native societies; contemporary problems arising from European penetration; emergence of native states.

Anthr **435 North American Prehistory** (3 cr). Theories, methods, and findings of prehistoric North American archaeology.

Anthr **WS480 Descriptive Linguistics** (3 cr). WSU 454. Anthropological uses of linguistic data; language structure.

Anthr **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under the general supervision of a faculty member. Graded on the basis of P or F. Prereq: perm of dept.

Anthr **499** (s) **Directed Study** (cr arr). Prereq: perm.

Anthr **500 Master's Research and Thesis** (cr arr).

Anthr **501** (s) **Seminar** (cr arr). Subjects normally offered are: methods of anthropological research, anthropological theory, and human ecology. Prereq: perm.

Anthr **502** (s) **Directed Study** (cr arr). Subjects normally offered are: anthropological theory, applied anthropology, and ethnohistory. Prereq: perm.

Anthr **503 Anthropological Field Methods** (1-8 cr, max 8). Individual field work in approved areas. Prereq: perm.

Anthr **504** (s) **Workshop** (cr arr). Prereq: perm.

Anthr **ID521 Seminar in Acculturation** (2-4 cr, max 4). Prereq: perm.

Anthr **ID531 Historical Archaeology** (3 cr). Excavation and analysis of historical archaeological sites, including acculturational implications. Three 1-day field trips. Prereq: perm.

Anthr **WS571 Interpretation of Quaternary Terrestrial Sediments** (4 cr). WSU 570. Pleistocene paleoclimatic changes as inferred from sediments, land forms, and fossil soil of archaeological importance. Three lec and one 3-hr lab per wk. Prereq: perm.

Anthr **WS572 Physical Stratigraphy of Archae-**

ological Sites (4 cr). WSU 571. Recognition, description, sampling, and analysis of sediments typically found with human cultural materials. Three lec and one 3-hr lab per wk. Prereq: perm.

Anthr **ID573 Paleoecology** (3 cr). See Geol ID548.

Anthr **WS580 Linguistic Field Methods** (3 cr). WSU 554. Prereq: perm.

Anthr **597** (s) **Practicum** (cr arr). Prereq: perm.

Anthr **598** (s) **Internship** (cr arr). Prereq: perm.

Anthr **599** (s) **Research** (cr arr). Prereq: perm.

Architecture

Paul L. Blanton, Head, Dept. of Art and Architecture (102 Art and Arch. North). Professors Bartell, Blanton, Sloan, Snyder (Landscape Architecture); Associate Professors Ashland (Landscape Architecture), Bevans, Dotts; Assistant Professors Berg, Drew, McCroskey, Smith, Tinder; Instructors Eder, Hill.

Arch **155-156 Introduction to Architecture** (2 or 4 cr). Lecture: overview of environmental design professions, visual awareness, design theory. Lab: fundamentals of programs and systems, graphics, two- and three-dimensional studies in space, form, and color. Majors register for 4 cr (two lec and two 3-hr labs per wk). General students register for 2 cr (two 1-hr lec per wk).

Arch **200** (s) **Seminar** (cr arr). Prereq: perm.

Arch **255-256 Architectural Design I** (3 cr). Fundamental form, space, and system concepts in architecture and interior design. Three 3-hr labs per wk.

Arch **257-258 Landscape Architecture I** (3 cr). Arch 257: visual analysis and portrayal of landscape character; a study series; physical landscape analysis incorporates plant study and planting design; grading and earthwork introduced; terminal project combines these elements in an actual site study. Arch 258: fundamental landscape planning continues as applied to larger scale recreation and housing arrangement; soils, vegetation, and other ecological design determinants. One lec and two 3-hr labs per wk; one 1-day field trip second semester. Prereq: 257 for 258.

Arch **263 Programs and Systems I** (3 cr). Intro to computer languages; problem programming employing applicable computer techniques; systems involving geometry and space.

Arch **265-266 Materials and Methods** (3 cr). Materials, elements, and techniques of building; force systems, their resolutions and applications to the building frame.

Arch **275 History of Ancient Architecture** (2 cr). Prehistoric, Egyptian, Western Asian, Aegean, Greek, and Roman periods.

Arch **276 History of Medieval Architecture** (2 cr). Early Christian, Byzantine, Islamic, Romanesque, and Gothic periods.

Arch **285-286 Landscape Construction I-II** (3 cr). Drainage and grading; soils and terrain in relation to earthwork as design determinants; irrigation layout; design of landscape structures. Three 3-hr labs per wk; one 1-day field trip each semester.

Arch **292 Plant Materials and Planting Design I** (2 cr). Selection and use of plant materials in relation to soils, topography, and climate. Field study. One lec and one 3-hr lab per wk; one 1-day field trip.

Arch **299** (s) **Directed Study** (cr arr). Prereq: perm.

Arch **355-356 Architectural Design II** (4 cr). Situation response, program formulation, synthesis in architecture. Four 3-hr labs per wk; one 7-day field trip during yr.

Arch **357-358 Landscape Architecture II** (3 cr). Development of a spatial notation system and visual analysis of the landscape, plant study, and planting design; grading problems; terminal project combines these elements in an actual site study. One lec and two 3-hr labs per wk; one 7-day field trip during yr. Prereq: 258.

Arch **359-360 Interior Design I** (3 cr). Situation response program formulation synthesis in interior design. Three 3-hr labs per wk; one 7-day field trip during yr.

Arch **363 Programs and Systems II** (2 cr). Goals and identification of architectural form determinants; analytic methods for the synthesis of architectural elements using applicable computer techniques.

Arch **365-366 Building Technology I** (4 cr). Basic behavior of elastic materials under various load conditions; design of elementary framing members, connections, and assembly (wood); environmental control; water supply, drainage, heating, and air conditioning systems.

Arch **369-370 Interiors and Materials** (3 cr). Use and application of textiles and furniture; drawings and models; furniture design.

Arch **375 History of Renaissance Architecture** (2 cr). Renaissance and Baroque periods in Europe from 1400 to 1800.

Arch **376 History of Modern Architecture** (2 cr). 19th and 20th centuries; emphasis on Europe and the U.S.

Arch **392 Plant Materials and Planting Design II** (2 cr). Continuation of 292. One lec and one 3-hr lab per wk; one 1-day field trip.

Arch **400** (s) **Seminar** (cr arr). Prereq: perm.

Arch **455-456 Architectural Design III** (4 cr). The building, the community, and the environment in architecture. Four 3-hr labs per wk; one 7-day field trip during yr.

Arch **457-458 Landscape Architecture III** (3 cr). Fundamentals, analysis and design applied to large-scale recreation and suburban development; soils, vegetation, and other ecological criteria as design determinants. One lec and two 3-hr labs per wk; one 7-day field trip during yr. Prereq: 457 for 458.

Arch **459-460 Interior Design II** (3 cr). Advanced problems in interior design. Three 3-hr labs per wk; one 7-day field trip during yr.

Arch **463 Programs and Systems III** (2 cr). Analytic research problems; development of design systems and activity analysis using applicable computer techniques.

Arch **465-466 Building Technology II** (4 cr). Design of steel and reinforced concrete buildings; theory and analysis of complex framing systems; environmental control; electrical systems, lighting and acoustics.

Arch **467-468 Introduction to City Planning** (3 cr). History and theory of city planning and the problems associated with urban growth; analysis of 20th-century planning to the U.S. and Europe; group housing and urban development patterns.

Arch **469-470 Interiors and Materials II** (2 cr). Use and application of ceramics, metals, and plastics; problems of acoustics; drawings and models.

Arch **473-474 Seminar in Research Methods** (2 cr). Problems relating to advanced information gathering, evaluation, and program formulation; applicable computer techniques.

Arch **475-476 Architectural Design IV** (5 cr). Case studies through analysis of significant aspects of building and project types. Five 3-hr labs per wk.

Arch **483 Park and Recreation Planning** (2 cr). Recreation facilities of community role; recreation concepts; design in relation to community socio-economic structure, land use, and recreation potential. One lec and one 3-hr lab per wk.

Arch **484 Regional Landscape Planning** (2 cr). Land use, analysis, and planning; use in relation to regional scale; problems in special area studies. One lec and one 3-hr lab per wk.

Arch **485-486 Building Technology III** (2 cr). Seismic analysis in basic and complex buildings; special problems (building type); environmental control, communications, and sound control systems.

Arch **493-494 Seminar in Urban Studies** (2 cr) See Inter 493-494.

Arch **495-496 Professional Practice I-II** (3 cr). The architect's duties and responsibilities in practice (construction documents and contracts), project supervision, office administration, and comprehensive services; specification writing, unit costs, and building estimation.

Arch **498** (s) **Proseminar** (1-3 cr, max 6). Prereq: perm.

Arch **499** (s) **Directed Study** (cr arr). Prereq: perm.

Arch **500 Master's Research and Thesis** (cr arr).

Arch **501** (s) **Seminar** (cr arr). Prereq: perm.

Arch **502** (s) **Directed Study** (cr arr). Prereq: perm.

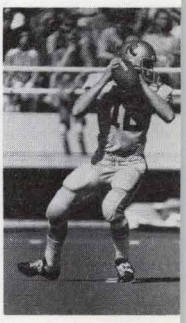
Arch **503** (s) **Workshop** (cr arr). Prereq: perm.

Arch **562 Concepts in Contemporary Habitation** (3 cr). The house in history and establishing precedents for the current patterns of housing with a critical analysis to determine their suitability to the requirements of today's society.

Arch **597** (s) **Practicum** (cr arr). Prereq: perm.

Arch **598** (s) **Internship** (cr arr). Prereq: perm.

Arch **599** (s) **Research** (cr arr). Prereq: perm.



Art

Paul L. Blanton, Head, Dept. of Art and Architecture (102 Art and Arch. North). Professors Dunn, Roberts (Chairman, Art), Westerlund; Assistant Professors Curtis, Wray; Instructors Cronk, Moreland.

Art **101-102 Survey of Art** (2 cr). To promote an understanding and appreciation of the various arts; viewpoints of artist and layman.

Art **111-112 Drawing I** (2 cr). Freehand drawing; emphasis on expressive use of materials. Two 2-hr labs per wk and assigned work.

Art **121-122 Design I** (2 cr). Elements of design explored through various media in two- and three-dimensional problems. Two 2-hr labs per wk and assigned work.

Art **200** (s) **Seminar** (cr arr). Prereq: perm.

Art **203** (s) **Workshop** (cr arr). Normally offered

in painting, water color, sculpture, drawing, ceramics, design, printmaking, and jewelry. Prereq: perm.

Art **211-212 Drawing II** (2 cr). Advanced drawing from life and nature. Two 3-hr labs per wk. Prereq: 111-112.

Art **221-222 Design II** (2 cr). Advanced design explored through various media in two- and three-dimensional problems. Two 2-hr labs per wk and assigned work.

Art **223-224 Graphic Design I** (2 cr). Lettering, typography, and layout. Art 223: basic letter forms and calligraphy. Art 224 (same as Jour 224): typography and layout. One lec and one 3-hr lab per wk.

Art **231-232 Painting I** (2-4 cr, max 8). Fundamentals of painting and color. One 3-hr lab per wk per cr.

Art **233-234 Water Color I** (2 cr). Intro to techniques of water color painting by individual instruction and group criticism. One lec and one 3-hr lab per wk. Prereq: 111-112.

Art **241-242 Sculpture I** (2 cr). Experiments in three-dimensional design employing sculptural tools, techniques, and materials. Two 3-hr labs per wk.

Art **261-262 Ceramics I** (2 cr). Hand-built pottery; use of wheel; glazing and firing. Two 3-hr labs per wk.

Art **299** (s) **Directed Study** (cr arr). Prereq: perm.

Art **301-302 History of Painting** (3 cr). Technical study of the great occidental painters of history.

Art **311-312 Drawing III** (2 cr). Advanced drawing from life in various media. Three hrs per wk per cr.

Art **323-324 Graphic Design II** (2 cr). Problems in illustration and advertising design. Two 3-hr labs per wk; one 2-day field trip one semester.

Art **331-332 Painting II** (2-4 cr, max 8). Painting in oil from the model, nature, and abstract form. One 3-hr lab per wk per cr. Prereq: 111-112 or 231-232.

Art **333-334 Water Color II** (2 cr). Techniques of water color painting; sketching from still life and nature. One lec and one 3-hr lab per wk. Prereq: 111-112.

Art **335-336 Composition** (3 cr). Pictorial composition through student problems. Prereq: 111-112 and 211-212 or 331-332.

Art **341-342 Sculpture II** (2-4 cr, max 8). Individual investigation of sculptural concepts and advanced techniques. One 3-hr lab per wk per cr.

Art **351-352 Printmaking** (2 cr). Art of printmaking; relief; planographic, and intaglio. Two 3-hr labs per wk. Prereq: 111-112.

Art **361-362 Ceramics II** (2 cr). Continuation of basic techniques; individual experiments with form and glazes. Two 3-hr labs per wk.

Art **371-372 Jewelry** (2 cr). Design of semi-precious materials; jewelry and silversmithing techniques; cutting and use of semi-precious stones. Prereq: 121-122.

Art **391-392 Crafts in Art Education** (2 cr). Design of leathers and other craft materials.

Art **400** (s) **Seminar** (cr arr). Prereq: perm.

Art **403** (s) **Workshop** (cr arr). Normally offered in painting, water color, sculpture, drawing, ceramics, design, printmaking, jewelry, art education, elementary school art, junior-high school art, and senior-high school art. Prereq: upper-div standing and perm.

Art **423-424 Graphic Design III** (3 cr). Advanced problems in illustration and advertising design; lectures on production and studio practice. One lec and two 3-hr labs per wk; one 2-day field trip one semester.

Art **431-432 Painting III** (2-4 cr, max 8). Advanced painting; portrait, life, and creative composition. One 3-hr lab per wk per cr.

Art **433-434 Water Color III** (2 cr).

Art **441 Sculpture III** (2-4 cr, max 8).

Art **463 Thesis** (2-4 cr, max 8).

Art **497** (s) **Proseminar** (1-3 cr, max 12). Prereq: perm.

Art **499** (s) **Directed Study** (cr arr). Prereq: perm.

Art **500 Master's Research and Thesis** (cr arr).

Art **501** (s) **Seminar** (cr arr). Prereq: perm.

Art **502** (s) **Directed Study** (cr arr). Prereq: perm.

Art **503** (s) **Workshop** (cr arr). Prereq: perm.

Art **504** (s) **Studio Problems** (3-5 cr, max 10).

Art **597** (s) **Practicum** (cr arr). Prereq: perm.

Art **598** (s) **Internship** (cr arr). Prereq: perm.

Art **599** (s) **Research** (cr arr). Prereq: perm.

Bacteriology

Campbell M. Gilmour, Head, Dept. of Bacteriology and Biochemistry (14 Life Sci. Bldg.). Professors Anderson, Beck, Gilmour; Associ-

ate Professor Teresa; Assistant Professors Heimsch, Lingg.

Bact **250 General Bacteriology** (4 cr). Primarily for students in the sciences. Two lec and two 2-hr labs per wk. Prereq: Chem 103 or 111.

Bact **254 Public Health and Hygiene** (3 cr). Applied hygiene and sanitation from the standpoint of bacteriological and related sciences; prevention of communicable diseases; environment in relation to health and disease. Also offered by correspondence study .

Bact **304 Pathogenic Bacteria** (3 cr). Disease-producing organisms; cultural, biochemical, and morphological characteristics which serve as a means of identification. Prereq: Bact 250.

Bact **305 Pathogenic Bacteriology Laboratory** (2 cr). Isolation and identification of disease-producing organisms. Two 2-hr labs per wk. Prereq or coreq: 304.

Bact **400** (s) **Seminar** (cr arr). Prereq: perm of dept.

Bact **402 Food and Applied Microbiology** (4 cr). Microbiological processes of importance to the food and fermentation industries; spoilage, spoilage control, and sanitation; food poisoning and food-borne infections. Two lec and two 3-hr labs per wk; one field trip. Prereq: 250.

Bact **409 Immunology** (3 cr). Theory and mechanisms of the immune response: immunogens, lymphatics, lymph and the lymphomyeloid complex, humoral and cellular immunity, immunoglobulins, complement, antigen-antibody reactions, immune tolerance, hypersensitivity, immunological deficiencies, blood transfusion, cancer immunology, tissue and organ transplantations and autoimmunity. Prereq: 250.

Bact **410 Immunology Laboratory** (2 cr). Preparation of immunizing agents, agglutination, hemagglutination, complement fixation, precipitation, medical legal serology, phagocytosis, toxins and antitoxins, hypersensitivity, immunoelectrophoresis, gel-diffusion analysis, immunofluorescence and autoimmunity. Two 2-hr labs per wk. Prereq or coreq: 409.

Bact **414 Clinical Laboratory Methods** (4 cr). Methods of analysis used in clinical laboratories; lab procedures in hematology, clinical chemistry, and serological diagnosis of disease. Two lec and two 3-hr labs per wk. Prereq: 250, 304, Chem 253.

Bact **421 Clinical Diagnosis: Internship** (1-32 cr, max 32). Lab methods used in hospital and public health labs; work to be pursued in approved and designated hospital or public health labs containing suitable equipment and staff. Twelve mos training. Prereq: 414.

Bact **425 Soil and Aquatic Microbiology** (3 cr). Same as Soils 425. Biogeochemical activities and relationships of microorganisms in soil and aquatic environments. Two lec and one 3-hr lab per wk. Prereq: 250.

Bact **481 Virology** (3 cr) (509). See VS 481.

Bact **499** (s) **Directed Study** (cr arr). Prereq: perm.

Bact **500 Master's Research and Thesis** (cr arr).

Bact **501** (s) **Seminar** (cr arr). Prereq: perm.

Bact **502** (s) **Directed Study** (cr arr). Areas normally offered are: aquatic, food, immunology, medical, microbial ecology, physiology, and soils. Prereq: perm.

Bact **503 Physiology of Bacteria** (2-4 cr). Alt/yrs 74-75. Cellular physiology as it applies to bacteria; cell structure and composition, metabolism, growth, and variation. Two lec, or two lec with labs per wk. Prereq: 250.

Bact **505 Microbial Fermentations** (2-4 cr). Alt/yrs 73-74. Industrial and non-industrial fermentations; biochemical mechanisms and methods of fermentation analysis. Two lec, or two lec with labs per wk. Prereq: 250, Chem 372, or perm.

Bact **507 Bacterial Taxonomy** (2 cr). Taxonomic groups of bacteria; philosophies of classification. Prereq: 250, 304.

Bact **512 Microbial Genetics** (2-4 cr). Same as Genet 512. Genetics of microorganisms; reproduction, variation, and heredity. Prereq: elem course in genetics is recommended.

Bact **597** (s) **Practicum** (cr arr). Prereq: perm.

Bact **598** (s) **Internship** (cr arr). Prereq: perm.

Bact **599** (s) **Research** (cr arr). Prereq: perm.

Bact **600 Doctoral Research and Dissertation** (cr arr).

Bact **601** (s) **Seminar** (cr arr). Prereq: perm.

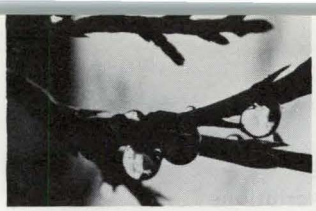
Bact **602** (s) **Directed Study** (cr arr). See 502 for areas normally offered. Prereq: perm.

Bact **603** (s) **Independent Study** (cr arr). Prereq: perm.

Biochemistry

Campbell M. Gilmour, Head, Dept. of Bacteriology and Biochemistry (14 Life Sci. Bldg.). Professors Le Tourneau, Wiese.

Biochem **205 General Biochemistry** (4 cr).



Chemistry as applied to agriculture, composition, metabolism, and growth of plants and animals. Three lec and one 3-hr lab per wk. Prereq: Chem 112 or 114.

Biochem **401 Undergraduate Research** (1-2 cr. max 4). Individual study. Prereq: sr standing and perm.

Biochem **431 Chemistry and Physiology of Vitamins** (3 cr). Alt/yrs 73-74. Includes their relation to human and animal nutrition. Prereq: course in biochemistry.

Biochem **461 Plant Biochemistry** (3 cr). Alt/yrs 73-74. Composition and metabolism of higher plants. Prereq: course in biochemistry.

Biochem **462 Plant Biochemistry Laboratory** (1 cr). Methods and techniques for analyzing plant materials. One 3-hr lab per wk. Prereq or coreq: 461, Chem 253, or equiv.

Biochem **490 Proseminar** (1 cr, max 2). Prereq: jr standing and perm.

Biochem **500 Master's Research and Thesis** (cr arr).

Biochem **501** (s) **Seminar** (cr arr). Prereq: perm.

Biochem **502** (s) **Directed Study** (cr arr). Prereq: perm.

Biochem **505 Advanced Laboratory Techniques** (4 cr). Same as Soils 505. Chromatography, spectrophotometry, manometric and other special techniques. Two lec and two 3-hr labs per wk. Prereq: Chem 253 and perm.

Biochem **531 Enzymes and Intermediary Metabolism** (3 cr). Alt/yrs 74-75. Chemistry of enzymes and intermediary metabolism of carbohydrates, lipids, and proteins. Prereq: Chem 481 or equiv.

Biochem **532 Enzymology Laboratory** (1 cr). Alt/yrs 74-75. One 3-hr lab per wk. Prereq or coreq: 531.

Biochem **581 Carbohydrates and Lipid Chemistry** (3 cr). Alt/yrs 74-75. See Chem 581.

Biochem **582 Amino Acids and Protein Chemistry** (3 cr). Alt/yrs 73-74. See Chem 582.

Biochem **597** (s) **Practicum** (cr arr). Prereq: perm.

Biochem **598** (s) **Internship** (cr arr). Prereq: perm.

Biochem **599** (s) **Research** (cr arr). Prereq: perm.

Biochem **600 Doctoral Research and Dissertation** (cr arr).

Biochem **601** (s) **Seminar** (cr arr). Prereq: perm.

Biochem **602** (s) **Directed Study** (cr a Prereq: perm.

Biochem **603** (s) **Independent Study** (ARR(% Prereq: perm.

Biology

Doyle E. Anderegg, Head, Dept. of Biological Sciences (115 Life Sci Bldg.). Professor Anderegg; Associate Professors Forbes, Johnson, Larrison, McMullen, Rabe, Tylutki; Assistant Professors Naskali, Rourke, Wallace.

Biol **100 Man and the Environment** (4 cr). Not open to majors or for minor credit. Fundamental concepts of cellular biology, genetics, evolution ecosystem ecology, environmental problems, and philosophy regarding man's place in nature. Three lec and one 2-hr lab per wk.

Biol **150 Heredity and Man** (2 cr). Same as Genet 106. Not open for credit to majors, minors, or students who have previous credit in genetics. Inheritance with emphasis on man.

Biol **201 Introduction to the Life Sciences** (4 cr). Biological principles important in understanding animals, plants, and microorganisms; cytology; ecology; evolution; genetics; growth; molecular biology; physiology. Three lec and two 2-hr labs per wk. Prereq: one yr high school chemistry with a grade of C or better or Chem 103 or 111.

Biol **202 General Zoology** (4 cr). Anatomy, embryology, histology, and physiology of vertebrate and invertebrate animals; the animal kingdom. Three lec and two 2-hr labs per wk. Prereq: 201.

Biol **203 General Botany** (4 cr). Vegetative and reproductive processes and structures of flowering plants in relation to environment, heredity, economics, and distribution; other divisional representatives of the plant kingdom in relation to flowering plants. Three lec and two 2-hr labs per wk. Prereq: 201.

Biol **207 Introduction to Oceanography** (3 cr). History, methods, and materials; geological, physical-chemical, and biological characteristics of the oceans; biological aspects emphasized. Prereq: course in biological science and sophomore standing.

Biol **331 General Ecology** (3 cr). Ecological principles of plants and animals; structure and function of the ecosystem; major ecosystems of the world. Two lec and one 1-hr demonstration per wk. Prereq: 202-203 or one yr of biology.

Biol **351 General Genetics** (3 cr). Same as Genet 314 and PlSc 314. Genetic mechanisms

in animals, plants, microorganisms; forms important in biological research. Also offered by correspondence study. Prereq: 201

Biol **352 General Genetics Laboratory** (1 cr). Same as Genet 315. One 3-hr lab per wk. Prereq or coreq: 351 or Genet 314 or PlSc 314.

Biol **361 Biological Literature** (1 cr). Botanical and zoological literature. Prereq: major in one of the life sciences or twenty cr in any combination of biology, botany, or zoology.

Biol **405 Biological Laboratory Procedures** (2 cr). Lab organization, preparations, and demonstrations using readily available, inexpensive materials.

Biol **N433 Bioecology** (3 cr). Consideration of the ecology of plants and animals in the field. Field labs and at least one weekend field trip.

Biol **442 Biological Evolution** (3 cr). Genetic, ecological, and paleontological aspects of evolution, including that of man. Also offered by correspondence study. Prereq: 202 and 351, or perm.

Biol **443 Bioecology** (3 cr). Consideration of the ecology of plants and animals in the field. Field labs and at least one weekend field trip.

Biol **445 Taxometrics** (3 cr). Quantitative approach to classification; analysis of numerical and computer taxonomics, phenetic and phylogenetic systems, codification of biological entities; applications of information theory to taxonomy; a numerical taxonomic problem worked out on a computer. Prereq: Ag 321 or perm.

Biol **451 Cytology** (3 cr). Structure and function of the nucleus and cytoplasm in animal and plant cells. Two lec and one 3-hr lab per wk. Prereq: 351.

Biol **462 Biological Field and Museum Techniques** (3 cr). Plants and animals in research and exhibit museums; organization and administration of collecting expeditions, types of specimens and field data obtainable, methods of analysis, storage of specimens, exhibit techniques, dissemination of research results. Two lec and one 3-hr lab per wk; one 4-day field trip. Prereq: perm.

Biol **499** (s) **Directed Study** (cr arr). Prereq: perm.

Biol **501** (s) **Seminar** (cr arr). Prereq: perm.

Biol **502** (s) **Directed Study** (cr arr). Prereq: perm.

Biol **503** (s) **Workshop** (cr arr). Prereq: perm.

Biol **504 Colloquium** (1 cr, max 2).

Biol **555 Physiological and Molecular Genetics** (2-3 cr). Same as Genet 537. Prereq: 351 or Genet 314 or PlSc 314.

Botany

Doyle E. Anderegg, Head, Dept. of Biological Sciences (115 Life Sci. Bldg.). Professor Roberts; Associate Professors McMullen, Spomer, Tylutki; Assistant Professors Henderson, Naskali.

Bot **241 Systematic Botany** (3 cr). Classification and identification of flowering plants; local flora. Three 2-hr labs per wk. Prereq: Biol 203 or perm.

Bot **311 Plant Physiology** (3 cr). Water and mineral relations, plant growth regulators, photophysiology, and selected topics of developmental physiology. Prereq: Biol 203 and organic chemistry.

Bot **312 Plant Physiology Laboratory** (2 cr). Two 3-hr labs per wk. Prereq or coreq: 311.

Bot **325 Morphology of Lower Plants** (4 cr). Structures, life histories, classifications, and phylogeny of fungi and algae. Two lec and two 3-hr labs per wk. Prereq: Biol 203.

Bot **326 Morphology of Bryophytes and Vascular Plants** (4 cr). Structures, life histories, classification, and phylogeny of liverworts, mosses, ferns, clubmosses, horsetails, conifers, and flowering plants. Two lec and two 3-hr labs per wk. Prereq: Biol 203.

Bot **364 Botanical Microtechnique** (3 cr). Methods of treating plant tissues for microscopic examination or histochemical tests. Two 3-hr labs per wk. Prereq: Biol 203 or perm.

Bot **381 Mushroom Identification** (1 cr). Methods of mushroom study; emphasis on the natural history of higher Basidiomycetes and Ascomycetes of the Pacific Northwest. Two 2-hr lec-labs per wk for the first 8 wks; one field trip (Fri-Sat-Sun) to Priest Lake. Prereq: course in biology.

Bot **382 Mold Identification** (1 cr). Methods and procedures for identifying filamentous fungi (Phycomycetes, Ascomycetes, Fungi Imperfecti) commonly found in soil, water, air, and decomposing organic matter. Two 2-hr lec-labs per wk for second 8 wks; two field trips. Prereq: course in biology.

Bot **401 Techniques of Plant Tissue Culture** (2 cr). Isolation and culture of higher plant cells, tissues, and organs, including physiological studies on the nutrition and morphogenesis of the cultures. Two 3-hr labs per wk. Prereq: perm.

Bot **413 Mineral Nutrition** (3 cr). Alt/yrs 73-74. Same as Soils 448. Physiology of mineral elements in higher plants; essentiality, metabolic function, deficiency symptoms and theories of ion uptake and translocation. Two lec and

one 2-hr disc per wk. Prereq: 311 and organic chemistry.

Bot **425 Developmental Plant Anatomy** (4 cr). Origin and development of tissues and organs of vascular plants in relation to heredity, environment, and physiology. Eight hrs per wk. Prereq: Biol 203.

Bot **432 Plant Ecology** (3 cr). Structure, composition, dynamics, and classification of plant communities; role of environmental factors; methods of sampling; phytogeography of North America. Two lec and one 3-hr lab per wk; three 1-day field trips. Prereq: Biol 203, 331; Bot 241 recommended.

Bot **WS435 Synecology** (3 cr). WSU 462. Structure, methods of analysis, dynamic behavior of plant communities. Prereq: 241.

Bot **WS437 Field Ecology** (2 cr). WSU 463. Structure, environmental relations; dynamism of local desert, grass land, and forest communities. Field trips. Prereq: WS435.

Bot **441 Agrostology** (3 cr). Classification, distribution, and structure of grasses. One lec and two 3-hr labs per wk. Prereq: Biol 203 or perm.

Bot **N443 Field Botany** (3 cr). Field observations, collection, preservation, and identification of local plants; consideration of habitat. Two lec and three 3-hr labs per wk.

Bot **472 Biology of Fungi** (4 cr). Life activity of fungi; examination of structure, life histories, and classification. Two lec and two 3-hr labs per wk. Prereq: Biol 203 or perm.

Bot **474 Phycology** (4 cr). Morphology and ecology of fresh water and marine algae; principles of classification; collection, identification, and making of permanent microscopic preparations. Prereq: Biol 203.

Bot **499** (s) **Directed Study** (cr arr). Prereq: perm.

Bot **500 Master's Research and Thesis** (cr arr).

Bot **501** (s) **Seminar** (cr arr). Prereq: perm.

Bot **502** (s) **Directed Study** (cr arr). Prereq: perm.

Bot **503** (s) **Workshop** (cr arr). Prereq: perm.

Bot **504 Colloquium** (1 cr, max 2).

Bot **512 Plant Growth Substances** (3 cr). Alt/yrs 74-75. Physiology of some auxin regulated growth phenomena; current theories of auxin action in higher plants. Two lec and one 2-hr disc per wk. Prereq: 311 and organic chemistry.

Bot **532 Autecology of Plants** (3 cr). Alt/yrs 74-75. Factors of the environment, plant reactions, ecological adaptations. Two lec and one 2-hr lab-disc per wk. Prereq: 432.

Bot **535 Plant Geography** (3 cr). Alt/yrs 73-74. Spatial relations of plants and plant communities as determined by intrinsic factors such as genetics and evolution, and extrinsic factors such as physiography, geology, climate, and climatic change; mechanisms of distribution; discontinuity patterns. Prereq: 432 or perm.

Bot **539 Physiological Ecology** (2 cr) Alt/yrs 73-74. Physiological mechanisms which influence plant distribution; natural inhibitors, toxins, symbiosis, soil nutrients, radiation, micro- and macro-organismal interrelationships. Prereq: 432.

Bot **ID558 Genetics of Fungi** (3 cr). Alt/yrs 74-75. Same as Genet 511. Genetic systems and sexuality of fungi. Prereq: 472, Biol 351, or perm.

Bot **WS575 Basidiomycetes** (3 cr). WSU PP 522. Taxonomy, physiology, reproduction of rusts, smuts, and higher basidiomycetes. Prereq: 241, Biol 203, or PISc 303.

Bot **WS576 Ascomycetes and Fungi Imperfecti** (2 cr). WSU PP 523. Taxonomy, phylogeny, physiology, and reproduction of ascomycetes and fungi imperfecti. Prereq: 241, Biol 203, or PISc 303.

Bot **WS577 Myxomycetes and Phycomycetes** (2 cr). WSU PP 524. Taxonomy, phylogeny, physiology, and reproduction of myxomycetes and phycomycetes. Prereq: 241, Biol 203, or PISc 303.

Bot **WS590 Advanced Topics in Botany** (2 cr). WSU 590. Recent research in plant science; includes library research and preparation of a term paper. Prereq: major in botany or equiv.

Bot **600 Doctoral Research and Dissertation** (cr arr).

Bot **601** (s) **Seminar** (cr arr). Prereq: perm.

Bot **602** (s) **Directed Study** (cr arr). Prereq: perm.

Bot **603** (s) **Independent Study** (cr arr). Prereq: perm.

Business

George W. Sheldon, Dept. Chairman (218 Admin. Bldg.). Professors Carter, Chrysler, Dobler; Associate Professors Del Mar, Golis, Moore, Parks, Seelye, Sheldon; Assistant Professors Benke, Hallaq, Trimble.

Bus **101 Introduction to Business Enterprises** (3 cr). Intro to business and economics.

Bus **R135 Principles of Cost Estimating** (3 cr). Techniques and skills; cost elements, data sources, and their application.

Bus **R136 Government Contract Pricing** (3 cr). Methodology of pricing. Prereq: R135 or perm.

Bus **R137 Fundamentals of Purchasing** (3 cr). Basic principles and methods of procurement, including contract types, finance, law, organization, and management.

Bus **200** (s) **Seminar** (cr arr). Prereq: perm.

Bus **R215 Government Contract Negotiation** (3 cr). Prime and subcontractor selection and negotiation with emphasis on management and behavior concepts; evaluation of contractors, marketing, pre-contract matters, and negotiation of all types of contracts. Prereq: perm.

Bus **231 Statistics** (4 cr). Same as InfSc 231. Intro to probability theory, hypothesis testing, and statistical inference. Prereq: Math 112 or 180.

Bus **232 Quantitative Methods in Business** (3 cr) (432). Same as InfSc 232. Survey of operations research. Prereq: 231.

Bus **233 Introduction to Computers** (3 cr). Same as InfSc 233. Fortran IV programming; programmed instruction. Graded on the basis of P or F.

Bus **299** (s) **Directed Study** (cr arr). Prereq: perm.

Bus **301 Financial Management** (3 cr). Policies and practices. Prereq: Acctg 132, Econ 252.

Bus **302 Financial Institutions and Credit** (3 cr). Emphasis on financial intermediaries, investment banking, and government financial institutions. Prereq: Acctg 132, Econ 252.

Bus **311 Introduction to Management Theory** (3 cr). Organization structures; philosophy and values in business; organization as a social issue.

Bus **312 Industrial Management** (3 cr). Location, buildings, equipment, layout, materials, production control, personnel policies. One 1-day field trip. Prereq: 231.

Bus **321 Marketing** (3 cr). Marketing processes, institutions, and middlemen. Prereq: Econ 252.

Bus **323 Principles of Advertising** (3 cr). Function; social and economic aspects; motivation, copy illustration, layout, and media; campaign planning. Also offered by correspondence study. Prereq: jr standing.

Bus **324 Sales Management** (3 cr). Selecting, training, compensating, stimulating, supervising, and directing the selling efforts of an outside sales force; organization and methods.

Bus **R325 Advanced Purchasing** (3 cr). Function of purchasing; solicitation, selection of contracts, administration, changes, and problems in the procurement process.

Bus **R333 Electronic Computers in Business and Economics** (3 cr). Impact of computers on decision making; Fortran IV, Cobol, PL/1; information science; information systems and data processing. Prereq: 233.

Bus **R335 PL/1 Computer Language** (3 cr). PL/1 computer language with applications for business students. Not open to students who have taken Math 205.

Bus **R360 Government Contract Law and Administration** (3 cr). Principles of law which affect a government agency's action; emphasis on AEC. Prereq: perm.

Bus **R361 Contract Changes and Terminations** (3 cr). Theory and techniques associated with changes in scopes of work called for in prime and subcontracts.

Bus **365 Business Law** (3 cr). Legal framework of business enterprise; importance and role of law; private property and contract as basic concepts in a free enterprise system. Also offered by correspondence study.

Bus **400** (s) **Seminar** (cr arr). Prereq: perm.

Bus **401 Investments** (3 cr). Problems; types of securities. One 1-day field trip. Also offered by correspondence study. Prereq: 301.

Bus **403 Insurance** (3 cr). Major branches of insurance; principles and practices.

Bus **404 Life Insurance** (3 cr). Companies, contracts, uses, premium computations, and economic aspects. Prereq: 403 or perm.

Bus **411 Organization Theory** (3 cr). Management; theories and research in human behavior and their managerial applications. Prereq: 311.

Bus **412 Personnel Management** (3 cr). Organization; policies and procedures. Prereq: 311 or perm.

Bus **413 Human Relations in Business** (3 cr). Case study method used to apply behavioral science theories and principles for the development of human collaboration. Prereq: 311 or perm.

Bus **414 Management Policy** (3 cr). Emphasis on policy decision making under conditions of uncertainty. Prereq: 311 or perm.

Bus **421 Marketing Problems** (3 cr). Distribution channels and policies; sales promotion; price determination and policies. Prereq: 321.

Bus **422 Marketing Research and Analysis** (3 cr). Purposes, methods, and techniques; market potential analysis; product analysis and adoption. Prereq: 231, 321.

Bus **423 Retail Merchandising Fundamentals** (3 cr). Location, capital, and physical requirements; store organization, personnel, merchandise, and pricing; buying and receiving; sales promotion; customer services; retail expense management. Prereq: 321.

Bus **424 Retail Merchandising Problems** (3 cr). Site selection; physical plant; personnel; purchase planning; pricing, buying, and receiving merchandise; advertising; customer services. One 1-day field trip. Prereq: 423.

Bus **425 Intermediate Marketing Management** (3 cr). Demand analysis theory; structure of distribution and location theory; organizational buying behavior; decision making by marketing management. Prereq: 321.

Bus **R434 Management of Major Procurements** (3 cr). Problems associated with the procuring of major items and systems, such as special contracts, negotiation techniques, organization, quality assurance, expediting, inspection, and disputes. Prereq: perm.

Bus **435 Operations Research I: Linear Programming** (2 cr). Same as InfSc 435. Linear programming techniques. Prereq: 231, 232, 233.

Bus **436 Business and Economic Fluctuations** (3 cr). Same as Econ 436. Application of recent theoretical, statistical, and institutional developments to business forecasting. Prereq: 231, Econ 372, or perm.

Bus **437 Statistics for Business Decisions** (2 cr) (334). Same as InfSc 437. Decision making under uncertainty; utility theory. Prereq: 231.

Bus **438 Advanced Statistics** (2 cr). Same as InfSc 438. Variance, simple and multiple regression, matrix models, correlation theory. Prereq: 231.

Bus **439 Systems and Simulation** (2 cr). Same as InfSc 439. Distribution theory, random numbers, simulation of queues, synchronous vs asynchronous simulation. Prereq: 231, 233, 453.

Bus **R440** (s) **Special Topics in Computer Applications** (3 cr, max 12). Normally offered in graphic devices and applications, conversational languages and terminals, assembly language, and computer storage devices. Prereq: perm.

Bus **441 Labor Relations** (3 cr). Negotiations and administration of current union-management issues.

Bus **442 Government Regulation of Business** (3 cr). Analysis and appraisal of major types of public policy toward business activity; emphasis on antitrust laws.

Bus **444 International Commercial Policy** (3 cr). Principles of international trade, tariff, foreign exchange, market development, dumping, foreign policies, trade agreements, and merchandising. Prereq: Econ 251.

Bus **453 Operations Research II: Queueing Theory** (1 cr). Same as InfSc 453. Distribution theory, birth-death processes, single and multiple server models. Prereq: 231, 232.

Bus **454 Operations Research III: Game Theory** (1 cr). Same as InfSc 454. Utility theory, zero-sum games, non-zero-sum games, psychological implications. Prereq: 231.

Bus **455 Integer, Non-Linear, and Dynamic Programming** (1 cr). Same as InfSc 455. Introduction. Prereq: 435.

Bus **456 Quality Control** (1 cr). Same as InfSc 456. Designing of efficient and effective systems for the maintenance of quality. Prereq: 231.

Bus **457 Operations Research IV: Non-Parametric Statistics** (1 cr). Same as InfSc 457. Methodology of non-parametric statistical tests. Prereq: 231.

Bus **461 Real Estate** (3 cr). Listing, selling, leasing, financing, and brokerage; fundamentals of valuation and listing property management. Also offered by correspondence study.

Bus **462 Real Property Appraisal** (3 cr). Theories and principles in estimating value of natural resources and any attached improvements. Prereq: Econ 252 or perm.

Bus **X463 Real Estate Fundamentals** (0 cr). Practical basic study of real estate activity; legal, social, economic, and financial operational phases of real estate in Idaho.

Bus **X464 Real Estate Law** (0 cr). Practical applied study of Idaho real estate law; to help avoid legal difficulties arising from real estate transactions.

Bus **466 Business Law** (3 cr). Trade regulations, negotiable instruments, sales, chattel mortgages, conditional sales, and suretyship insurance. Also offered by correspondence study. Prereq: 365 or perm.

Bus **467 Business Law** (3 cr). Agency, partnerships, corporations, and real property. Prereq: 365 or 466.

Bus **470 Motion Study, Time Study, and Job Design** (1 cr). Principles and concepts for the effective and efficient employment of labor. Prereq: 231.

Bus **471 Product Design, Value, and Engineering Analysis** (1 cr). Analytical approach to

reducing manufacturing costs via product design, process specification, and distribution methods. Prereq: 231.

Bus **493-494 Seminar in Urban Studies** (2 cr). See Inter 493-494.

Bus **495 Honors** (3 cr). Directed program of individual study to provide selected students an opportunity for more advanced work than normally available to undergraduates. Prereq: perm of dept.

Bus **499** (s) **Directed Study** (cr arr). Prereq: perm.

Bus **500 Master's Research and Thesis** (cr arr).

Bus **501** (s) **Seminar** (cr arr). Normally offered in real estate, investments, insurance, government regulation of business, industrial management, industrial relations, and current business problems. Prereq: perm.

Bus **502** (s) **Directed Study** (cr arr). Prereq: perm.

Bus **503 Financial Policy** (3 cr). Social and economic implications of the financial process. Prereq: perm.

Bus **505** (s) **Workshop** (cr arr). Prereq: perm.

Bus **513 Administrative Organization** (3 cr). Organizational theory; research and theories in behavioral sciences and economics as related to business organization theory. Prereq: perm.

Bus **521 Advanced Marketing** (3 cr). Production development, pricing, demand creation, physical distribution, and channel selection. Prereq: perm.

Bus **525 Operations Management** (3 cr). Decision making in production and operations management; design and control of the production system. One 1-day field trip. Prereq: 231.

Bus **532 Dynamics of Business Decisions** (3 cr). Same as InfSc 532. Statistical decision theory and operations research techniques. Prereq: 231 or perm.

Bus **533 Automation Systems** (1 cr). Same as InfSc 533. Types of computers for accumulation and control of accounting data; programming and multiple use of data; audit of machine systems.

Bus **R571-R572 Techniques of Management Science** (3 cr). Recent techniques, including PERT-CPM techniques, statistical decision procedures, inventory, queuing, and waiting time models, theory of games and linear programming, allocation, replacement, and competitive models, and time and motion studies. Prereq: perm.

Bus **580 Seminar in Administrative and Contemporary Issues** (3 cr). See Inter 580.

Bus **R595-R596 Statistical Methods in Business Applications** (3 cr). Development and application of mathematical statistics to business procedures. Prereq: perm.

Bus **597** (s) **Practicum** (cr arr). Prereq: perm.

Bus **598** (s) **Internship** (cr arr). Prereq: perm.

Bus **599** (s) **Research** (cr arr). Prereq: perm.

Business Education

Robert M. Kessel, Chairman (230 Admin. Bldg.). Professor Kessel (Business Education); Assistant Professor Holup (Distributive Education).

BusEd **200** (s) **Seminar** (cr arr). Prereq: perm.

BusEd **203** (s) **Workshop** (cr arr). Prereq: perm.

BusEd **299** (s) **Directed Study** (cr arr). Prereq: perm.

BusEd **400** (s) **Seminar** (cr arr). Prereq: perm.

BusEd **403** (s) **Workshop** (cr arr). Prereq: perm.

BusEd **491-492 Teaching Business Education I-II** (2-3 cr; 3 cr). Methods and materials. BusEd 491: office occupations. BusEd 492: basic business subjects. Prereq: perm.

BusEd **493 Teaching Distributive Education** (3 cr). Same as VocEd 493. Selection, organization, and presentation of subject matter pertaining to preparatory distributive education programs at the secondary-school level; emphasis on teaching methods and techniques.

BusEd **494 Distributive Education Materials** (2 cr). Same as VocEd 494. Examination, development, and application of instructional materials in distributive education.

BusEd **495 Supervising DECA Programs** (2 cr). Same as VocEd 495. Role of DECA in distributive education; organization and implementation of youth activities.

BusEd **496 Directed Work Experience** (2 cr). Same as VocEd 496. Job analysis and descriptions; weekly work-experience reports and analysis coordinated with problems related to the student's employment in an approved distributive occupation. Prereq: perm.

BusEd **497 Coordination Techniques** (3 cr). Same as VocEd 497. Problems of the coordinator in the cooperative part-time program; guidance and selection; placing students in work stations; assisting job adjustment; developing the training program.

BusEd **499** (s) **Directed Study** (cr arr). Prereq: perm.

BusEd **500 Master's Research and Thesis** (cr arr).

BusEd **501** (s) **Seminar** (cr arr). Prereq: perm.

BusEd **502** (s) **Directed Study** (cr arr). Prereq: perm.

BusEd **503** (s) **Workshop** (cr arr). Normally offered in office occupations, economic education, and distributive education.

BusEd **520 Office Occupations Subjects** (3 cr). Methods and materials; standards of achievement; review of literature and research. Prereq: perm.

BusEd **521 Basic Business Subjects** (3 cr). Methods and materials; standards of achievement; review of literature and research. Prereq: perm.

BusEd **522 Issues in Business Education** (3 cr). Philosophies, objectives, trends, and organization patterns of business education in secondary schools. Prereq: perm.

BusEd **523 Adult Distributive Education** (3 cr). Establishing and developing adult programs in distributive education. Prereq: perm.

BusEd **524 Issues in Distributive Education** (3 cr). Same as VocEd 524. Philosophies, objectives, trends, and organization patterns of distributive education in secondary schools. Prereq: perm.

BusEd **597** (s) **Practicum** (cr arr) Prereq perm

BusEd **598** (s) **Internship** (cr arr). Prereq: perm.

BusEd **599** (s) **Research** (cr arr). Prereq: perm.

Chemical Engineering

Robert R. Furgason, Dept. Chairman (308 Buchanan Engr. Lab.). Professors Edwards, Furgason, Hoffman, Jackson; Associate Professors Sheldorf, Thomson; Assistant Professors Blair, Hager, Soot; Instructor Soni; Associate Engineer McConnachie.

ChE **200 Sophomore Seminar** (0 cr). Discussion sessions to allow an exchange of ideas among the sophomores, other students in the Department of Chemical Engineering, and faculty members. Topics of current concern to the profession stressed. Graded on the basis of P or F.

ChE **299** (s) **Directed Study** (cr arr). Prereq: perm.

ChE **243-244 Chemical Engineering Laboratory** (3-4 cr) (443). Unit operations and chemical reactions related to elementary theory, equipment operations, materials of fabrication, and instrumentation and measurements. One or two lec and two 3-hr labs per wk. Cannot to be used to fill credit requirements for B.S.Ch.E. degree.

ChE **271 Process Engineering** (2-3 cr). (371). Applications of unit operations, chemical reactions, and economic and other relevant non-technical guielines to selected chemical process industries.

ChE **323 Material and Energy Balances** (3 cr). Conservation of material and energy calculations with examples from selected chemical processes and unit operations.

ChE **330 Stage-wise Operations** (3 cr). Stage-wise process operations including distillation, extraction, absorption, and ion exchange. Coordinated lec-lab periods. Prereq: 323, ES 321.

ChE **344 Automatic Process Control** (3 cr). Process dynamics and control, including application of industrial instruments to processing systems. Two lec and one 3-hr lab per wk. Prereq: EE 200.

ChE **390 Introduction to Chemical Engineering Principles** (3 cr) (490). For chemists and engineers. Material and energy balances and unit operations used in chemically-related industries. Prereq: perm.

ChE **393 Chemical Engineering Projects** (1-3 cr, max 9). Problems of a research or exploratory nature. Prereq: perm of dept.

ChE **410 Fundamentals of Polymer Science and Processing** (1-3 cr). Structure and formation of polymers, polymerization processes, flow characteristics, mechanical and general properties, fabrication processes. Prereq: perm.

ChE **423 Reactor Kinetics and Design** (3 cr). Kinetics and design of chemical reactors; chemical equilibrium reaction rates; catalysis and reactor types. Prereq: 323, Chem 305.

ChE **430-431 Transport and Rate Processes I-II** (3-4 cr). Transport phenomena involving mass, heat, and momentum transfer, with applications; design of processing equipment from rate considerations including chemical reactors and such unit operations as drying, crystallization, filtration, sedimentation, and fluidization. Coordinated lec-lab periods. Prereq or coreq for 430: ES 320; prereq or coreq for 430-431: Math 310.

ChE **453-454 Chemical Process Analysis And Design** (3 cr). Estimation of equipment and total investment costs, annual costs and profits, and the indices of attractiveness, optimization, design of equipment, and entire processes including economic considerations, selection of alternate equipment, and proces-

sing schemes; design in the presence of uncertainty; case studies on selected processes. One 1-wk field trip. Prereq: Econ 251, sr standing.

ChE **491-492 Seminar** (0 cr). Professional aspects of the field; recent developments and topics. Graded on the basis of P or F. Prereq: sr standing.

ChE **499** (s) **Directed Study** (cr arr). Prereq: perm.

ChE **500 Master's Research and Thesis** (cr arr).

ChE **501** (s) **Seminar** (cr arr). Prereq: perm.

ChE **502** (s) **Directed Study** (cr arr). Prereq: perm.

ChE **515 Transport Phenomena** (3-4 cr). Same as ME 515. Unified treatment of momentum, heat, and mass transfer in three dimensions; unsteady state; pertinent vector equations; methods of solution. Prereq: perm.

ChE **525 Advanced Heat Transfer** (2-3 cr). Applications of fundamentals of heat conduction, radiation, and convection; relationships to fluid dynamics and mass transfer; economics and design applications. Prereq: perm.

ChE **527 Chemical Engineering Thermodynamics** (2-3 cr). Equilbrium in physical and chemical systems; theoretical and generalized prediction of thermodynamic properties of pure materials and solutions, including deviations from ideality. Prereq: perm.

ChE **529 Chemical Engineering Kinetics** (2-3 cr). Analysis of industrial chemical reactions; theories of reaction rates and catalysis; catalytic reactor design. Prereq: perm.

ChE **534 Chemical Engineering Processes** (2-3 cr). Industrial processes, including electrochemistry and high pressure technology, petroleum refinery engineering, and pulp and paper technology. Prereq: perm.

ChE **537 Advanced Fluid Mechanics** (2-3 cr). Fluid systems encountered in industry; non-Newtonian behavior of particle and plastic systems; two-phase situations including fluidization and film flow. Prereq: perm.

ChE **541 Chemical Engineering Analysis I** (2-3 cr). Same as ME 541. Mathematical analysis of chemical engineering operations and processes; mathematical modeling and computer applications. Prereq: perm.

ChE **542 Chemical Engineering Analysis II** (2-3 cr). Numerical and analytical methods applied to solution of chemical engineering problems; numerical techniques to solve partial differential equations including matrix manipulations and iterative techniques; application of approximate variational methods and integral transforms. Prereq: perm.

ChE **544 Advanced Process Control** (2-3 cr). Theory of process dynamics and systems engineering. Two lec and one 3-hr lab per wk. Prereq: perm.

ChE **545-546 Mass Transfer Operations I-II** (2-3 cr). Diffusional and equilibrium stagewise operations: absorption, drying, distillation, extraction, etc.; design calculations. Prereq: perm.

ChE **571 Advanced Plant Design** (2-3 cr). Design of process plants for optimum cost and economic return; scale-up of pilot plants; comprehensive problems in chemical engineering design. Prereq: perm.

ChE **600 Doctoral Research and Dissertation** (cr arr).

ChE **601** (s) **Seminar** (cr arr). Prereq: perm.

ChE **602** (s) **Directed Study** (cr arr). Prereq: perm.

ChE **603** (s) **Independent Study** (cr arr). Prereq: perm.

Chemistry

Malcolm M. Renfrew, Dept. Head (118 Phys. Sci. Bldg.). Professors Cooley, Grahn, Gustafson, Raunio, Renfrew, Shreeve, Thyagarajan; Associate Professors Garrard, Grieb, Nelson, Porter; Assistant Professors Barrus, Brown, Spangler, Wai, Willett.

RELATED FIELD: See biochemistry.

ADVANCED PLACEMENT: Courses in this subject field which are vertical in content are: 111-112-253; 111-114; 111-275.

Chem **101 Concepts of Chemistry** (4 cr). Nonmathematical descriptive treatment relating key developments of chemistry to modern living. Demonstrations, three lec, and one 2-hr lab per wk.

Chem **102 Chemistry and the Citizen** (3 cr). Impact of chemistry on society; what is new in chemical technology and its effect on the public; transfer of chemical know-how to underdeveloped nations; guidelines for the nonscientist in evaluating chemical science and industry.

Chem **103 Introduction to Chemistry** (4-5 cr). Not open to students who have taken 111. Students having high school chemistry may earn only four cr. Principles and applications. Three lec, two rec, and one 3-hr lab per wk.

Chem **111 Principles of Chemistry** (4 cr). Not open to students who have taken 103. Principles and applications. Three lec, one rec, and one 3-hr lab per wk. Prereq: high school chemistry.

Chem **112 Inorganic Chemistry and Qualitative Analysis** (5 cr). Elementary theoretical chemistry and its application to analytical practice. Lab work in the qualitative separation of cations and anions by semi-micro methods. Max six cr in 112 and 114 combined. Three lec and two 3-hr labs per wk. Prereq: 103 or 111.

Chem **114 General Chemistry** (4 cr). Continuation of 103 or 111 for students who do not plan to take further professional chemistry courses. Some work in inorganic, organic, and biochemistry, electrochemistry, nuclear chemistry, and in qualitative inorganic analysis. Max six cr in 112 and 114 combined. Three lec, one rec, and one 3-hr lab per wk. Prereq: 103 or 111.

Chem **121 Glassblowing** (1 cr). Techniques used in constructing scientific apparatus and artistic objects from glass. One 3-hr lab per wk.

Chem **200** (s) **Seminar** (cr arr). Prereq: perm.

Chem **253 Quantitative Analysis** (5 cr). Theory and practice of gravimetric and volumetric analysis; intro to modern analytical chemistry. Three lec and two 3-hr labs per wk. Prereq: 112 or 114.

Chem **275 Carbon Compounds** (3 cr). Aspects of organic chemistry important to students in the life sciences. Duplicate credit will not be allowed in first-year courses in organic chemistry. Prereq: 103 or 111.

Chem **277 Organic Chemistry I** (3 cr). Principles and theories of organic chemistry and the properties, preparations, and reactions of organic compounds. Duplicate credit will not be allowed in first-year courses in organic chemistry. Prereq: 112 or 114.

Chem **278 Organic Chemistry I: Laboratory** (1 cr). Lab to accompany 275 or 277. One 3-hr lab per wk. Prereq or coreq: 275 or 277.

Chem **299** (s) **Directed Study** (cr arr). Prereq: perm.

Chem **302 Principles of Physical Chemistry** (3 cr). Emphasis on topics important in biological and agricultural sciences. Prereq: 112 or 114, Math 180, Phys 113, or perm.

Chem **303 Principles of Physical Chemistry Laboratory** (1 cr). Lab to accompany 302. One 3-hr lab per wk. Prereq or coreq: 302.

Chem **N304 Principles of Theoretical Chemistry** (3 cr). Various topics in physical chemistry such as gas laws, equilibrium, electrochemistry, and kinetics.

Chem **305-306 Physical Chemistry** (3 cr). Kinetic theory, thermodynamics, and the constitution of matter. Prereq: 112 or 114, Math 200; prereq or coreq: Phys 222.

Chem **307-308 Physical Chemistry Laboratory** (1 cr). Lab to accompany 305-306. One 3-hr lab per wk. Prereq or coreq: 305-306.

Chem **N363 Inorganic Chemistry** (3 cr). Elements and their compounds; relationship between atomic strucure and chemical properties; intro to modern theories.

Chem **372 Organic Chemistry II** (3 cr). Continuation of 277. Prereq: 277.

Chem **374 Organic Chemistry II: Laboratory** (1 cr). Lab to accompany 372. One 3-hr lab per wk. Prereq or coreq: 372.

Chem **376 Organic Chemistry II: Laboratory** (2 cr). Primarily for majors. Lab to accompany 372, including qualitative analysis and modern instrumental techniques. Two 3-h labs per wk. Prereq or coreq: 372.

Chem **N377 Organic Chemistry** (3 cr). Introductory organic chemistry with emphasis on topics which will aid in answering the questions of high school students.

Chem **400** (s) **Seminar** (cr arr). Prereq: perm.

Chem **N408 Chemistry for High School Teachers** (2 cr). Acid base theory (Lowry-Bronsted and Lewis approaches), pH, buffer theory, oxidation and reduction, electrochemistry and introductory rate theory, and introductory kinetics.

Chem **409 Proseminar** (1 cr). Current publications in chemistry and chemical engineering with reports on typical scientific papers. Prereq: 372 and sr standing.

Chem **N411 Experimental Chemistry I** (3 cr). Based largely on the CHEM Study Curriculum, using its texts and films. N411 should be followed by N412 the following summer. Two 4-hr sessions per wk.

Chem **N412 Experimental Chemistry II** (3 cr). The CHEM Study Curriculum, using its texts and films. Two 4-hr sessions per wk.

Chem **R413 Radiochemistry for Engineers** (2 cr). Primarily for engineers. Properties of nuclear particles, nuclear reactions, techniques of producing reactions, interaction of radiation with matter, and radiochemical techniques. Prereq: perm.

Chem **416 Methods in Radiochemistry** (3 cr). Basic theory and practice in use of radionuclides; practical lab experience. Two lec and one 3-hr lab per wk. Enrollment is limited by facilities. Prereq: 306 or perm.

Chem **418 Environmental Chemistry** (3 cr). Case histories in which new chemical proces-

ses or products have had recognizable impact upon ecological systems either directly or through primary modification of the physical environment; responsibilities of industry, governmental laboratories, and universities for corrective action; chemical counter measures for damage to environment. Prereq: jr standing and perm. Graded on the basis of P or F.

Chem **435 Principles of Chemical Instrumentation** (3 cr). One lec and two 3-hr labs per wk. Prereq: 253, Phys 222, or perm.

Chem **441 Chemical Literature** (1 cr). Survey of important chemical reference works and periodicals with experience in the use of these sources. Prereq: perm.

Chem **454 Instrumental Analysis** (4 cr). For students in chemistry and allied fields. Techniques in operating new and specialized instruments for qualitative and quantitative analysis and analytical methods of an advanced nature. Two lec and two 3-hr labs per wk. Prereq: 253, 305; prereq or coreq: 306.

Chem **N459 Analytical Principles** (3 cr). Basic principles involved in analytical procedures and typical methods of analysis.

Chem **N461 Structure of Matter** (3 cr). Same as Phys N461. Nuclear structure, chemical periodicity, electronic structure of atoms, crystal structure, atomic and molecular orbital theory, structure of metals, intermolecular forces, and transition metal complexes.

Chem **463 Inorganic Chemistry** (3 cr). Principles, complex ions and coordination compounds, theory of acids and bases, nonaqueous solvents, familiar elements and their relationship to the periodic table. Prereq: 305; prereq or coreq: 306 or perm.

Chem **464 Inorganic Chemistry Laboratory** (1 cr). Lab to accompany 463. One 3-hr lab per wk. Coreq: 463.

Chem **473 Intermediate Organic Chemistry** (3 cr). Theories and mechanisms of organic chemistry. Prereq: 372; prereq or coreq: 306.

Chem **475 Qualitative Organic Analysis** (3 cr). Homologous reactions and the separation and identification of various types of organic compounds. One lec and two 3-hr labs per wk. Prereq: 372 or perm.

Chem **480 Elements of Biochemistry** (3 cr). Survey. Max six cr in any combination of 480, 481, and 482. Prereq: 112 or 114, 275 or 277.

Chem **481-482 Biochemistry** (3 cr). Modern biochemistry. Max six cr in any combination of 480, 481, and 482. Prereq: 372 and 302 or 306, or perm.

Chem **483 Biochemistry Laboratory** (1-2 cr, max 2). One 3-hr lab per wk. Prereq: 278; coreq: 480, 481, or 482.

Chem **N485 Biochemistry** (3 cr). Chemistry of living things and substances of which they are made, applications to nutrition and to chemistry of basic life processes. Prereq: organic chemistry.

Chem **N490** (s) **Professional Problems** (1-6 cr, max 6). Individual study in any field of chemistry. Prereq: perm.

Chem **491** (s) **Research** (1-6 cr, max 6). Submission of a report of the research done for placement in the permanent departmental files is required. Prereq: perm of dept.

Chem **495 Chemical Thermodynamics** (3 cr) (505). Partial molar quantities and systems of variable composition, application to solutions of non-electrolytes and electrolytes; intro to statistical thermodynamics. Prereq: 306. Students unable to demonstrate proficiency in elementary thermodynamics and calculus will be required to review 305.

Chem **499** (s) **Directed Study** (cr arr). Prereq: perm.

Chem **500 Master's Research and Thesis** (cr arr).

Chem **501** (s) **Seminar** (cr arr). Prereq: perm.

Chem **502** (s) **Directed Study** (cr arr). Prereq: perm.

Chem **WS503 Advanced Topics in Inorganic Chemistry** (3 cr, max arr). WSU 503. Recent significant developments. Prereq: 561.

Chem **504** (s) **Workshop** (cr arr). Prereq: perm.

Chem **ID507 Topics in Physical Chemistry** (1-9 cr, max 9). Colloid chemistry, polarography, nuclear magnetic and electron paramagnetic resonance; kinetics of irreversible processes; other topics not covered extensively in regularly scheduled courses. Prereq: perm.

Chem **509-510 Advanced Physical Chemistry** (3 cr) (493). Applications of quantum theory to chemical bonding, molecular spectroscopy, and molecular structure. Prereq: 306 or perm.

Chem **513 Nuclear Chemistry** (3 cr). Intro to artificial and natural radioactivity, tracer methods, and atomic energy. Prereq: 306 or Phys 360.

Chem **R516 Methods in Radiochemistry** (3 cr). Radiochemical techniques and applications of tracers to chemistry; fundamentals of radioactive decay; statistical relationships; interaction of radiation with matter; production of radioactive samples; chemistry of radioactive elements. Prereq: perm.

Chem **517 Chemistry of High Polymers** (3 cr). Relationship of structure and properties of polymeric materials; applications of thermodynamic principles of polymers and their solutions; kinetics of polymerization. Prereq: 306.

Chem **WS525 Special Topics in Analytical Chemistry** (2 cr, max arr). WSU 525. Selected topics of current interest. Prereq: perm.

Chem **N527 History of Chemistry** (3 cr). Development of the theories and laws of chemistry.

Chem **WS537 Advanced Topics in Physical Chemistry** (2 cr, max arr). WSU 537. Selected subjects; irreversible thermodynamics; chemical bonding, NMR, ligand field theory; X-ray diffraction and neutron diffraction.

Chem **WS544 Advanced Topics in Organic Chemistry** (3 cr, max arr). WSU 544. Current research. Prereq: 575.

Chem **553 Modern Analytical Methods** (3 cr). Absorption and emission spectroscopy, polarography, potentiometry, nuclear magnetic resonance, chromatography. Prereq: 306, 454, or perm.

Chem **555 Advanced Chemistry** (3 cr). Fundamental principles of classical and analytical chemistry; homogeneous and heterogeneous equilibria, complex ions; analytical separations, non-aqueous equilibria. Prereq: 306 or perm.

Chem **556 Chemical Spectroscopy** (3 cr). Interpretation of spectra.

Chem **R557 Topics in Analytical Chemistry** (1-6 cr, max 6). Techniques and methods not usually covered in 555; potentiometry, polarography, coulometry, and spectroscopic methods. Prereq: perm.

Chem **561 Advanced Inorganic Chemistry** (3 cr). Theoretical approach to the underlying principles of inorganic chemistry with an integration of theory and descriptive chemistry. Prereq: 306, 463, or perm.

Chem **563 Advanced Inorganic Chemistry Laboratory** (2 cr, max 4). Inorganic preparations utilizing aqueous, non-aqueous, and high vacuum techniques. Prereq or coreq: 561.

Chem **ID565 Topics in Inorganic Chemistry** (1-9 cr, max 9). Coordination compounds; halogens; less familiar elements; clathrate, interstital, non-storchiometric compounds; chemical bonding; inorganic reaction mechanisms. Prereq: prerm.

Chem **WS568 Advanced Topics in Biochemistry** (2 cr, max arr). WSU 568. Current research. Prereq: 482.

Chem **ID571 Topics in Organic Chemistry** (1-9 cr, max 9). Selected topics from the current literature. Prereq: perm.

Chem **573 Synthetic Organic Chemistry** (3 cr). Use of organic reactions in synthesis.

Chem **575 Mechanisms of Organic Reactions** (3 cr). Nucleophilic substitution; reactions of carboxylic acids and esters; carbanions, electrophilic, and nucleophilic aromatic substitutions; elimination and addition reactors. Prereq: 306, 473.

Chem **579 Physical Organic Chemistry** (3 cr). Physical chemical methods applied to organic chemistry.

Chem **581 Carbohydrate and Lipid Chemistry** (3 cr). Same as Biochem 581. Carbohydrates, lipids, and related compounds. Prereq: 482.

Chem **582 Amino Acid and Protein Chemistry** (3 cr). Same as Biochem 582. Amino acids, proteins, and nucleo-proteins. Prereq: 482.

Chem **ID583 Advanced Topics in Biochemistry** (1-9 cr, max 9). Recent research in enzymes, hormones, complex lipids, vitamins, nucleic acids, antibiotics, viruses, and biochemical genetics. Prereq: perm.

Chem **600 Doctoral Research and Dissertation** (cr arr).

Chem **601** (s) **Seminar** (cr arr). Prereq: perm.

Chem **602** (s) **Directed Study** (cr arr). Prereq: perm.

Chem **603** (s) **Independent Study** (cr arr). Prereq: perm.

Civil Engineering

Robert L. Schuster, Dept. Chairman (104 Buchanan Engr. Lab.). Professors Hall, Hathaway, Lottman, Russell, Schuster, Smith, Wallace, Warnick; Associate Professors Haber, Junk, Sack, Watts; Assistant Professors Brockway, Milligan.

CE **112 Elementary Surveying** (2 cr). Primarily for non-engineering students. Theory of measurements and manipulation of surveying instruments; application of surveying methods to construction; topographic and land surveys. One lec and one 3-hr lab per wk. Prereq: Math 140, 141, and Engr 101 or Arch 155 or Geog 380.

CE **211 Engineering Measurements** (4 cr). Primarily for engineering students. Theory and practice; types and distribution of errors; manipulation of instruments; route and land surveying; construction surveys; intro to photogrammetry and urban planning. Three lec and one 3-hr lab per wk. Prereq: Math 140, 141, Engr 101 or equiv.

CE **218 Elementary Surveying and Photogrammetry** (3 cr). Primarily for non-engineering students. Theory of measurement; public land surveying and manipulation of surveying instruments; principles of photogrammetry

and photo-interpretation. Two lec and one 3-hr lab per wk. Prereq: Math 140, 141.

CE **317 Land Surveying** (2 cr). History and development; related laws; preparation and filing of property descriptions and plats; subdivision planning; methods for property surveys. Prereq: 211.

CE **319 Photogrammetry and Photo-Interpretation** (3 cr). Geometry of single and stereoscopic pairs of aerial photographs; stereo-plotters; photo-interpretation; applications to problems of engineering importance. Two lec and one 3-hr lab per wk. Prereq: 211.

CE **322 Hydraulics** (4 cr). Quantitative hydrology; applying priciples of fluid mechanics to problems in hydraulic engineering. Three lec and one 3-hr lab per wk. Prereq: ES 320.

CE **342 Theory of Structures** (4 cr). Analysis of stresses and strains in statically determinate and indeterminate beam, truss, and rigid frame structures; effects of moving loads; matrix displacement method. Three lec and one 3-hr lab per wk. Prereq or coreq: ES 340.

CE **345 Structural Design** (3 cr) (440). Continuation of ES 340 and CE 342. Intro to design concept. Two lec and one 3-hr lab per wk. Prereq: ES 340 and CE 342.

CE **357 Mechanical Properties of Materials** (3 cr). Characteristics and measurement of stress-strain stiffness and strength properties of structural materials for improvement, selection, and design. Two lec and one 3-hr lab per wk. Prereq: ES 340.

CE **372 Transportation Engineering** (4 cr). Intro to planning, design, construction, operation, maintenance, and administration of transportation systems with emphasis on highways and airports. Three lec and one 3-hr lab per wk. Prereq: jr standing.

CE **382 Engineering Economy** (2 cr). Economic analysis and comparison of engineering, alternatives by annual-cost, present-worth capitalized cost, and rate-of-return methods; income tax considerations. Prereq: jr standing.

CE **420 Fluid Mechanics II** (3 cr) (ES 420). Analysis of fluids in motion; basic laws for systems and control volumes; Navier Stokes equations; boundary layer theory; potential flow. Prereq: ES 320.

CE **422 Hydraulic Design** (3 cr). Hydraulic problems in planning and design of gravity and pressure systems; intro to unsteady flow. Two lec and one 3-hr lab per wk; one field trip. Prereq: perm.

CE **431 Sanitary Engineering** (4 cr). Application of basic engineering sciences to treatment of domestic and industrial water supplies; treatment and disposal of domestic sewage and industrial wastes. Three lec and one 3-hr lab per wk. Prereq: ES 320.

CE **432 Sanitary Engineering Techniques** (3 cr). Physical, chemical, and biological techniques for analysis of sanitary engineering problems; development of design criteria for common operations and processes. Two lec and one 3-hr lab per wk. Prereq: perm.

CE **441 Reinforced Concrete Design** (3 cr). Emphasis on ultimate strength method in accordance with latest ACI building code. Two lec and one 3-hr lab per wk. Prereq: 345.

CE **444 Steel and Timber Design** (4 cr). Working-stress design and plastic design of steel using latest AISC specs. One credit on timber design using latest NFPA specs. Three lec and one 3-hr lab per wk. Prereq: 345.

CE **460 Soil Mechanics** (3 cr). Physical and mechanical properties of soils; behavior of soil structures under load; application to engineering problems. Prereq: ES 320 and ES 340.

CE **468 Engineering Properties of Soils** (2 cr). Measurement of physical properties of soils. One lec and one 3-hr lab per wk. Prereq: 460.

CE **473 Highway Planning** (2 cr). Origin-destination surveys and analysis; traffic generation, distribution, and assignment; transportation and land use planning, organization, and implementation. Prereq: 372.

CE **474 Highway Design and Operation** (3 cr). Fundamentals of geometric design and traffic engineering for urban and rural highways. Prereq: 372.

CE **475 Pavement Design** (3 cr). Flexible and rigid pavements for highways and airports. Prereq: 372 or perm.

CE **476 Airport Engineering** (2 cr). Planning and design of air transportation facilities including terminal areas, runways, and navigational aids. Prereq: 372.

CE **477 Highway Capacity** (2 cr). Analysis of rural and urban highway and intersection capacity for design and operations. Prereq: 372.

CE **482 Project Management Techniques** (3 cr). Application of critical path and other optimization methods to project management and systems analysis. Prereq: sr standing.

CE **484 Contracts and Specifications** (2 cr). Development of law, courts, and ethics; laws of contracts, agency, sales, property, and patents; specifications; preparation of contract documents. Prereq: sr standing.

CE **491-492 Seminar** (0 cr). Technical topics, employment practice and interviewing procedures, and field trips. One 3-5 day field trip may be required. To be taken during last two semesters in residence. One meeting per wk. Graded on the basis of P or F.

CE **499** (s) **Directed Study** (cr arr). Prereq: perm.

CE **500 Master's Research and Thesis** (cr arr).

CE **501** (s) **Seminar** (cr arr). Conferences and reports on current developments.

CE **502** (s) **Directed Study** (cr arr). Prereq: perm.

CE **521 Hydraulic Design** (3 cr). Dams, spillways, and outlet works; design of a major structure. Two lec and one 3-hr lab per wk. Prereq: perm.

CE **523 Water Resources Systems** (3 cr). Concepts in water development; coordination of development of other natural resources; systems approach and optimization techniques. Prereq: perm.

CE **524 Water Resources Planning** (3 cr). Utilization of water resources in a river system; provision for domestic water supply, power, flood control, navigation, irrigation, and recreational use; design and feasibility problems; guest lecturers. Prereq: perm.

CE **WS530 Water and Wastewater Analysis** (3 cr). WSU 540. Theory and methods of analysis of water, wastewater, and air; electromatric, spectrophotometric, and chromatographic techniques.

CE **ID&WS531 Unit Operations of Sanitary Engineering** (3 cr). WSU 541. Analysis and design of physical and chemical operations of water and waste treatment; flow models, sedimentation, flocculation, filtration, and water conditioning. Prereq: perm.

CE **ID&WS532 Unit Processes of Sanitary Engineering** (3 cr). WSU 542. Analysis and design of chemical and biological processes of water and waste treatment, stream pollution analysis, gas transfer, biological oxidations, aerobic and anaerobic processes, and combustion processes. Prereq: perm.

CE **WS533 Environmental Health Engineering Practice** (2 cr). WSU 548. Mathematical principles applied to environmental health investigation and control.

CE **ID534 Sanitary Engineering Analysis** (2 cr). Theoretical and lab methods for development of design criteria for sanitary engineering systems. One lec and one 3-hr lab per wk. Prereq: perm.

CE **ID536 Wastewater Treatment System Design** (2 cr). Application of unit operations and processes to design of integrated wastewater treatment systems; critical analysis of existing designs. Prereq: 531; coreq: 532.

CE **WS537 Environmental Health** (2 cr). WSU 543. Vector control, refuse disposal, rural sanitation, water, and sewage systems, flood control, and environmental health organization. Prereq: 431 or elem bact.

CE **WS538 Environmental Health Engineering Science II** (4 cr) (WS539). WSU 584. Role of microorganisms, including bacteria, algae, fungi, and protozoa in water and waste treatment processes.

CE **WS539A Industrial Wastes and Stream Sanitation** (2 cr). WSU 545. Causes of stream pollution; industrial wastes, pollution surveys, waste treatment, and pollution abatement.

CE **WS539B Water Quality Management** (3 cr). WSU 546. Systems analysis applied to management of water quality problems including economic, political, and sociological aspects.

CE **WS539C Radiological Health** (3 cr). WSU 547. Sources and units of radiation and radioactivity, radiological health, radiation detection, and radioactive waste disposal.

CE **WS539D Air Pollution Meterology** (3 cr). WSU 571. Weather and climate; atmospheric turbulence; transport and diffusion to air pollution problems by modeling, statistical, and graphic treatment.

CE **WS539E Air Pollution Measurement Techniques** (2 cr). WSU 572. Survey design and site selection; identification and determination of air pollutants by chemical and physical methodology.

CE **WS539F Air Pollution Abatement and Administration** (3 cr). WSU 573. Control measures; process modification; atmospheric dilution; air quality criteria and standards; administration of air pollution control agencies.

CE **WS539G Environmental Health Engineering Science** (3 cr). WSU 583. Chemical principles applied to unit operations of environmental health engineering.

CE **WS539H Applied Stream Sanitation** (3 cr). WSU 586. Assimilating capability and complex self purification capacity of a natural water system.

CE **WS539J Radiological Wastes** (4 cr). WSU 588. Sources of radioactive solid, gaseous, and liquid wastes; decontamination; disposal by dilution; concentration and curtailment.

CE **541-542 Design of Structures I-II** (3 cr). CE 541: arches, reinforced concrete applications, including prestressed concrete and thin-shell design. CE 542: non-prismatic member analysis, secondary stresses, composite sections, plate girder design. Prereq: 441, 444, or perm.

CE **543 Structural Dynamics** (3 cr). Analysis and design of reinforced concrete and steel structures for seismic, blast, and mechanical disturbances. Prereq: 441, 444, Math 310.

CE **544 Buckling in Structures** (3 cr). Analysis of elastic and inelastic stability of columns, trusses, rigid frames, plates, and shells; lateral stability of beams. Prereq: 444, Math 310.

CE **546 Analysis of Structures** (3 cr). Development of theory using matrix notation; consideration of efficient methods for solution of structures using digital computer procedures; intro to solution of problems of continuum mechanics using finite element method. Prereq: 342 or perm.

CE **548 Elasticity** (3 cr). Same as ME 548. Mathematical analysis of strain and stress including vectors, tensors, and coordinate transformations; equations of elasticity; stress problems involving extension, torsion, and flexure; theories of failure. Prereq: perm.

CE **ID556 Physical Properties of Concrete** (3 cr). Composite physical behavior of concretes on basis of aggregate and binder constituents; applications to portland cement and asphalt concretes. Two lec and one 3-hr lab per wk. Prereq: 357 or perm.

CE **557 Strength and Modulus Properties of Non-Elastic Materials** (3 cr). Quantitative effects and analysis of stress-strain mode, time, temperature on strength and modulus properties of time-dependent, non-elastic materials; concepts and applications of fracture mechanics, composite materials. Prereq: 357 or perm.

CE **ID561-ID562 Advanced Soil Mechanics I-II** (3 cr). CE ID561: effective stresses and lateral earth pressures; interrelationships of applied stresses, pore pressure, permeability, strain, and shear strength of soils; application to retaining walls, trenches, and tunnels. CE ID562: consolidation and seepage; theory, design, and construction of shallow and deep foundations and earth embankments; slope stability analysis and control. Prereq: 460.

CE **571 Transportation Engineering** (2-3 cr). Demand, economic applications of various modes of transportation, economic impact on land areas of transportation development, national transportation policy, and metropolitan and regional transportation studies. Prereq: 372 or perm.

CE **572 Traffic Engineering** (2-3 cr). Urban street systems, traffic signals, signing, striping and illumination, mathematical statistics of traffic, freeway operations, warrants, accident analysis, traffic research and administration. Prereq: 372 or perm.

CE **599** (s) **Research** (cr arr). Prereq: perm.

CE **600 Doctoral Research and Dissertation** (cr arr).

CE **601** (s) **Seminar** (cr arr). Prereq: perm.

CE **602** (s) **Directed Study** (cr arr). Prereq: perm.

CE **603** (s) **Independent Study** (cr arr). Prereq: perm.

Communications

Don H. Coombs, Director, School of Communication (212 Univ. Classroom Ctr). Professor Cross.

Comm **120 Mass Communications in a Free Society** (2 cr). Role of the media of mass communication; their performance and significance in a free society.

Comm **200** (s) **Seminar** (cr arr). Prereq: perm.

Comm **203** (s) **Workshop** (cr arr). Prereq: perm.

Comm **299** (s) **Directed Study** (cr arr). Prereq: perm.

Comm **400** (s) **Seminar** (cr arr). Prereq: perm.

Comm **403** (s) **Workshop** (cr arr). Prereq: perm.

Comm **499** (s) **Directed Study** (cr arr). Prereq: perm.

Economics

Gary A. Lynch, Dept. Chairman (329 Admin. Bldg.). Professor Fletcher; Associate Professors Ghazanfar, Lynch; Assistant Professors Campbell, Di Noto, Knudsen, Reynolds.

Econ **170 Contemporary Economics** (3 cr). Economic issues and the economic principles involved. One semester survey course for non-majors. Less technical than 251-252.

Econ **251-252 Principles of Economics** (3 cr). Econ 251: organization and operation of the American economy; supply and demand; money and banking; employment and aggregate output; public finance; economic growth. Econ 252: principles governing production, price relationships, and income distribution. Econ 251 and 252 each carry one credit after 170. Also offered by correspondence study. Prerq: 251 or perm for 252.

Econ **272 Foundations of Economic Analysis** (4 cr). Not open to students who have taken 251-252 or equiv. Concepts underlying micro- and macroeconomic analysis. Econ 272 carries one credit after 170. Prereq: Math 180 or perm.

Econ **321 Intermediate Microeconomic Analysis** (3 cr). Theory of the consumer, firm, industry, market, price determination, and allocation of productive resources. Honors section covering additional selected topics offered fall semester. Prereq: 251-252 or perm.

Econ **372 Intermediate Macroeconomic Analysis** (3 cr). Theory of the economy as a whole; national income accounting as a tool of analy-

sis; national output and income, employment, price levels, and growth. Honors section covering additional selected topics offered spring semester. Prereq: 251-252 or perm for regular sections; 321 or perm for honors section.

Econ **385 Welfare and Environmental Economics** (3 cr). Welfare economics, "public goods," and the application of economic theory to environmental problems, including pollution. Prereq: 321 or 272 or perm.

Econ **R395 Fundamentals of Economics** (4 cr). Primarily for students in the Master of Business Administration program. Concepts underlying micro- and macroeconomic analysis. Prereq: perm.

Econ **400** (s) **Seminar** (cr arr). Prereq: perm.

Econ **403 Money and Banking** (3 cr). Influence of money and banking on economic activity and of monetary policies to achieve society's economic goals. Also offered by correspondence study. Prereq: 251-252 or 272.

Econ **409 Public Finance** (3 cr). Federal government expenditures and taxation; structure and economic effects of the federal tax system; analysis of the tools of fiscal policy and public debts. Prereq: 251-252 or 272.

Econ **410 State and Local Government Finance** (3 cr). Criteria for and determinants of expenditures; equity, adequacy, and economic impact of taxes; urban fiscal problems; intergovernmental relations. Prereq: 251-252 or 272.

Econ **430 Regional Economics** (3 cr). Methods of economic analysis appropriate to regional problems; application to the Pacific Northwest. Prereq: 251-252 or 272.

Econ **433 Introduction to Econometrics** (3 cr). Use of quantitative techniques to analyze and test economic theories. Prereq: Bus 231 or equiv statistics.

Econ **435 American Economic Development** (3 cr). Patterns and causes of change in the American economy from colonial times to the present. Prereq: 170 or 251-252 or 272.

Econ **436 Business and Economic Fluctuations** (3 cr). See Bus 436.

Econ **441 Labor Economics** (3 cr). Application of contemporary and traditional economic theory to the labor market. Prereq: 251-252 or 272.

Econ **474 International Economics** (3 cr). Analysis of the significance and determination of international trade flows, national commercial and balance of payments policies, and the international monetary system. Prereq: 321.

Econ **477 Economics of Developing Countries** (3 cr). Same as AgEc 477. Characteristics of underdevelopment; historical perspective; population growth; barriers to growth; theories explaining development; development policies. Prereq: 251-252 or 272 or perm.

Econ **490 Comparative Economic Systems** (3 cr). Origin, development, and attributes of major contemporary economic systems. Prereq: 170 or 251-252 or 272.

Econ **493-494 Seminar in Urban Studies** (2 cr). See Inter 493-494.

Econ **499** (s) **Directed Study** (cr arr). Prereq: perm.

Econ **500 Master's Research and Thesis** (cr arr).

Econ **501** (s) **Seminar** (cr arr). Prereq: perm.

Econ **502** (s) **Directed Study** (cr arr). Prereq: perm.

Econ **505 History of Economic Thought** (3 cr). Economic doctrines; value and distribution; 19th-century dissenters.

Econ **507 Research Methodology** (3 cr). See AgEc 507.

Econ **521 Advanced Microeconomic Theory** (3 cr). Same as AgEc 521. Effects of rational decision making by individuals, firms, and governments on the allocation and distribution of resources.

Econ **522 Advanced Aggregate Economics** (3 cr). Same as AgEc 522. Determinants of national income, employment, price levels, and economic growth.

Econ **523 Advanced Monetary Theory** (3 cr). Same as AgEc 523. Influence of monetary systems and policies on the performance of the economy.

Econ **524 Theory of Economic Development** (3 cr). See AgEc 524.

Econ **525 Econometrics** (3 cr). See AgEc 525.

Econ **526 Business Conditions Analysis** (3 cr). Social accounting and macroeconomic theory pertaining to economic forecasting and analysis. Prereq: perm.

Econ **599** (s) **Research** (cr arr). Prereq: perm.

Education

Thomas O. Bell, Dept. Head (404-B Educ. Bldg.). Professors Archambault, Farley, Foster, E. Kelly, Kirkland, Maib, Samuelson, Shreve, Snider, Vent; Associate Professors Amos, Armstrong, Kaus, Marten, Miller, Rich-

ardson, L. Smith, Woolums, Wriggle; Assistant Professors Couch, Freer, Glenn, J. Kelly; Instructors G. Kelly, Langen. See also faculty listings with business education, guidance and counseling, industrial education, library science, and vocational teacher education.

RELATED AREAS: For other offerings in the fields of education, see: agricultural education, art, business education, guidance and counseling, home economics, industrial education, library science, music, physical education, special education, and vocational teacher education.

PREREQUISITE: For registration in upper-division courses in education, students must have been admitted to the teacher-education program and have a grade-point average of 2.00, unless a higher average is stated as a prerequisite in the course description.

Ed **200** (s) **Seminar** (cr arr). Prereq: perm.

Ed **201 Introduction to Teaching** (2 cr). Includes teaching aid experience, writing objectives, courses and unit planning, teaching strategies, and classroom evaluation techniques. Two lec plus fifty hrs of clinical experience in the public schools during semester.

Ed **203** (s) **Workshop** (cr arr). Prereq: perm.

Ed **273 International Education Scene** (1-9 cr, max 9). Study-tour conducted by a University of Idaho faculty member to observe selected educational systems and procedures in foreign countries. One cr per wk.

Ed **275 Elementary School Art Methods** (2 cr). Materials and techniques; correlation of art with other subjects and activities.

Ed **299** (s) **Directed Study** (cr arr). Graded on the basis of P or F. Prereq: perm.

Ed **C302 The Child and Society** (3 cr). Child in the social milieu; family, social group, community, school; social pressures and conditioning upon the child and the educative process.

Ed **303 Kindergarten Education** (2-3 cr). History, theory, equipment, and practices; helping the child become oriented to school routine.

Ed **314 Strategies for Teaching** (2-3 cr). Problems and methods of teaching common to all subject and grade levels. Two lec or two lec and 3 hrs of micro-teaching lab per wk.

Ed **315 Secondary School English Methods** (2-3 cr). Special methods, problems, and materials. Two lec or two lec and three hrs of micro-teaching lab or field problems per wk.

Ed **316 Secondary School Social Studies Methods** (2 cr). Special methods, problems, and materials.

Ed **317 Secondary School Science Methods** (2 cr). Special methods, problems, and materials.

Ed **318 Secondary School Mathematics Methods** (2 cr). Special methods, problems, and materials.

Ed **319 Secondary School Art Methods** (2 cr). Special methods, problems, and materials.

Ed **320 Primary Language Arts Methods** (3 cr). Not open for credit to students who have taken 322 or 338. Reading readiness; introducing the child to reading; extension of reading skills.

Ed **322 Intermediate Language Arts Methods** (3 cr). Not open for credit to students who have taken 320 or 338. Reading skills, vocabulary development, study habits, relatedness of the areas of language arts.

Ed **323 Health Education Methods** (3 cr). Special methods and materials for junior and senior high school levels.

Ed **326 Elementary School Mathematics Education** (3 cr). Curriculum; availability and use of instructional materials and devices. Prereq: Math 135-136.

Ed **C&X338 Methods and Materials in Language Arts** (3 cr). Not open for credit to students who have taken 320 or 322. The language arts program; reading, spelling, communication, and handwriting; readiness, retardation, enrichment, and selection of materials.

Ed **341 Secondary School Foreign Language Methods** (2 cr). Special methods, problems, and materials.

Ed **381 Elementary School Music Methods** (3 cr). See MusT 381.

Ed **400** (s) **Seminar** (cr arr). Prereq: perm.

Ed **402 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under the general supervision of a faculty member. Graded on the basis of P or F. Prereq: perm of dept.

Ed **403** (s) **Workshop** (cr arr). Prereq: perm.

Ed **406 Elementary School Team Teaching** (3 cr). Philosophy; organization; trends in building construction for team teaching; curriculum materials; role of teacher, pupils, and auxiliary personnel.

Ed **411 The Junior High School** (3 cr). Principles, organization, administration, and methods of instruction.

Ed **415 Educational Psychology** (3 cr). Application of psychological principles and methods to the school situation. Prereq: Psych 100.

Ed **421 Elementary School Social Studies Methods** (2-3 cr). Curriculum, instructional materials, and devices. Two 2-hr lec or two 2-hr

lec and 3 hrs of micro-teaching lab per wk; one 1/2 day and one 1-day field trip.

Ed **426 Organization and Administration of School Media Centers** (3 cr). Standards for media programs, physical facilities, staffing, budget, media services, and in-service programs.

Ed **428 Audio-Visual Aids** (3 cr). Principles and methods of audio-visual education; administration of the audio-visual program in schools. Class limited to twenty-five.

Ed **429 Elementary School Curriculum** (3 cr). Overview; goals; curricula and techniques; place of skills and abilities; content areas; appreciative and creative programs. Also offered by correspondence study.

Ed **430 Practicum: Elementary School Teaching** (3-9 cr, max 9). Offered each nine wks. Supervised teaching in elementary schools. Graded on the basis of P or F. Prereq: 320 or 322, 326, 445, Psych 205 or 421 or Ed 415, cumulative GPA of 2.25, and perm of dept. (Submit application to director of clinical experiences in teacher education by December 1 of school year prior to enrolling.)

Ed **431 Practicum: Secondary School Teaching** (3-9 cr, max 9). Offered each nine wks. Supervised teaching in secondary schools. Graded on the basis of P or F. Prereq: 314, 445, Psych 206 or 421 or Ed 415, cumulative GPA of 2.25, and perm of dept. (Submit application to director of clinical experiences in teacher education by December 1 of school year prior to enrolling.)

Ed **432 Practicum: Music Teaching** (3-9 cr, max 9). Supervised teaching in grades 1-12; two-thirds of the experience is in secondary schools. Graded on the basis of P or F. Prereq: 314, 445, Psych 206 or 421 or Ed 415, cumulative GPA of 2.25, and perm of dept. (Submit application via coordinator of music education to the director of clinical experiences in teacher education by December 1 of school year prior to enrolling.)

Ed **434 Children's Literature** (3 cr). For each grade level; story plays, dramatizations, effective reading and telling children's stories, and their place in the elementary school. Also offered by correspondence study.

Ed **435 Practicum: Elementary School Teaching (Special)** (3 cr). Primarily for secondary education students majoring in art or physical education who wish to qualify for Idaho endorsement to teach these subjects at the elementary level. Graded on the basis of P or F. Prereq: special methods in the subject area. (Submit application to director of clinical experiences in teacher education by December 1 of school year prior to enrolling.)

Ed **436 Elementary School Reading** (3-6 cr, max 6). Teaching reading at the primary and intermediate levels.

Ed **438 Elementary School Mathematics Laboratory** (3 cr). Construction and solution to problems based on experiments that may be easily performed in elementary schools.

Ed **439 Comparative Education** (3 cr). Educational systems in relation to the cultural backgrounds which gave rise to them.

Ed **440 Driver Education I** (2 cr). Teaching methods; presented in cooperation with the American Automobile Association; successful completion of AAA requirements is required. Class limited to twenty. Prereq: valid driver's license.

Ed **443 Teaching of Geography** (3 cr). Same as Geog 492. Trends, methods, audio-visual materials, planning the program, specialized skills, and forces contributing to change in geographic education.

Ed **444 Elementary School Science Methods** (2-3 cr). Instructional materials and devices. Two lec or two lec and 3 hrs of micro-teaching lab per wk; one 1/2 day and one 1-day field trip.

Ed **445 Proseminar in Teaching** (1 cr). Offered each nine wks. Orientation to practicum. Graded on the basis of P or F.

Ed **448 Production and Use of Media in Education** (3 cr). Production, utilization, and organization of media in the student's field of interest. Prereq: experience in teaching.

Ed **449 Driver Education II** (2 cr). Principles and practice of driver and traffic safety education for teachers, supervisors, and administrators. Prereq: valid driver's license.

Ed **460 The Logic of Teaching** (3 cr). Analysis of the logical operations which are employed in the teaching act.

Ed **467 Developing Reading Efficiency** (3 cr). Detection and correction of factors which interfere with the development of efficient reading.

Ed **468 Contemporary Education** (3 cr) (287). Role of education and problems of the profession in modern society as related to historical and philosophical backgrounds.

Ed **473 International Education Scene** (1-9 cr, max 9). See 273.

Ed **498 Instructional Television Institute** (6 cr). Preparation, utilization, and evaluation of telecourses.

Ed **499** (s) **Directed Study** (cr arr). Graded on the basis of P or F. Prereq: perm.

Ed **500 Master's Research and Thesis** (cr arr).

Ed **501** (s) **Seminar** (cr arr). Prereq: perm.

Ed **502** (s) **Directed Study** (cr arr). Prereq: perm.

Ed **503** (s) **Workshop** (cr arr). Prereq: perm.

Ed **504 School Administration** (3 cr). Principles and problems of organization and administration of city, county, and state systems. Two field trips.

Ed **505 School Finance** (3 cr). Theory of financing schools; applications to Idaho problems. Prereq: 504.

Ed **506 Elementary School Administration** (3 cr). Patterns of organization of grades 1-6; problems and techniques. Prereq: 10 cr in ed.

Ed **507 Supervision of Instruction** (3 cr). To prepare supervisors of instruction so they can aid in the improvement of instruction.

Ed **508 Secondary School Administration** (3 cr). Problems of organization, administration, and supervision of the secondary school; problems of small high schools.

Ed **509 Educational Television** (2 cr). Experience in educational innovations.

Ed **510 Philosophy of Education** (3 cr). Analysis of educational objectives, concepts, and theories.

Ed **511 Secondary School Curriculum** (3 cr). Principles underlying curriculum construction in secondary schools.

Ed **512 Curriculum Construction** (3 cr). Preparation of course of study outlines in the major subject areas. Prereq: 511 or perm.

Ed **513 History of Educational Thought** (3 cr). Writings which have influenced educational theory and practice.

Ed **515 Logic of New Media** (3 cr). Technological development in education; advanced forms of media as they influence learning, teaching, and curriculum content and organization.

Ed **516 Teaching Reading** (3 cr). Trends in the teaching of reading.

Ed **517 Advanced Elementary School Mathematics Education** (4 cr). Recently developed methods and materials in elementary school mathematics. Prereq: qualified for a standard elem certificate.

Ed **520 Elementary School Science and Social Studies** (3 cr). Methods and techniques; foundations of the unit as a means of instruction. Prereq: qualified for a standard elem certificate.

Ed **521 Elementary School Language Arts** (3 cr). Research in the language arts and implications of data related to modern techniques of teaching.

Ed **523 Creative Arts and Creative Teaching** (3 cr). Creativity in children; art, music, sociodrama-creative writing. Prereq: qualified for a standard elem cerificate.

Ed **525 Problems in Secondary Social Studies** (3 cr). Recent research and interpretation in social studies content, methods, and materials.

Ed **X528 Reading Instruction and Improvement** (3 cr). Not open for credit to students who have taken 436. Techniques of teaching reading in the lower and intermediate grades; problems of remedial reading through 12th grade; materials, procedures, testing, and curriculum.

Ed **530 Education Law** (3 cr). Statutory and case materials; principles applicable to all states.

Ed **531 Elementary School Mathematics Education Research** (3 cr). Classic and contemporary research; experimental studies; rationale for position of specialist; objectives; coordination of services. Prereq: perm.

Ed **538 Student Teacher Supervision** (3 cr). Nature and scope of student teaching; role of cooperating agencies; role of participants; techniques; planning; evaluation.

Ed **551 Children's Literature and the Curriculum** (3 cr). How all phases of literature fit into and become a part of the curriculum; developing various areas of the curriculum based on literature; evaluation of literature, authors, and illustrators.

Ed **560 Research and Writing** (3 cr). Techniques of research in education.

Ed **572 Measurement and Evaluation** (3 cr). Improvement of testing, examination, and evaluation in schools; practice in making, giving, scoring, and interpreting tests; use of results in counseling.

Ed **580 Seminar in Administration and Contemporary Issues** (3 cr). See Inter 580.

Ed **587-588 Modern Techniques of Science Instruction in Physics** (2 cr). See Phys 507-508.

Ed **590 History of Education** (3 cr). Development and influence of educational ideals and practices.

Ed **591 Administration of Personnel** (3 cr). Selection, placement, and evaluation of teachers; salaries and salary schedules; tenure; leave of absence; teacher organizations and related matters.

Ed **592 School-Community Relations** (3 cr). Interpreting the schools to the public; two-way flow of ideas between the school and community.

Ed **593 School Facilities Planning and Main-**

tenance (3 cr). Planning new school facilities and maintaining them; legal provisions involving financing; preliminary surveys of need; relationships with architects and contractors. Two field trips.

Ed **594 Theory in School Administration** (3 cr). Theories from psychological, sociolgical, and cultural points of view; their application to school administration; problem solving/decision making using case study approach.

Ed **595 Higher Education** (3 cr). College and university education in the U.S.; history, objectives, organization, finance, instructional methods, faculty, and student problems.

Ed **596 Collective Negotiations for Teachers** (3 cr). Collective negotiations in public education; recognition of bargaining agent; appropriate unit; administrative personnel and unit determination; representation and recognition procedures; scope and process of negotiations; bargaining power and impasse procedures; the collective agreement; impact of collective negotiations.

Ed **597** (s) **Practicum** (cr arr). Graded on the basis of P or F. Prereq: perm.

Ed **598** (s) **Internship** (cr arr). Currently offered in public school teaching, college teaching, school administration, and higher education. Graded on the basis of P or F. Prereq: perm.

Ed **599** (s) **Research** (cr arr). Prereq: perm.

Ed **600 Doctoral Research and Dissertation** (cr arr).

Ed **601** (s) **Seminar** (cr arr). Prereq: perm.

Ed **602** (s) **Directed Study** (cr arr). Prereq: perm.

Ed **603** (s) **Independent Study** (cr arr). Prereq: perm.

Electrical Engineering

Donald E. Rathbone, Dept. Chairman (208 Buchanan Engr. Lab.). Professors Mann, Parish, Rathbone; Associate Professors Baily, Gray, Hagen, Hespelt, Maki, Rigas, Stefanakos, Stevens, Thomas; Assistant Professor Olson; Instructor Fronek.

EE **C010 Elementary Electrical Theory** (0 cr). Basic electrical theory and circuits for electrical employees based upon the background of high school algebra, geometry, and physics. Content equiv to 2 cr for fee purposes.

EE **200 Systems and Circuits** (3 cr). Introductory course for engineering students; includes signal flow, power and energy; transient and steady state behavior of circuit elements; network theorems. Prereq: Math 180.

EE **201 Transients in Linear Systems** (4 cr). Analysis of transients in electrical and mechanical systems and circuits; Laplace transform theory and applications. Three lec and one 3-hr analog computation lab per wk (lab may be taken separately). Prereq: 200 or perm; coreq: Math 310.

EE **240 Digital Computer Fundamentals** (3 cr). History and application of computer; concepts of programming; number systems, basic logical circuits, arithmetic and memory elements, input-ouput devices, and computer organization and control. Prereq: soph standing or perm.

EE **300 Linear Circuit Analysis** (3 cr). Sinusoidal analysis, coupled circuits and transformers, resonance, two terminal networks, frequency response, instrumentation, and Fourier series. Two lec and one 3-hr lab per wk. Prereq: 200.

EE **305 Transmission Lines** (3 cr). Transmission of signals and power in distributed parameter circuits; characteristic impedances, attenuation, phase shift, reflections, and Smith charts. Prereq: 300.

EE **310 Electronics I** (5 cr). Qualitative survey; external electrical characteristics of circuits and devices; amplifiers, oscillators, rectifiers, and switching circuits. Four lec and one 3-hr lab per wk. Prereq: 201, 300.

EE **314 Electronics and Control Systems** (4 cr). For non-majors. Electronic devices and systems; linear control systems. Three lec and one 3-hr lab per wk. Prereq: 200.

EE **320 Energy Conversion I** (5 cr). Three phase circuit; theory and applications of electrical machinery and transformers. Four lec and one 3-hr lab per wk. Prereq: 201, 300.

EE **324 Electrical Machinery** (3 cr). For non-majors. Magnetic circuits and electromechanical energy converting systems; theory and characteristics of common ac and dc machinery. Two lec and one 3-hr lab per wk. Prereq: 200.

EE **330 Electromagnetic Theory** (5 cr). Vector calculus; electrostatics; electrodynamics; electromagnetic waves in isotropic media; Maxwell's equations; boundary value problems. Four lec and one 3-hr lab per wk. Prereq: Math 310.

EE **391-392 Junior Seminar** (0 cr). Curriculum options, elective courses, preparation for graduate study, and current technical topics. Field trip may be required. Graded on the basis of P or F.

EE **401 Advanced Circuit Theory** (3 cr). Passive and active electrical networks; linear

graph theory and digital computers in network analysis; network synthesis. Prereq: perm.

EE **410 Electronics II** (3 cr). Physical electronics; diode and transistor models; noise mechanisms. Prereq: 310, 330, and Phys 360.

EE **411 Pulse and Digital Circuits** (3 cr). Electronic switching, timing, and pulse shaping techniques; logic functions realization with diodes, transistors, and FETs. Prereq: 310.

EE **412 Pulse and Digital Networks** (3 cr). Pulse and digital circuit design in special purpose electronic networks; integrated circuit modules in sequential networks. Two lec and one project-type lab per wk. Prereq: 411.

EE **420 Energy Conversion II** (3 cr). Direct energy conversion devices; solar cells, fuel cells, thermoelectric devices, MHD power generation, and thermionic devices. Prereq: 310, 330, and Phys 360.

EE **421 Power System Analysis** (3 cr). Problem recognition and basic analysis for the modern interconnected power system; energy supplies, voltage control, fault control, reliability, economics, and stability; intro to symmetrical components. Prereq: 320.

EE **422 Computer Methods in Power Systems** (3 cr). Analog and digital computers in the solution of load flow; short circuit and stability problems. Prereq: 421 or perm.

EE **435 Antennas and Microwave Devices** (3 cr). Antennas, antenna systems, waveguides and waveguide devices, klystrons, magnetrons, and traveling wave tubes. Two lec and one 3-hr lab per wk. Prereq: 330 or perm.

EE **440 Digital Systems Engineering** (3 cr). Same as InfSc 440. Concepts of Boolean algebra, logic components; combinational and sequential circuit analysis and synthesis; number systems. Prereq: jr standing.

EE **445 Computer Programming Systems** (3 cr) (543). Same as InfSc 445. System software; programming systems; machine language programming; input-output programming; assemblers; searching and sorting. Prereq: perm.

EE **446 System Modeling and Simulation** (3 cr) (546). Same as InfSc 446. Computer simulation of physical and environmental systems; simulation of continuous and discrete systems; design and use of computer simulation models; probability concepts in simulation; optimization methods. Prereq: perm.

EE **449 Analog and Hybrid Computing** (2 cr). Analog, hybrid, and related digital techniques for the solution of differential equations; analog computer scaling methods; operational characteristics of analog components; analog-to-digital and digital-to-analog conversion, stability problems. Prereq: perm.

EE **450 Random Processes and Systems** (3 cr). Random variables; auto and cross correlation functions; spectral analysis; shot and thermal noise; optimum linear systems filtering. Prereq: 300, Math 310.

EE **452 Communication Systems** (3 cr). Linear (amplitude) modulation, exponential (frequency, phase) modulation, pulse modulation techniques, noise; intro to information theory. Prereq: 300, 310.

EE **465 Control Engineering** (3 cr). For nonmajors. Continuous systems; transient response; frequency response; root locus; stability. Prereq: 200, plus familiarity with basic Laplace transforms.

EE **470 Control Systems** (5 cr). Continuous control systems; frequency-response; root-locus; computer techniques; stability criteria; modern systems theory. Four lec and one 3-hr lab per wk. Prereq: 201.

EE **476 Classical Techniques in Control** (3 cr). Multiple input-multiple output linear systems; parameter variations; nonlinear control systems, phase-space concepts, and describing functions; digital control systems. Prereq: 470.

EE **480-481 Principles of Design** (3 cr). Computer-aided techniques, economics, marketing, reliability, and patents; projects require original design, working model, and report. Prereq: sr standing.

EE **486 Solid-State Electronics I** (3 cr). Modern microelectronics technology; thin film and thick film electronic circuits; laboratory projects in fabrication and testing. Coreq: 410.

EE **491-492 Senior Seminar** (0 cr). Technical topics, employment practice, and interviewing. One lec per wk; one 3-6 day field trip may be required. Graded on the basis of P or F.

EE **493 Thesis** (3 cr, max 6). Original investigation or dissertation upon some subject in electrical engineering. Prereq: sr standing and perm.

EE **499** (s) **Directed Study** (cr arr). Prereq: perm.

EE **500 Master's Research and Thesis** (cr arr).

EE **501** (s) **Seminar** (cr arr). Prereq: perm.

EE **ID502** (s) **Directed Study** (cr arr). Prereq: perm.

EE **505 Nonlinear Network Analysis** (3 cr). Approximation methods; describing functions; harmonic balance techniques; perturbation methods; numerical analysis methods using digital computers. Prereq: 300 and ability to use digital computation facilities.

EE **ID507 Computer-Aided Network Design** (3 cr). Digital computers in design of electrical

networks; constrained and unconstrained optimization in network design. Prereq: perm.

EE **ID512 Active Network Synthesis** (3 cr). Active devices; classical network synthesis; two-port theory; amplifiers, filters, negative impedance converters. Prereq: 310.

EE **520 Advanced Electric Machinery** (3 cr). Synchronous machines and transformers; machine transient and subtransient reactances, excitation and voltage regulation, power curves, transformer connections, impedance, harmonics, and impulse characteristics. Prereq: 320.

EE **521 Power System Stability** (3 cr). Steady-state and transient stability; power flow equations, transient stability swing curves, relaying, and protection. Prereq: 421.

EE **523 Symmetrical Components** (3 cr). Concepts of symmetrical components; sequence impedances of devices and lines; circuit equivalents for unbalanced faults; management during faults. Prereq: 421.

EE **524 Transients in Power Systems** (3 cr). Voltage transients; overvoltages during faults; recovery voltage characteristics; arc restrikes, switching surges, ferroresonance, and nonlinear phenomena. Prereq: 421.

EE **530-531 Electromagnetic Field Theory I-II** (3 cr). EE 530: Static field problems; Laplace and Poisson equations for charge configurations. EE 531: Time-varying fields, radiation, propagation in anisotropic and layered media; vector and scaler potentials, retarded potentials; general relativity theory. Prereq: 330 for 530, 530 for 531. Equivalent to Phys 541-542.

EE **533 Antenna Theory** (3 cr). Linear, loop, and special antennas; synthesis and arrays; microwave reflectors and lenses. Prereq: 531 or perm.

EE **535 Microwave Circuits** (3 cr). Waveguide systems and components, oscillators and detectors; masers, parametric amplifiers, and other related methods. Prereq: 531 or perm.

EE **540 Computation Structures and Machine Organization** (3 cr). Same as InfSc 540. Design of digital computing systems; subsystems and their realization; time shared, parallel computer system design; modular organization of hardware; memory organization, and models of programs structure. Prereq: 440.

EE **541 Theoretical Foundations in Computers** (3 cr). Same as InfSc 541. Finite-state automata; computability according to Turing; properties and capabilities of synchronous and asynchronous, completely and incompletely specified machines; non-writing, push-down store, and probabilistic automata. Prereq: 440.

EE **542 Theoretical Models for Computation** (3 cr). Same as InfSc 542. Theoretical models with widest application to computer systems and programming; equivalence between abstract machines and corresponding formal grammars; formal languages and grammars; turing machines. Prereq: 541 or equiv.

EE **545 Algorithms and Information Structures** (3 cr). Same as InfSc 545. Basic algorithms of computer science; implementation of algorithms on the computer; lists, list processing languages, and data structures. Prereq: 445 or equiv.

EE **WS548 Hybrid Simulation Techniques** (3 cr). WSU EE 513. Complex systems with the aid of Hybrid computer. Prereq: 201, 440.

EE **ID550 Communication Theory I** (3 cr). Quantum receiver principles; channel constraints, binary communication techniques; fading and scattering media, diversity techniques; optimum reception; phase-locked loops. Prereq: 450.

EE **ID551 Communication Theory II** (3 cr). Hypothesis testing; optimum detection of signal in noise; sequential detection; maximum likelihood estimation; spatial processing; data reduction techniques. Prereq: 450.

EE **554-555 Information Theory I-II** (3 cr). Same as InfSc 554-555. EE 554: information and uncertainty measure; channel capacity; reliable transmission through unreliable channels. EE 555: error-detecting/correcting code via linear codes, polynomial codes, Bose-Chaudhuri codes, codes for arithmetic operations; design of encoders and decoders. Prereq: 450.

EE **565 Markov Processes and Queueing Theory** (3 cr). Same as InfSc 565. Discrete and continuous-time decision processes; queueing theory; Poisson and exponential distributions; Markov chains and optimal Markovian decision rules. Prereq: 450.

EE **572 Modern Control Theory** (3 cr). Modern control concept, controlability, observability, and stability; relation between modern control theory and classical control theory. Prereq 470.

EE **574 Optimal Control Theory I** (3 cr). Classical theory of min-max; calculus of variations; Lagrange problem; Stochastic processes; Wiener-Hopf and Kalman-Bucy filtering; linear programming. Prereq: 572.

EE **575 Optimal Control Theory II** (3 cr). Search techniques and nonlinear programming; dynamic programming; maximum principle. Prereq: 572.

EE **WS581-WS582 Wave Propagation I-II** (3 cr). WSU 528-529. EE 581: theory of radio wave propagation in a magnetoionic medium; application to communication problems involving earth's ionosphere. EE 582: pheno-

mena occurring within the solar-terrestrial environment; effects on radio wave propagation.

EE **WS583 Artificial Intelligence and Heuristic Programming** (3 cr). WSU CptS 501. Normative and descriptive models of intelligent processes; programming languages used to specify these models.

EE **WS584 Modeling and Simulation of Ecological Systems** (3 cr). WSU CptS 510.

EE **WS585 Advanced Topics in Information Processing** (3 cr, max 6). WSU CptS 520.

EE **586 Solid-State Eiectronics II** (3 cr). Transitors, tunnel diodes, and other junction devices; metal-semiconductor devices; field-effect transitors; optoelectronic devices; Gunn oscillators and other bulk-effect devices. Prereq: 410, 486, or perm; suggested coreq: Phys 551.

EE **588 Equilibrium Tensor Properties of Solids** (3 cr). Tensor analysis; crystal symmetry and symmetry transformations; dielectric, magnetic, and elastic properties; interaction effects; piezoelectricity; optical properties; piezo-optical effects. Prereq: perm.

EE **589 Transport Phenomena in Solids** (3 cr). Electrical and thermal conductivities, diffusivity; thermoelectric, electro-diffusive, and thermodiffusive conductivities; thermodynamics of irreversible processes; Hall, Nerst, Ettinghausen, and Leduc-Righi effects; piezo-resistance and piezogalvanomagnetic effects. Prereq: perm.

EE **599** (s) **Research** (cr arr). Prereq: perm.

EE **600 Doctoral Research and Dissertation** (cr arr).

EE **601** (s) **Seminar** (cr arr). Prereq: perm.

EE **602** (s) **Directed Study** (cr arr). Prereq: perm.

EE **603** (s) **Independent Study** (cr arr). Prereq: perm.

Engineering (General)

Roland O. Byers, Chairman (324 Engr. Bldg.). Professor Byers; Associate Professors Tovey, Turner; Assistant Professors Nelson, Shaw.

Engr **101 Engineering Graphics** (2 cr). Visualization of points, lines, planes, and solids in space; sketching, orthographic projection, pictorial representation, charts and graphs, and lettering; some drafting techniques and methods. Also offered by correspondence study.

Engr **102 Engineering Graphics** (2 cr). Descriptive geometry; technique of solving problems involving points, lines, planes, and surfaces in space; application to graphical problems in engineering and other fields. Also offered by correspondence study. Prereq: 101 or equiv.

Engr **111 Engineering Computations** (1 cr). Principles and use of slide rule. Prereq: Math 140-141 (or with 141).

Engr **120-121 Engineering Analysis and Design I-II** (2 cr). Open to non-engineering students by perm. Basic concepts for beginning engineering students. Engineering method of problem solving and the design process.

Engr **131 Digital Computer Programming** (1-2 cr). Same as InfSc 131. Principles and logic; flow charts, one- and two-dimensional arrays, function and subroutine subprograms, application to problem solving. Also offered by correspondence study.

Engr **234 Advanced Fortran Programming** (2 cr). Same as InfSc 234. Advanced fortran statements, complex and logical variables, advanced I/O, disk and tape use, numeric and non-numeric algorithms. Open for one cr only to students who have taken Bus 233. Prereq: 131 or Bus 233.

Engr **294 The Man-Made World** (4 cr). For non-engineering students. Intro to technology through the development of such concepts as decision making, optimization, systems, and uses of the computer. Real-life investigations based on "The Man-Made World" text. Three lec and one 3-hr lab per wk. Prereq: high school algebra.

Engr **R314 Advanced Engineering Graphics** (2 cr). Industrial drafting practices; curve plotting; creative problems; sketching; production illustrations; graphical mathematics; nomography, graphical integration, and differentiation. Prereq: 101.

Engr **394 Technology and Societal Decisions** (3 cr). Same as Inter 394. Basic treatment of the engineering approach to decision making in society, including the evaluation of alternatives based upon economic, social, and human values.

Engr **X&R411 Engineering Fundamentals** (3 cr). May not be used toward an engineering degree. Review of basic engineering and science material covered in undergraduate engineering curricula; selected areas of mathematics, chemistry, physics, mechanics, thermodynamics, electricity and electronics, and engineering economics. Prereq: engineering degree or perm.

Engr **N496-N497-N498 Engineering Concepts for High School Teachers I-II-III** (2 cr; 3 cr; 2 cr). Based largely on the Engineering Concepts Curriculum Project (ECCP), The Man-Made World, Parts I-II-III. Seven to eleven hrs of lec and lab per wk for six wks during summer sessions. Prereq: perm.

Engineering Science

George L. Bloomsburg, Chairman (224 Engr. Bldg.). Professor Bloomsburg; Associate Professors Haber, Scheldorf, Sun; Assistant Professor Hager.

ES **C210 Mechanics I — Statics** (2 cr). Composition and resolution of forces; Newton's laws as they pertain to equilibrium; vector analysis, free body diagrams, centroids, and moments of inertia; applications include trusses, frames, and friction. Prereq or coreq: Math 190; prereq: Phys 220.

ES **211 Introduction to Mechanics** (4 cr). Resolution of forces; vector analysis; equilibrium; free body diagrams; centroids and moments of inertia; kinematics, kinetics, work energy, and momentum methods for systems of particles. Three lec and one 2-hr lab per wk. Prereq: Math 190.

ES **C220 Mechanics II — Dynamics** (2 cr). Kinetics; acceleration analysis; systems of particles; work and energy, momentum, impulse, power in systems with linear and angular motion. Prereq or coreq: Math 200; Prereq: 210.

ES **221 Dynamics of Rigid Bodies** (2 cr). Kinematics, kinetics, work energy, and momentum methods for rigid bodies. Prereq: 211; coreq: Math 310.

ES **310 Engineering Materials Science** (3 cr). Structure of materials; mechanical, electrical, chemical, and thermal properties of materials. Prereq: Chem 114, Phys 221.

ES **320 Fluid Mechanics** (3 cr). Physical properties of fluids; fluid statics; continuity, energy, momentum relationships; laminar and turbulent flow; boundary layer effects; flow in pipes, open channels, and around objects. Also offered by correspondence study. Prereq: 211, Math 200.

ES **321 Thermodynamics and Heat Transfer** (3 cr). First and second laws of thermodynamics; thermodynamic processes; thermodynamic properties of fluids; flow processes; conversion of heat into work; refrigeration; conduction and radiation. Prereq: 211, Math 200.

ES **340 Mechanics of Materials** (3 cr). Elasticity, strength, and modes of failure of engineering materials; theory of stresses and strains for ties, shafts, beams, and columns. Also offered by correspondence study. Prereq: 211, Math 200.

ES **401 Engineering Statistics** (3 cr). Same as InfSc 401. Concepts and applications of probability and statistics; discrete and continuous distributions and their applications to confidence interval estimates, design of experiments, quality control, and linear regression in engineering problems. Prereq: Math 200.

ES **402 Applied Numerical Methods** (3 cr). Same as InfSc 402. Approximate and numerical methods for solution of boundary value, initial value, and eigen value systems, with practical applications, errors, improvement of accuracy, and numerical and matrix techniques for computation by digital computer. Prereq: Math 310.

ES **490 Systems Analysis of Environmental Problems I** (3 cr). Modeling and simulation of environmental systems; systems analysis and optimization techniques especially applied to environmental problems. Prereq: Math 310.

ES **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under the general supervision of a faculty member. Graded on the basis of P or F. Prereq: perm of dept.

ES **R505 Engineering Statistics** (1-3 cr). Same as InfSc R505. Theory of probability, statistics, and stochastic processes applied to selected areas of engineering. Prereq: 401 or perm.

ES **540 Continuum Mechanics** (3 cr). Stress and deformation of continua using tensor analysis; relationship between stress, strain, and strain rates in fluids and solids; applications. Prereq: perm.

ES **590 Systems Analysis of Environmental Problems II** (3 cr). Systems analysis of environmental problems and processes including linear, dynamic, and geometric programming; systems modeling, stochastic systems, and other optimization techniques. Prereq: perm.

English

Leo F. Storm, Dept. Chairman (200 Faculty Office Bldg.). Professors Storm, Tung; Associate Professors Heningham, Malek, Meldrum; Assistant Professors Adams, Barber, Davis, Dozier, Foriyes, Gilbertson, Hannaford, Knight, Leyden, McFarland, Murphy, Sipahigil, Stratton, Tanner, Wallins; Instructors Bie, Driskell, Elwood, McKie, Michel, O'Callaghan, Riley, Stewart.

ADVANCED PLACEMENT: Courses in this subject field which are vertical in content are: 101-201.

PREREQUISITES: Students may enroll for a second-semester course in English without having had the first-semester course, unless it is a stated prerequisite to the second-semester course. Eng 101 and 201 are prerequisites to all upper-division courses. A transfer student who lacks 101 or 201, or both,

may take either or both for credit even though he has already taken a literature course for which 101 or 201 are prerequisite here.

Eng **101 English Composition** (3 cr). Rhetoric and expository writing. Students in need of special instruction may be assigned to do additional work in the English clinic or in reading techniques. Also offered by correspondence study.

Eng **111-112 Literature of Western Civilization** (3 cr). Masterpieces reflecting the development of Western thought and culture. Eng 111: Classical Greece to the Renaissance. Eng 112: 17th century to the present. May be taken with 101.

Eng **150 Expository Prose Analysis** (3 cr). Concentrates on persistent problems of diction, syntax, and clear expression in student prose exposition. Prereq: 101.

Eng **175 Introduction to Literature** (3 cr). Basic course in literary genres (novel, drama, poetry) to provide the general student or the beginning English major with the terminology and standard techniques of literary explication. May be taken with 101.

Eng **201 Language and Literature** (3 cr). Not open to freshmen. Should be taken in the sophomore or junior year. Fundamentals of literature, emphasis on writing expository papers in support of elementary literary analysis and research. Also offered by correspondence study. Prereq: 101 or perm of dept.

Eng **267-268 Survey of English Literature** (3 cr). Eng 267: Beowulf to Samuel Johnson. Eng 268: Robert Burns to contemporary writers. Also offered by correspondence study. Prereq: 101.

Eng **277-278 Survey of American Literature** (3 cr). Eng 277: colonial beginnings to Melville. Eng 278: Whitman to contemporary writers. Prereq: 101.

Eng **291-292 Creative Writing** (3 cr). Techniques of writing; narrative prose and poetry. Graded on the basis of P or F. Prereq: perm.

Eng **313 Business Writing** (3 cr). Correspondence and reports; form, content, and style. Prereq: ability to type is desirable.

Eng **317 Technical and Engineering Report Writing** (3 cr). Principles of clear writing related to technical style; problems in the technical article, formal engineering reports, and business letters.

Eng **321 The Novel for Non-Majors** (3 cr). Major novels from the 18th century to the present; special emphasis upon the variety and kinds of novels written.

Eng **325 Contemporary Literature for Non-Majors** (3 cr). Current poetry and prose; emphasis on American authors.

Eng **327 Black Literature** (3 cr). Same as AfrAm 327. Major works of American Black writers; emphasis on the 20th century.

Eng **330 American Indian Literature** (3 cr). Recent poetry and prose written by and about the American Indians.

Eng **335 Shakespeare for Non-Majors** (3 cr). Primarily for students not majoring in English literature. Intro to Shakespeare's major plays.

Eng **350 Backgrounds of Literature** (3 cr). Survey of those areas of tradition which underlie the art-literature of the Western World: the Bible, the mythology of classical antiquity and of Northern Europe, and the medieval romance.

Eng **375 The Bible as Literature** (3 cr). Literary qualities of the Bible.

Eng **395 Methods of Literary Criticism** (3 cr). Intro to major principles and methods of literary analysis; practice in applying critical methods to selected poems, fiction, and drama.

Eng **400** (s) **Seminar** (cr arr). Prereq: perm.

Eng **401 Advanced Composition** (3 cr). Model class for prospective teachers of English; equal emphasis on rhetorical theory and the teaching of composition.

Eng **402 Composition and Criticism** (3 cr). Survey of basic critical approaches which illuminate student experience as expressed in secondary-level literature; designed to aid in the integration of literature and composition.

Eng **421 Development of the English Novel** (3 cr). Major writers from the beginnings to Scott.

Eng **422 The Nineteenth-Century English Novel** (3 cr). Dickens to Hardy.

Eng **425 Irish Literary Renaissance** (3 cr). Literature of Ireland after 1880, especially Yeats, Joyce, and Synge.

Eng **426 Modern Poetry** (3 cr).

Eng **427 American Fiction in the Twentieth Century** (3 cr).

Eng **428 British Fiction in the Twentieth Century** (3 cr).

Eng **433 Chaucer** (3 cr). Intro to Chaucer's poetical works except *Troilus and Criseyde*.

Eng **434 Middle English Literature** (3 cr). Middle English language and literature to 1500, exclusive of the works of Chaucer and of medieval drama.

Eng **435 Shakespeare: Comedies and Histories** (3 cr).

Eng **436 Shakespeare: Tragedies and Romances** (3 cr).

Eng **437 English Drama to 1642** (3 cr). Liturgical beginning through the Age of Elizabeth, excluding Shakespeare, and concluding with the close of the theatres by the English Civil War; emphasis upon Marlowe, Jonson, and Webster.

Eng **438 English Drama, 1660-1800** (3 cr). Heroic play and tragedy; sentimental drama; comedy of manners.

Eng **439 Modern English and American Drama** (3 cr). Plays of the chief 20th-century English and American dramatists.

Eng **441 Descriptive Linguistics** (3 cr). Intro to the study of English; surveys; surveys of sound patterns, morphological processes, and syntactic structures; exercises from a variety of modern languages, with emphasis on American English.

Eng **442 Current Developments in Transformational Grammar** (3 cr). Reviews phrase structures and investigates cyclic rules and conjoining and embedding from semantic deep structures. Prereq or coreq: 441 or perm.

Eng **443 Seminar in Syntactic Theories** (3 cr). Student investigation and reports on theories of language structure and process; emphasis on systemic grammar, tagnemics, case grammar, stratificational grammar, and generative semantics. Prereq or coreq: 441 or perm.

Eng **445 Literature for Young People** (3 cr). Primarily for students working for teacher or library certification. Reading and appraisal of literature appropriate to the needs, interests, and abilities of young people.

Eng **451 The Poetry of Spencer and His Age** (3 cr).

Eng **452 Milton** (3 cr). Major prose and poetry of Milton

Eng **453 Seventeenth-Century Literature in Prose** (3 cr). Evolution of 17th century prose from Bacon to Dryden, including Browne, Overbury, Burton, Donne, Andrews, and Milton.

Eng **454 Seventeenth-Century Poetry** (3 cr). Jacobean and Caroline poetry (including the metaphysicals, but excluding Milton), 1600-1660.

Eng **455 The Age of Dryden and Pope** (3 cr). Neoclassical temper and the literature of the middle class; Dryden, Pope, and prose writers.

Eng **456 The Age of Johnson** (3 cr). Rational spirit and growth of sensibility as found in Swift, Johnson, and the Pre-romantics.

Eng **464 The Romantic Period — Blake, Wordsworth, and Coleridge** (3 cr). Poetry and prose of the first generation romantics.

Eng **465 The Romantic Period — Shelley, Keats, and Byron** (3 cr). Poetry and prose of the second generation romantics.

Eng **466 Victorian Poetry** (3 cr). Major and minor poets of the period, emphasizing their literary concerns and styles, their recognition of the problems of the period, and their attempts to cope with those problems.

Eng **471 Poe, Hawthorne, and Melville** (3 cr). Major works and genres of three authors to delineate their ethos and artistry in relation to the American Renaissance. Prereq: 277.

Eng **472 Emerson, Thoreau, and Whitman** (3 cr). Major works and genres of three authors to delineate their ethos and artistry in relation to the American Renaissance. Prereq: 277.

Eng **473 Literature of the American West** (3 cr). Writings that reflect the growth of the western United States from frontier days to the present.

Eng **474 Growth of American Realism, 1865-1914** (3 cr). Prereq: 278.

Eng **476 American Folklore** (3 cr). Forms, including ballads and folksongs, known in the U.S.; their collection and study with special attention to their appearance in American literature.

Eng **482-483** (s) **Major Authors** (3 cr). Comprehensive study of the works of a single author. See current time schedule of classes for author.

Eng **487-488 Modern European Literature** (3 cr). Readings in translation of the chief European writers; emphasis on the 19th and 20th centuries and including drama.

Eng **491-492 Advanced Creative Writing** (3 cr). Continuation of 291-292. Graded on the basis of P or F. Prereq: 291 or 292, and perm.

Eng **495 Literary Criticism** (3 cr). History of literary criticism from Plato to the present.

Eng **496 History of the English Language** (3 cr). Evolution of the English language from Proto-Germanic to American English.

Eng **499** (s) **Directed Study** (1-3 cr, max 3). Prereq: perm.

Eng **500 Master's Research and Thesis** (cr arr).

Eng **501** (s) **Seminar** (cr arr). Prereq: perm.

Eng **502** (s) **Directed Study** (1-3 cr, max 3). Normally offered in English and American literature and in linguistics. Prereq: perm.

Eng **503 Problems and Methods of Literary Study** (3 cr).

Eng **505** (s) **Workshop** (cr arr). Prereq: perm.

Eng **507 Old English** (3 cr). Prereq: 441, 442, 496, or perm.

Eng **508 Middle English** (3 cr). Prereq: 441, 442, 496, or perm.

Eng **509 Early and Late Modern English** (3 cr). Prereq: 441, 442, 496, or perm.

Eng **525** (s) **Renaissance Proseminar** (3 cr, max 9). Studies in 16th and 17th century poetry, prose, and drama.

Eng **526** (s) **American Proseminar** (3 cr, max 12). Studies in American literature.

Eng **527** (s) **Proseminar** (3 cr, max 12). Studies in English literature by historical periods, except the Renaissance.

Eng **528** (s) **Proseminar** (3 cr, max 12). Studies in literary genre and mode; poetry, drama, folklore, satire, criticism, and Western American.

Eng **535** (s) **Renaissance Seminar** (3 cr, max 12). Studies in major Elizabethan writers: Spenser, Shakespeare, Donne, or Milton.

Eng **536** (s) **American Seminar** (3 cr, max 12). Studies of major American writers: Melville, Thoreau, James, Twain, Faulkner, O'Neill, or Lewis.

Eng **537** (s) **Seminar** (3 cr, max 12). Studies of major British writers: the Beowulf poet, Chaucer, Dryden, Pope, Swift, Johnson, Wordsworth, Coleridge, Keats, Browning, Arnold, Dickens, Yeats, Lawrence, T. S. Eliot, or Conrad.

Eng **548 Applied Linguistics** (3 cr). Credit in this course cannot be used for the 30-credit requirement for the M.A. degree with a major in English. Recent research in linguistics and its application to the teaching of composition, reading, literature, oral English, and language. Prereq: 6 cr in the following: 441, 442, 496.

Eng **599** (s) **Research** (cr arr). Prereq: perm.

Entomology

Arthur R. Gittins, Dept. Head (101 Ent. Bldg.). Professors Barr, Bishop, Gittins, Schenk, Stark; Associate Professors Brusven, Smith; Associate Research Professor Scott; Assistant Professor O'Keeffe; Assistant Research Professors Carpenter, Waters.

Ent **X121 Applied Entomology** (3 cr). Identification, life history, and control of insect pests in the Pacific Northwest; for students interested in the biology and control of pest insects.

Ent **211 General Entomology** (4 cr). Structure, development, classification, habits, and ecology of insects. Two lec and two 2-hr labs per wk.

Ent **314 Entomology for Biology Teachers** (3 cr). Use of insects in illustrating biological principles, techniques and methodology in rearing, preparing, and studying insects. Two lec and one dem-disc per wk. Prereq: perm.

Ent **322 Economic Entomology** (3 cr). Insect relationships to man and his environment; identification, biology, and control. Two lec and one 2-hr lab per wk.

Ent **342 Insect Identification** (4 cr). Survey of the major families; collecting and preservation techniques. Two lec and two 2-hr labs per wk; two 1-day field trips. Prereq: 211.

Ent **400** (s) **Seminar** (cr arr). Prereq: perm.

Ent **438 Pesticides in the Environment** (2 cr). Same as PISc 438 and Inter 438. The role of herbicides, fungicides, bactericides, nematocides, insecticides, and rodenticides in pollution, with methods of detection, control, and prevention. Two lec per wk.

Ent **442 Immature Insects** (3 cr). Alt/yrs 74-75. Structure, behavior, and identification of immature insects. One lec and two 2-hr labs per wk. Prereq: 211.

Ent **WS447 Plant Resistance to Insects** (2 cr). Alt/yrs 74-75. WSU 447. Mechanisms of plant resistance; factors affecting expression or permanence of resistance; analysis of insect-plant associations. Prereq: perm.

Ent **WS448 Medical Entomology** (3 cr). WSU 448. Insects and related arthropods in relation to human health; means of control. Prereq: adv standing in entomology.

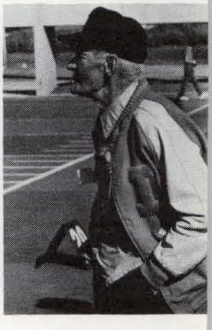
Ent **WS449 Biological and Integrated Control** (2 cr). Alt/yrs 73-74. WSU 449. Use of natural organisms for control of insect and weed pests; development of integrated programs.

Ent **WS451 Insect Physiology** (4 cr). Alt/yrs 73-74. WSU 451. Mechanisms of vital processes in insects are explained at the organ, cellular, subcellular, chemical, and physical levels. Prereq: course in organic chemistry and cell physiology.

Ent **467 Forest Entomology** (3 cr). Same as FWR 467. Influence of insects on forestry practices and on the forest ecosystem; identification, ecology, survey, and control of major forest insect pests. Two lec and one 2-hr lab per wk.

Ent **ID472 Aquatic Entomology** (1 cr) (ID372). Alt/yrs 74-75. Identification and biology of insects associated with aquatic and subaquatic environments. Prereq: perm.

Ent **ID474 Aquatic Entomology Laboratory** (2 cr) (ID372). Alt/yrs 74-75. Lab to accompany ID472. Two 3-hr labs per wk; two 1-day field trips. Coreq: ID472.



Ent **484 Insect Anatomy and Physiology** (4 cr). Alt/yrs 73-74. Organ systems of insects and their functions. Three lec and one 3-hr lab per wk. Prereq: 211.

Ent **ID498 Insect Morphogenesis** (3 cr). Alt/yrs 73-74. Ontogenetic development; embryogenesis, metamorphosis, morphology, and phylogeny of insects. Prereq: adv standing in entomology.

Ent **499** (s) **Directed Study** (cr arr). Prereq: perm.

Ent **500 Master's Research and Thesis** (cr arr).

Ent **501** (s) **Seminar** (cr arr). Prereq: perm.

Ent **502** (s) **Directed Study** (cr arr). Prereq: perm.

Ent **ID513 Entomological Research Methods** (3 cr). Procedures and techniques of studying insects; measuring physical environmental factors.

Ent **517 Entomological Literature** (2 cr). Survey of literature and bibliographic aids.

Ent **521 Principles of Insect Control** (3 cr). Alt/yrs 74-75. Principles, theory, and methodology of regulating populations of detrimental insects.

Ent **ID538 Pesticide Toxicology** (3 cr). Alt/yrs 73-74. Same as PISc 538. Modes of action of pesticide chemicals; effects on living organisms. Prereq: perm.

Ent **ID541 Insect Ecology** (3 cr). Alt/yrs 74-75. Factors affecting the distribution, abundance, and behavior of insects; population dynamics. Two lec and one 3-hr lab per wk; two 1-day field trips. Prereq: 211 and general ecology or perm.

Ent **WS542 Insect Behavior** (4 cr). Alt/yrs 73-74. WSU 542. Behavior of insects: orientation to environmental conditions. Three lec and one 3-hr lab per wk.

Ent **WS543 Pest Management** (3 cr). Alt/yrs 74-75. WSU 543. Insect population ecology; ecological methods and concepts of applied ecology. Prereq: perm.

Ent **544 Systematic Entomology** (3 cr). Principles and concepts of insect classification; taxonomic procedure and rules of zoological nomenclature.

Ent **WS546 Insect Toxicology** (4 cr). Alt/yrs 74-75. WSU 546. Mode of action of insecticides at the neural membrane and molecular levels; mechanisms of selectivity of and resistance to poisons. Prereq: organic chemistry or perm.

Ent **WS551 Insect Biochemistry** (3 cr). Alt/yrs 74-75. WSU 551. Examination of current knowledge of insect chemistry. Prereq: course in biochemistry.

Ent **569 Advanced Forest Entomology** (3 cr). Alt/yrs 73-74. Same as FWR 569. Biological and economic evaluation and applied control of forest insect populations; population phenomena. Two lec and one 2-hr lab per wk; two 1-day field trips to university forest. Prereq: 467 or perm.

Ent **ID582 Insect Physiological Ecology** (4 cr). Alt/yrs 74-75. Interrelationships of environment with metabolic functions, structure, and biology of insects. Three lec and one 3-hr lab per wk. Prereq: 484 or perm.

Ent **597** (s) **Practicum** (cr arr). Prereq: perm.

Ent **598** (s) **Internship** (cr arr). Prereq: perm.

Ent **599** (s) **Research** (cr arr). Prereq: perm.

Ent **600 Doctoral Research and Dissertation** (cr arr).

Ent **602** (s) **Directed Study** (cr arr). Prereq: perm.

Ent **603** (s) **Independent Study** (cr arr). Prereq: perm.

Food Science

John E. Montoure, Dept. Head (103 Food Sci. Bldg.). Associate Professors Barnhart, Montoure, Muneta; Associate Research Professor Sauter; Assistant Professor Swanson.

FS **101 Introduction to Food Science** (3 cr). Food science and its relation to agriculture; opportunities in the various fields of the food industry; trends in procurement, management, processing, distributing, and utilization of food.

FS **201 Physical Principles of Food Processing** (3 cr). Alt/yrs 73-74. Processing by heat, freezing, dehydration, radiation, and other methods.

FS **204 Chemical Principles of Food Processing** (3 cr). Alt/yrs 74-75. Texture, color, flavor, and nutritive quality during food harvesting, processing, and distribution.

FS **259 Food Product Analysis for Quality Control** (4 cr). Methods of food examination basic to detection of adulteration, food grading, and quality control; procedures for analysis of food products. Two lec and two 2-hr labs per wk.

FS **263 Introduction to Meat Science** (3 cr). See Anl 263.

FS **294 Food Processing I** (4 cr). Science, engineering, and bacteriological influences involved in purchasing, processing, and distribution of market milk and other perishable

foods. Two lec and one 4-hr lab per wk. Prereq: 259 or perm.

FS **312 Food Plant Equipment and Building** (3 cr). Alt/yrs 74-75. Principles of construction, operation, and maintenance of food processing equipment; process control; steam, water, electrical, refrigeration, and air production and control; building construction, design, materials, and methods. Two lec and one 2-hr lab per wk.

FS **313 Food Plant Sanitation and Inspection** (3 cr). Alt/yrs 73-74. Hard surface detergency, detergent classification and formulation; water conditioning and treatment; waste disposal; inspection as established by federal and state agencies. Two lec and one 3-hr lab per wk. Prereq: 294 or perm.

FS **329 Proseminar** (1 cr). Food science problems and review of literature.

FS **334 Meat Technology** (3 cr). See Anl 334.

FS **410 Undergraduate Research** (1-2 cr, max 4).

FS **416 Food Plant Management** (3 cr). Alt/yrs 74-75. Organization, operation, and management of processing plants; local, state, and federal regulations pertaining to processing, sale, and distribution of food products. Prereq: perm.

FS **422 Food Chemistry and Analysis** (3 cr). Alt/yrs 74-75. Two lec and one 3-hr lab per wk. Prereq: Chem 253, 275, or equiv.

FS **438 Fruit and Vegetable Processing** (4 cr). Processing of fruits, vegetables, pickles, jellies, and jams; unit operations and processes of canning, freezing, and dehydration. Three lec and one 3-hr lab per wk. Prereq: perm.

FS **441 Food Processing II** (4 cr). Alt/yrs 73-74. Theory and practice of processing food products into ice cream and other frozen desserts; chemical and physical changes during preparation, freezing, refrigerated storage, and freeze drying; cultured food products and cottage cheese. Two lec and one 4-hr lab per wk. Prereq: 294 or perm.

FS **442 Food Processing III** (4 cr). Alt/yrs 73-74. Techniques involved in production of manufactured food products through coagulation and precipitation phenomena as well as controlled fermentation, concentration by dehydration, cheese varieties, and butter production. Two lec and one 4-hr lab per wk. Prereq: 294 or perm.

FS **476 Advanced Food Products Analysis** (2 cr). Alt/yrs 73-74. Modern sophisticated instruments and lab techniques used in research and in technical control of dairy and food products. Two 2-hr labs per wk. Prereq: 259 or perm.

FS **500 Master's Research and Thesis** (cr arr).

FS **501** (s) **Seminar** (cr arr). Prereq: perm.

FS **502** (s) **Directed Study** (cr arr). Prereq: perm.

FS **511-512 Advanced Food Science** (2 cr). Application of microbiological, physical, and physiochemical principles to the processing of food products; problems of bacterial destruction and growth, viscosity, foam formation, freezing, crystallization, and protein and fat stability. Prereq: 12 cr in chem, 7 cr in bacteriology or perm.

FS **522 Pesticide Residues and Chemical Additives in Food** (3 cr). Sources and nature.

FS **573 Meat Science** (3 cr). See Anl ID573.

FS **599** (s) **Research** (cr arr). Prereq: perm.

Foreign Languages And Literatures

C. L. Iiams, Dept. Chairman (314 Admin. Bldg.). Professors Iiams (German), Reed (German); Associate Professors Aaron (Spanish), Rowe (Classics), Sita (Spanish and Italian), Stevenson (French), Sullivan (German); Assistant Professors Fiske (French), Jensen (Spanish), Koubourlis (Russian), Moody (Spanish); Instructors Bessette (Classics), Cohee (French), Reece (German), Rose (French), Surles (Spanish), Wu (French); Instructor Van Horn.

ADVANCED PLACEMENT: Courses in this subject field which are vertical in content are: 101-102-201-202; 121-122-221-222; 341-342-441-442; 151-152-251-252; 161-162-261-262; 171-172-271-272; 181-182-281-282. In appropriate cases, with the approval of the chairman of the Department of Foreign Languages and Literatures, any one of the following courses may be considered the terminal course in the vertical sequence for advanced placement: 301-302; 321-322; 361-362; 371-372; 381-382.

PREREQUISITE: Prerequisite for upper-division language courses, except those in Greek, is the appropriate intermediate course or equivalent.

COURSES OFFERED IN ENGLISH

No prerequisite or foreign language experience required.

FL **100 English as a Second Language** (3 cr, max 6). Limited to students whose native language is other than English. Normally scheduled on the basis of three lec per wk; however, additional lec, lab, and/or tutorial sessions may be scheduled and required. Prereq: perm of dept.

FL **211-212 Classical Mythology** (2 cr). Intro to classical myths and legends and their survival in western literature and art.

FL **243-244 English Word Origins** (2 cr). Fundamental Latin and Greek words used in the humanities and natural sciences; emphasis on terminology of fields in which students are especially interested; knowledge of Greek or Latin is not required.

FL **313-314 Modern French Literature in Translation** (3 cr). Does not count toward a major or minor in French. Major modern French authors in English translation; knowledge of French is not required.

FL **323-324 German Literature in Translation** (3 cr). Does not count toward a major or minor in German. Knowledge of German is not required.

FL **363-364 Survey of Classical Origins** (3 cr). FL 363: Greece. FL 364: Rome. Literature, history, philosophy, archaeology, and art of Greece and Rome; discussions and writing.

FL **373-374 Russian Literature in Translation** (3 cr). Main currents of Russian literature in English translation. Knowledge of Russian not required. May be used to fulfill the L & S humanities literature requirement.

FL **393-394 Masterpieces of Spanish Literature in Translation** (3 cr). Does not count toward a major or minor in Spanish. Masterpieces of Spanish literature in English translation; knowledge of Spanish is not required.

GENERAL COURSES FOR FOREIGN LANGUAGES

FL **200** (s) **Seminar** (cr arr). Prereq: perm.

FL **299** (s) **Directed Study** (cr arr). Prereq: perm.

FL **400** (s) **Seminar** (cr arr). Prereq: perm.

FL **449 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under the general supervision of a faculty member. Graded on the basis of P or F. Prereq: perm of dept.

FL **498** (s) **Proseminar** (1-3 cr, max 12). May be graded on the basis of P or F when this grading system is uniform for all students in the class. Prereq: perm.

FL **499** (s) **Directed Study** (cr arr). Prereq: perm.

FL **500 Master's Research and Thesis** (cr arr).

FL **501** (s) **Seminar** (cr arr). Prereq: perm.

FL **502** (s) **Directed Study** (cr arr). Prereq: perm.

FL **506** (s) **Workshop** (cr arr). Prereq: perm.

FL **597** (s) **Practicum** (cr arr). Prereq: perm.

FL **598** (s) **Internship** (cr arr). Prereq: perm.

FL **599** (s) **Research** (cr arr). Prereq: perm.

FRENCH

Note: FL 101, 102, 201, and 202 may be taken concurrently (successively) during a single term if the student is a resident of the French Language House.

FL **101-102 Elementary French** (4 cr). Pronunciation, vocabulary, reading, spoken French, and functional grammar.

FL **104 Elementary French Reviewed** (4 cr). Not open for credit to students who have taken 101 or equiv in college. Review of subject matter covered in 101-102. Prereq: 2 yrs of French in high school.

FL **105-106 French for Graduate Students** (0 cr). Preparation for the doctoral reading examination. Two 1-hr lec per wk. Graded on the basis of P or F.

FL **201-202 Intermediate French** (4 cr). Reading, grammar review, speaking, and writing. Prereq: 102.

FL **301-302 Advanced French Grammar and Composition** (3 cr) Recommended for prospective teachers of French.

FL **303-304 French Culture and Institutions** (3 cr).

FL **305-306 Survey of French Literature** (3 cr). Middle Ages to the present.

FL **401-402 Nineteenth-Century French Literature** (3 cr).

FL **403-404 Seventeenth-Century French Literature** (3 cr).

FL **405-406 Eighteenth-Century French Literature** (3 cr).

FL **407-408 Contemporary French Literature** (3 cr).

FL **409-410 French Phonetics** (1-3 cr, max 6). Phonetic description and phonemic analysis; stress, its nature and place; intonation patterns in conversation; reading of prose and poetry.

FL **411-412 French Composition and Conversation** (2 cr).

FL **413-414 French for Teachers** (2 cr). Language and culture; pronunciation and diction.

FL **503 History of the French Language** (3 cr).

FL **504 Explications Francaises** (3 cr).

FL **505 Seventeenth-Century French Drama** (3 cr).

GERMAN

FL **121-122 Elementary German** (4 cr). Pronunciation, vocabulary, reading, spoken German, and functional grammar.

FL **125-126 German for Graduate Students** (0 cr). Preparation for the doctoral reading examination. Two 1-hr rec per wk. Graded on the basis of P or F.

FL **221-222 Intermediate German** (4 cr). Reading, grammar review, speaking, and writing. Prereq: 122.

FL **223-224 Intermediate German: Scientific** (4 cr). Readings adapted to the needs of students in scientific curricula. Prereq: 122.

FL **321-322 Advanced German Grammar and Composition** (3 cr). Recommended for prospective teachers of German.

FL **325-326 German Culture and Institutions** (3 cr).

FL **327-328 Survey of German Literature** (3 cr). To the close of the 19th century.

FL **421-422 Nineteenth-Century German Literature** (3 cr).

FL **423-424 Modern German Literature** (3 cr).

FL **425-426 Eighteenth-Century German Literature** (3 cr).

FL **427-428 Classical Period in German Literature** (3 cr).

FL **429-430 German Phonetics** (1 cr). Phonetic description and phonemic analysis; stress, its nature and place; intonation patterns in conversation; reading of prose and poetry.

FL **431-432 German Composition and Conversation** (2 cr).

FL **433-434 German for Teachers** (2 cr). Language and culture; pronunciation and diction.

FL **523 History of the German Language** (3 cr).

FL **524 Middle High German** (3 cr).

FL **525 Goethe's Faust** (3 cr).

GREEK

FL **341-342 Elementary Greek** (4 cr). Pronunciation, vocabulary, reading, and functional grammar.

FL **441-442 Intermediate Greek** (4 cr). FL 441: Xenophon's *Anabasis*. FL 442: Plato's *Apology of Socrates* and the *Crito*.

ITALIAN

FL **151-152 Elementary Italian** (4 cr). Pronunciation, vocabulary, reading, spoken Italian, and functional grammar.

FL **251-252 Intermediate Italian** (4 cr). Reading, grammar review, speaking, and writing. Prereq: 152.

LATIN

FL **161-162 Elementary Latin** (4 cr). Pronunciation, vocabulary, reading, spoken Latin, and functional grammar.

FL **261-262 Intermediate Latin** (4 cr). Reading, grammar review, speaking, and writing. Prereq: 162.

FL **361-362 Advanced Latin Grammar and Composition** (3 cr). Recommended for prospective teachers of Latin.

FL **365-366 Survey of Latin Literature** (3 cr). To the close of the third century.

FL **461-462 Latin Literature of the Augustan Age** (3 cr).

FL **463-464 Latin Literature of the Republic** (3 cr).

FL **465-466 Latin Literature of the Silver Age** (3 cr).

FL **467-468 Latin for Teachers** (2 cr).

RUSSIAN

FL **171-172 Elementary Russian** (4 cr). Pronunciation, vocabulary, reading, spoken Russian, and functional grammar. FL 171 also offered by correspondence study.

FL **271-272 Intermediate Russian** (4 cr). Reading, grammar review, speaking, and writing. Prereq: 172.

FL **371-372 Advanced Russian Grammar and Composition** (3 cr). Recommended for prospective teachers of Russian.

SPANISH

FL **181-182 Elementary Spanish** (4 cr). Pronunciation, vocabulary, reading, spoken Spanish, and functional grammar.

FL **184 Elementary Spanish Reviewed** (4 cr). Not open for credit to students who have taken 181 or equiv in college. Review of subject matter covered in 181-182. Prereq: 2 yrs of Spanish in high school.

FL **281-282 Intermediate Spanish** (4 cr). Reading, grammar review, speaking, and writing. Prereq: 182.

FL **381-382 Advanced Spanish Grammar and Composition** (3 cr). Recommended for prospective teachers of Spanish.

FL **383-384 Hispanic Culture and Institutions** (3 cr). Includes topics in Spanish-American civilization.

FL **385-386 Survey of Spanish Literature** (3 cr).

FL **387-388 Survey of Spanish-American Literature** (3 cr).

FL **481-482 Nineteenth-Century Spanish Literature** (3 cr).

FL **483-484 Golden Age in Spanish Literature** (3 cr). Sixteenth and seventeenth centuries.

FL **485-486 Contemporary Spanish Literature** (3 cr).

FL **487-488 Contemporary Spanish-American Literature** (3 cr).

FL **489-490 Spanish Phonetics** (1 cr). Phonetic description and phonemic analysis; stress, its nature and place; intonation patterns in conversation; reading of prose and poetry.

FL **491-492 Spanish Composition and Conversation** (2 cr).

FL **493-494 Spanish for Teachers** (2 cr). Language and culture; pronunciation and diction.

FL **583 History of the Spanish Language** (3 cr).

FL **584 Spanish Phonetics and Phonemics** (3 cr).

FL **585 Cervantes** (3 cr)

Forestry, Wildlife And Range Sciences

John H. Ehrenreich, Dean (201 FWR Bldg.). Professors Bjornn, Chapman, Ehrenreich, Hironaka, Hornocker, Howe, Hungerford, John, Johnson, Klontz, Loewenstein, MacPhee, Partridge, Pitkin, Schenk, Seale, Sharp, Stark, Tisdale, Wang; Associate Professors Adams, Belt, Bizeau, Falter, Knight, Sowles; Assistant Professors Cherem, Godfrey, Hofstrand, Schuster, White; Instructors Allen, King, McNevin; Extension Forester Burlison.

PREREQUISITE: Courses in this subject field numbered above 299 are not open to any student who is on academic probation.

FWR **101 Forestry Orientation** (1 cr). Intro to forestry and related wildland management professions; orientation to the university and college.

FWR **200** (s) **Seminar** (cr arr). Prereq: perm.

FWR **203 Wildland Resources Conservation** (3 cr). Basic concepts of forest and rangeland ecology; major resources of wildlands, their use, and the principles of management which lead to their conservation; man's role in the natural environment and problems of pollution. Not open to students in the College of FWR. Two days of field trips.

FWR **216 Tree Identification** (2 cr). Identification, distribution, and economic use of important trees of western U.S.; emphasis on Idaho trees. Not open to students in the College of FWR. One lec and one 2-hr lab per wk; one 1-day field trip.

FWR **221 Silvics** (3 cr) (321). Ecological basis for the management of vegetation, especially forests. Prereq: general botany.

FWR **294 Models for Resource Decisions I** (3 cr). Methodical, logical, and scientific approach to problem solving for students of natural resources; topics stress use of systems and mathematics to identify and evaluate factors influencing natural resources. Prereq: Math 180 and computer course.

FWR **299** (s) **Directed Study** (cr arr). Prereq: perm.

FWR **300 Forest Resource Measurements** (1-4 cr, max 4). Map and aerial photo measurement and interpretation; land surveying; log, tree, and stand measurement; wildland surveys for resource inventories and mapping. Four weeks of all-day summer camp classes at McCall. Prereq: course in surveying.

FWR **301 Wildland Ecology** (4 cr). Ecological principles, methods, and concepts as applied to forest, range, wildlife and fishery management; ecological basis for integrated management of wildland. Four weeks of all-day summer camp classes at McCall. Prereq: 221 and systematic botany.

FWR **303 Forest Resources Conservation** (2 cr). Ecosystem approach to resource management on forest and range lands; observations of management practices integrating timber, range forage, wildlife, fish, water, and recreation resources, stressing principles which lead to their conservation. Two weeks of all-day classes during summer post session at McCall, Idaho. Prereq: course in a biological science.

FWR **305 Farm Forestry** (2 cr). The farm woodlot; growing wood products; seasoning, preservation, use, and marketing of farm forest products; windbreak and shelterbelt planting; forestry in the economics of agriculture. Prereq: jr standing in agriculture.

FWR **307 Biometry** (3 cr). See Ag 321.

FWR **314 Fish and Wildlife Population Ecology** (3 cr). Characteristics of fish and wildlife populations and their environment. Prereq: general ecology or perm.

FWR **320 Dendrology** (3 cr). Identification, classification, distribution, and associations of the important tree species in the U.S.; important regional shrubs. Two lec and two 2-hr labs per wk; two 1-day field trips. Prereq: 301 and systematic botany.

FWR **327 Elementary Forest Tree Improvement** (1 cr). Same as Genet 307. Basic genetic principles and practices of forest tree improvement. Two 1/2 day field trips. Prereq: general botany.

FWR **331 Introduction to Wood Technology** (3 cr). Plant anatomy pertinent to woody plants; identification of woods by gross and minute characteristics; physical and chemical properties of commercial woods; relation of wood properties to wood processing and wood in use. Two lec and two 2-hr labs per wk; two days of field trips. Prereq: general botany.

FWR **351 Elements of Range Management** (3 cr). Development of the range industry; grazing regions; production and utilization of range forage; range improvement and reseeding; range survey and management plans; relation of range management to other phases of wildland management. Prereq: general botany.

FWR **367 Fire Control** (2 cr). Objectives and policy; effects of fire on the ecosystem; fire behavior; use of fire as a wildland management tool. One 2-day field trip.

FWR **370 Principles of Forest Management** (2 cr). Forest regions and industries; silvicultural principles and practices employed in timber production and utilization; interrelations between wood production and other uses of forest land.

FWR **400** (s) **Seminar** (cr arr). Prereq: perm.

FWR **WS406 Radiation Ecology** (2 cr). Alt/yrs 74-75. WSU BioSc 440. Fate and effect of radio nuclides in the natural environment.

FWR **408 Forest Soils** (2 cr). Same as Soils 408. Properties of wildland soils; forest humus; soil-site relationships, improvement of unproductive forest soils; soils and reforestation; management of nursery soils. Prereq: general soils.

FWR **411 Ichthyology** (3 cr). See Zool 481.

FWR **412 Aquatic Pollution Ecology** (3 cr). Physical, chemical, and biological interrelationships of altered lakes and streams. Two lec and one lab-disc per wk. Prereq: limnology or perm.

FWR **ID413 Fish Ecology** (2 cr). Racial discrimination, migration, and spawning activities of salmonids; environmental stress with reference to physiology, competition, predation, and pollution. Two lec per wk; three days of field trips. Prereq: ecology or perm.

FWR **ID414 Fish Ecology Laboratory** (1 cr). One 2-hr lab per wk. Graded on the basis of P or F. Prereq: general zoology and perm.

FWR **415 Limnology** (3 cr). Same as Zool 436. Interrelationships of the physical, chemical, and biological features of lakes and streams. Two lec and one 2-hr lab per wk; three days of field trips. Prereq: general chemistry and general zoology.

FWR **417 Fish Culture** (2 cr). Alt/yrs 74-75. Propagation, nutrition, diseases, bioenergetics, and growth of fresh-water fishes with emphasis on the economics of various fish culture practices. Five days of field trips.

FWR **418 Fishery Management Techniques** (2 cr). Methods and techniques employed in fishery management. Prereq: 307 and ecology.

FWR **422 Forest Planting** (2 cr). Methods of seed collection, extraction, and storage; germination; nursery practice; field planting. One lec and one 3-hr lab per wk; one 2-day field trip. Prereq: 221, 301.

FWR **424 Silviculture** (3 cr). Silvicultural cutting systems, cultural operations, and the silvicultural characteristics of important commerical species. Two lec and one 3-hr lab per wk; one or two 1-day field trips. Prereq: 221, 301.

FWR **434 Forest Engineering and Harvesting** (3 cr). Management system concept including reconnaisance, engineering concepts of route design and logging, silvicultural and milling considerations, yarding systems and costs; development of a logging plan for an operating area. Five days of field trips. Prereq: 294, 300.

FWR **436 Biological Properties of Wood** (3 cr). Wood quality and its relation to growing conditions in the forest; theory and practice of air and kiln drying methods for wood; protection of wood by chemical impregnation. Two lec and one lab per wk; one 5-day field trip. Prereq: general botany.

FWR **437 Physical Properties of Wood** (3 cr). Technology and physical properties of woods, including wood moisture relations; mechanical properties; application of strength data and design principles to the use of wood in construction. Two lec and one lab per wk. Prereq: 331.

FWR **438 Chemical Properties of Wood** (3 cr). Chemistry of wood; chemical and technological processes for the conversion of wood into commodities; properties and uses; industrial trends; adhesives and their use; wood finishing. Two lec and one lab per wk; five days of field trips. Prereq: organic chemistry.

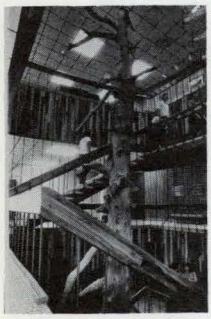
FWR **442 Fish and Wildlife Management** (3 cr). Measurement, analysis, and manipulation of fish and wildlife populations and their habitats; emphasis on outside reading, case histories, and objective decision-making pro-

cedures. Two lec and one lab per wk; two 1-day field trips. Prereq: 314.

FWR **448 Wildlife Ecology** (2 cr). Environmental relations of wildlife species and individuals in altered and in natural habitats. Prereq: 314.

FWR **449 Wildlife Ecology Laboratory** (1 cr). One 3-hr lab per wk; three days of field trips. Prereq or coreq: 448.

FWR **452 Range Communities** (3 cr). Vegetational composition, physical characteristics, grazing reactions, and management of plant communities in the major range regions. Two 3-hr lec-labs per wk; two days of field trips. Prereq: general botany; prereq or coreq: systematic botany.



FWR **453 Range Methods and Techniques** (3 cr). Techniques and methods of measuring and describing: (1) range vegetation, and (2) consumption and use of vegetation by animals. Two lec and one lab per wk; two days of field trips. Prereq: 307, 351.

FWR **454 Range Improvement and Management Planning** (3 cr). Objectives, methods, and benefits of range improvement practices and their impact on management; fundamentals of management planning for the utilization of rangeland resources; problem definition and analysis, determination of objectives, action planning, and follow-up measures. Two lec and one lab-disc per wk; one 1-wk field trip. Prereq: 351, 453.

FWR **462 Watershed Management** (2 cr). Hydrologic cycle in the context of forest and range lands; emphasis on influence of land management practices on the processes of surface run-off and erosion. One lec and one 2-hr lab per wk; three days of field trips.

FWR **463 Watershed Analysis and Planning** (2 cr). Procedures and techniques for analyzing the impact of land management practice on the hydrologic characteristics of forest catchments. Prereq: 462 or perm.

FWR **464 Forest Pathology** (2 cr). Pathology, symptomatology, causes of diseases and decays; environmental influences on disease; disease as part of the forest environment; control and protection as related to silviculture, management, and utilization. One lec and one lab per wk; one 1-day field trip. Prereq: 301, 474.

FWR **465 Biometeorology** (2 cr). Alt/yrs 73-74. Interactions of the atmosphere and plant-soil-water complex; physical laws governing energy and mass balances of selected plant communities and their biological implications; mountain-valley wind systems, radiation balance, evapotranspiration, and diffusion processes; related instrumentation. One 2-day field trip; occasional labs. Prereq: one year physics (calculus desirable), or perm.

FWR **467 Forest Entomology** (3 cr). See Ent 467.

FWR **474 Mensuration** (3 cr). Theory of log, tree, and stand measurement; construction and use of volume tables; construction and application of yield tables; growth studies. Two lec and one 2-hr lab per wk. Prereq: 300, 307.

FWR **476 Forest Regulation and Finance** (3 cr). Organization and control of forest growing stock to meet management objectives, appraisal of land, growing stock, stumpage, and damages; applications of simple and compound interest, capitalization and discount formulae for forest business. Two lec and one 2-hr lab per wk; eight days of field trips. Prereq: 424, 474.

FWR **483 Economics of Conservation** (3 cr). Economics of production of forest goods and services; role of economic forces in resource analysis and conservation; planning of forest resource use by the firm and society. Prereq: general economics.

FWR **484 Forest Policy and Administration** (3 cr). Evaluation of land and forest problems and policies in the U.S.; analysis of current conditions and policies; historical development of governmental and private agencies concerned with the administration of forest conservation programs. Prereq: general economics.

FWR **487 Forest Recreation** (3 cr). Objectives and problems in the integration of recreation into multiple-use land management. Three days of field trips.

FWR **493 Environmental Law** (2 cr). Basic laws governing the administration of wildland resources, and laws designed to regulate impact on the environment. Prereq: sr standing.

FWR **494 Models for Resource Decisions II** (3 cr). Same as InfSc 494. Use of mathematical models of resource systems to explore managerial strategy; problem analysis; systems concepts and optimization of resource allocation. Prereq: 294, sr standing in the College of FWR or perm.

FWR **495 Fish and Wildlife Seminar** (1 cr, max 2). For majors in wildlife-fishery resources. Discussions integrating biological, social, political, economic, and philosophic aspects of fish and wildlife problems.

FWR **496 Forest Products Seminar** (1 cr). Contemporary problems relevant to the manufacture of wood products including lumber, plywood, hardboard, particle-board, and paper; equipment and basic layouts.

FWR **497 Land Management Seminar** (1 cr, max 2). Assigned studies in wildland management. Graded on the basis of P or F. Prereq: sr standing in the College of FWR.

FWR **498 International Wildland Management**

(1-3 cr, max 3). World approaches and problems in forest, wildlife, range, and fisheries management. Prereq: sr standing and perm.

FWR **499** (s) **Directed Study** (cr arr). For the individual student; conferences, library, field, or laboratory work. Areas of concentration normally offered are forest, range, wildlife, fishery, or watershed management, and wood utilization technology. Prereq: sr standing in the College of FWR, GPA 2.5, and perm.

FWR **500 Master's Research and Thesis** (cr arr).

FWR **501** (s) **Seminar** (cr arr). Major philosophical, management, and research problems of wildlands; presentation of individual studies on assigned topics. Prereq: perm.

FWR **502** (s) **Directed Study** (cr arr). Normally offered in forestry, range, wildlife, fishery, wood, and watershed sciences. Prereq: perm.

FWR **503** (s) **Workshop** (cr arr). Selected topics in the conservation and management of natural resources. Prereq: perm.

FWR **504 Fundamentals of Research** (2 cr). Objectives and techniques of research; historical development of the scientific method; preparation of working plans; assembly, interpretation, and presentation of data; structure and use of the scientific literature; and preparation of manuscripts. Enrollment limited to fifteen.

FWR **WS507 Statistical Ecology** (3 cr). Alt/yrs 73-74. WSU BioSc 530. Collection and interpretation of ecological data according to biometrical procedures.

FWR **ID510 Advanced Fishery Management** (3 cr). Alt/yrs 73-74. Compensation as a phenomenon basic to exploitation; yield in numbers and weight; models of yield; stock-recruitment functions; economic yield, application of theory of physical and economic yield to empirical examples in commercial and sport exploitation. One 5-day field trip.

FWR **514 Fish Population Dynamics** (2 cr). Alt/yrs 74-75. Fish population dynamics; models and empirical examples of density changes, competition, and predation; mechanisms controlling population density and biomass; social behavior; production in fish populations; aquatic community processes.

FWR **521 Advanced Forest Soils** (3 cr). Same as Soils 507. Wildland soils and their relation to vegetation; emphasis may be varied according to the specific interest of students. Two lec and one lab per wk; one or two 1-day field trips. Prereq: perm.

FWR **523 Forest Community Classification** (3 cr). Application of the concepts of ecological classification of western forest communities; qualitative field application. Lec-disc periods and field labs. Three days of field trips. Prereq: plant ecology or silvics. Enrollment limited to six students.

FWR **525 Advanced Silviculture** (2 cr). Silvicultural systems and intermediate cuttings. Two days of field trips. Prereq: 424.

FWR **527 Forest Genetics** (3 cr). Same as Genet 527. Application of principles of genetics to the improvement of trees and silvicultural practices. Two lec and one lab per wk. Prereq: 424 and general genetics.

FWR **528 Forest Tree Improvement** (3 cr). Same as Genet 528. Practical problems and techniques related to genetic improvement of forest trees. Two days of field trips. Prereq: 424 and general genetics.

FWR **531 Advanced Wood Technology** (2-3 cr). Anatomical features of wood, including fibers; methods of preparing woody tissues for study; physical properties of wood and their implications on technology. Prereq: 331, 437.

FWR **536 Wood Chemistry** (3-4 cr). Chemistry of woody tissues, including lignin, cellulose, hemi-celluloses, and other polysaccharides; lab work in the analysis and the chemistry of wood. Prereq: 438.

FWR **541 Advanced Population Biology** (2 cr). Alt/yrs 74-75. Readings and discussions of current theories of population control, their biological basis, and application to wildlife populations. Prereq: 442, 544.

FWR **542 Wetland Habitat Management** (2 cr). Alt/yrs 73-74. Ecology and management of species using wetland habitats and current practices, problems, and procedures for managing such habitats. Lec-disc periods, field labs; three days of field trips. Prereq: background in ecology, wildlife populations, and knowledge of aquatic plants.

FWR **544 Big Game Management** (3 cr). Big game species and their populations and habitats; objective balance of the components of habitats with population levels. One 3-hr lec per wk; three days of field trips. Prereq: 442, Zool 483.

FWR **545 Game Range Ecology** (2 cr). Alt/yrs 73-74. Reading and discussion on autoecology of forage plants important to game animals and synecology of game ranges. Prereq: 442, perm, background in plant and animal ecology.

FWR **546 Upland Game Ecology** (2 cr). Alt/yrs 74-75. Ecology and management of wildlife species using forest and rangeland habitats; current management problems and procedures. Three days of field trips. Prereq: perm.

FWR **ID551 Range Ecology: Concepts** (3 cr). Alt/yrs 73-74. Ecological concepts and methods as applied to the classification and use of lands for grazing purposes; influence of livestock, big game, other biotic factors, including

insects and rodents, and fire on plant species and communities. Prereq: plant ecology and at least one course in range management.

FWR **552 Range Ecology: Quantitative** (2 cr). Alt/yrs 73-74. Quantitative treatment of ecological data to show species interaction, soil-vegetation relations, and classification and characterization of plant communities. Prereq: 307, ID551.

FWR **553 Range Forage Productivity and Management** (3 cr). Alt/yrs 74-75. Measurement of forage productivity and the factors that influence production; evaluation of animal response under various management systems. Prereq: animal nutrition, two courses in range management, including range methods.

FWR **555 Range Literature** (3 cr). Alt/yrs 74-75. Survey and analysis of the literature in range management and closely related fields.

FWR **ID563-564 Advanced Forest Pathology** (2-4 cr). Field methods, laboratory techniques, and use of original literature in preparation for extensive studies of tree diseases and rots, deterioration of wood products, and the organisms which cause them; seminar in selected problem in forest pathology and their relations to forest practices. Prereq: 464.

FWR **566 Activities of Tree-Inhabiting Organisms** (2 cr). Alt/yrs 74-75. Environmental and biochemical actions and interactions of important bacteria, fungi, higher plants, and animals (excluding insects) associated with trees. Prereq: ID563 or 564, and one year of organic chemistry.

FWR **569 Advanced Forest Entomology** (3 cr). See Ent 569.

FWR **574 Advanced Forest Mensuration** (2 cr). Mathematical and statistical principles and techniques in determination of volume and growth of trees and stands; applications of sampling theory and correlation analysis. Prereq: courses in mensuration equivalent to 474 and in statistical methods, preferably beyond the elementary course.

FWR **575 Advanced Forest Management** (2 cr). Aspects of forest regulation; recent developments in applied forest management and important contributions in forest management.

FWR **581-582 Advanced Forest Economics** (2 cr). Economic principles, legislation, and policies affecting forestry, particularly those bearing on the character and intensity of land use.

FWR **587 Advanced Forest Recreation** (2 cr). Problems, practices, and economics of the use of lands and waters for recreation. Two days of field trips. Prereq: course in forest recreation.

FWR **589 Water Resources Seminar** (1 cr). See Inter 589.

FWR **595** (s) **Problems in World Resources** (1-3 cr, max arr). Normally offered in forest, wildlife, fisheries, and grazing resources. Max 3 cr in any one field. Consult the time schedule for areas offered each semester. Prereq: 498 or equiv.

FWR **597** (s) **Practicum** (cr arr). Prereq: perm.

FWR **598** (s) **Internship** (cr arr). Prereq: perm.

FWR **599** (s) **Research** (cr arr). Prereq: perm.

FWR **600 Doctoral Research and Dissertation** (cr arr).

FWR **601** (s) **Seminar** (cr arr). Prereq: perm.

FWR **602** (s) **Directed Study** (cr arr). Prereq: perm.

FWR **603** (s) **Independent Study** (cr arr). Prereq: perm.

Genetics

Doyle E. Anderegg, Coordinator (115 Life Sci. Bldg.). Professors Christian, Wang; Associate Professors Forbes, Tylutki; Assistant Professor Lingg.

Genet **106 Human Heredity** (2 cr). See Biol 150.

Genet **200** (s) **Seminar** (cr arr). Prereq: perm.

Genet **299** (s) **Directed Study** (cr arr). Prereq: perm.

Genet **307 Elementary Forest Tree Improvement** (1 cr). See FWR 327.

Genet **314 General Genetics** (3 cr). See Biol 351 and PlSc 314.

Genet **315 General Genetics Laboratory** (1 cr). See Biol 352.

Genet **400** (s) **Seminar** (cr arr). Prereq: perm.

Genet **421 Population Genetics** (3 cr). See Anl 421.

Genet **422 Animal Breeding** (3 cr). See Anl 422.

Genet **446 Plant Breeding** (3 cr). See PlSc 446.

Genet **499** (s) **Directed Study** (cr arr). Prereq: perm.

Genet **501** (s) **Seminar** (cr arr). Prereq: perm.

Genet **502** (s) **Directed Study** (cr arr). Prereq: perm.

Genet **511 Genetics of Fungi** (3 cr). See Bot ID558.

Genet **512 Microbial Genetics** (2-4 cr). See Bact 512.

Genet **519 Genetics Literature** (2 cr). See PlSc 519.

Genet **522 Statistical Genetics** (3 cr). See Anl 522.

Genet **527 Forest Genetics** (3 cr). See FWR 527.

Genet **528 Forest Tree Improvement** (3 cr). See FWR 528.

Genet **534 Cytogenetics** (3 cr). See PlSc 534.

Genet **537 Physiological and Molecular Genetics** (2-3 cr). See Biol 555.

Geography

Morton W. Scripter, Dept. Head (210 Mines Bldg.). Professors Caldwell, Scripter; Associate Professor Day; Assistant Professor Allen.

Geog **100 Man's Physical Environment** (4 cr) (103). Natural environment of man: nature, distribution, and relationships of climate, landforms, oceans, vegetation, hydrography, and soils; map and airphoto analysis. Three lec and one 2-hr lab per wk.

Geog **140 Economic Geography** (3 cr) (112). Reciprocal relationships between mankind and the earth environment, resource distribution, changing pattern of commodity movement and industrialization; effect upon national and international developments.

Geog **200** (s) **Seminar** (cr arr). Prereq: perm.

Geog **250 World Regional Geography** (3 cr) (254). Countries, regions, and peoples of the world; interrelationships between man and his physical and cultural environments.

Geog **265 Cultural Geography** (3 cr) (252). Population growth, distribution, and movement; origin and dispersal of culture traits; landscape settlement patterns; man's impact on the land and the environment's impact on man.

Geog **299** (s) **Directed Study** (cr arr). Prereq: perm.

Geog **315 Geomorphology** (3 cr) (415). See Geol 335.

Geog **327 Environment and Population of the United States** (4 cr). Geographic survey of recent trends in population, affluence, science, and technology and their influence on the liveability of the environment of the United States.

Geog **357 Europe** (3 cr) (416). Regional and systematic geography of Europe, exclusive of the Soviet Union, with emphasis on contemporary problems.

Geog **359 Mexico and Middle America** (3 cr) (444). Regional and systematic geography of Middle America and Mexico with emphasis on contemporary problems.

Geog **360 South America** (3 cr) (445). Regional and systematic geography of South America with emphasis on contemporary problems.

Geog **362 United States and Canada** (3 cr) (340). Regional and systematic geography of the United States and Canada with emphasis on contemporary problems. Two 1-day field trips.

Geog **364 Idaho and the Pacific Northwest** (3-4 cr) (343). Regional and systematic geography of the Pacific Northwest with emphasis on Idaho and on contemporary problems. One 2-day field trip.

Geog **380 Cartography** (3 cr) (251). Visual presentation, map projections, lettering and sketching, techniques, layout, compilation and design problems, three-dimensional models, map and photo interpretation. One lec and six hrs of lab per wk.

Geog **400** (s) **Seminar** (cr arr). Prereq: perm.

Geog **401 Atmospheric Environment** (3 cr). Weather, air masses, storms and associated phenomena, meterological instruments, weather maps, forecasting; world's weather and climate types with emphasis on their effects upon man. One 1-day field trip. Prereq: 100 or Geol 101-102, or perm.

Geog **427 Decision-Making in Resource Management** (3 cr) (437). Impact of ecosystem analysis and conflicts over environmental quality control on conservation theory; economic, political, managerial, perceptual, and scientific factors in shaping decisions for allocating natural resources.

Geog **430 Urban Geography** (3 cr) (470). Theory and models for the functions, origin, development, structure, and distribution of cities; urban land use classification; geographic aspects of city planning. One 1-day field trip.

Geog **440 Spatial Organization of Society** (3 cr) (424). Principles governing spatial organization of society; theoretical and empirical approaches to location of urban and rural settlement and economic activities; spatial structures and their interrelationship and changes in organization.

Geog **446 Geography of Transportation** (3 cr). Theoretical roles of transportation in spatial interaction; comparative advantages of air, water, motor vehicle, rail, and pipeline

transport; world regional patterns of transportation.

Geog **447 Recreational Geography** (3 cr) (532). Dynamics of recreational uses of land and water; measurement and planning; interaction of local and regional approaches; economic impact studies.

Geog **455 Asia** (3 cr). Regional and systematic geography of Asia with emphasis on contemporary affairs.

Geog **466 Political Geography** (3 cr) (480). Geographic nature of states; organization, power, boundaries, ethnic units, internal and external relations as influenced by, and adjusted to, geographic conditions; geopolitics and contemporary problems.

Geog **481 Advanced Cartography and Remote Sensing** (2 cr) (452). Scribing, reproduction, color, infrared, thermal, and radar imagery, airbrush, computer cartography and model construction. Two 3-hr labs per wk; one 2-day field trip.

Geog **490 Trends in Geography** (3 cr) (495). Prereq: sr standing.

Geog **491** (s) **Field Techniques** (1-3 cr, max 6) (507). Acquisition of data in the field; analysis, interpretation, and presentation of results of field investigations. May also be taken in conjunction with other geography courses. Prereq: perm.

Geog **492 Teaching of Geography** (3 cr). See Ed 443.

Geog **493-494 Seminar in Urban Studies** (2 cr). See Inter 493-494.

Geog **497** (s) **Practicum** (1-6 cr, max 6). Practical, on-the-job experience in applied geography, usually in the Cartographic Laboratory; oral and written reports are presented in which the student reviews and constructively criticizes the experience gained. Prereq: perm.

Geog **499** (s) **Directed Study** (cr arr). Prereq: perm.

Geog **500 Master's Research and Thesis** (cr arr).

Geog **501** (s) **Seminar** (cr arr). Prereq: perm.

Geog **502** (s) **Directed Study** (cr arr). Prereq: perm.

Geog **503** (s) **Workshop** (cr arr). Prereq: perm.

Geog **505 Applied Climatology** (3 cr) (521). Climatic classifications, microclimatic investigations, instrumentation; impact of climate on agriculture, vegetation, and economic activities.

Geog **525 Plant Geography** (3 cr). See Bot 535.

Geog **526 Zoogeography** (2 cr). See Zool 538.

Geog **527 Experimental Conservation Workshop** (4 cr). A field trip oriented approach to conflict resolution concerning state and regional conservation questions.

Geog **531 Settlement and Rural Geography** (3 cr). Spatial relationships, perception, viability, dependency, and dynamics of small towns and their rural hinterlands; role of development, non-development, individual and cluster town decisions, rural and regional planning and zoning and land use.

Geog **533 Urban Structure** (3 cr). Internal structure of metropolitan areas; detailed consideration of urban social geography, intra-city location models, urban morphology, and metropolitan development models. Prereq: 430 or perm.

Geog **534 Urban Systems** (3 cr). Systems approach to inter-city relations that focus on the role of the city in the structure and development of space economies; detailed study of selected spatial and regional development models. Prereq: 430 or perm.

Geog **540 Location Theory** (3 cr) (506). Hypotheses, models, and theoretical constructs which apply to locational decision-making in transportation, trade, manufacturing, and agriculture; contributions of Weber, Christaller, Greenhut, Hoover, Dunn, Von Thunen, and Losch. Prereq: economic geography and statistics.

Geog **ID570 Quantitative Geography** (3 cr) (ID595). Application of univariate and multivariate statistical procedures to research in human and physical geography and to research in related fields; laboratory exercises conducted on the digital computer. Prereq: course in FORTRAN-IV, and Ag 321 or Bus 231 or Math 320 or Math 451-452.

Geog **571 Spatial Analysis** (3 cr) (596). Statistical analysis and comparison of data organized by areas; spatial statistics; measurement of aggregation and concentration; description of areal distributions and gradients; regionalization techniques. Prereq: ID570.

Geog **597** (s) **Practicum** (cr arr). Prereq: perm.

Geog **598** (s) **Internship** (cr arr). Practical, on-the-job experience with governmental agencies or commercial establishments; oral and written reports are presented in which the student reviews and constructively criticizes the experience gained; salary may be received for services performed. Prereq: perm.

Geog **599** (s) **Research** (cr arr). Prereq: perm.

Geology

George A. Williams, Dept. Head (211 Mines Bldg.). Professors Bond, Hall, Reid, Siems, Smiley, G. Williams, R. Williams; Associate Professors Jones, Powell, Savage; Assistant Professors Bishop, Knowles, Ralston, Wai.

Geol **101 Physical Geology** (3 cr). The earth, its composition, structure, and natural processes. Concurrent enrollment in 102 recommended. One 1-day field trip.

Geol **102 Physical Geology Laboratory** (1 cr). Laboratory study relevant to 101. Coreq: 101.

Geol **106 Historical Geology** (3 cr). Evolution of the physical earth, plants, and animals; techniques used in interpretation of geologic history. One 1-day field trip. Concurrent enrollment in 107 recommended. Prereq: 101.

Geol **107 Historical Geology Laboratory** (1 cr). Laboratory study relevant to 106. Coreq: 106.

Geol **X123 Geology of Idaho and the Pacific Northwest** (3 cr). Geologic history; development of geologic structures and present-day distribution of rocks and mineral deposits; geology of area in which the course is given.

Geol **X150 Applied Geology** (3 cr). Prospecting, mineral property development, water well location, food control, foundation and excavation problems; laws affecting mineral resource exploration and development. Prereq: perm.

Geol **200** (s) **Seminar** (cr arr). Prereq: perm.

Geol **211 Ancient Life** (4 cr) (111). Life in the different geologic periods; evolutionary development of organisms; lab study of fossils. Three lec and one 2-hr lab per wk.

Geol **255 Mineralogy** (2 cr). Crystallography and mineralogy; properties, occurrence, uses, identification, and classification of rock-forming and ore minerals. One lec and one 2-hr lab per wk. Prereq: 101, 102.

Geol **265 Lithology** (2 cr). Hand specimen identification of igneous, sedimentary, and metamorphic rocks. One lec and one 2-hr lab per wk; two 1-day field trips. Prereq: 101, 102.

Geol **299** (s) **Directed Study** (cr arr). Prereq: perm.

Geol **301 Field Geology and Report Writing** (6 cr) (431). Field problems and methods; use of instruments; interpretation of field data; preparation of reports based on field observations and interpretations. Three field trips taken away from camp. Accident and health insurance required. Prereq: 345 or perm.

Geol **315 Invertebrate Paleontology** (3 cr) (412). Morphology, evolutionary trends, and classification of invertebrate fossil groups. Two lec and one 3-hr lab per wk; one 2-day field trip. Prereq: 101, 102, or 106, 107, or perm.

Geol **335 Geomorphology** (3 cr) (401). Same as Geog 315. Classification, recognition, origin, and significance of land forms; land form analysis in interpretation of geologic structure and history. One 2-day field trip. Prereq: 101, 102, or 106, 107, or perm.

Geol **345 Sturctural Geology** (1-3 cr) (421). Deformed rocks; mechanics of failure, recognition, description, classification, and genesis of folded and fractured rocks. Two lec and one 2-hr lab per wk; one 2-day field trip. Prereq: 101, 102.

Geol **365 Igneous and Metamorphic Rocks** (2 cr). Petrology of igneous and metamorphic rocks. Two 2-hr labs per wk; two 1-day or one 2-day field trips. Prereq: 265.

Geol **400** (s) **Seminar** (cr arr). Prereq: perm.

Geol **405 Earth Science** (4 cr) (427). Earth and its place in the solar system, processes responsible for changes; course patterned on ESCP recommendations for teachers of earth science. Three lec and one 2-hr lab per wk; two 1-day field trips. Prereq: 101, 102, or Geog 100, or equiv.

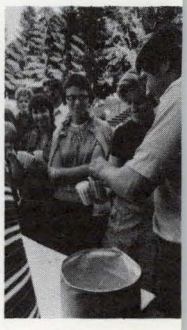
Geol **N407 Historical Geology** (3 cr). Rock and fossil record of earth's history; interpretation of geologic history from the evolutionary record. Four lec and 3 hrs of lab per wk; two 1-day field trips.

Geol **409 Ground Water** (3 cr) (447). Occurrence, movement, and properties of subsurface water; intro to ground-water geology and hydrology. Two lec and one 2-hr lab per wk; one 1-day field trip. Prereq: 101, 102, and Math 111 or 140.

Geol **N416 Origin of Rocks and Minerals** (3 cr). Origin, identification, and classification of common rocks, rock-forming minerals, and ore minerals; interpretation of hand specimens in terms of origin or history emphasized over descriptive mineralogy and petrography. Four lec and 3 hrs of lab per wk; two 1-day field trips.

Geol **417 Advanced Paleontology** (3 cr) (453). Fossil assemblages of different ages and environments; sequence of floras and faunas through time. Three 2-hr labs per wk; one 1-day field trip. Prereq: 315, or perm.

Geol **425 Sedimentology** (2 cr) (413). Environments and processes responsible for separation of clastic and non-clastic sedimentary rock materials; roles of transportation, deposition, including siltation, and lithification. Two 2-hr labs per wk; one 1-day field trip. Prereq: 255.



Geol **426 Stratigraphy** (2 cr) (414). Description, classification, distribution, and correlation of layered rocks; significance of stratigraphic analysis and geologic history. Two 2-hr labs per wk; one 1-day field trip. Prereq: 425.

Geol **435 Engineering Geology** (3 cr) (441). Application of geology to engineering problems; rock weathering, soil mechanics; fractures; landslide recognition; materials location; explosives; damsite and reservoir problems; earthquakes; route locations; requirements of a report for an engineering project. Two lec and one 2-hr lab per wk; two 1-day field trips. Prereq: 101, 102, Phys 113 or 220.

Geol **436 Geological Engineering Design** (3 cr) (445). Application of engineering and geological principles to analysis and design in the construction industries. One 1-day field trip. Prereq: 435.

Geol **449 Geology of Industrial Rocks and Minerals** (2 cr). Classification, occurrence, origin, preparation, extraction, use, and economy of chiefly nonmetallic rocks and minerals of major importance to a nation's industries. Prereq: 265.

Geol **465 Optical Mineralogy** (2 cr). Optical crystallography; identification of minerals by optical means. Two 2-hr labs per wk. Prereq: 255.

Geol **466 Petrography and Petrology** (3 cr). Origins, characteristics, and classification of igneous, sedimentary, and metamorphic rocks; their description and identification by use of petrographic microscope and in hand specimens. Two lec and one 2-hr lab per wk; one 3-day field trip. Prereq: 465.

Geol **475 Mineral Deposits** (4 cr) (458). Occurrence, classification, and origin of metallic and non-metallic economic mineral deposits. Three lec and one 3-hr lab per wk; one 3-day field trip. Prereq: 265, 345.

Geol **476 Exploration Geology** (3 cr) (460). Design of geologic surveys and mineral exploration programs; integration and evaluation of geologic, geochemical, and geophysical exploration techniques. Prereq or coreq: 475.

Geol **ID485 Geochemical Exploration** (3 cr). Rapid chemical tests on rock, soil, sediment, vegetation, or water samples to determine dispersion patterns in prospecting for mineral deposits. Two lec and one 3-hr lab per wk; two 1-day field trips. Prereq: 101, Chem 112.

Geol **486 Principles of Geochemistry** (3 cr). Chemical concepts applied to geology. Prereq: 255, Chem 112.

Geol **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed under the general supervision of a faculty member. Graded on the basis of P or F. Prereq: perm of dept.

Geol **499** (s) **Directed Study** (cr arr). Prereq: perm.

Geol **500 Master's Research and Thesis** (cr arr).

Geol **501** (s) **Seminar** (cr arr). Prereq: perm.

Geol **502** (s) **Directed Study** (cr arr). Prereq: perm.

Geol **503** (s) **Workshop** (cr arr). Prereq: perm.

Geol **ID515 Paleoecology** (3 cr) (ID548). Alt/yrs 73-74. Also offered as Anthr ID573. Past environments; interrelations of physical and biological factors; changes in the physical environments of the past; their influence on distribution and evolution of organisms, including man.

Geol **ID516 Methods in Paleontology and Biostratigraphy** (3 cr) (512). Alt/yrs 73-74. Methods of collection, preparation, illustration of paleontologic data; principles of systematic paleontology; statistical-graphic presentation of biostratigraphic and paleontologic information. One lec and two 2-hr labs per wk; one 5-day field trip.

Geol **WS520 Regional Stratigraphic Analysis** (3 cr). Alt/yrs 73-74. WSU 520. Analysis, synthesis, interpretation, and presentations of stratigraphic data. One lec and two 3-hr labs per wk. Prereq: course in stratigraphy.

Geol **525 Stratigraphic Paleobotany** (3 cr) (551). Alt/yrs 74-75. Fossil floras and floral successions; taxonomic problems; geologic ranges and past distributions of plant taxa; paleoecological interpretations; methods and correlation and dating by fossil plants. One 1-day and one 2-day field trip.

Geol **526 Sedimentary Petrology and Petrography** (3 cr) (553). Alt/yrs 74-75. Origin, classification, distribution, depositional environments of sedimentary rocks, with emphasis on petrographic methods of analysis. Two lec and one 2-hr lab per wk.

Geol **546 Tectonics** (3 cr) (570). Alt/yrs 74-75. Form, pattern, and evolution of large-scale units of the earth's crust.

Geol **WS550 Advanced Mineralogy** (3 cr). WSU 550. Crystal chemistry and structure of rock-forming minerals and their application to petrologic problems. Prereq: 101, 102, and Chem 111.

Geol **WS551 Ore Microscopy** (3 cr). Alt/yrs 73-74. WSU 551. Identification of ore minerals using polarized ore microscopy, measurement of relation properties; interpretation of ore textures; photomicrography, practical problems. Three 3-hr labs per wk. Prereq: 255, 475.

Geol **WS552 X-ray Analysis in Geology** (3 cr). WSU 552. Internal symmetry of crystals; generation and use of X-rays in geological re-

search; theory and practices of powder diffraction and X.R.F. spectrometry.

Geol **WS560 Advanced Igneous Petrology** (3 cr). WSU 560. Petrogenesis of igenous rocks. Two lec and one 3-hr lab per wk. Prereq: 465.

Geol **ID565 Metamorphism** (3 cr). Metamorphic minerals, rocks, processes, and facies; poly-metamorphic rocks; recent developments in structural geometry. Two lec and one 3-hr lab per wk. Prereq: 465.

Geol **566 Volcanic Geology** (3 cr) (564). Alt/yrs 73-74. Volcanoes, volcanic activity, petrology of volcanic rocks, and regional problems in layered volcanic rocks. Two lec and one 2-hr lab per wk; one 3 1/2 day and three 1-day field trips. Prereq: 465.

Geol **WS573 Advanced Topics in Economic Geology** (2 cr). WSU 573. Recent ideas, concepts, and factual data relating to the character and origin of mineral deposits. Prereq: course in origin of mineral deposits.

Geol **ID575 Advanced Mineral Deposits I** (3 cr) (561). Alt/yrs 74-75. Ore minerology and fabric; sulfide phase equilibria.

Geol **ID576 Advanced Mineral Deposits I Laboratory** (1 cr). Alt/yrs 74-75. Identification of ore minerals; their textures, association, and paragenesis.

Geol **577 Advanced Mineral Deposits II** (3 cr) (562). Alt/yrs 74-75. Modern concepts on the origin and geochemistry of metallic mineral deposits. Two lec and one 3-hr lab per wk.

Geol **578 Theory of Mineral Exploration** (2 cr) (560). Alt/yrs 73-74. History and development of thought; statistical methods; application of geologic studies in search for mineral deposits.

Geol **WS580 Physical Geochemistry** (3 cr). WSU 580. Physical chemistry of the earth's crust; principles and applications. Two lec and one 3-hr lab per wk.

Geol **WS581 Mineral Equilibria** (3 cr). WSU 581. Principles of experimental petrology and phase equilibria in mineral systems and their application to geologic problems. Prereq: WS580.

Geol **WS582 Advanced Topics in Geochemistry** (2 cr). WSU 582. Recent contributions to our knowledge of the role of volatiles in geologic processes. Prereq: WS580.

Geol **WS583 Introductory Geochemistry** (3 cr). Alt/yrs 73-74. WSU 480. The chemistry of earth materials and processes. Prereq: Chem 111.

Geol **ID586 Advanced Geochemical Exploration** (3 cr) (580). Alt/yrs 73-74. Theory and use of colorimetric and instrumental analytical methods in mineral exploration; primary and secondary dispersion patterns; endogenetic and exogenetic behavior of individual elements. Two lec and one 3-hr lab per wk. Prereq: ID485.

Geol **587 Instrumental Techniques in Geochemistry** (3 cr) (581). Modern instrumentation, including X-ray fluorescence, gas chromatography, electron microprobe, atomic absorption, infrared, and Mossbauer spectometry applied to geochemical problems. Two lec and one 3-hr lab per wk. Prereq: perm.

Geol **589 Water Resources Seminar** (1 cr). See Inter 589.

Geol **ID590 Photogeology** (3 cr). Manipulation and analysis of air photos for geologic information; photogrammetry; map preparation and interpretation of stereo vertical and oblique air photos, some in color. One lec and two 3-hr labs per wk. Prereq: 335, 345, or perm.

Geol **595 Geology-Oriented Environmental Problems** (2 cr). Directed reading and discussion of environmental problems related to natural geologic phenomena or artificial disruption of natural geologic conditions. Prereq: perm.

Geol **596 Advanced Photogeology** (3 cr) (592). Alt/yrs 73-74. New research techniques in photogeology; use of special photographic imagery, such as color, infrared color, and restricted wave length black-and-white materials. One lec and two 3-hr labs per wk. Prereq: ID590 or perm.

Geol **ID598 Electron Microprobe** (3 cr) (585). Theory and application of the electron microprobe and scanning electron microscope in studying rock-forming minerals. Two lec and one 3-hr lab per wk. Prereq: 465 or perm.

Geol **599** (s) **Research** (cr arr). Prereq: perm.

Geol **600 Doctoral Research and Dissertation** (cr arr).

Geol **601** (s) **Seminar** (cr arr). Prereq: perm.

Geol **602** (s) **Directed Study** (cr arr). Prereq: perm.

Geol **603** (s) **Independent Study** (cr arr). Prereq: perm.

Guidance and Counseling

Thomas O. Bell, Head, Dept. of Education (404-B Educ. Bldg.). Professors Kees, Kjos; Associate Professors T. Hipple (Chairman), Morris; Assistant Professors Bain, Hill, J. Hipple, Jampsa, Prescott.

Guid **200** (s) **Seminar** (cr arr). Prereq: perm.

Guid **299** (s) **Directed Study** (cr arr). Prereq: perm.

Guid **322 Vocational Guidance** (3 cr). Same as VocEd 322. Identification of individuals who can profit from vocational-technical education programs, information for realistic vocational and educational planning, adjustments in vocational education programs, occupational placement and adjustment, and follow-up procedures.

Guid **400** (s) **Seminar** (cr arr). Prereq: perm.

Guid **401** (s) **Workshop** (cr arr). Professional issues. Prereq: perm.

Guid **403** (s) **Workshop** (cr arr). Professional issues. Prereq: perm.

Guid **420 Principles and Practices in Guidance** (3 cr). Nature of the guidance process and the services provided in pupil personnel work. Also offered by correspondence study.

Guid **460 Occupational-Educational Information** (3 cr). Sources, dissemination, and uses of vocational and educational information. Two 1-day field trips.

Guid **499** (s) **Directed Study** (cr arr). Prereq: perm.

Guid **500 Master's Research and Thesis** (cr arr).

Guid **501** (s) **Seminar** (cr arr). Prereq: perm.

Guid **502** (s) **Directed Study** (cr arr). Prereq: perm.

Guid **503** (s) **Workshop** (cr arr). Professional issues. Prereq: perm.

Guid **520 Group Standardized Tests** (3 cr). Theories and group techniques of appraising individual characteristics, performance, and behavior; evaluation of group tests; collection and interpretation of data. Prereq: Psych 317 or perm.

Guid **523 Guidance Laboratory** (2 cr). Supervised school experience and simulation in cumulative records and reports, information, placement, and follow-up. Prereq: 420, 460.

Guid **525 Techniques of Counseling** (3 cr). Development of basic counseling techniques; case studies, role playing, and tape and video recordings.

Guid **527 Psychometric Assessments** (3 cr). Developmental assessment procedures used by counselors in various settings. Prereq: 520, 525.

Guid **560 Theories of Vocational Choice** (3 cr). Psychological, sociological, and economic foundation of vocational choice and adjustment. Prereq: 460 and perm.

Guid **561 Organization and Administration of Guidance Services** (3 cr). Simulated planning, primarily for those who will be responsible for the guidance services in public school systems. Prereq: perm.

Guid **564 Group Counseling** (3 cr). Principles and techniques of counseling groups; didactic and lab learning experience. Prereq: 529 or perm.

Guid **565 Theories of Counseling** (3 cr). Consideration and evaluation of contemporary theories. Prereq: 525 and perm.

Guid **597** (s) **Practicum** (cr arr). Initial practica provide a minimum of 30 hrs of supervised experience in individual counseling in schools (elementary, junior-high, secondary, vocational-technical, community college, college) or in a public agency. Advanced practica include individual and group counseling procedures, field experience in a variety of settings, and a minimum of 30 hrs of supervised experience. Prereq: 525 and perm. Prereq for adv practica: 564 plus 3 cr in initial practicum and perm.

Guid **598** (s) **Internship** (cr arr). Primarily for advanced graduate students. Currently offered in counselor education, college student personnel services, school pupil personnel services, and school psychology. Prereq: perm.

Guid **599** (s) **Research** (cr arr). Prereq: perm.

Guid **600 Doctoral Research and Dissertation** (cr arr).

Guid **601** (s) **Seminar** (cr arr). Prereq: perm.

Guid **602** (s) **Directed Study** (cr arr). Prereq: perm.

Guid **603** (s) **Independent Study** (cr arr). Prereq: perm.

History

William S. Greever, Dept. Head (315 Admin. Bldg.). Professors Coonrod, Greever, Rolland, Winkler; Associate Professors Barnes, Hackmann, Harris, Proctor; Assistant Professor Baldridge.

PREREQUISITE: Two-semester courses in this field may be taken in either order. Students may enroll in second-semester courses without having had the first. Ordinarily six lower-division credits in history are required for registration in upper-division courses; exceptions by permission.

Hist **101-102 History of Civilization** (3 cr). Great civilizations; contributions to the modern world. Hist 101: to 1650. Hist 102: 1650 to present. Also offered by correspondence study.

Hist **111-112 Introduction to United States History** (3 cr). Political, diplomatic, economic, social, and cultural history; earliest times to the present. Hist 111: to 1877. Hist 112: 1877 to present. Also offered by correspondence study.

Hist **271-272 History of England** (3 cr). Political, social, economic, and religious development of the British Isles. Hist 271: to 1714. Hist 272: 1714 to present. Also offered by correspondence study.

Hist **411-412 American Colonial and Revolutionary History to 1789** (3 cr). Hist 411: foundations; political, intellectual, economic, and military history of the colonies to 1750. Hist 412: Great War for empire, independence and founding of a new nation, confederation period, framing and adoption of the Constitution.

Hist **413 United States: Early National Period** (3 cr). Economic, political, constitutional, and social problems; nationalism and beginnings of sectionalism; 1789-1828.

Hist **414 United States: Sectionalism and Civil War** (3 cr). Jacksonian democracy, slavery, growing rift between sections, and Civil War; 1828-1865.

Hist **415 United States: Emergence of Industrial America** (3 cr). Reconstruction era, industrial development, and resulting problems; 1865-1895.

Hist **417-418 Twentieth-Century America** (3 cr). Evolution of 20th-century American policy, foreign and domestic. Hist 417: 1896 to 1929. Hist 418: 1929 to present.

Hist **423 Idaho and the Pacific Northwest** (3 cr). Political, economic, social development; earliest times to the present; emphasis on Idaho and Inland Empire. Also offered by correspondence study.

Hist **427-428 History of the Westward Movement** (3 cr). Westward migration of people, customs, and institutions of the U.S.; appropriating and developing wilderness to uses of man. Hist 427: U.S. east of the Mississippi River. Hist 428: west of the Mississippi River.

Hist **429-430 History of American Diplomacy** (3 cr). Hist 429: quest for diplomatic independence and emergence of the U.S. as a world power; 1783-1921. Hist 430: problems of the U.S. as a world power since 1921.

Hist **432 The Negro in American History** (3 cr). Same as AfrAm 432. African background, slave trade, and slavery; abolition movement; emergence of the Negro as a significant element in American cultural, political, and economic life; the current Negro revolution and its various ramifications.

Hist **433-434 Social and Cultural History of the United States** (3 cr). Growth of customs, traditions, and intellectual habits; American way of life from colonial times to the present. Hist 433: to 1865. Hist 434: 1865-1950.

Hist **435 Colonial Latin America** (3 cr). Iberian background; high Indian civilizations; European discovery and colonization; Spanish Imperial System; social and economic development; wars of independence.

Hist **438 Mexico Since Independence, Central America, and the Caribbean** (3 cr). Political, economic, social, and cultural development; search for stability; growth of nationalism.

Hist **439 National Latin America: The South American Republics** (3 cr). Political, economic, social, and cultural developments, search for stability; growth of nationalism.

Hist **440 Inter-American Relations** (3 cr). Diplomatic relations between American republics, including regional agreements and the problem of U.S. preponderance.

Hist **441-442 Greek and Roman History** (3 cr). Political, constitutional, social, and cultural history. Hist 441: Greece from the earliest times to Roman conquest. Hist 442: Rome from the earliest times to the end of the Western Empire.

Hist **445-446 Medieval Europe** (3 cr). Hist 445: transition from Graeco-Roman civilization to Byzantine, Islamic, and Frankish realms in early middle ages. Hist 446: expansion and fruition of Latin Christian civilization in high middle ages; decline in later middle ages.

Hist **447 Renaissance and Reformation** (3 cr). Europe, 1450-1648; transition from medieval to modern Europe; emphasis on political, economic, and religious aspects.

Hist **449 Age of Absolutism** (3 cr). Europe 1648-1789; rise of absolutism in the 17th century; the old regime of the 18th century.

Hist **451 The French Revolution** (3 cr). Europe in the era of the French Revolution and Napoleon, 1789-1815.

Hist **452 Europe from Vienna to Versailles** (3 cr). Revolution and reform of the 19th century and international frictions culminating in irredentist and imperialist rivalries of WW I.

Hist **455-456 Recent Times** (3 cr). Europe and its impact on world-wide events. Hist 455: 1914 to 1939. Hist 456: World War II and postwar era.

Hist **457 History of the Middle East** (3 cr). Survey of the Middle East from the beginning of the Islamic period to the present; emphasis on modern period.

Hist **464 European Diplomatic History 1500-1914** (3 cr). Development of the European state system; struggle for control over cen-

tral Europe; Near Eastern Question; diplomacy of imperialism; diplomatic background of World War I.

Hist **465-466 Social and Cultural History of Europe** (3 cr). Hist 465: the 17th and 18th centuries; Baroque culture, the scientific revolution, and the Age of Enlightenment. Hist 466: 19th and 20th centuries: romanticism, nationalism, liberalism, and socialism.

Hist **467-468 History of Russia** (3 cr). Hist 467: The Russian Empire in the 17th, 18th, and 19th centuries to 1894. Hist 468: Russia from the beginning of the reign of Nicholas II through the revolutions of 1905 and 1917, and the Soviet Period to the present.

Hist **469 Modern France** (3 cr). French nation from 1815 through the DeGaulle era.

Hist **473-474 Tudor and Stuart England** (3 cr). Royal prerogative versus representative government; rise of middle class; exploration and colonization; religious changes and conflicts; culture. Hist 473: Tudor rulers. Hist 474: Stuarts.

Hist **477 Georgian Britain, 1714-1830** (3 cr). Rule of the oligarchy; development of the Empire; wars against France; industrialization; Parliamentary Reform.

Hist **481 Japan, 1600-1890** (3 cr). Tokugawa institutions and thought; confrontation with West; Maiji Restoration; beginning of modernization.

Hist **482 Japan Since 1890** (3 cr). Rise as a world power; industrialization and urbanization; political and constitutional developments; militarism and totalitarianism; WW II; occupation and post-occupation periods.

Hist **483 China, 1800-1911** (3 cr). Foreign incursions; rebellions, reform, revolution, and resistance to change.

Hist **484 China Since 1911** (3 cr). Republican experiment and its failure; economic problems; international relations; rise and victory of the Chinese Communist Party.

Hist **495 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under the general supervision of a faculty member. Graded on the basis of P or F. Prereq: perm of dept.

Hist **496 Theory and Practice in History** (3 cr). Readings and discussion of what outstanding historians have said about the nature and the methods of their craft.

Hist **499** (s) **Directed Study** (cr arr). Prereq: perm.

Hist **500 Master's Research and Thesis** (cr arr).

Hist **501** (s) **Seminar** (cr arr). Normally offered in early modern European history, late modern European history, English history, American history, and history of the American west. Prereq: perm.

Hist **502** (s) **Directed Study** (cr arr). Normally offered in- American foreign relations, American frontier, society and thought in America, Pacific Northwest, America before 1789, Negro in America, U.S.-Latin American relations, early modern England, Greek and Roman history, Middle Ages, Renaissance and Reformation, Age of Absolutism and the Revolutionary Era, 19th-century Europe, 20th-century Europe, evolution of Russia, evolution of France, society and thought in Europe, European foreign relations, hispanic America, modern Mexico, U.S. 1789-1828, U.S. 1828-1865, U.S. 1865-1895, U.S. since 1896, England and the Georgian Era. Prereq: perm.

Hist **590 Introduction to Historical Research** (2 cr). Techniques in compiling a bibliography, assembling material, composition, interpretation, and historical criticism.

Hist **591-592 Historiography** (2 cr). Nature of history; major historians; ideas in history; philsophy of history; bibliography. Hist 591: American historians. Hist 592: European and British historians.

Hist **599** (s) **Research** (cr arr). Prereq: perm.

Hist **600 Doctoral Research and Dissertation** (cr arr).

Hist **601** (s) **Seminar** (cr arr). See 501 for areas normally offered. Prereq: perm.

Hist **602** (s) **Directed Study** (cr arr). See 502 for areas normally offered. Prereq: perm.

Hist **603** (s) **Independent Study** (cr arr). Prereq: perm.

Home Economics

Florence D. Aller, Dept. Head (108A Mary Hall Niccolls Home Ec Bldg.). Professors Aller, Bellinger, Newcomb; Associate Professors Old, Potter; Assistant Professors Forbes, Kessel, Kiehn, Medsker, Myers; Instructors Jonas, Miller.

HEc **109 Introduction to Home Economics** (0 cr). Orientation to home economics as a career; the founders, professional contributors, and literature. Graded on the basis of P or F.

HEc **113 Art** (3 cr). Art and crafts for home and community. One lec and two 3-hr labs per wk.

HEc **123 Textiles** (3 cr). Properties of natural and synthetic fibers, yarns and fabric structure, dyes and finishes, labeling, legislation, and trade conditions affecting the consumer.

HEc **124 Clothing** (3 cr). Principles of clothing construction and fitting; analysis and comparison of techniques related to efficiency, wear, appearance, fabric limitations, emphasis on self-evaluation and time management. One lec and six hrs of lab per wk.

HEc **170 Family Nutrition and Meal Management** (2 cr). Open to men and women; primarily for non-majors. Basics. One lec and one 3-hr lab per wk.

HEc **200** (s) **Seminar** (cr arr). Prereq: perm.

HEc **203** (s) **Workshop** (cr arr). Prereq: perm.

HEc **229 Clothing Analysis** (2 cr). Factors affecting the selection of adult clothing; means of expressing individuality in the wardrobe.

HEc **234 Introduction to Child Development** (2 cr). Development and guidance of the preschool child. One lec and two hrs of supervised nursery school observation per wk.

HEc **236 Preschool Observation Analysis** (1 cr). Interpretation of the literature and analysis of preschool observations.

HEc **242 Household Equipment** (3 cr). Selection, use, and care. Two lec and one 3-hr lab per wk.

HEc **270 Nutrition** (3 cr). Open to non-majors. Food selection and the daily diet; variations from the normal diet necessitated by difference in age, health, and environmental conditions; inborn errors of metabolism and dietary treatment; obesity, malnutrition, over-nutrition, food fads, food additives, and nutrition for athletes.

HEc **271 Foods** (3 cr). Basic cookery and meal planning. Two lec and one 3-hr lab per wk. Prereq or coreq: 270, Chem 103 or 111, Phys 101.

HEc **272 Food Management** (2 cr). Food preservation, marketing, table service, meal planning, and food preparation techniques. One lec and one 3-hr lab per wk. Prereq: 271.

HEc **299** (s) **Directed Study** (cr arr). Prereq: perm.

HEc **314 Weaving** (3 cr). Principles, techniques, and aesthetics of handweaving. One lec and six hrs of lab per wk.

HEc **324 Flat Pattern Study** (3 cr). Fitting and pattern alteration for individualized shell and sloper; flat pattern design; construction related to original patterns. One lec and six hrs of lab per wk. Prereq: 124.

HEc **326 Housing and Home Furnishings** (3 cr). Housing principles, furniture, materials, and color in the present day home. Two lec and three hrs of lab per wk; one field trip.

HEc **327 Tailoring** (3 cr). Alt/yrs 73-74. Textile selection for tailored garments; comparative study of tailoring techniques. One lec and six hrs of lab per wk. Prereq: 124.

HEc **329 History of Costume and Textiles** (3 cr). Alt/yrs 73-74. Costume as an expression of the times. Prereq: 229.

HEc **334 Child Development** (3 cr). Principles of development in infants and children. Two lec and supervised nursery school experience equiv to one 3-hr lab per wk. Also offered by correspondence study. Prereq: Psych 100, Soc 110, or perm.

HEc **340 Family Relations** (3 cr). Interpersonal relationships throughout the family life. Also offered by correspondence study. Prereq: Psych 100 or Soc 110 or perm.

HEc **346 Principles of Home Management** (2 cr). Open to non-majors by perm. Analysis of recources in meeting family goals; time and money management; work simplification; emphasis on decision-making and evaluation as family processes.

HEc **347 Home Management House Residence** (3 cr). Management; emphasis on relationships and decision-making. Residence 6-8 wks. Advance reservation with dept required. Prereq: 272 and perm of dept; prereq or coreq: 346.

HEc **349 Home Management for Married Students** (3 cr). Comparable to 347 for homemakers or students with special dietary or other problems. Prereq: 272; prereq or coreq: 346.

HEc **352 Methods in Teaching Home Economics** (3 cr). Techniques and materials for secondary schools; lesson plan development for homemaking classes. Field trip included. Prereq: developmental or education psychology, VocEd 351, or perm.

HEc **370 Nutrition for the Elementary School** (2 cr). Primarily for elementary teachers and student teachers. Fundamentals of nutrition and methods of teaching nutrition in the elementary grades.

HEc **400** (s) **Seminar** (cr arr). Prereq: perm.

HEc **403** (s) **Workshop** (cr arr). Prereq: perm.

HEc **409 Trends and Perspectives in Home Economics** (1 cr). Literature, professional role, leaders, concerns, issues, and trends.

HEc **413 Textile Design** (2 cr). Alt/yrs 73-74. History of design and production of fabrics as an expression of man's cultural achievement; textile design applied to rugs, upholstery and drapery fabrics; experience in media for textile design. One lec and one 3-hr lab per wk. Prereq: 113.

HEc **423 Advanced Textiles** (3 cr). Textile performance and problems involving recent de-

velopment in textile products. Two lec and one 3-hr lab per wk; one field trip. Prereq: 123.

HEc **424 Original Design** (3 cr). Alt/yrs 74-75. Design, rendering, and construction of apparel; emphasis on contemporary environment. One lec and six hrs of lab per wk. Prereq: 324, 329, 429.

HEc **426 History of Interiors and Furnishings** (3 cr). Alt/yrs 74-75. History and development of styles and design in furniture and interiors as expressions of changes in art and culture. Prereq: 326 or perm.

HEc **428 Family Housing** (2 cr). Housing for contemporary living; family life cycles, socio-economic aspects of family housing, site selection, floor plans, building materials, and outside environment. One lec and three hrs of lab per wk.

HEc **429 Social-Psychological Aspects of Clothing** (2 cr). Alt/yrs 74-75. Clothing in relation to culture, human behavior, aesthetics, the economy, and the physical self. Prereq: 229, Psych 100, Soc 110, or perm.

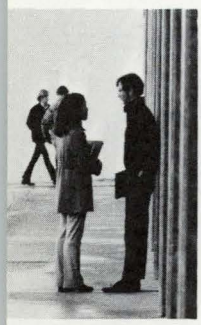
HEc **433 Preschool Resources** (2 cr). Professional organizations, methods, resources, and research facilities in U.S. and internationally. Prereq: perm.

HEc **434 Preschool Participation** (6-9 cr, max 9). Active participation in the preschool laboratory; application of child development theory, direction and preparation of preschool curriculum. Prereq: jr standing or perm.

HEc **435 History and Philosophy of Child Development** (2 cr). Includes one field trip. Prereq: 234 or 334, or Soc 110 and Psych 100.

HEc **436 Current Theories in Child Development** (3-4 cr). Educational, psychological, and sociological theories of child development.

HEc **442 Current Developments in Household Equipment** (2 cr). Available space and selection of functional equipment; materials, construction, operation, care, and relative cost. Prereq: 242.



HEc **448 Consumer Education** (3 cr). Consumer motivation and behavior, protection, information, organizations, use of credit, and selected problems in consumer decision-making.

HEc **455 Problems in Teaching Homemaking and Adult Education** (3 cr). Analysis, organization, implementation, and evaluation of homemaking programs for youth and adults. Orientation to the nature and scope of the student's teaching role. Field trip. Prereq: 352.

HEc **457 Student Teaching in Home Economics Classes** (9 cr, max 9). Supervised teaching at secondary-school level. Apply to home economics teacher educator one semester prior to registration. Prereq: cumulative GPA of 2.25; HEc GPA of 2.50; HEc 352; special project; acceptance into teacher education program.

HEc **460 Family as an Ecosystem** (3 cr). Survey of the literature and discussion of environmental factors affecting contemporary families; analysis of the interrelationship of social change, and family values, structure, roles on the ecological system; determination of the role and potential contribution of family life to ecology.

HEc **470 Problems in Nutrition** (3 cr). Recent advances; emphasis on investigation of infant, child, and adult nutrition. Also offered by correspondence study. Prereq: 270, Zool 119, sr or grad standing.

HEc **471 Dietetics** (4 cr). Diet therapy, adaptation of the normal diet to meet needs of adults and children in disease and convalescence. One field trip. Prereq: Anl 305.

HEc **472 Investigation of Foods** (3 cr). Advanced problems in foods. Two lec and three hrs of lab per wk. Prereq: 272 or perm.

HEc **475 Nutrition Principles for the Classroom Teacher** (3 cr). Designed to prepare elementary and secondary teachers for teaching food selection and the daily diet; variations from the normal diet due to age, environmental conditions, and metabolism are explored, as well as malnutrition, over-nutrition, food fads, additives, obesity, and nutrition for athletes.

HEc **478 Recent Advances in Foods** (2 cr). Topics in food preservation and processing; development of low calorie foods and commercial mixes; food additives. Prereq: 271 or equiv.

HEc **482 Quantity Cookery** (3 cr). Preparation of food in large quantities; menu planning for institutions; lab experience in institution food services. One lec per wk; two 6-hr labs per wk for nine wks (1-7 pm); one 1-day field trip.

HEc **483 Institutional Administration** (4 cr). Organization and scientific management applied to institutional administration in food service units; selection, arrangement, and care of equipment. Three lec and one 2-hr lab per wk.

HEc **485 Institution Food Buying** (2 cr). Food distribution, specifications, and legislation; methods of quantity food purchasing. Prereq: 272 or perm.

HEc **487 Dietetics Practicum** (8 cr, max 8) Supervised practicum in hospitals, clinics, and public health agencies. Prereq: perm.

HEc **499** (s) **Directed Study** (cr arr). Prereq: perm.

HEc **500 Master's Research and Thesis** (cr arr).

HEc **501** (s) **Seminar** (cr arr). Prereq: perm.

HEc **502** (s) **Directed Study** (cr arr). Prereq: perm.

HEc **503** (s) **Workshop** (cr arr). Prereq: perm.

HEc **540 Parent-Child Relationships** (2 cr). Open to non-majors. The developing family; patterns of child rearing. Prereq: 334, 340, and six cr in psych and/or soc or equiv.

HEc **546 Problems in Home Management** (2 cr). Selected topics. Prereq: 346 or equiv.

HEc **551 Techniques of Supervision** (2 cr).

HEc **553 Home Economics Education** (1-4 cr, max 4).

HEc **554 Curriculum in Home Economics** (2 cr). Problems and planning in secondary-school homemaking education.

HEc **570 Current Concepts in Nutrition** (2 cr). Innovative concepts and special techniques in nutrition research; current scientific investigations; present-day nutrition problems. Prereq: 470, Zool 119, or equiv.

HEc **583 Recent Trends in Institutional Management** (2 cr). Management principles applied to food service institutions. Prereq: 483.

HEc **597** (s) **Practicum** (cr arr). Prereq: perm.

HEc **598** (s) **Internship** (cr arr). Supervised internship in educational institutions, government and social agencies, hospitals, or industry; geared to the educational and vocational goals of students. Prereq: perm.

HEc **599** (s) **Research** (cr arr). Prereq: perm.

HEc **601** (s) **Seminar** (cr arr). Prereq: perm.

HEc **602** (s) **Directed Study** (cr arr). Prereq: perm.

HEc **603** (s) **Independent Study** (cr arr). Prereq: perm.

HEc **604 Interinstitutional Doctoral Study** (1-15 cr, max 24). Prereq: perm of dept.

Hydrology

George A. Williams, Head, Dept. of Geology (211 Mines Bldg.). Professor R. Williams; Assistant Professor Ralston.

Hydro **500 Master's Research and Thesis** (cr arr).

Hydro **501** (s) **Seminar** (cr arr). Prereq: perm.

Hydro **502** (s) **Directed Study** (cr arr). Prereq: perm.

Hydro **563 Geohydrology** (3 cr). Equations governing single fluid flow through saturated porous media under various geologic conditions; models, general relations between flow systems and water quality, and between surface and ground water. Prereq: Geol 409, Math 200 or perm.

Hydro **566 Geochemistry of Ground Water** (3 cr). Nature and origin of dissolved constituents in ground water; modification of ground water quality through mineral processes and by human activities. Two lec and one 2-hr lab per wk. Prereq: Geol 409 or perm.

Hydro **567 Hydrometerology** (3 cr). Exchange of water between the atmosphere and the lithosphere or hydrosphere; factors influencing areal and temporal distribution, evaportranspiration, and micrometerology; instrumentation techniques and theory. Two lec and one lab per wk.

Hydro **568 Advanced Geohydrology** (3 cr). Analysis of problems which have confronted the geohydrologist since the inception of quantitative methods. Prereq: Hydro 563.

Hydro **569 Application of Hydrogeological Concepts** (3 cr). Application of hydraulic and chemical characteristics of well and aquifer systems to practical field problems.

Hydro **599** (s) **Research** (cr arr). Prereq: perm.

Industrial Education

William R. Biggam, Chairman (Room C, Industrial Ed. Bldg.). Professor Biggam; Associate Professor Amos (Metals); Assistant Professor R. Smith (Electronics, Plastics).

IEd **130 Basic Electricity** (3 cr). Technical theory and skills in electrical testing procedures; preparation of instructional program for a junior high school program.

IEd **131 Basic Electronics** (4 cr). Continuation of 130. Electron tube and semiconductor circuits. Prereq: 130.

IEd **140 Woodwork I** (3 cr). Hand tool and machine operations; materials, equipment, and processes; selection and fabrication of industrial woodwork products.

IEd **170 Machine Woodwork** (3 cr). Adjustment and safe operation of basic woodwork power tools; selection and fabrication of products for machine woodwork; materials and processes. Prereq: 140.

IEd **200** (s) **Seminar** (cr arr). Prereq: perm.

IEd **203** (s) **Workshop** (cr arr). Prereq: perm.

IEd **R211 Introduction to Quality Assurance** (3 cr). Overview of quality assurance; special

emphasis on the nuclear industry; planning, managing, conducting, and evaluating quality assurance programs.

IEd **R212 Elements of Quality Assurance** (3 cr). Continuation of R211.

IEd **R213 Principles of Dimensional Inspection** (3 cr). Concepts, principles, classification, and control as related to the dimensional inspection area of quality assurance.

IEd **R215 Electronic Components** (3 cr). Physical and electrical characteristics of electronic devices; emphasis on solid state devices; will cover discrete and integrated circuit components.

IEd **235 Communication Electronics** (4 cr). Application of electronic circuits to communications equipment; radio receivers and transmitters; technical radio and TV for avocational use. Prereq: 130-131.

IEd **236 Industrial Electronics** (4 cr). Continuation of 235. Theory and test procedures common to industrial control and automatic processing; computer electronics. Prereq: 235.

IEd **R240 Electronics and Control Systems** (3 cr). Complex frequency domain; application of electronic devices and systems; intro to control theory.

IEd **250 General Metals** (3 cr). Materials, machines, and fabricating processes; methods and techniques of fabricating products from perforated and expanded metal, aluminum, wrought iron, mild steel, and galvanized iron.

IEd **251 Plastics** (2 cr). Materials and industrial methods of fabrication; vacuum, blow, and pressure forming; laminating; extrusion; plastisol and injection molding.

IEd **253-254 Materials Processing Laboratory I-II** (1 cr). IEd 253: use of standard machine tools for shaping metals. IEd 254: theory and practice of welding, casting, and heat treatment; developments in forming and shaping materials. Charge for materials payable at Controller's Office. One lec-dem and 2-hr lab per wk; one 1-day field trip. Prereq: Engr 101 for 253; 253 for 254.

IEd **280 Carpentry** (2 cr). Alt/yrs 74-75. Framing, rafter layout, materials, and job estimating. Prereq: 170 or perm.

IEd **290 Industrial Arts Crafts** (2 cr). Alt/yrs 74-75. Creative craftwork in leather, Keene cement, metal tooling, metal enameling, craft plastics, and mosaic tile.

IEd **299** (s) **Directed Study** (cr arr). Prereq: perm.

IEd **300 Finishing Materials and Methods** (2 cr). Alt/yrs 74-75. Methods and materials relative to finishing wood, metal, composition board, plastics, and other industrial products.

IEd **303 Advanced Machine Tool Laboratory** (2-3 cr). Practice in fabrication of metals beyond that covered in 253-254; extra credit for individual project. Charge for materials payable at Controller's Office. One lec and one 3-hr lab per wk. Prereq: 254 and perm.

IEd **310 Maintenance of Tools and Equipment** (3 cr). Selection, care, and maintenance of hand tools and machines common to industrial arts and vocational-technical shops. Prereq: 170 or perm.

IEd **315 Industrial Design** (2 cr). Alt/yrs 73-74. Planning, designing, and fabricating products from a variety of industrial materials; period furniture and principles of product design. Prereq: 170 or perm.

IEd **R320 Electronic Drafting** (3 cr). Drafting philosophy as related to instrumentation and control circuits; design, layout, and fabrication of printed circuit boards; drafting as related to circuit fabrication.

IEd **R330-R331 Industrial Instrumentation** (3 cr). Utilization of electronic circuits and devices for process parameter measurements; methods of process control from digital and analog signals; investigation of computer control concepts.

IEd **R333 Computer Electronics** (3 cr). Logic of circuits, basic circuits used in computers, and interfacing hardware for computer peripherals.

IEd **360 Welding** (2 cr). Principles and practices in cutting metals and fabrication by modern methods of welding; design, inspection, and testing of weldments. Charge for materials payable at Controller's Office. One lec and one 3-hr lab per wk. Prereq: perm.

IEd **365 Industrial Supervision** (2 cr). Alt/yrs 74-75. Principles and practices; duties and responsibilities of the industrial plant supervisor; use of rating scales and other employee evaluating devices; supervisory methods utilized in on-the-job training and in-plant training programs; methods of conducting job analysis; preparation and use of job descriptions and specifications.

IEd **375 Heat Treatment of Metals** (2 cr). Properties of metals, annealing and normalizing, hardening, tempering, surface hardening, stress relief of welds; equipment and methods. One lec and one 3-hr lab per wk. Prereq: perm.

IEd **400** (s) **Seminar** (cr arr). Prereq: perm.

IEd **403** (s) **Workshop** (cr arr). Consult the time schedule for the complete title and the length of each workshop when offered. Prereq: perm.

IEd **404 Industrial Education and Work Experience Programs for Special Education Teach-**

ers (3 cr). Industrial education programs in schools; development and coordination of work experience programs; planning and implementation of manual arts therapy programs.

IEd **405 Advanced Woodwork** (3 cr). Alt/yrs 74-75. Design and construction of wood products; use of fixtures, jigs, and templates; structural details of cabinet construction; fastening devices; materials and processes. Prereq: 140, 170, or perm.

IEd **410 Advanced Metals** (3 cr). Alt/yrs 73-74. Materials, tools, and processes of metal technology; students may specialize in one or several areas. Prereq: 250 or perm.

IEd **420 Evaluation in Industrial Education** (3 cr). Same as VocEd 420. Methods and techniques; construction and use of objective-type tests, performance tests, rating scales, check lists, and grading industrial products and projects.

IEd **R424 Computer Hardware Organization and Control** (3 cr). Utilization and arithmetic and related hardware; timing and control of computers; description of computer hardware/software interface.

IEd **425 Advanced Electricity-Electronics** (4 cr). Independent readings, research, and lab experimentation. Prereq: 235, 236, or perm.

IEd **R431-R432 Reactor and Nuclear Instruments** (3 cr). Nuclear electronics including detection; application of instruments for reactor control and for experimental data acquisition.

IEd **R445 Digital Process Control** (3 cr). Application of digital computers for process control; utilization of digital control circuits and comparison of digital and analog signals; multiple computer control.

IEd **450 Industrial Safety** (3 cr). Same as VocEd 450. Organization and administration of safety programs in industry and vocational-technical education shops; materials, research, literature, methods, and techniques relative to industrial safety education.

IEd **451 School Shop Planning and Administration** (3 cr). Same as VocEd 451. Technical shops and laboratories; selecting, purchasing, and storage of shop supplies and equipment; organizing a shop personnel system; implementing shop safety programs; maintaining shop records.

IEd **460 Industrial Education for Elementary Teachers** (3 cr). Common hand tools and processes useful in developing creative craft programs in elementary-school classes; project work in wood, metals, plastics; correlation and integration of manual activities with instruction in elementary school subjects.

IEd **462 Industrial Education Curriculum** (3 cr). Same as VocEd 462. Principles of occupational analysis and course construction; subject content; state curriculum patterns; special education progrms; trends and new concepts.

IEd **472 Industrial Education Methods** (3 cr). Same as VocEd 472. Particularized to industrial education and technical education subjects; demonstration, lecture, and problem solving; construction and use of instructional aids; preparation and use of individual instruction sheets and programmed instructional material.

IEd **480 History and Philosophy of Industrial Education** (3 cr). Development of vocational and general education phases of industrial education; comparative and conflicting philosophies; leaders and their contributions.

IEd **499** (s) **Directed Study** (cr arr). Prereq: perm.

IEd **500 Master's Research and Thesis** (cr arr).

IEd **501** (s) **Seminar** (cr arr). Prereq: perm.

IEd **502** (s) **Directed Study** (cr arr). Prereq: perm.

IEd **503** (s) **Workshop** (cr arr). Prereq: perm.

IEd **510 Professional Problems** (1-3 cr, max 6). Prereq: perm.

IEd **511 Technical Problems** (1-3 cr, max 6). Prereq: perm.

IEd **530 Administration and Supervision of Industrial Education Programs** (3 cr). Principles and practices; secondary-school and post high school levels; federal and state legislation regarding industrial education programs.

IEd **540 Instructional Media for Industrial Education** (3 cr). Preparation and use of new instructional media and systems for industrial-technical arts and technical-vocational subjects.

IEd **599** (s) **Research** (cr arr). Prereq: perm.

Information Science

Dale O. Everson, Coordinator (10 Ag. Sci. Bldg.). Professors Crowley, Edwards, Everson, John, E. Kelly, Montgomery, Rathbone; Associate Professors Crandall, Del Mar, Haber, Lynch, Maki, Potratz, Rigas, Sheldon, Sun, Thomson, Turner, Wang; Assistant Professors Nelson, Olson; Instructor Shaw.

Courses in this subject area are under the general jurisdiction of the University Curri-

culum Committee and its Subcommittee on Information Science.

COMPUTER SCIENCE

InfSc **131 Digital Computer Programming** (1-2 cr). See Engr 131.

InfSc **205 Introduction to Computer Programming** (3 cr). See Math 205.

InfSc **233 Introduction to Computers** (3 cr). See Bus 233.

InfSc **234 Advanced Fortran Programming** (2 cr). See Engr 234.

InfSc **305 Digital Computers** (3 cr). See Math 305.

InfSc **370 Numerical Analysis** (3 cr). See Math 370.

InfSc **402 Applied Numerical Methods** (3 cr). See ES 402.

InfSc **439 Systems and Simulation** (2 cr). See Bus 439.

InfSc **440 Digital Systems Engineering** (3 cr). See EE 440.

InfSc **445 Computer Programming Systems** (3 cr) (543). See EE 445.

InfSc **446 System Modeling and Simulation** (3 cr) (546). See EE 446.

InfSc **R500 Master's Research and Thesis** (cr arr). Prereq: perm.

InfSc **533 Automation Systems** (1 cr). See Bus 533.

InfSc **540 Computation Structures and Machine Organization** (3 cr). See EE 540.

InfSc **541 Theoretical Foundations in Computers** (3 cr). See EE 541.

InfSc **554-555 Information Theory I-II** (3 cr). See EE 554-555.

APPLIED STATISTICS

InfSc **231 Statistics** (4 cr). See Bus 231.

InfSc **232 Quantitative Methods in Business** (3 cr) (432). See Bus 232.

InfSc **317 Introduction to Statistics for the Behavioral Sciences** (3 cr). See Psych 317.

InfSc **320 Probability and Statistics** (3 cr). See Math 320.

InfSc **321 Biometry** (3 cr). See Ag 321.

InfSc **401 Engineering Statistics** (3 cr). See ES 401.

InfSc **406 Statistical Research Methods** (3 cr). See Ag 406.

InfSc **418 Intermediate Statistics for the Behavioral Sciences** (3 cr). See Psych 418.

InfSc **435 Operations Research I: Linear Programming** (2 cr). See Bus 435.

InfSc **437 Statistics for Business Decisions** (2 cr) (334). See Bus 437.

InfSc **438 Advanced Statistics** (2 cr). See Bus 438.

InfSc **451-452 Probability Theory and Mathematical Statistics** (3 cr). See Math 451-452.

InfSc **453 Operations Research II: Queueing Theory** (1 cr). See Bus 453.

InfSc **454 Operations Research III: Game Theory** (1 cr). See Bus 454.

InfSc **455 Integer, Non-Linear, and Dynamic Programming** (1 cr). See Bus 455.

InfSc **456 Quality Control** (1 cr). See Bus 456.

InfSc **457 Operations Research IV: Non-Parametric Statistics** (1 cr). See Bus 457.

InfSc **494 Models for Resource Decisions** (3 cr). See FWR 494.

InfSc **R505 Engineering Statistics** (1-3 cr). See ES R505.

InfSc **507 Experimental Design** (3 cr). See Ag 507.

InfSc **532 Dynamics of Business Decisions** (3 cr). See Bus 532.

InfSc **565 Dynamic Programming, Markov Processes, and Queueing Theory** (3 cr). See EE 565.

Interdisciplinary Studies

Elmer K. Raunio, Coordinator (114 Admin. Bldg.).

Courses in this subject area are under the general jurisdiction of the University Curriculum Committee and its Subcommittee on Interdisciplinary Studies.

Inter **101 Man in a Nuclear Age** (2 cr). Same as SocSc 101. Concerns about man and his environment presented by leading university authorities in such fields as foreign policy, nuclear physics, ecology, psychology, urban affairs, cybernetics, and race relationships.

Inter **200** (s) **Seminar** (cr arr). Each seminar under this number is offered jointly by two or more departments and has been approved by

the University Curriculum Committee. Prereq: perm.

Inter **203 Environmental Pollution** (3 cr). See Ag 203.

Inter **299** (s) **Independent Study** (cr arr). Projects which have been approved by two or more departments and by the University Curriculum Committee. Prereq: perm.

Inter **300** (s) **Seminar** (cr arr). See 200.

Inter **394 Technology and Societal Decisions** (3 cr). See Engr 394.

Inter **399** (s) **Independent Study** (cr arr). See 299.

Inter **400** (s) **Seminar** (cr arr). See 200.

Inter **438 Pesticides in the Environment** (2 cr). See Ent 438.

Inter **490 Technology and Human Values** (2-3 cr). Same as RelSt 490. Ideological and value implications of technology for the future of man and his environment.

Inter **493-494 Seminar in Urban Studies** (2 cr). Same as Arch, Bus, Econ, Geog, PolSc, or Soc 493-494. Interdisciplinary inquiry focusing on the analysis and alternative solutions to problems of communities, physical factors, transportation and communication, housing, planning business and industrial districts, zoning, aesthetics, socio-cultural and psychological factors, neighborhoods, local government and finance, urban renewal, regional planning, government programs, and dynamics of development; discussions led by faculty members and consultants.

Inter **499** (s) **Independent Study** (cr arr). See 299.

Inter **501** (s) **Seminar** (cr arr). See 200.

Inter **502** (s) **Directed Study** (cr arr). See 299.

Inter **580 Seminar in Administration and Contemporary Issues** (3 cr). Same as Bus, Ed, or PolSc 580. Interdisciplinary approach to complex problems confronting administrators in the fields of business, education, and government. Prereq: perm.

Inter **589 Water Resources Seminar** (1 cr). Same as AgE, FWR, or Geol 589. Reports by faculty members and graduate students on current problems and projects; reports are organized to give maximum interchange of ideas between divisions.

Journalism

Bert C. Cross, Dept. Chairman (104 Journ. Bldg.). Professor Cross; Assistant Professors McGrane, Stanton, VanLeuven.

ADVANCED PLACEMENT: Courses in this subject field which are vertical in content are: 221-222.

Jour **200** (s) **Seminar** (cr arr). Prereq: perm.

Jour **203** (s) **Workshop** (cr arr). Prereq: perm.

Jour **215 Photojournalism** (2 cr). Fundamentals of news photography; camera techniques, processing, and printing. One 3-hr lab per wk. Prereq: perm.

Jour **221 News Writing** (2 cr). Principles of news writing for newspapers and radio. Two 2-hr lec-labs per wk. Prereq: ability to type.

Jour **222 Reporting** (3 cr). Types and sources of news; gathering and writing news for newspaper and radio use. Two lec and one lab per wk. Prereq: 221.

Jour **224 Lettering and Layout** (2 cr). See Art 224.

Jour **299** (s) **Directed Study** (cr arr). Prereq: perm.

Jour **324 Specialized Article Writing** (2 cr). Primarily for non-majors. Feature article writing and science reporting for specialized publications, newspapers, and magazines.

Jour **354 News Editing** (3 cr). News selection, evaluation, editing, and display; responsibilities of copyreader. Two lec and one lab per wk. Prereq: 221, 222, or perm.

Jour **362 Retail Advertising** (2 cr). Application of fundamentals of advertising to a retail program; preparation, selling, and servicing of advertising through local media.

Jour **366 Advertising Copy and Layout** (3 cr). Selection and presentation of advertising appeals through the media; typography, layout, and copywriting. Two lec and one lab per wk. Prereq: 221, 224, or perm.

Jour **370 Advertising Media** (2 cr). Analysis in terms of markets and audience; planning regional and national campaigns.

Jour **384 Publications Editing** (3 cr). Editing, illustration, layout, and design for magazines, periodicals, business publications, pamphlets, and brochures. Lecture and laboratory. Prereq: perm.

Jour **400** (s) **Seminar** (cr arr). Prereq: perm.

Jour **403** (s) **Workshop** (cr arr). Prereq: perm.

Jour **405 Supervising High School Publications** (2 cr). For secondary-school teachers. Planning and direction of the newspaper and yearbook; teaching methods for journalism.

Jour **423 Public Affairs Reporting** (3 cr). Practice in reporting public affairs; practical work in the professional field. One lec per wk. Prereq: 221, 222, or perm.

Jour **432 Magazine Article Writing** (2 cr). For students in any field. Development of articles for publication in trade, regional, and national magazines; all types of magazines studied.

Jour **433 Interpreting Contemporary Affairs** (2 cr). Interpretive and explanatory writing on current affairs; practice in writing editorials and columns. Prereq: 221, 222, or perm.

Jour **445 Media Internship** (1-8 cr, max 8). Directed internship in the professional news media and related agencies; supervised work in advertising, reporting, and editing; students work in positions commensurate with their abilities and interests. Graded on the basis of P or F. Prereq: perm.

Jour **455 History of Mass Communications** (3 cr). Growth and development of the mass media in the United States; social and political impacts on American society.

Jour **472 Principles of Public Relations** (3 cr). Problems and practices; techniques for mass media; projects related to student's major interest.

Jour **491 Law of Mass Communications** (2 cr). Freedom of the press, libel, right to know, privacy, contempt, regulation of advertising, radio, and television.

Jour **492 Journalism and Public Opinion** (2 cr). Role of news media in formation of public opinion; publicity and propaganda techniques of government, economic, and social groups.

Jour **496** (s) **Proseminar** (2 cr). Current problems; responsibilities, ethics, and criticism; current research. Prereq: sr standing or perm.

Jour **499** (s) **Directed Study** (cr arr). Prereq: perm.

Law

Albert R. Menard, Dean (128 Admin. Bldg.). Professors Bell, Grant, Jones, Menard, Peterson, Stevenson, Vieira; Associate Professors Brabham, DeJong, McLeod, Wyse; Assistant Professor Dunham.

For complete descriptions of the courses in this section, see the annual announcement of the College of Law. Registration in any course offered by the College of Law by non-law students requires permission in advance by the dean and the instructor of the course.

Law **505-506 Procedure I-II** (3 cr).

Law **507-508 Property I-II** (3 cr).

Law **509-510 Torts I-II** (3 cr; 2 cr).

Law **511 Fundamentals of Public Law** (2 cr).

Law **512 Criminal Law and Its Administration** (3 cr).

Law **513-514 Contracts I-II** (3 cr).

Law **515-516 Legal Writing I-II** (1 cr).

Law **601** (s) **Seminar** (cr arr).

Law **605 Constitutional Law** (4 cr).

Law **607 Administrative Law** (3 cr).

Law **608 Labor Law** (2 cr).

Law **609 Federal Courts** (3 cr).

Law **610 Antitrust and Trade Regulation** (3 cr).

Law **611 Municipal Corporations** (2 cr).

Law **612 Legislation** (2 cr).

Law **620 Business Associations** (4 cr).

Law **622 Corporate Securities** (3 cr).

Law **623 Commercial Paper** (2 cr).

Law **624 Sales and Products Liability** (3 cr).

Law **625 Secured Transactions** (2 cr).

Law **626 Creditor's and Debtor's Rights** (3 cr).

Law **627 Seminar, Business Planning** (3 cr).

Law **630-631 Taxation I-II** (3 cr; 2 cr).

Law **632 Estate Planning** (4 cr).

Law **641 Wills, Estates and Trusts** (3 cr).

Law **642 Natural Resources** (3 cr).

Law **643 Environmental Law** (2 cr).

Law **644 Seminar, Land Use Planning** (2 cr).

Law **645 Community Property** (2 cr).

Law **650 Evidence** (4 cr).

Law **652 Remedies and Restitution** (3 cr).

Law **653 Criminal Procedure** (3 cr).

Law **654-655 Practice Court I-II** (1 cr).

Law **656 Appellate Court** (1 cr, max 2).

Law **660 Conflict of Laws** (3 cr).

Law **661 Seminar, Jurisprudence** (2 cr).

Law **662 Legal Practice** (1 cr, max 2).

Law **663 Family Law** (2 cr).

Law **681 Legal Aid** (2 cr).

Law **682 Law Review** (1-2 cr, max 2).

Law **683 Legal Research** (1-2 cr, max 4).

Library Science

Thomas O. Bell, Head, Dept. of Education (404B Educ. Bldg.). Instructor Krukar.

LibSc **299** (s) **Directed Study** (cr arr). Prereq: perm.

LibSc **400** (s) **Seminar** (cr arr). Prereq: perm.

LibSc **420 Classification and Cataloging** (4 cr). Organization of library materials; principles of cataloging, subject analysis, classification, bibliographical methods, Dewey decimal system.

LibSc **421 Selection of Books and Related Materials** (3 cr). Evaluation and selection of books and other materials for libraries; analysis of community library needs and interests.

LibSc **422 Use of the School Library** (2 cr). Methods of interesting students in the library and using it to best advantage.

LibSc **423 Reference in School Libraries** (3 cr). Reference books in school and public libraries; judging and selecting reference collections.

LibSc **425 School Library Problems** (2-4 cr, max 4). Organization and management of school libraries.

LibSc **427 Library and Media Center Practicum** (1-3 cr, max 6). Practical experience through work in libraries and other information centers under professional supervision. Prereq: perm of dept.

LibSc **499** (s) **Directed Study** (cr arr). Prereq: perm.

Mathematics

Howard E. Campbell, Dept. Chairman (300 Faculty Office Bldg.). Professors Campbell, Crowley; Associate Professors Bobisud, Calvert, Christenson, Cobb, Dierker, Potratz, Voxman, Walker, Wang; Assistant Professors Barbut, Goetschel, Neuhaus, Royalty; Instructor Boron.

ADVANCED PLACEMENT: Courses in this subject field which are vertical in content are: 180-190-200-471-472. Students may not obtain advanced-placement credit by enrolling in 140 or 141; however, students without previous college-level courses in mathematics who complete 180 or a higher course in the sequence with a grade of "C" or better will be granted credit in 140 and 141 as well as any other bypassed course.

CREDIT LIMITATIONS: Max 12 cr in Math 111, 112, 140, 141, 180 combined; Math 111 carries no cr after 140; Math 112 carries 3 cr after 140; Math 140-141 each carry 2 cr after 111; Math 140 carries no cr after 111-112; Math 141 carries 2 cr after 112.

Math **R070 Review of Mathematics** (0 cr). Prereq: perm.

Math **R080 Remedial Mathematics** (0 cr). Fundamentals of algebra. Prereq: 1 yr high school algebra and perm.

Math **R090 Basic Engineering Mathematics** (0 cr). Review of parts of college algebra, calculus, and differential equations important in engineering curricula. Prereq: perm.

Math **R105 Introduction to Digital Computers** (3 cr). Intro to computer techniques using Fortran compiler language; conditional and unconditional control statements, input-output statements, and binary and octal number systems. Prereq: perm.

Math **111-112 Fundamentals of Mathematics** (4 cr). Terminal sequence. Nature of mathematics; fundamental concepts of algebra, set theory, geometries, probability, and calculus. Prereq: 1 yr high school algebra and 1 yr of plane geometry.

Math **135-136 Number System and Its Structure** (3 cr). For elementary school teachers. Language and nature of deductive reasoning, elements of set theory, whole numbers, numeration systems, integers, rational numbers, elementary number theory, decimals, and real numbers. Also offered by correspondence study.

Math **140 College Algebra** (3 cr). Properties of real numbers; algebraic, exponential, and logarithmic functions, complex numbers, sequences, and series. Also offered by correspondence study. Prereq: 1 1/2 yrs high school algebra and 1 yr of plane geometry, or equiv, or 111.

Math **141 Analytic Trigonometry** (2 cr). Circular and trigonometric functions, inverse functions, applications including De Moivre's theorem. Also offered by correspondence study. Prereq: 2 yrs high school algebra and 1 yr plane geometry or 140. (If prereq to 140 is satisfied, 140-141 may be taken concurrently.)

Math **180 Analytic Geometry and Calculus I** (4 cr). Functions, limits, continuity, differentiations, integration, applications, differentiation and integration of transcendental func-

tions. Also offered by correspondence study. Prereq: 2 yrs high school algebra and 1 yr plane geometry and 1/2 yr of analytic trigonometry, or equiv, or 141.

Math **R181 Analytic Geometry and Calculus I** (3 cr). Function, rate of change, limits, continuity, differentiation of algebraic functions with applications, and integration. Prereq: perm.

Math **184 Elements of Linear Algebra** (2 cr). Vector spaces, linear transformations, matrices, linear equations and determinants, and characteristics values. Prereq: 140.

Math **186 Theory of Numbers** (3 cr). Elementary number theory, including divisibility properties, congruences, and Diophantine equations. Prereq: 180.

Math **190 Analytic Geometry and Calculus II** (4 cr). Differentiation and integration of transcendental functions, integration techniques, general mean value theorem, numerical techniques, and series. Prereq: 180.

Math **R191 Analytic Geometry and Calculus II** (3 cr). Applications of the definite integral, differentiation and integration of transcendental functions, methods of integration, and determinants and linear equations. Prereq: perm.

Math **200 Analytic Geometry and Calculus III** (3 cr). Vectors, functions of several variables, and multiple integration. Prereq: 190.

Math **R201 Analytic Geometry and Calculus III** (3 cr). Two- and three-dimensional analytic geometry, vectors, hyperbolic functions, parametric equations, and polar coordinates. Prereq: perm.

Math **202** (s) **Seminar** (cr arr). Prereq: perm.

Math **205 Introduction to Computer Programming** (3 cr). Same as InfSc 205. Properties of algorithms, intro to P1/1 programming, data and file organizations, operating system.

Math **R211 Analytic Geometry and Calculus IV** (3 cr). Partial derivatives, infinite series, and complex numbers and functions. Prereq: perm.

Math **299** (s) **Directed Study** (cr arr). Prereq: perm.

Math **300 Mathematics for Teachers** (3 cr). Sets, number systems, elementary number theory, geometric constructions, projective geometry, and Euclidean geometry. Prereq: 180.

Math **N301 Calculus** (3 cr). Review of basic calculus: functions, graphs, slopes, limits, continuity, derivative, rate of change, extrema, integral, moments, and applications.

Math **303 Mathematics as an Art** (3 cr). Primarily for students of non-mathematical fields. Introduction to the creative process of mathematics. Graded on the basis of P or F.

Math **305 Computer Organization and Programming** (3 cr). Same as InfSc 305. Organization of digital computers, machine assembly language programming, macro instructions, input-output linkages of assembly subroutines to other languages. Prereq: 205 or Engr 131.

Math **310 Ordinary Differential Equations** (3 cr). Classification, initial and boundary value problems of one variable, exact equations, methods of solving higher-order linear equations, second order equations with constant coefficients, series solutions, systems of linear equations, Laplace transforms, and existence theorems. Prereq: 200.

Math **315 Vector Calculus** (3 cr). Differential and integral calculus of vectors, line, surface, and volume integrals, divergence, curl, Stokes' theorem, and related applications. Prereq: 200.

Math **320 Probability and Statistics** (3 cr). Same as InfSc 320. Sample spaces, random variables, distribution functions, estimation, and testing of hypotheses. Prereq: 180.

Math **331 Algebra for Elementary School Teachers** (3 cr). Properties of real numbers, linear equations and inequalities, modular arithmetic, complex numbers, polynomials, algebraic structures, and functions. Prereq: 136.

Math **332 Geometry for Elementary School Teachers** (3 cr). Experimental and informal geometry, points, lines, planes, space, congruence and measurement, geometric construction, space figures, similarity and trigonometry, spherical geometry, and plane coordinated geometry. Prereq: 136.

Math **370 Numerical Analysis** (3 cr). Same as InfSc 370. Numerical methods useful in solving applied problems; calculus of finite differences. Prereq: 200.

Math **390 Postulational Geometry** (3 cr). Postulates of Hilbert and Euclid; non-Euclidean geometries; the Erlanger program; projective geometry. Prereq: 200.

Math **400** (s) **Seminar** (cr arr). Prereq: perm.

Math **N401 Computer Programming** (3 cr). Introduction to the characteristics of digital computers, programming principles and language, with some program writing.

Math **N402 Structure of the Real Number System** (3 cr). Topics include a systematic development of the rational and real numbers from the integers, elementary properties of the real number system, sequences, and the limit concept.

Math **N406 Concepts of Analysis** (3 cr). Sets, relations, functions, Dedekind cuts, sequences, limits of functions, differentiation, and integration.

Math **N407 Number Theory** (3 cr). Elementary number theory, including divisibility properties, congruences, Diophantine equations, primitive roots, and well-known theorems and conjectures.

Math **N409 Topology** (3 cr). Construction of topologies, closure, dense sets, compactness, and connectedness.

Math **411 Elementary Topology** (3 cr). Alt yrs 74-75. Primarily topology of metric spaces; compactness, connectedness, continuity, completeness, finite products, general topological spaces, function spaces, and Urysohn's lemma. Prereq: 184, 200, or perm of dept.

Math **420 Introduction to Complex Variables** (3 cr). Theory of functions of one complex variable and its applications. Prereq: 200.

Math **440 Linear Algebra** (3 cr). Algebra and geometry of vector spaces, linear transformations and matrices, quadratic forms, symmetric matrices, and characteristic vectors and roots. Prereq: 184.

Math **N441 Linear Algebra** (2 cr). Algebra of vector spaces, linear transformations, and matrices.

Math **451-452 Probability Theory and Mathematical Statistics** (3 cr). Same as InfSc 451-452. Random variables, distribution functions, characteristic functions, limit theorems, distribution of sample statistics, order statistics, estimation, and testing hypotheses. Prereq: 184, 200.

Math **N453 Probability and Statistics** (3 cr). Basic probability theory, distributions, frequency, sampling theory, and testing hypotheses.

Math **N460 Set Theory and Logic** (3 cr). Elementary set operations, cardinality, and symbolic logic.

Math **461-462 Higher Algebra** (3 cr). Abstract algebra. Prereq: 184.

Math **471-472 Advanced Calculus** (3 cr). Analysis; elementary topology of Euclidean n-space; limit concept and continuity; differentiation; Riemann and Lebesgue integration theory. Prereq: 184, 200.

Math **481 Fourier Analysis** (3 cr). Fourier series; Fourier transforms and boundary value problems of mathematical physics. Prereq: 310.

Math **482 Advanced Applied Mathematics** (3 cr). Such topics as partial differential equations and boundary value problems, Green's functions, perturbation techniques, and calculus of variations. Prereq: 310.

Math **N483 Modern Algebra** (3 cr). Properties of groups, rings, integral domains, and fields. Coreq: N460 recommended.

Math **490 Introduction to Set Theory** (3 cr). Alt yrs 73-74. Set operations, functions, binary operations and relations, cardinal and ordinal numbers, axiom of choice, partially ordered sets, and Zorn's lemma. Prereq: 200.

Math **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under the general supervision of a faculty member. Graded on the basis of P or F. Prereq: perm of dept.

Math **499** (s) **Directed Study** (cr arr). Prereq: perm.

Math **500 Master's Research and Thesis** (cr arr).

Math **501** (s) **Seminar** (cr arr). Prereq: perm.

Math **502** (s) **Directed Study** (cr arr). Prereq: perm.

Math **N503 The Structure of the Real Number System** (3 cr). Topics include a systematic development of the rational and real numbers from the integers, elementary properties of the real number system, sequences, and the limit concept.

Math **511-512 Topology** (3 cr). Alt yrs 73-74. Basic concepts of point set and algebraic topology.

Math **516 Topics in Topology** (3 cr). Algebraic methods and topics in topology.

Math **521 Seminar in Topology** (1-2 cr, max arr). Current literature.

Math **523-524 Algebraic Topology** (3 cr). Alt yrs 74-75. Basic homotopy theory, covering spaces, constructive and axiomatic homology and cohomology theory, and applications.

Math **525-526 Advanced Topics in Topology** (3 cr, max 12).

Math **530 Differential Geometry** (3 cr). Space curves, surfaces and geometry on surfaces, Gaussian and mean curvature, non-Euclidean geometries, Riemanian geometry.

Math **531-532 Complex Variables** (3 cr). Alt/yrs 74-75. Theory of functions of a complex variable.

Math **535-536 Real Variables I-II** (3 cr). Alt/yrs 73-74. Theory of functions of real variables.

Math **539 Theory of Ordinary Differential Equations** (3 cr). Alt/yrs 73-74. Systems of ordinary equations of first order, linear equations, equations of n'th order with analytic coefficients and regular singular points, and self-adjoint boundary value problems.

Math **541 Seminar in Analysis** (1-2 cr, max arr). Current literature.

Math **545-546 Advanced Topics in Analysis** (3 cr, max 12).

Math **551-552 Abstract Algebra I-II** (3 cr). Alt/yrs 73-74. Structure of rings; Galois theory. Prereq: 462.

Math **553-554 Abstract Algebra III-IV** (3 cr). Alt/yrs 74-75. Group theory; non-associative algebras. Prereq: 462.

Math **561 Seminar in Algebra** (1-2 cr, max arr). Current literature.

Math **565-566 Advanced Topics in Algebra** (3 cr, max 12).

Math **R570 Advanced Numerical Analysis** (3 cr). Interpolation; numerical methods of differentiation, integration, and solution of algebraic and differential equations. Prereq: numerical analysis.

Math **571-572 Functional Analysis** (3 cr). Alt/yrs 74-75. Linear topological spaces, Banach spaces, Hilbert spaces, and linear operators on the spaces. Prereq: 536.

Math **574 Topics in Applied Mathematics** (3 cr). Integral and differential equations.

Math **R577-R578 Advanced Mathematical Statistics** (3 cr). Development and application of mathematical statistics to problems in the engineering sciences; applications. Prereq: perm.

Math **R580 Numerical Solutions of Partial Differential Equations** (3 cr). Finite difference methods for elliptic, parabolic, and hyperbolic equations; solution methods suitable for digital computers; interative methods for large scale linear systems. Prereq: perm.

Math **585-586 Recent Developments in Mathematics** (3 cr). For students with extensive background in specific phases.

Math **599** (s) **Research** (cr arr). Prereq: perm.

Math **600 Doctoral Research and Dissertation** (cr arr).

Math **601** (s) **Seminar** (cr arr). Prereq: perm.

Math **602** (s) **Directed Study** (cr arr). Prereq: perm.

Math **603** (s) **Independent Study** (cr arr). Prereq: perm.

Mechanical Engineering

Richard B. Stewart, Dept. Chairman (111 Engr. Bldg.). Professors Barnes, Stewart, Warner; Associate Professors Falkenhagen, Norgord, Penton, Place, Silha, Jacobsen; Assistant Professor Avery.

ME **253 Materials Processing** (3 cr). Theory and practice of machining, casting, forming, and shaping materials. Two lec and one 2-hr dem per wk; two 1-day field trips.

ME **261 Engineering Materials** (4 cr). Materials and properties; fundamental factors influencing properties and selection in design and fabrication. Three lec and one 3-hr lab per wk. Prereq: Chem III.

ME **299** (s) **Directed Study** (cr arr). Individual study of selected topics. Detailed report on study project is required. Prereq: perm.

ME **304 Materials Selection for Mechanical Design** (2 cr). Service conditions encountered by engineering components; selection of materials as related to service. Prereq: 261.

ME **320 Fluid Mechanics Laboratory** (1 cr). One 2-hr lab per wk. Coreq: ES 320; prereq: ES 211, Math 200.

ME **322 Applied Thermodynamics** (4 cr). First and second law topics: property relations, irreversibility, mixtures, compressible flow, combustion, and systems analysis; classical and statistical concepts. Three lec and one 2-hr lab per wk. Prereq: ES 321.

ME **324 Mechanical Design I** (3 cr). Kinematic principles and their applications (with statics and dynamics) to analysis and synthesis of machines. Two lec and one 3-hr lab per wk; one 1-day field trip. Prereq: ES 211, 221.

ME **326 Mechanical Engineering Project** (1-3 cr). Individual investigation and report; may include design, experiment, or analytical studies. Prereq: jr standing and perm of dept.

ME **366 Advanced Engineering Materials** (4 cr). Strengthening, softening, and surface treatment of materials; solidification and joining of metals; properties of non-metallics; composite materials; photomicrography; failure investigation; component failures in mechanical engineering systems. Three lec and one 2-hr lab per wk. Prereq: 261.

ME **374 Fuels and Lubricants** (2 cr). (467). Correlation between properties of fuels and lubricants and their performance in an engine or machine, and in the significance of the standard tests conducted on these materials. One lec and one 2-hr lab per wk. Prereq: perm.

ME **390 Mechanical Engineering Analysis** (3 cr). Application of mathematical analysis to problems of mechanical engineering; analysis of discrete and continuous systems. Prereq: Math 310.

ME **404 Advanced Materials Processing** (3 cr). Materials processing, fabrication, and finishing. Two lec and one 2-hr lab per wk. Prereq: 253.

ME **410 Production Engineering** (3 cr). Planning, analysis, and control of engineering design processes; decision models, planning models, CPS, PERT, queueing theory, data collection and analysis, linear programming, Monte Carlo simulation, materials management and inventory, quality control, and computer techniques.

ME **412 Gas Dynamics** (4 cr). Continuation of study of compressible flow introduced in ES 320; control volume, compressibility, one-dimensional flow, normal and oblique shock wave phenomena, two-dimensional flows, methods of characteristics, unsteady, duct flow, the shock tubes. Three lec and one 2-hr lab per wk. Prereq: ES 320, Math 310.

ME **420 Fluid Dynamics** (4 cr). Continuation of study of viscous flows introduced in ES 320; fluid states, the control volume, multi-dimensional ideal flow, Navier-Stokes equation, boundary layer equation, phenomenological theories of turbulance. Three lec and one 2-hr lab per wk. Prereq: ES 320, Math 310.

ME **425 Mechanical Design II** (4 cr). Stress and strain analysis, failure theories, and combined stresses; design properties of materials; design for variable and impact loading; design of machine elements and components; lubrication theory and bearing design. Prereq: 324, ES 340.

ME **426 Mechanical Systems Design** (2 cr). Individual or team development and design of a system, including its economic aspects; final report to include each student's computations and drawings. Two 2-hr labs and 2 hrs of indep work per wk. Prereq: 425.

ME **427 Optimum Design** (3 cr). Techniques for optimum design with application to simple mechanical elements in problems with practical constraints. Prereq: 425.

ME **433 Internal Combustion Engines** (3 cr). Theory and characteristics of internal combustion engines (gasoline, diesel, gas turbines); includes engine testing, combustion, fuels, lubrication, exhaust emissions and control, carburetion and fuel injection. Prereq: 322.

ME **441 Thermal Systems Design** (3 cr). Design of integrated thermal system such as a steam power plant, including economics, influence on design of variable output, and environmental considerations. Prereq: 322.

ME **444 Environmental Engineering** (4 cr). Phenomena and problems associated with man's environment: air conditioning, refrigeration, solar heating, thermoelectric cooling, air pollution, and means for controlling environment. Three lec and one 2-hr lab per wk. Prereq: 322.

ME **445 Heat Transfer** (4 cr). Transmission by conduction of heat in steady and unsteady states, free and forced convection, radiation; combined effects of conduction, convection, radiation, and fluid friction. Three lec and one 2-hr lab per wk. Prereq: ES 320, 321.

ME **450 Cryogenic Engineering** (3 cr). Engineering for low temperature systems: liquefaction of gases, cryogenic refrigeration systems, gas-separation and purification, cryogenic fluid storage and transfer systems; measurement systems, properties of materials at low temperatures, insulation for cryogenic temperatures. Coreq: 445; prereq: ES 321.

ME **451 Aerospace Propulsion** (3 cr). Thermodynamic, fluid flow, heat transfer, and aerodynamic problems in jet propulsion systems. Prereq: ES 321.

ME **472 Mechanical Vibrations** (4 cr). Free, forced, and transient vibrations with and without damping; multimass and distributed systems; single degree and two degrees of freedom; special techniques; vibration control. Three lec and one 2-hr lab per wk. Prereq: ES 221, Math 310.

ME **473 Applied Stress Analysis** (3 cr). For students interested in design. Analytical and experimental techniques for determining stresses and strains under static and dynamic loads, including photoelastic methods. Two lec and one 2-hr lab per wk. Prereq: ES 340.

ME **474 Lubrication, Friction, and Wear** (3 cr). Fundamentals of lubrication theory, compressible and incompressible lubricants, modern design of hydrostatic and hydrodynamic bearings; general nature of the process of friction and wear. Prereq: ES 320, 321.

ME **491-492 Seminar** (0 cr). One 3-6 day field trip. Graded on the basis of P or F. Prereq: sr standing.

ME **499** (s) **Directed Study** (cr arr). Individual study of selected topics. Detailed report on study project is required. Prereq: sr standing and perm.

ME **500 Master's Research and Thesis** (cr arr).

ME **501** (s) **Seminar** (cr arr). Engineering and engineering-related topics. Graded on the basis of P or F. Prereq: perm.

ME **502** (s) **Directed Study** (cr arr). Primarily for advanced graduate students. Supervised study, including critical reading of current literature. Prereq: perm.

ME **503** (s) **Workshop** (cr arr). Prereq: perm.

ME **505 Dynamics** (3 cr). Kinematical analysis, dynamic specification of a solid body, basic principles of dynamics; dynamics of rectan gular, angular, and plane motion; dynamics in three dimensions; beams. Prereq: ES 221, Math 310, or perm.

ME **507 Machine Design** (3 cr). Topics in advanced mechanical design to meet needs

and interests of students; special projects. Prereq: 425 or perm.

ME **508 Advanced Stress Analysis** (3 cr). Evaluation of stress and strain by analytic methods with discussion of experimental methods; use of the digital computer in the evaluation of complex stress fields; application of stress analysis methods to design of mechanical components. Prereq: 473, ES 340.

ME **512 Advanced Gas Dynamics** (3 cr). Compressible potential flow, linearized theory, transonic, supersonic, and hypersonic flow theory; compressible turbulent boundary layer and shock wave boundary layer interactions. Prereq: 322, ES 320.

ME **515 Transport Phenomena** (3-4 cr). See ChE 515.

ME **520 Advanced Fluid Dynamics** (3 cr) (527). Applications of vector and tensor calculus as applied to problems in fluid dynamics; Navier-Stokes equation, boundary layer theory including classical and similarity solutions, and solutions with pressure gradients; turbulent flows and turbulent boundary layers.

ME **522 Statistical Thermodynamics** (3 cr) (422). Principles of probability theory and quantum mechanics; formulation of basic postulate of statistical mechanics, thermodynamic probability, and most probable macrostate; molecular interpretation of first and second laws; intro to kinetic theory of a perfect gas. Prereq: ES 321.

ME **524 Thermodynamics** (3 cr). Development of the thermodynamic laws for the design and optimization of thermodynamic systems; intro of statistical methods; equations of state, and properties of ideal and real fluids; applications to recent developments in the experimental and theoretical aspects of thermodynamics. Prereq: 322 or perm.

ME **541 Mechanical Engineering Analysis I** (2-3 cr). See ChE 541.

ME **548 Elasticity** (3 cr). See CE 548.

ME **550 Vibration Engineering** (3 cr). Analysis of vibrating systems; including several degrees of freedom, branched systems, closed systems, and applications of energy method; vibration measurement and control. Prereq: 472 or perm.

ME **553 Radiation** (2 cr). Analytical study of radiative transfer with current engineering applications. Prereq: 445 or perm.

ME **554 Advanced Heat Transfer** (3 cr). Analytical study and applications of heat transfer by convection, radiation, and conduction; laminar, turbulent, and two-phase convection; radiative exchange in enclosures; steady and transient conduction in one, two, and three dimensions. Prereq: 445 or perm.

ME **599** (s) **Research** (cr arr). Prereq: perm.

Metallurgy

J. R. Hoskins, Head, Dept. of Mining Engineering and Metallurgy (217 Mines Bldg.). Professors Clifton, Newton; Associate Professor Bobeck.

Met **102 Materials and Their Manufacture** (1 cr). Intro to materials for students who wish to know how and from what the material things of our civilization are made. One 3-hr lab per wk; one 1-day field trip.

Met **201 Elements of Materials Science** (3 cr). Principles relating properties of metals, ceramics, polymers, and composites to their structures. Lab work on metallography, hardness, casting, packing factors, porosity, phase diagrams. Two lec and one 3-hr lab per wk. Prereq: Chem 103 or 111 or 114.

Met **299** (s) **Directed Study** (cr arr). Prereq: perm.

Met **305 Structure of Solids** (3 cr). Crystallography, crystal properties and chemical bonding, defects, amorphous solids, polymorphism and crystal growth. Prereq: Chem 103 or 111 or 114, Phys 211.

Met **308 Introduction to Metallurgical Thermodynamics** (2 cr). Review of the laws of thermodynamics, heterogeneous equilibrium, solution thermodynamics, applications to metallurgical systems. Prereq: Chem 305, ES 321.

Met **400** (s) **Seminar** (0 cr). Review of current literature. One 3-day field trip. Prereq: perm.

Met **403 Introductory Extractive Metallurgy** (3 cr). Intro to ore dressing, smelting, refining, hydrometallurgy, and electrometallurgy. Prereq: Chem 103 and 111 or 114, Phys 220, 221.

Met **410 Metallurgical Laboratory** (2 cr). Ore dressing, sampling, hydrometallurgy, electrometallurgy, high-temperature metallurgy, and fire assaying for gold and silver. Two 3-hr labs per wk. Prereq: 403.

Met **412 Mechanical Metallurgy** (3 cr). Alt/yrs 74-75. Mechanical forming and testing of metals. Two lec and one 3-hr lab per wk. One 1-day field trip. Prereq: 201.

Met **413 Physical Metallurgy I** (3 cr). Theory, structure, and properties of metals and alloys; their relation to industrial problems. Two lec and one 3-hr lab per wk. Prereq: 201, 308.

Met **414 Materials Engineering** (2-3 cr). Alt/yrs 73-74. Selection of materials, manufacturing processes, and industrial practices. Prereq: 201, ES 340.

Met **416 Physical Metallurgy II** (2 cr). Continuation of 413 with emphasis on precipita-

tion, diffusion, phase diagrams, and transformations in steel. Prereq: 413 or perm.

Met **417 X-ray Diffraction** (3 cr). Diffraction of X-rays by crystals; application to study of polycrystalline materials. Two lec and one 3-hr lab per wk. Prereq: Phys 114 or 221.

Met **WS418 Polymeric Materials** (3 cr). WSU 402. Structural characterization, syntheses, and reactions of polymeric materials; relationships between structure and properties, viscoelasticity, deformation, and physical behavior of polymers. Prereq: 201 or jr standing in engineering or physical science.

Met **421 Ceramic Materials** (3 cr). Properties and uses; cermets and related materials. Prereq: Phys 113-114 or 220-221, Chem 103 or 111 or 114.

Met **422 Ceramics Laboratory** (2 cr). Ceramic fabrication; PCE and DTA determinations. Two 3-hr labs per wk. Prereq: 421.

Met **441 Ore Dressing** (3 cr). Methods of comminution and concentration of ores. Two 1-day field trips. Prereq: 403.

Met **442 Extractive Metallurgy** (3 cr). Extraction and refining of ferrous and non-ferrous metals. Prereq: 403.

Met **499** (s) **Directed Study** (cr arr). Prereq: perm.

Met **500 Master's Research and Thesis** (cr arr).

Met **501** (s) **Seminar** (cr arr).

Met **502** (s) **Directed Study** (cr arr).

Met **503 Advanced Extractive Metallurgy** (3 cr). Topics in the extraction and refining of metals. Prereq: 403 or perm.

Met **506 Advanced Ore Dressing** (3 cr). Theories of comminution; flotation and related surface phenomena; electrical and magnetic concentration; process control. Prereq: 403, 410, or perm.

Met **ID507 Advanced Ceramics** (3 cr). Alt/yrs 74-75. Theoretical aspects; constitution of green bodies; shrinkage; porosity; sintering; effect of structure on mechanical, electrical, and magnetic properties; glasses. Prereq: perm.

Met **510 Research Methods** (3 cr). Alt/yrs 74-75. Experimental methods and apparatus; planning and evaluation. Two lec and one lab per wk. Prereq: perm.

Met **511 Advanced Physical Metallurgy** (3 cr). Theory of metals and alloys; application to problems of structure; properties of engineering metals. Prereq: perm.

Met **512 Metallurgical Thermodynamics** (3 cr). Alt/yrs 73-74. Aspects of thermodynamics most used in metallurgy; application to problems. Prereq: perm.

Met **514 Phase Rule and Phase Relations** (3 cr). Alt/yrs 74-75. Phase rule construction and interpretation of phase diagrams; metastable and unstable phase relations. Prereq: perm.

Met **517 Kinetics of Metallurgical Reactions** (3 cr). Alt/yrs 73-74. Application of absolute rate theory; time and temperature dependence; kinetics of gas-solid reactions; corrosion, diffusion, and recrystallization. Prereq: perm.

Met **518 Advanced Mechanical Metallurgy** (3 cr). Alt/yrs 73-74. Microscopic and macroscopic theories of deformation; materials-forming processes; mechanical tests. Prereq: perm.

Met **ID520 Nucleation in Solids** (3 cr). Alt/yrs 74-75. Theories of Volmer-Weber and Becker-Doring; application to solid-state nucleation; relation to solid-state transformations. Prereq: perm.

Met **ID522 Surface Reactions of Metals** (3 cr). Alt/yrs 73-74. Surface chemistry and physics; illustrative examples from metallurgy. Prereq: perm.

Met **R525 Physical Chemistry of Metals** (3 cr). Thermodynamics, heterogenous equilibria, electrochemistry, diffusion, and kinetics. Prereq: perm.

Met **R531 Behavior of Engineering Materials** (3 cr). Static and dynamic properties; relation of mechanical properties to physical properties and crystal imperfections. Prereq: perm.

Met **R533 Advanced X-ray Diffraction** (3 cr). Principles and applications to advanced problems. Prereq: perm.

Met **R534 Radiation Effects in Materials** (3 cr). Interactions between radiation and solids. Prereq: perm.

Met **R533 Failure of Structural Materials** (3 cr). Mechanisms by which failure can occur in structural materials.

Met **R536 Theoretical Structural Metallurgy** (3 cr). Structure of metals and alloys; free electron theory; zone theory; equilibrium; order-disorder; kinetics of phase changes and shear processes. Prereq: perm.

Met **R538 Corrosion in Metallurgy** (3 cr). Corrosion by aqueous media, gases, liquid metals, and fused salts. Prereq: physical chemistry, including electrochemistry, or perm.

Met **R539 Electron Metallography** (3 cr). Operation and applications in metallurgy of the electron microscope, microprobe, and other instruments applying charged particle optics. Prereq: perm.

Met **WS541 Anisotropy of Solids** (3 cr). WSU 517. Representation of physical properties by tensors and matrices; equilibrium properties; elasticity; thermodynamics of irreversible processes. Prereq: thermodynamics.

Met **WS544 Advanced Topics in Material Science** (2 cr, max 4). WSU 501. Topics of current interest in chemical crystallography, quantum theory of metals, and theories of ideal and imperfect solids.

Met **597** (s) **Practicum** (cr arr). Prereq: perm.

Met **598** (s) **Internship** (cr arr). Prereq: perm.

Met **599** (s) **Research** (cr arr). Prereq: perm.

MINING ENGINEERING-METALLURGY

The courses listed below are limited to students enrolled in the composite doctoral program in mining engineering-metallurgy.

MinMt **600 Doctoral Research and Dissertation** (cr arr).

MinMt **601** (s) **Seminar** (cr arr). Prereq: perm.

MinMt **602** (s) **Directed Study** (cr arr). Prereq: perm.

MinMt **603** (s) **Independent Study** (cr arr). Prereq: perm.

Military Science

Daniel L. Miller, Dept. Head (101 Memorial Gym.). Professor Miller; Assistant Professors King, Mirus, Nuccitelli, Ratchye, Reilly.

MS **101-102 Fundamentals of Military Leadership and Management** (1 cr). Orientation to the Army Officer Education Program, organization, missions, and functions of the Army; military map reading; intro to military leadership and management.

MS **200** (s) **Seminar** (cr arr). Prereq: perm.

MS **201-202 Applied Leadership and Management** (1 cr). Leadership training, command experience, organization and employment of basic military units, and a study of unit management, leadership, and problems. Prereq: 101-102.

MS **205 Fundamentals and Applied Leadership and Management (Compressed)** (2 cr). Compression of 102, 201-202. Leadership training, command experience, organization and employment of basic military units, map reading, and unit leadership problems. Prereq: outstanding work in 101 and perm of dept.

MS **299** (s) **Directed Study** (cr arr). Prereq: perm.

MS **301-302 Advanced Leadership and Management** (3 cr). Leadership and management; leader's role in offensive and defensive missions of units ranging from squad to battalion. Prereq: 201-202 and two semesters in art of communications, i.e., speech or English composition, or perm of dept.

MS **400** (s) **Seminar** (cr arr). Prereq: perm.

MS **401-402 Seminar in Leadership and Management** (3 cr). Application of leadership and management skills; Army organization; team work in military operations. Prereq: 301-302.

MS **403 Army Aviation Flight Training** (0 cr). To prepare students for Army Aviation flight training and FAA examinations leading to private pilot's license. Ground school, plus 36 1/2 hrs of flight instruction. Coreq: 401-402.

MS **499** (s) **Directed Study** (cr arr). Prereq: perm.

Mining Engineering

J. R. Hoskins, Head, Dept. of Mining Engineering and Metallurgy (217 Mines Bldg.). Professors Gregory, Hoskins, Hall; Associate Professor Chan; Assistant Professor Green.

Min **101 Elements of Mining I** (2 cr). Terminology and first principles of mineral industry economics, history, exploration, operations, engineering services, and environmental problems.

Min **200** (s) **Seminar** (cr arr). Prereq: perm.

Min **202 Elements of Mining II** (2 cr). Basic mining problems in materials handling, engineering applications, metallurgy, and management functions.

Min **210 Geophysical Prospecting I** (3 cr). Alt/yrs 74-75. Principles and practical methods; magnetic, electrical, electromagnetic seismic, gravitational, radioactive, and geothermal methods; geophysical well logging. One 3-day field trip. Prereq: physical geology and physics.

Min **301 Mining Engineering I** (2 cr). Explosives and blasting practices; drilling and rock penetration; methods of mining and tunneling.

Min **304 Explosives** (2 cr). Drilling and blasting equipment; detonation; use of commercial explosives and detonators; design of blasting rounds (surface and underground). One 1-day field trip. Prereq: jr standing or perm.

Min **306 Industrial Safety** (2 cr). Underground and surface environmental problems of accident and health; statistics, prevention, economy, research on dusts, lighting, rock stability, air, and contaminants. One 2-day field trip.

Min **350 Mineral Economics** (3 cr). Domestic and foreign sources and production of mineral commodities; domestic economy in relation to mineral production, ore reserve calculation, metal market, and stock exchange; assessment of deposits and mine value in relation to economic factors, metal price, and predictions.

Min **352 Mine Management** (3 cr). Principles of mineral economics, labor management, accounting, administration, and costs. One 2-day field trip. Prereq: 202.

Min **372 Mine Ventilation** (3 cr). Sources, evaluation, and dispersal of contaminants; health and explosion hazards; heat stress; methods of dispersal and mitigation; fluid mechanics applied to mine ventilation; hygrometry; resistance of airways; surveys, natural ventilation, fans, and ventilation economics; design of systems, and equipment; ventilation networks. Two lec and one 3-hr lab per wk.

Min **391 Mining Principles** (3 cr). Mine design, planning, problem solving, and electrical distribution. One 4-day field trip. Prereq: 202, ES 211; coreq: ES 340.

Min **400** (s) **Seminar** (cr arr). Prereq: perm.

Min **401 Rock Mechanics** (3 cr). Application of engineering principles in solving problems of crushing, drilling, blasting, breaking, and supporting rock structures. One 4-day field trip. Prereq: 202, ES 340.

Min **410 Mine Plant Design** (2 cr). Alt/yrs 73-74. Design of mine structures such as headframes, buildings, ore bins, and mechanical devices. Two 3-hr labs per wk; one 1-day field trip. Prereq: ES 340.

Min **420 Mineral Resources Management and the Environment** (3 cr). Factors which must be considered in the management, development, or exploitation of nonrenewable natural resources. One 2-day field trip. Prereq: jr standing.

Min **R431 Industrial Fire Protection I** (3 cr). Application of engineering principles to industrial fire protection; analysis and use of building codes; management of industrial fire protection programs. Prereq: perm.

Min **R432 Industrial Fire Protection II** (3 cr). A review and analysis of significant fire loss experience in the U.S.; the cause factors and lessons learned will be emphasized and related to development of Fire Codes; modern trends in fire safety research technology are analyzed.

Min **R433 Environmental Health I—Industrial** (3 cr). Types, mechanisms, and magnitudes of toxicity are examined, defined, and related to the human system as an industrial environmental problem; all types of metals, compounds, and reagents are considered for their influence and effect on the productivity of the human; sampling and analysis of contaminants is included.

Min **R434 Environmental Health II—Occupational Stress** (3 cr). Intro to the human system response and susceptibility to problems of occupation originating from air conditioning, air cleaning, ventilation, respiratory devices, air pressure, noise, lighting, temperature, and radiation; identification, documentation, and reporting of problems and results are included.

Min **R435 Operational Safety** (3 cr). Basic concepts of industrial safety programs with respect to the more common mechanical problems of construction and operation within modern industry.

Min **450 Mine Planning I** (3 cr). Design of surface systems, open cuts, quarries, alluvial, and strip mining; slope stability, stripping, and earthmoving; applications of operation research techniques, transportation by rail, belt, cable, and wheel. One 3-day field trip. Prereq: 301.

Min **451 Mine Planning II** (3 cr). Design of underground openings and systems; industrial engineering practices; operations research techniques; equipment selection. One 3-day field trip. Prereq: 301.

Min **470 Mine Services** (3 cr). Movement of materials which includes principles of fluids and mechanics; ventilation fundamentals, pumping, hoisting, conveying, track, and rail haulage. One 4-day field trip. Prereq: 202, ES 211, ES 320.

Min **499** (s) **Directed Study** (cr arr). Prereq: perm.

Min **500 Master's Research and Thesis** (cr arr).

Min **501** (s) **Seminar** (cr arr). Prereq: perm.

Min **502** (s) **Directed Study** (cr arr). Prereq: perm.

Min **503 Mine Stress Analysis** (3 cr). Alt/yrs 74-75. Application of techniques in experimental stress analysis for structural design in all phases of the engineering system; photoelastic modeling and coating; and strain gage techniques; stress patterns in frameworks, rock masses, and foundations. One lec and two 3-hr labs per wk. Prereq: ES 340.

Min **504 Rock Mechanics II** (3 cr). Alt/yrs 74-75. Theories of rupture of elastic and inelastic, brittle materials; mechanisms of fracture propagation and effects in engineering structures and rock fragmentation; effects of

nuclear blasting, earthquakes, and other dynamic stress waves. Prereq: 401 or perm.

Min **505 Design of Mine Structures** (4 cr). Alt/yrs 74-75. Application of experimental stress analysis and the principles of engineering similitude in the design of stable mine structures. One lec and three 3-hr labs per wk. Prereq: 401 and 503 or 504.

Min **510 Mine Plant Design II** (3 cr). Alt/yrs 73-74. Practical problems; system synthesis of design of headframes, buildings, bridges, ore bins, road, railroad, and other structures; engineering case methods; Three 3-hr labs per wk. Prereq: 202, 410, and ES 340 or perm.

Min **513 Mine Ventilation Planning** (3 cr). Alt/yrs 73-74. Physical and economic factors involved in providing adequate air flow to a typical mine circuit affected by gas emission, heat flux from rock walls, and dust sources; ventilation networks. Two lec and one 3-hr lab per wk. Prereq: perm.

Min **514 Mine Environmental Analysis** (3 cr). Alt/yrs 74-75. Contaminating effects of gases, dust, radiation, heat, and moisture in a mine environment; work efficiency of miners subjected to various environmental conditions. Two lec and one 3-hr lab per wk; one 3-day field trip. Prereq: perm.

Min **520 Mining Geophysics II** (3 cr). Alt/yrs 74-75. Theory and application of magnetic, electrical, electromagnetic, and radioactive methods of geophysical prospecting for metallic and non-metallic mineral deposits. Two lec and one 3-hr lab per wk; one 3-day field trip. Prereq: 210 or perm.

Min **530 Mining Exploration Techniques** (3 cr). Alt/yrs 74-75. Underground exploration for mining engineers; application of geological, geochemical, geophysical, and statistical methods in exploration; reduction, correlation, and overall interpretation of data; computer application. Two lec and one 3-hr lab per wk; one 3-day field trip. Prereq: 210 or perm.

Min **540 Mine Valuation** (3 cr). Alt/yrs 73-74. Mine examination and valuation; sampling methods and calculations; determining present value of a deposit.

Min **560 Mine Management** (3 cr). Financing, management labor relations, operations, and government regulations. Prereq: perm.

Min **561 Mine Industrial Engineering** (3 cr). Alt/yrs 74-75. Industrial engineering, operations research, and computer programming; application to mining engineering problems. Prereq: perm.

Min **570 Mine Systems Design** (3-6 cr). Alt/yrs 73-74. Integration and synthesis of equipment, methods, and design; use of latest operation research tools to provide a complete mine plan of operation. Prereq: perm.

Min **573 Haulage Systems Design** (3 cr). Alt/yrs 74-75. Design criteria in the specification of all pertinent aspects involved in transportation of lump ore on surface or underground. Two lec and one 3-hr lab per wk. Prereq: perm.

Min **597** (s) **Practicum** (cr arr). Prereq: perm.

Min **598** (s) **Internship** (cr arr). Prereq: perm.

Min **599** (s) **Research** (cr arr). Prereq: perm.

MINING ENGINEERING-METALLURGY

The courses listed below are limited to students enrolled in the composite doctoral program in mining engineering-metallurgy.

MinMt **600 Doctoral Research and Dissertation** (cr arr).

MinMt **601** (s) **Seminar** (cr arr). Prereq: perm.

MinMt **602** (s) **Directed Study** (cr arr). Prereq: perm.

MinMt **603** (s) **Independent Study** (cr arr). Prereq: perm.

Museology

Roderick Sprague, Head, Dept. of Sociology/Anthropology (101 Graduate Center). Associate Professor Burcaw (Director, University Museum).

Museo **200** (s) **Seminar** (cr arr). Prereq: perm.

Museo **203** (s) **Workshop** (cr arr). Prereq: perm.

Museo **299** (s) **Directed Study** (cr arr). Prereq: perm.

Museo **301 Introduction to Museology** (3 cr). Museum appreciation for the general student; history, theory, and practice of museums; not specialized as to subject field. One 1-day and two 1/2-day field trips. Also offered by correspondence study.

Museo **400** (s) **Seminar** (cr arr). Prereq: perm.

Museo **402 Intermediate Museology** (3 cr). Primarily for students considering museum work as a career. Techniques of caring for collections, preparing exhibits, and museum administration; not specialized as to subject field. Two lec and one 3-hr lab per wk. One 4-day field trip. Prereq: 301 and/or perm.

Museo **403** (s) **Workshop** (cr arr). Prereq: perm.

Museo **450 Advanced Museology** (2 cr, max 4). Museum work under supervision suited to the student's needs. Some travel may be necessary. Prereq: 402 and perm.

Museo **499** (s) **Directed Study** (cr arr). Prereq: perm.

Museo **501** (s) **Seminar** (cr arr). Prereq: perm.

Museo **502** (s) **Directed Study** (cr arr). Prereq: perm.

Music

Floyd H. Peterson, Director (205 School of Music Bldg.). Professors Bauer, Billingsley, Frykman, Lockery, Logan, Peterson; Associate Professors Bray, Klimko, Seiler, Walton; Assistant Professors Barnes, Bilyeu, R. Hahn, Jones, Probasco, Skinner, Spevacek; Instructors DuPree, Gold, S. Hahn, Robbins, Werner.

APPLIED PERFORMANCE STUDIES

MusA **101** (s) **Individual Instruction** (1-3 cr, max arr). Areas normally offered are voice, piano, organ, harpsichord, harp, violin, viola, cello, string bass, clarinet, saxophone, oboe, flute, bassoon, french horn, trumpet, trombone, baritone, tuba, percussion, and guitar. Special fee course. Consult the School of Music for proficiency requirements for admission to the various levels (MusA 101, 301, 401, 505). Enrollment may be limited to majors in the School of Music. Prereq: perm of dept.

MusA **103 Concert Choir** (1 cr, max arr). Three to five rehearsals per wk. Prereq: audition and perm.

MusA **104** (s) **Chorus** (1 cr, max arr). Section A is a balanced mixed chorus with three rehearsals per wk; section B is a women's chorus with two rehearsals per wk. Prereq: perm.

MusA **105 (s) Orchestra** (1 cr, max arr). Three to five rehearsals per wk, with occasional evening rehearsals. Prereq: perm.

MusA **106** (s) **Band** (1 cr, max arr). Three to five rehearsals per wk. Prereq: perm.

MusA **108 Festival Chamber Orchestra** (1 cr, max arr). One to five rehearsals per wk; may include evening rehearsals. Prereq: perm.

MusA **109 Festival Choir** (1 cr, max arr). Daily rehearsals; open to all students.

MusA **145-146 Piano Class** (1 cr). Prereq: perm of dept.

MusA **147-148 Voice Class** (2 cr). Prereq: perm of dept.

MusA **151-152 Guitar Class** (1 cr). Prereq: perm of dept.

MusA **200** (s) **Seminar** (cr arr). Prereq: perm.

MusA **203** (s) **Workshop** (cr arr). Prereq: perm.

MusA **265** (s) **Chamber Ensemble** (1 cr, max arr). Chamber music performing groups; organized each semester. Prereq: perm.

MusA **266 Collegium Musicum** (1 cr, max arr). Prereq: perm.

MusA **280 Opera Workshop** (1 cr, max 4). Analysis, rehearsal, and performance of operatic literature. Prereq: perm.

MusA **299** (s) **Directed Study** (cr arr). Prereq: perm.

MusA **301** (s) **Individual Instruction** (1-3 cr, max arr). See MusA 101 for description and areas. Prereq: perm of dept.

MusA **303 Concert Choir** (1 cr, max arr). Three to five rehearsals per wk. Prereq: 4 cr in choral groups, audition, and perm.

MusA **304** (s) **Chorus** (1 cr, max arr). See MusA 104. Prereq: 4 cr in choral groups, audition, and perm.

MusA **305** (s) **Orchestra** (1 cr, max arr). See MusA 105. Prereq: 4 cr in instrumental groups, audition, and perm.

MusA **306** (s) **Band** (1 cr, max arr). See MusA 106. Prereq: 4 cr in instrumental groups, audition, and perm.

MusA **308 Festival Chamber Orchestra** (1 cr, max arr). See MusA 108. Prereq: 4 cr in instrumental groups, audition, and perm.

MusA **309 Festival Choir** (1 cr, max arr). See MusA 109. Prereq: 4 cr in choral groups and perm.

MusA **365** (s) **Chamber Ensemble** (1 cr, max arr). See MusA 265. Prereq: 2 cr in MusA 265 or upper-div standing in indiv instruction in applied performance studies.

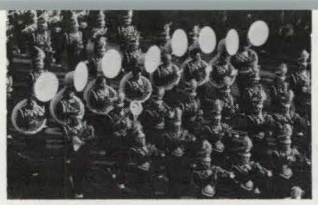
MusA **366 Collegium Musicum** (1 cr, max arr). Prereq: perm.

MusA **387-388 Conducting** (2 cr). Baton techniques, score reading, and problems of conductor of large choral and instrumental organizations. Prereq: MusC 122 or MusC 141.

MusA **400** (s) **Seminar** (cr arr). Prereq: perm.

MusA **403** (s) **Workshop** (cr arr). Prereq: perm.

MusA **407** (s) **Individual Instruction** (1-3 cr, max arr) (401). Not open to undergraduates. Limited to graduate students who are not concentrating in applied performance studies (who need to earn degree credit in an applied area), and to graduate students concentrating in applied performance studies (who need to earn degree credit in a secondary applied area). See MusA 101 for areas offered. Prereq: perm of dept.



MusA **480 Opera Workshop** (1-3 cr, max 8). See MusA 280. Prereq: 2 cr in MusA 280 or perm.

MusA **490 Senior Recital** (0 cr). Credit is granted under MusA 301. Graded on the basis of P or F. Prereq: perm of dept.

MusA **498 Proseminar** (2 cr). Prereq: perm.

MusA **499** (s) **Directed Study** (cr arr). Prereq: perm.

MusA **500 Master's Research and Thesis** (cr arr).

MusA **501** (s) **Seminar** (cr arr). Prereq: perm.

MusA **502** (s) **Directed Study** (cr arr). Prereq: perm.

MusA **503** (s) **Workshop** (cr arr). Prereq: perm.

MusA **505** (s) **Individual Instruction** (1-2 or 6 cr, max arr). Primarily for majors concentrating in musical performance. See MusA 101 for description and areas. Prereq: perm of dept.

MusA **513-514 Seminar in Conducting** (1-4 cr, max 8). Prereq: perm.

MusA **565** (s) **Chamber Ensemble** (1 cr, max 3). See MusA 265. Prereq: perm.

MusA **566 Collegium Musicum** (1 cr, max 3). Prereq: perm.

MusA **590 Master's Recital** (0 cr). Registration for recital related to degree. Credit is granted under MusA 505. Graded on the basis of P or F. Prereq: perm of dept.

MusA **599** (s) **Research** (cr arr). Prereq: perm.

THEORY AND COMPOSITION

MusC **120 Fundamentals of Music** (2 cr). For students in fields other than music. Not open to students who have taken MusC 121 or 141. Max 8 cr in any combination of MusC 120, 121-122, 141, 142.

MusC **121-122 Elements of Music Theory** (4 cr). For minors and students majoring in fields other than music. Singing, playing, dictation, writing scales, intervals, chords, and progressions. Not open for credit to students who have taken MusC 141-142. Max 8 cr in any combination of MusC 120, 121-122, 141, 142. Five lec per wk. Prereq: MusC 121 for 122.

MusC **133 Theory Keyboard Laboratory** (1 cr). Fundamentals of keyboard technique as related to theoretical concepts and skills. Coreq: MusC 141.

MusC **141 Musicianship and Music Literature** (4 cr). Primarily for and may be limited to majors. Fundamentals of music, sight-singing; intro to electronics used in reproducing music; analysis of selected works from each period of music history. Students who have taken MusH 100, MusC 120, 121, or similar courses, must deduct the previously-earned credits on the class permit for MusC 141 when registering. Duplicate credit is not permitted. One lec and four rec per wk. Prereq: perm of dept; coreq: MusC 133.

MusC **142 Theory of Music I** (4 cr). Primarily for and may be limited to majors. Sight-singing, ear-training; analysis and written exercises of melody, harmony, rhythm, and form based on examples from Gregorian chant through Palestrina. Five rec per wk. Prereq: MusC 141; coreq: MusH 144.

MusC **149 Rudiments of Music** (3 cr, max 6). Flexible content to meet the needs of students. Prereq: perm.

MusC **200** (s) **Seminar** (cr arr). Prereq: perm.

MusC **203** (s) **Workshop** (cr arr). Prereq: perm.

MusC **241 Theory of Music II** (4 cr). Primarily for and may be limited to majors. Emphasis on harmony and forms of the Baroque and Rococo periods. Five rec per wk. Prereq: MusC 142; coreq: MusH 243.

MusC **242 Theory of Music III** (4 cr). Primarily for and may be limited to majors. Emphasis on harmony and forms of the Classic and Romantic periods. Five rec per wk. Prereq: MusC 241; coreq: MusH 244.

MusC **299** (s) **Directed Study** (cr arr). Prereq: perm.

MusC **323 Tonal Counterpoint** (2 cr). Stylistic approach to writing counterpoint; emphasis on the *Two-Part Inventions* and *French Suites* of J. S. Bach. Prereq: MusC 341 or perm.

MusC **324 Modal Counterpoint** (2 cr). Stylistic approach to writing two-part counterpoint; emphasis on the vocal polyphony of the 16th century. Prereq: MusC 341 or perm.

MusC **325-326 Composition** (2 cr). Study and practice of composing with 20th-century techniques and devices. Prereq: MusC 242 or perm.

MusC **327 Instrumentation** (2 cr). Elementary principles of transcription and orchestration; emphasis on instrument ranges, idiomatic characteristics, and score preparation. Prereq: MusC 242 or perm.

MusC **328 Choral Arranging** (2 cr). Primarily for music education students and others generally interested in composition. Devices and techniques. Prereq: MusC 122 or 142, or perm.

MusC **341 Twentieth-Century Music Theory and Literature** (4 cr). Techniques of composition studied through aural and visual analy-

sis of significant works by 20th-century composers. Prereq: MusC 242 or perm.

MusC **345 Theory Review** (3 cr). Primarily for advanced-degree candidates. Summary of subject-matter covered in MusC 141, 142, 241, 242, 341.

MusC **400** (s) **Seminar** (cr arr). Prereq: perm.

MusC **403** (s) **Workshop** (cr arr). Prereq: perm.

MusC **420 Advanced Tonal Counterpoint** (2 cr). Continuation of MusC 323. Emphasis on three- and four-part counterpoint, including the fugue, beginning with the style of the 18th century. Prereq: MusC 323 or perm.

MusC **421 Advanced Modal Counterpoint** (2 cr). Continuation of MusC 324. Emphasis on three- and four-part vocal polyphony of the 16th century. Prereq: MusC 324 or perm.

MusC **423-424 Advanced Composition** (2 cr). Continuation of MusC 325-326. Increasing emphasis on varied media and larger forms, but with value being placed on student's originality. Prereq: MusC 326 or perm.

MusC **427 Orchestration** (2 cr). Instrumental scoring; emphasis on orchestral styles of various periods and on creativity in orchestral writing. Prereq: MusC 327 or perm.

MusC **429 Theoretical Basis of Jazz** (2 cr). Harmonic, melodic, rhythmic, and stylistic analysis of principal trends. Prereq: perm.

MusC **461 Band Arranging** (2-4 cr, max 4). Scoring for wind instruments; range, transposition, and tone color. Prereq: MusC 242 or perm.

MusC **498 Proseminar** (2 cr). Prereq: perm.

MusC **499** (s) **Directed Study** (cr arr). Prereq: perm.

MusC **500 Master's Research and Thesis** (cr arr).

MusC **501** (s) **Seminar** (cr arr). Prereq: perm.

MusC **502** (s) **Directed Study** (cr arr). Prereq: perm.

MusC **503** (s) **Workshop** (cr arr). Prereq: perm.

MusC **513-514 Seminar in Music Theory** (1-4 cr, max 8). Prereq: perm.

MusC **515-516 Seminar in Composition** (1-4 cr, max 8). Prereq: perm.

MusC **521 Musical Analysis** (3 cr, max 6). Analysis of selected musical compositions. Prereq: perm.

MusC **523-524 Counterpoint** (2 cr). Advanced contrapuntal writing, including canon and fugue. Prereq: MusC 421.

MusC **527 Advanced Orchestration** (2-4 cr, max 4). Orchestral scoring; recent trends. Prereq: MusC 427 or perm.

MusC **599** (s) **Research** (cr arr). Prereq: perm.

HISTORY AND LITERATURE

MusH **100 Music Appreciation** (3 cr). Not open for credit to majors or to those who have taken MusC 141. Intro to the art and nature of music; emphasis on aural skills, historical styles, musical forms, and the literature of music.

MusH **127 Introduction to Symphonic Music** (2 cr). Primarily for students in fields other than music. Masterworks of symphonic literature.

MusH **128 Introduction to Opera** (2 cr). Primarily for students in fields other than music. Masterworks of operatic literature.

MusH **129 Introduction to Chamber Music** (2 cr). Primarily for students in fields other than music. Masterworks of chamber music literature.

MusH **144 History of Music I** (2 cr). Primarily for and may be limited to majors. Medieval period through Renaissance. Prereq: perm of dept; coreq: MusC 142.

MusH **200** (s) **Seminar** (cr arr). Prereq: perm.

MusH **203** (s) **Workshop** (cr arr). Prereq: perm.

MusH **243 History of Music II** (2 cr). Primarily for and may be limited to majors. Baroque through Rococo period of 18th century. Three lec per wk. Prereq: perm of dept; coreq: MusC 241.

MusH **244 History of Music III** (2 cr). Primarily for and may be limited to majors. Classic through Romantic period of 19th century. Three lec per wk. Prereq: perm of dept; coreq: MusC 242.

MusH **299** (s) **Directed Study** (cr arr). Prereq: perm.

MusH **321-322 Music in Western Civilization** (3 cr). May be taken by students majoring in fields other than music as well as music majors and minors. History of music from early middle ages to the mid-20th century; musical styles in cultural context of each period. These courses may be taken in either order; students may enroll in 322 without having had 321.

MusH **340 American Music** (3 cr). Survey including native American and European folk influences, early American traditional music, and 20th-century popular and concert music.

MusH **400** (s) **Seminar** (cr arr). Prereq: perm.

MusH **403** (s) **Workshop** (cr arr). Prereq: perm.

MusH **410 Historical Survey of Jazz** (2 cr). Origins, sources, evolution, styles, and performers of jazz music.

MusH **411 Music in the Medieval World** (2 cr). Prereq: perm.

MusH **412 Music in the Renaissance** (2 cr). Prereq: perm.

MusH **413 Music in the Baroque Era** (2 cr). Prereq: perm.

MusH **414 Rococo and Pre-Classical Music** (2 cr). Prereq: perm.

MusH **415 Viennese Classical Period** (2 cr). Prereq: perm.

MusH **416 Music in the Romantic Era** (2 cr). Prereq: perm.

MusH **417 Late Nineteenth-Century Music** (2 cr). Prereq: perm.

MusH **418 Music in the Twentieth Century** (2 cr). Prereq: perm.

MusH **431-432 Piano Literature** (2 cr). Baroque through contemporary period. Prereq: perm.

MusH **435 Solo Vocal Literature** (2 cr). Baroque through contemporary period. Prereq: perm.

MusH **498 Proseminar** (2 cr). Prereq: perm.

MusH **499** (s) **Directed Study** (cr arr). Prereq: perm.

MusH **500 Master's Research and Thesis** (cr arr).

MusH **501** (s) **Seminar** (cr arr). Prereq: perm.

MusH **502** (s) **Directed Study** (cr arr). Prereq: perm.

MusH **503** (s) **Workshop** (cr arr). Prereq: perm.

MusH **513-514 Seminar in Music History** (1-4 cr, max 8). Prereq: perm.

MusH **599** (s) **Research** (cr arr). Prereq: perm.

MUSIC TEACHING

MusT **200** (s) **Seminar** (cr arr). Prereq: perm.

MusT **203** (s) **Workshop** (cr arr). Prereq: perm.

MusT **250** (s) **Instrumental Techniques** (1 cr, max 12). Group instruction. Problems in playing and teaching instruments in elementary and secondary schools. Normally offered in violin, viola, cello, string bass, flute, clarinet, saxophone, oboe, bassoon, french horn, trumpet, trombone, and percussion. Each area may be repeated for credit. Prereq: perm.

MusT **251 String Instrument Techniques** (1 cr). Group instruction. Problems of playing and teaching stringed instruments in elementary and secondary schools. Prereq: perm.

MusT **252 Reed Instrument Techniques** (1 cr). Group instruction. Problems of playing and teaching clarinet, oboe, and bassoon in elementary and secondary schools. Prereq: perm.

MusT **253 Brass Instrument Techniques** (1 cr). Group instruction. Problems of playing and teaching brass instruments in elementary and secondary schools. Prereq: perm.

MusT **254 Flute and Percussion Techniques** (1 cr) Group instruction. Problems of playing and teaching flute and the percussion instruments in elementary and secondary schools. Prereq: perm.

MusT **299** (s) **Directed Study** (cr arr). Prereq: perm.

MusT **381 Elementary School Music Methods** (3 cr). Same as Ed 381. Curriculum organization, and instructional materials for teaching general classroom music. Two lec and one lab per wk. Prereq: MusC 120 or satisfactory demonstration of basic music skills.

MusT **383 Principles of Music Teaching** (3 cr). Students in the School of Music take this course in lieu of Ed 468. Philosophy, principles, curriculum and organization of the school music program. Prereq: MusC 122 or 142.

MusT **385 Choral Music in the Secondary School** (2 cr). Methods, instructional materials, and techniques for teaching choral music in grades 7-12. Two lec and one lab per wk. Prereq: MusC 122 or 142; prereq or coreq: MusT 383, MusA 387, or perm.

MusT **386 Instrumental Music in the Secondary School** (2 cr). Methods, instructional materials, and techniques for teaching instrumental music in grades 7-12. Two lec and one lab per wk. Prereq: MusC 122 or 142; prereq or coreq: MusT 383, MusA 287, or perm.

MusT **400** (s) **Seminar** (cr arr). Prereq: perm.

MusT **403** (s) **Workshop** (cr arr). Prereq: perm.

MusT **433 Piano Pedagogy** (2 cr). Methods and materials of teaching piano. Prereq: perm.

MusT **437 Vocal Pedagogy** (2 cr). Methods and materials of teaching voice. Prereq: perm.

MusT **438 Practicum in Studio Teaching** (1 cr, max arr). Supervised experience in teaching applied performance studies; private lessons and class situations. Prereq: upper-div standing in an applied performance area and perm of dept.

MusT **439 Practicum in the Teaching of Theory** (1 cr, max arr). Supervised experience in teach-

ing music theory; private lessons and class situations. Prereq: upper-div standing and perm of dept.

MusT **441 String Pedagogy** (2 cr). Methods and materials of teaching stringed instruments. Prereq: perm.

MusT **463** (s) **Instrumental Techniques** (1-3 cr, max 6). Group instruction. Problems involved in the playing and teaching of instruments in elementary and secondary schools. Prereq: perm.

MusT **466 Marching Band Techniques** (1 cr). Techniques of drilling; materials for field and street manuevers; preparation of shows. Prereq: MusC 242.

MusT **467 Literature for Instrumental Ensembles** (2 cr). Chamber music materials suitable for use in schools.

MusT **468 Literature for Vocal Ensembles** (2 cr). Chamber music materials suitable for use in schools.

MusT **498 Proseminar** (2 cr). Prereq: perm.

MusT **499** (s) **Directed Study** (cr arr). Prereq: perm.

MusT **500 Master's Research and Thesis** (cr arr).

MusT **501** (s) **Seminar** (cr arr). Prereq: perm.

MusT **502** (s) **Directed Study** (cr arr). Prereq: perm.

MusT **503** (s) **Workshop** (cr arr). Prereq: perm.

MusT **513-514 Seminar in Music Teaching** (1-4 cr, max 8). Prereq: perm.

MusT **562 Choral Literature and Techniques** (2 cr). Prereq: MusT 385, MusA 387, or perm.

MusT **563 Orchestral Literature and Techniques** (2 cr). Prereq: MusT 386, MusA 387, or perm.

MusT **564 Band Literature and Techniques** (2 cr). Prereq: MusT 386, MusA 387, or perm.

MusT **581** (s) **College Music Teaching** (3 cr, max 6). Contemporary teaching techniques in one or more of the following fields: theory, music literature, piano, voice, woodwind instruments, stringed instruments, brass instruments, percussion, and music education. Prereq: perm.

MusT **583 School Music Administration** (2 cr). Principles underlying sound policies in the supervision and administration of school music. Prereq: one yr of teaching experience or perm.

MusT **597** (s) **Practicum** (cr arr). Prereq: perm.

MusT **598** (s) **Internship** (cr arr). Prereq: perm.

MusT **599** (s) **Research** (cr arr). Prereq: perm.

MISCELLANEOUS

MusX **140 Convocation** (0 cr). For majors. Attendance at designated musical events. Graded on the basis of P or F.

MusX **200** (s) **Seminar** (cr arr). Prereq: perm.

MusX **203** (s) **Workshop** (cr arr). Prereq: perm.

MusX **283-284 Diction for Singers** (2 cr). MusX 283: German. MusX 284: French.

MusX **299** (s) **Directed Study** (cr arr). Prereq: perm.

MusX **400** (s) **Seminar** (cr arr). Prereq: perm.

MusX **403** (s) **Workshop** (cr arr). Prereq: perm.

MusX **498 Proseminar** (2 cr). Prereq: perm.

MusX **499** (s) **Directed Study** (cr arr). Prereq: perm.

MusX **500 Master's Research and Thesis** (cr arr).

MusX **501** (s) **Seminar** (cr arr). Prereq: perm.

MusX **502** (s) **Directed Study (cr arr). Prereq: perm.**

MusX **503** (s) **Workshop** (cr arr). Prereq: perm.

MusX **511 Introduction to Musical Scholarship** (2 cr). Orientation to graduate study; bibliography and research procedures.

MusX **599** (s) **Research** (cr arr). Prereq: perm.

HIGH SCHOOL SUMMER MUSIC CAMP

MusZ **011** (s) **Musicianship Laboratory** (0 cr).

MusZ **021** (s) **Band** (0 cr).

MusZ **023** (s) **Chorus** (0 cr).

MusZ **025** (s) **Orchestra** (0 cr).

MusZ **027 Stage Band** (0 cr).

MusZ **029 Opera Workshop** (0 cr).

MusZ **035 Piano** (0 cr).

MusZ **036 Organ** (0 cr).

MusZ **041 Voice** (0 cr).

MusZ **043 Violin** (0 cr).

MusZ **044 Viola** (0 cr).

MusZ **045 Cello** (0 cr).

MusZ **046 String Bass** (0 cr).

MusZ **051** (s) **Woodwind Instruments** (0 cr).

MusZ **061** (s) **Brass Instruments** (0 cr).

MusZ **071** (s) **Percussion Instruments** (0 cr).

Native American Affairs

Jack R. Ridley, Director (Center for Native American Development, 730 Deakin Ave.). Associate Professor Ridley.

NatAm **200** (s) **Seminar** (cr arr). Prereq: perm.

NatAm **203** (s) **Workshop** (cr arr). Prereq: perm.

NatAm **299** (s) **Directed Study** (cr arr). Prereq: perm.

NatAm **400** (s) **Seminar** (cr arr). Prereq: perm.

NatAm **403** (s) **Workshop** (cr arr). Prereq: perm.

NatAm **499** (s) **Directed Study** (cr arr). Prereq: perm.

NatAm **501** (s) **Seminar** (cr arr). Prereq: perm.

NatAm **502** (s) **Directed Study** (cr arr). Prereq: perm.

NatAm **503** (s) **Workshop** (cr arr). Prereq: perm.

Naval Science

Jack R. Voorhees, Dept. Head (Navy Bldg.). Professor Voorhees; Associate Professor Elliott; Assistant Professors Bell, Berman, Birchmier, Dowling, Wetherell, Yanaros.

NS **101-102 Naval Ship Systems I-II** (3 cr). Naval objectives and organization for logistics, service, and support; missions of major components of the Navy and Marine Corps; design and structure of ships, dynamics of ship stability and impaired stability, conventional and nuclear propulsion systems, basic weapons systems, auxiliary systems, and damage control. Three lec and one lab per wk; one 5-day field trip.

NS **200** (s) **Seminar** (cr arr). Prereq: perm.

NS **201-202 Seapower and Maritime Affairs** (1 cr). National and international naval and merchant marine affairs as reflected in current events and history; importance today; future role. One lec and one lab per wk; one 5-day field trip.

NS **299** (s) **Directed Study** (cr arr). Prereq: perm.

NS **301-302 Navigation and Operations I-II** (3 cr). NS 301: theory, principles, procedures of terrestrial and celestial navigation; time. NS 302: practice of navigation; naval operations and tactics. Three lec and two labs per wk; one 5-day field trip. Prereq: 301 for 302.

NS **311 Evolution of Warfare** (3 cr). Alt/yrs 73-74. Evolution of warfare in the broadest areas of strategy, technology, and administration; flow of tactical developments focusing on historical examples. Three lec and two labs per wk; one 5-day field trip.

NS **400** (s) **Seminar** (cr arr). Prereq: perm.

NS **401-402-403 Naval Weapons I-II-III** (3 cr). NS 401: weapons systems and systems approach; linear analysis of ballistics and weapons; dynamics of basic components. NS 402: weapons control, components, propulsion systems, trajectories and damage criteria; effectiveness and kill probability. NS 403: content of 402 scaled for students not having technical backgrounds. Three lec and one lab per wk; one 5-day field trip. Prereq: 401, calculus and physics for 402.

NS **404-405 Naval Leadership** (1 cr). Seminar in the problems of leadership; case studies and situations encountered in group control.

NS **406 Naval Management and Leadership** (3 cr). Principles and theory of management as applied to management resources in the Navy; emphasis on leadership skills. Three lec and one lab per wk; one 3-day field trip.

NS **412 Amphibious Operations** (3 cr). Alt/yrs 74-75. Modern doctrinal techniques and concepts of amphibious operations; USMC leadership; command and staff organization; personnel administration. Three lec and two labs per wk; one 5-day field trip.

NS **451 Navy Flight Indoctrination Program** (0 cr). Includes 30 hrs of ground school and approximately 36 hrs of flying time (20 hrs dual, 16 hrs solo); students receive FAA pilot's licenses upon successful completion of written examination and flight checks. Graded on the basis of P or F. Prereq: perm of dept.

NS **499** (s) **Directed Study** (cr arr). Prereq: perm.

Nuclear Engineering

William P. Barnes, Chairman, Nuclear Engineering Committee (240 Gauss Lab.). Professors Barnes, Hoffman, Rathbone, Warner.

RELATED FIELDS: For other courses offered in the nuclear field, see Chem 416, Chem 513, Phys 465, and Phys WS565.

NE **R120 Fundamental Concepts of Nuclear Engineering** (3 cr). Basic concepts; intro to atomic structure, nuclear reactions, fission process, nuclear reactor fundamentals and types.

NE **323 Introduction to Nuclear Engineering** (2-3 cr). For students in all fields. Nuclear and atomic physics, elementary reactor principles, materials, chemical processes, and reactor types. Prereq: jr standing or perm.

NE **380 Fallout Shelter Analysis** (2 cr). Primarily for practicing engineers and architects. Determination of radiological protection of buildings when subjected to nuclear fallout. Prereq: perm.

NE **460 Nuclear Reactor Design** (3 cr). Nuclear reactor design problems in thermodynamics, fluid flow, heat transfer, reactor theory, shielding, control, materials, and safety, as they affect engineering analysis. Prereq: 323 or perm.

NE **461 Nuclear Reactor Laboratory** (1-2 cr). Use of subcritical reactor for experiments on diffusion length, Fermi age, thermal utilization, and buckling; use of alpha, beta, gamma, and neutron detectors, and counters. One or two 3-hr labs per wk. Coreq: 323 or perm.

NE **R462 Nuclear Reactor Codes and Standards** (3 cr). ASME nuclear codes and standards; their contribution to nuclear power plant design and operation. (Credit in this course may not be counted toward a degree.)

NE **R470 Nuclear Reactor Safety** (3 cr). Light water reactor safety: evaluation methods, system disturbances, safety criteria, containment, AEC licensing process, and computer codes for nuclear safety analysis; intro to liquid metal safety. Prereq: perm.

NE **473 Nuclear Instrumentation** (3 cr). Alt/yrs 73-74. Radiation detection instruments and associated circuitry as applied to nuclear engineering. Prereq: EE 314 or equiv.

NE **R480 Waste Management and Nuclear Fuel Reprocessing** (3 cr). Head-end processing, solvent extraction processes, ion exchange processes, precipitation processes, and effluent disposal.

NE **500 Master's Research and Thesis** (cr arr).

NE **501** (s) **Seminar** (cr arr). Prereq: perm.

NE **502** (s) **Directed Study** (cr arr). Prereq: perm.

NE **R530 Two-Phase Flow** (3 cr). Treatment of fluid mechanics and heat transfer in conjunction with nuclear reactors where two-phase flow problems are found.

NE **R550 Topics in Advanced Nuclear Engineering** (3 cr). Prereq: perm.

NE **WS556 Experimental Reactor Techniques** (2 cr). WSU ChE 516. Special experiments using the subcritical reactor, WSU TRIGA critical reactor, probes, detectors, and counters. Prereq: perm.

NE **ID561 Advanced Nuclear Engineering** (3 cr). Fuel preparation and configuration, materials, fluid flow, heat removal, product separation, reactor theory, control, waste treatment, safety, and economics. Prereq: perm.

NE **R565 Reactor Engineering** (3 cr). Radiation shielding, materials, instrumentation and controls, separation of stable isotopes, chemical separation and processing, and special techniques. Prereq: Phys ID566 or perm.

Office Administration

Robert M. Kessel, Dept. Chairman (231 Admin. Bldg.). Professor Kessel; Associate Professor Dacres; Instructor Marlatt.

OAd **101-102-103 Typewriting I-II-III** (2 cr). OAd 101: development of skill sufficient for personal use. OAd 102: speed and control to occupational competence levels. OAd 103: occupational competence, including correspondence, manuscripts, legal documents, and other special problems.

OAd **115-116 Shorthand I-II** (4 cr). OAd 115: theory of Gregg shorthand simplified. OAd 116: dictation and introduction to transcription.

OAd **185 Office Machines** (2 cr). Operation of commonly used office adding-calculating machines.

OAd **200** (s) **Seminar** (cr arr). Prereq: perm.

OAd **203** (s) **Workshop** (cr arr). Prereq: perm.

OAd **271-272 Shorthand III-IV** (3 cr). OAd 271: speed development. OAd 272: transcription skill to occupational competency level. Prereq: perm.

OAd **299** (s) **Directed Study** (cr arr). Prereq: perm.

OAd **313 Office Management** (2 cr) (Bus 313). Application of generally-accepted principles to administrative services.

OAd **395-396 Secretarial Procedures** (3 cr). OAd 395: filing systems; operation of transcribing and duplicating machines; secretarial duties, responsibilities, and procedures. OAd 396: office experience with related seminars;

secretarial administration; advanced dictation and transcription. Prereq: perm.

OAd **400** (s) **Seminar** (cr arr). Prereq: perm.

OAd **403** (s) **Workshop** (cr arr). Prereq: perm.

OAd **499** (s) **Directed Study** (cr arr). Prereq: perm.

Philosophy

Francis Seaman, Chairman (305-C Admin. Bldg.). Professor Seaman; Assistant Professors Gier, Holmes.

Phil **101 Introduction to Philosophy: Types of Philosophy** (3 cr). Not open to students who have taken 103. Chief types of philosophic thought through a study of their more distinguished representatives; Plato, Lucretius, DesCartes, Berkeley, and James.

Phil **103 Introduction to Philosophy: Principles and Problems** (3 cr). Not open to students who have taken 101. Nature of philosophy through a consideration of certain key philosophic questions reflecting student interest; explored by methods appropriate to their solution.

Phil **107 Critical Thinking** (1 cr). Evaluation by informal methods of arguments current in the market place. Not open to students who have taken 211. After this course, 211 carries 2 cr.

Phil **111 Introduction to the Philosophy of Religion** (2-3 cr). Main points of view.

Phil **121 Philosophy of the Arts** (3 cr). The chief conceptions of the nature of the arts and their role in society.

Phil **201 Ethics** (3 cr). Development of ethical thought. Also offered by correspondence study. Prereq: 101 or 103 or soph standing.

Phil **211 Logic** (3 cr). Methods of reasoning; function of logic in the methods of science. Prereq: 101 or 103 or soph standing.

Phil **305 Philosophy of Religion** (3 cr). Current dialogue between the religious and the secular.

Phil **309 History of Ancient Philosophy** (3 cr). Philosophic and political thought from the early Greeks through the Middle Ages. Also offered by correspondence study.

Phil **310 History of Modern Philosophy** (3 cr). Philosophic and political thought from DesCartes through Kant. Also offered by correspondence study.

Phil **400** (s) **Seminar** (cr arr). Prereq: perm.

Phil **403 Advanced Logic** (3 cr). Ideas and techniques of contemporary logic.

Phil **411 Philosophy of the Social Sciences** (3 cr). Concepts and methods of the social sciences.

Phil **412 Philosophy of Science** (3 cr). Basic concepts of modern science.

Phil **414 Ethical Theory** (3 cr). Main points of view.

Phil **415-416** (s) **Contemporary Philosophy** (3 cr). Movements and figures of the 20th century such as logical positivism, linguistic analysis, Russell, Wittgenstein, and Sartre.

Phil **421 Existentialism** (3 cr). Readings in such writers as Kierkegaard, Nietzsche, Camus, and Sartre.

Phil **422 Philosophical Ideas in Recent Literature** (3 cr). Ethical, social, and political trend; Nietzsche, Stein, Sartre, Maugham, Joyce, Hardy.

Phil **425 American Philosophy** (3 cr). Philosophical ideas of the U.S.; emphasis on period since 1875.

Phil **432 India's Philosophies** (3 cr). Survey of the Indian philosophical tradition, including Upanishads, Bhagavad Gita, Buddhism, Nyaya-Vaiseshika, Samkhya-Yoga, and Vendanta.

Phil **442 Philosophy of Mind** (3 cr). Recent discussion of the concept of mind, action, emotion, and private language; identity theory.

Phil **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under the general supervision of a faculty member. Graded on the basis of P or F. Prereq: perm of dept.

Phil **499** (s) **Directed Study** (cr arr). Prereq: perm.

Phil **500 Master's Research and Thesis** (cr arr).

Phil **501** (s) **Seminar** (cr arr). Normally offered in history of philosophy, value theory, contemporary philosophy, philosophy of science, metaphysics, and medieval philosophy. Prereq: perm.

Phil **502** (s) **Directed Study** (cr arr). Normally offered in history of philosophy, value theory, contemporary philosophy, philosophy of science, and metaphysics. Prereq: perm.

Phil **599** (s) **Research** (cr arr). Prereq: perm.

Photography

Don H. Coombs, Director, School of Communication (212 Univ. Classroom Ctr.).

Photo **281-282 Introduction to Photography** (3 cr). Techniques, development, and present-day uses of photography.

Photo **200** (s) **Seminar** (cr arr). Prereq: perm.

Photo **203** (s) **Workshop** (cr arr). Prereq: perm.

Photo **299** (s) **Directed Study** (cr arr). Prereq: perm.

Photo **400** (s) **Seminar** (cr arr). Prereq: perm.

Photo **403** (s) **Workshop** (cr arr). Prereq: perm.

Photo **499** (s) **Directed Study** (cr arr). Prereq: perm.

Photo **481-482 Advanced Photography** (3 cr). Applications and advanced techniques. Prereq: 281-282.

Photo **483-484 Miniature Photography** (3 cr). History, present-day uses, and techniques of the miniature camera; practical application of color. Prereq: 281-282.

Physical Education

Leon G. Green, Head, Dept. of Health, Physical Education, and Recreation (203 Men's Gym.). Professors Betts (Chairman for Women, WHEB 102), Green (Chairman for Men), Kirkland (Recreation); Associate Professors Parberry (Physical Education and Intramurals), Peterson (Intramurals and Physical Education), Porter (Research), Young; Assistant Professors Gorton, Hall, Lathen, MacFarlane, Marten (Health Education), Thompson (Service Program), Walker (Dance), Wolf; Instructor Parker.

ACTIVITY COURSES

Note: PE 105, 106, 107, and 108 may be repeated for credit if the student engages in a different activity. See general academic regulation "J-3-b" in part 3 of this catalog for requirements in physical education.

PE **105 Dance** (1 cr, max arr). Modern and folk dancing; rhythmic expression. Two hrs per wk. Graded on the basis of P or F.

PE **106** (s) **Individual and Dual Sports** (1 cr, max arr). Equitation, bowling, racket sports, fencing, golf, gymnastics, and conditioning. Two hrs per wk. Graded on the basis of P or F.

PE **107** (s) **Team Sports** (1 cr, max arr). Field sports, volleyball, basketball, and softball. Two hrs per wk. Graded on the basis of P or F.

PE **108 Swimming** (1 cr, max arr). All levels of proficiency, including senior life-saving and diving. Two hrs per wk. Graded on the basis of P or F.

FUNDAMENTAL SKILLS COURSES

PE **111 Fundamentals of Movement** (2 cr). Physical principles, kinesthetic patterns, and rhythmic structure involved in fundamental movement activities. One lec and two labs per wk.

PE **112 Dance Techniques** (1 cr). Modern dance, composition, and rhythmic analysis. Two hrs per wk.

PE **113 Problems in Dance Composition** (1 cr, max 4). Various styles, choreography, movement quality, music, costuming, and staging. Two hrs per wk. Prereq: 105 or perm.

PE **115 Team Sports Backgrounds** (2 cr). Field sports, softball, volleyball, and basketball. Four hrs per wk.

PE **116-117 Individual Sports Backgrounds I-II** (2 cr). PE 116: racket games and golf. PE 117: bowling, archery, fencing, track, and field. Four hrs per wk.

PE **126 Weight Training and Conditioning** (1 cr). Two lec-labs per wk.

PE **138 Swimming** (1 cr). Advanced swimming and diving. Two hrs per wk. Prereq: proficiency or perm.

PE **139 Gymnastics** (2 cr). Teaching techniques and skills of gymnastics. One lec and one 2-hr lab per wk.

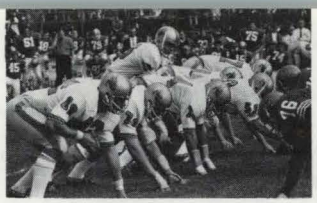
PE **141 Wrestling** (1 cr). Two lec-labs per wk.

PE **142 Tumbling and Floor Exercise** (2 cr). Emphasis on skill development and progressions from elementary through high school. One lec and two labs per wk.

PE **226 Officiating Women's Sports** (1 cr). Officiating in team and individual sports (20 hrs officiating in the intramural program included). Section A: team sports (hockey, volleyball, basketball); section B: individual sports (gymnastics, swimming, track and field).

PE **243 Highly Organized Games** (2 cr). Techniques and skills of games of high organization and lead up activities. One lec and two labs per wk.

PE **244 Life Saving** (1 cr). Students passing the Red Cross tests receive advanced swimmer



and life saving certificates. One lec and two labs per wk. Prereq: 138 or perm.

PE **255 Backpacking and Camping Skills** (2 cr). Lecture, discussion, demonstration, and practical application in backpacking and camping skills. Field trips required. Prereq: perm.

PROFESSIONAL COURSES

PE **110 Health Issues** (2 cr). Project approach to the health problems of the college student and the community.

PE **145 Introduction to Physical Education** (2 cr). Survey, philosophy, aims, and objectives.

PE **C147 History of Physical Education** (2 cr). Backgrounds and development; trends in various countries; modern trends in the U.S.

PE **150 General Hygiene** (3 cr). Maintaining health; individual and public health.

PE **200** (s) **Seminar** (cr arr). Prereq: perm.

PE **203** (s) **Workshop** (cr arr). Prereq: perm.

PE **220 Rhythms for Children** (2 cr). Alt/yrs 73-74. Movement, structured rhythmic movement form; creative rhythmic movement; teaching rhythms and creative movement. One lec and two hrs lab per wk.

PE **252 Elementary School Physical Education** (2 cr). Organization and teaching methods. Three hrs per wk. Also offered by correspondence study.

PE **254 Camp Leadership** (2-3 cr, max 3). Objectives, program, and philosophy of private, organizational, and school camp programs. One 3-4 day field trip.

PE **256 Camp Counseling Practicum** (2-3 cr, max 3). For camp counselors who are employed by or assigned to approved camps. Credit granted on the basis of one credit for each two weeks of camping. Student contracts with instructor for written work. Prereq: perm.

PE **260 Man and Leisure** (3 cr). Expanding role of leisure in contemporary American life; emphasis on contemporary factors influencing leisure; analysis of leisure values as related to the individual and society.

PE **261 Recreational Arts and Crafts** (2 cr). Handicrafts suitable for playground. Prereq: perm.

PE **264 Recreational Music** (1 cr). Musical program in recreational and community centers.

PE **266 Aquatic Instructor's Course** (2 cr). Methods. Students passing Red Cross tests will receive instructor's certificates. Three hrs per wk. Prereq: senior life-saving and 18 yrs old.

PE **271 Interpretation of Physical Education, Health, and Recreation** (3 cr). Importance of these related fields to general education from the Greeks to the present day.

PE **288 First Aid** (2 cr). Emergency care of injuries resulting from accidents or illness; advanced Red Cross first aid card given.

PE **299** (s) **Directed Study** (cr arr). Prereq: perm.

PE **316 Elementary School Health Materials** (2 cr). For elementary classroom teachers.

PE **317** (s) **Recreational Skills** (1 cr, max 3). For elementary and secondary school teachers and recreation leaders, with basic skills and methods of teaching. Areas normally offered are fly fishing, marksmanship, and scuba. One lec and three hrs lab per wk per cr. Students may enroll for more than one of the areas. Prereq: perm.

PE **320 Labanotation** (1 cr). Alt/yrs 74-75. Intro to methods of notating movement; history of notation; fundamentals of labanotation; drafting a score; reconstruction of movement score notated in labanotation; teaching methods. Two hrs lab per wk.

PE **321 Theory and Techniques of Teaching Dance** (2 cr). Teaching modern dance, dance composition, and folk dance. Three hrs per wk.

PE **322 Teaching Individual Sports** (2 cr). Methods for majors and minors.

PE **323 Teaching Team Sports** (2 cr). Methods for majors and minors. Prereq: 322.

PE **325 Dance Production** (2 cr). Alt/yrs 74-75. Organization and production of dance concerts; publicity; set design; costumes; lighting; make-up; accompaniment; house and stage management. One lec and two hrs lab per wk.

PE **326 Drill Team** (1 cr). Alt/yrs 74-75. Techniques, organization, and training of drill teams.

PE **329 Leadership in Recreation** (2 cr). Organization, planning, and conduct of school and community, social, recreation, and extra-curricular events.

PE **341 Basketball Coaching Methods** (2 cr).

PE **342 Baseball Coaching Methods** (2 cr).

PE **343 Track Coaching Methods** (2 cr).

PE **344 Football Coaching Methods** (2 cr).

PE **348 Athletic Injuries** (2 cr). Care, prevention and treatment, and training methods.

PE **C&X371 Principles of Physical Education** (3 cr). Interpretation of aims and objectives.

PE **387 Intramural and Athletic Officiating** (3 cr). Intramural programs in schools; rules and methods of officiating athletic contests; includes 30 hrs of officiating in the intramural department.

PE **400** (s) **Seminar** (cr arr). Prereq: perm.

PE **403** (s) **Workshop** (cr arr). Prereq: perm.

PE **418 Physiology of Exercise** (3 cr). Effects of physical activity on the circulatory, respiratory, and other systems. Two lec and one 2-hr lab per wk. Prereq: Zool 118.

PE **419 Human Kinesiology** (3 cr). The body movement; anatomical and mechanical analysis. Prereq: Zool 127.

PE **424 Adapted Physical Education** (2 cr). Adapting physical education programs to meet individual needs.

PE **427 Methods and Materials in Physical Education** (2 cr). For majors. Practices, problems, program planning, and teaching methods.

PE **430 Advanced Techniques and Skills** (2 cr). Designed to offer opportunity for increasing knowledge, skill, and teaching techniques in specific motor activities.

PE **450 Coaching Clinic** (1-2 cr, max 2). Alternate summers. Procedures and techniques in coaching high school and college sports. Consult the summer bulletin for information.

PE **467 Physical Education and Recreation for the Handicapped** (3 cr). Adaption of these programs to the mentally and physically handicapped child.

PE **481 Tests and Measurements** (3 cr). Testing in physical education. Prereq: Psych 100 or 205 or 206.

PE **486 Program Planning for Recreation Centers** (3 cr). Organization, management, programs, and public relations involved in the operation of recreation centers, settlement-housing, military posts, and college student unions.

PE **494 Community Recreation** (3 cr). Planning and development of community recreation programs; leadership, facilities, finances, services, and public relations.

PE **495 Internship in Recreation** (9 cr). Supervised field work in recreation centers, playgrounds, camps, churches, and other social agencies; placement in a full-time professional recreation position for a minimum of 9 wks. Graded on the basis of P or F.

PE **496 Organization and Administration** (3 cr). Health and physical education programs in the public schools.

PE **497 Sports and Athletic Problems** (3 cr). Scheduling, facilities, equipment, maintenance, budgeting, and public relations in the school. Section A: men; section B: women.

PE **499** (s) **Directed Study** (cr arr). Prereq: perm.

PE **500 Master's Research and Thesis** (cr arr).

PE **501** (s) **Seminar** (cr arr). Prereq: perm.

PE **502** (s) **Directed Study** (cr arr). Prereq: perm.

PE **503** (s) **Workshop** (cr arr). Prereq: perm.

PE **506 Foundations of Motor Skills** (3 cr). Application of psychological, kinesiological, and mechanical principles leading to an understanding of motor activity.

PE **518 Advanced Principles in Physiological Assessments of Human Performance** (3 cr). Principles and methods essential to the experimental approach to physiological performance problems. Two lec and one lab per wk.

PE **520 History of Physical Education and Sport** (3 cr). Cultural, philosophical, and comparative study of physical education and sport throughout civilization; emphasis on background influences on the American program.

PE **544 Program Development** (3 cr). Developing physical education and sport programs; emphasis on new methods and curriculum content.

PE **550 The Psycho-Social Dimensions of Sport** (3 cr). Psychological and sociological aspects of sport as they relate to player, coach, and spectators; emphasis on sport and its relationship to social stratification, social discrimination, social change, and personality characteristics.

PE **581 Research in Physical Activity, Theory, and Design** (1-6 cr, max 6). Principles of scientific inquiry and their application to the study of physical activity; individual research projects.

PE **591 Social Basis of the Profession** (3 cr). Democratic philosophy for physical education, health education, and recreation; principles and objectives as related to the development of the individual and man's cultural heritage.

PE **592 The School Health Program** (3 cr). For teachers and administrators. Well-balanced health program; organization and administration; health services, healthful school living, and health instruction.

PE **596 Advanced Organization and Administration** (3 cr). Policies and problems; classification of children, the time schedule, teaching staff, training, load, office organization and administration, state laws, and finances.

PE **597** (s) **Practicum** (cr arr). Application of theories and techniques. Graded on the basis of P or F. Prereq: perm.

PE **598** (s) **Internship** (cr arr). Supervised field experience in an appropriate public or private agency. Graded on the basis of P or F. Prereq: perm.

PE **599** (s) **Research** (cr arr). Prereq: perm.

Physics

Michael E. Browne, Dept. Chairman (13 Phys. Sci. Bldg.). Professors Browne, Johnston, Peck, Sieckmann; Associate Professors Davis, Ingerson, Kearney; Assistant Professors Deutchman, Geiger, Patsakos, Willmes.

Phys **101 Fundamentals of Physical Science** (4 cr). Primarily for students in non-scientific fields. General, non-mathematical study of chemistry and physics and their role in contemporary society; quantitative aspects of science presented through demonstrations, experiments, and problem-solving; basic physical laws and concepts, and their applications. Three lec and one 2-hr lab per wk.

Phys **105 Physics and Society** (3 cr). Non-mathematical, penetrating investigation of the interaction of science and society; emphasis on current topics, including radioactivity; pollution, transportation, communications, weapons, power generation, and ecology; exploration of the ethical, technological, and economic impact of science. Recommended companion course: 106.

Phys **106 Physics and Society Laboratory** (1 cr). Relevant lab work to accompany 105. One 3-hr lab per wk. Coreq: 105.

Phys **111 Elementary Physics** (3-4 cr). Not open to students who have taken 113 or 220. Survey of classical and modern physics for non-science majors. Three lec and one 2-hr lab per wk.

Phys **113-114 General Physics** (3 cr). Phys 113 is not open to students who have taken 111 or 120; 114 is not open to students who have taken 221. Phys 113: mechanics, sound, and heat. Phys 114: magnetism, electricity, light, and modern physics. Three lec and one rec per wk. Prereq: Math 140, 141.

Phys **115-116 General Physics Laboratory** (1 cr). Lab to accompany 113-114. One 2-hr lab per wk.

Phys **200** (s) **Seminar** (cr arr). Prereq: perm.

Phys **R205-R206-R207 Principles of Physics** (3 cr). Phys 205: mechanics. Phys 206: electricity and magnetism. Phys 207: heat, sound, and optics. Prereq: Math R181 and perm.

Phys **R208-R209 Introduction to Radiological Health Physics** (3 cr). Sources, properties, detection, and measurement of radiation; interaction of radiation with matter and with biological systems; shielding, contamination, waste disposal; control of radiation hazards. Prereq: 113-114.

Phys **220 Engineering Physics I -- Mechanics** (3 cr). Basics of mechanics; statics of rigid bodies; one- and two-dimensional linear and rotational motion; simple harmonic motion; Newton's law of gravitation; problems on static forces and torques, and the motion of general bodies under the laws of simple mechanics. Two lec, one 2-hr lab, and one quiz section per wk. Prereq or coreq: Math 180.

Phys **221 Engineering Physics II -- Electricity and Magnetism** (3 cr). Coulomb's, Ampere's, Faraday's, and Gauss's laws of electricity and magnetism; simple electrical circuits; elementary electronics; Maxwell's equations; laws of electromagnetic radiation; laws of magnetic materials (ferromagnetism, paramagnetism, etc.). Two lec, one 2-hr lab, and one quiz section per wk. Prereq: 220, or ES 211, or equiv; prereq or coreq: Math 190.

Phys **222 Engineering Physics III -- Wave Motion** (3 cr). Nature and properties of wave motion with applications to sound, optics, and elementary atomic physics; laws of reflection and refraction with treatment of geometrical and physical optics, lasers, interference and diffraction, construction of telescopes and microscopes, color, polarization, optical activity, electro-optical effects, elementary acoustics, propagation of sound waves, interference and diffraction of sound, and kinetic theory. Two lec, one 2-hr lab, and one quiz section per wk. Prereq: 221; prereq or coreq: Math 200.

Phys **299** (s) **Directed Study** (cr arr). Prereq: perm.

Phys **N301 Physics for High School Teachers** (3 cr). Mechanics, heat, sound, light, electricity, and magnetism, modern physics; examples from PSSC materials. Four lec and one 3-hr lab per wk.

Phys **N302 Seminar in Experimental Physics** (1 cr). Discussion of high school physics lab experiences, including experiments based on N301 and with PSSC physics.

Phys **N303 Experimental Physics** (4 cr). Introductory lab work designed to emphasize the experimental approach in the teaching of physics; majority of experiments employ apparatus available in high-school labs; special emphasis on design of simple experiments to test physical hypotheses.

Phys **304 General Astronomy** (3 cr). Descriptive and physical astronomy.

Phys **N306 Astronomy** (3 cr). Descriptive and

physical astronomy; includes experience with the university's sixteen-inch reflector.

Phys **307 Sound Waves and Acoustics** (3 cr). Sources of sound, propagation of sound waves through elastic media, and architectural acoustics. Prereq: 114 or 222, Math 200, or perm.

Phys **308 Acoustics Laboratory** (1 cr). Basic experiments in physical, physiological, musical, and architectural acoustics. One 3-hr lab per wk. Coreq: 307.

Phys **R309 Fundamentals of Radiation Biophysics** (3 cr). Nuclear physics, interaction of radiation with matter, detection of radiation, radiation dose limits, theory of ionization; dosimetry; dosimetry techniques, biological and medical effects of radiation, radiation shielding, radiation protection standards, counting statistics, and related topics. Prereq: perm.

Phys **N310 Analytical Mechanics** (3 cr). Dynamics and kinematics of particles; statics, dynamics, and kinematics of rigid bodies.

Phys **R311 Health Physics in Industrial Safety** (3 cr). Basic concepts of physics, biology, and radiation control as related to personnel protection from ionizing radiation.

Phys **314 Experimental Astronomy** (1 cr). Experimental techniques. One 3-hr lab per wk. Prereq or coreq: 304.

Phys **R317 Electronics** (3 cr). Electron ballistics, vacuum and gaseous tubes. Prereq: perm.

Phys **321-322 Analytical Mechanics** (3 cr). Statics; kinematics and dynamics of a particle; system of particles; rigid continuous media; intro to Lagrange's equations. Prereq: 114 or 222, Math 200.

Phys **N340 Electricity and Magnetism** (3 cr). Electrostatics, magnetostatics, electromagnetism; dc and ac circuits; fundamental electrical measurements. Four lec and one 3-hr lab per wk.

Phys **341-342 Electricity and Magnetism** (3 cr). Theory using vector methods; electrostatics, magnetostatics, electromagnetism, analysis of dc and ac circuits; Maxwell's equations; radiation and propagation of electromagnetic waves. Prereq: 114 or 222, Math 200.

Phys **343 Electricity and Magnetism Laboratory** (1 cr). Lab to accompany 342. Use, calibration, and care of precision electrical engineering instruments. One 3-hr lab per wk.

Phys **351 Elementary Quantum Mechanics** (3 cr). Methods; one-dimensional harmonic oscillator, free particle, rectangular potential barrier, hydrogen atom, and perturbation theory. Prereq: 360; coreq: 322.

Phys **360 Introduction to Modern Physics -- Engineering Physics IV** (3 cr). Fundamentals of the qualitative and quantitative description of atomic and nuclear physics; quantum theory, radioactivity, relativity, fusion and fission, spectra, X-rays, neutron physics, elementary particles, and solid state. Prereq: 114 or coreq: 222.

Phys **361 Introduction to Modern Physics Laboratory** (1 cr). Lab to accompany 360. One 3-hr lab per wk.

Phys **400** (s) **Seminar** (cr arr). Prereq: perm.

Phys **N403 Concepts in Physics I** (4 cr). Review and extension of basic physical concepts in the areas of mechanics, heat, and sound. Six hrs lec and four hrs lab per wk.

Phys **N404 Concepts in Physics II** (4 cr). Review and extension of basic physical concepts in the area of magnetism, electricity, and light. Six hrs lec and four hrs lab per wk.

Phys **411-412 Physical Instrumentation I-II** (3 cr). Methods and instruments used in experimental physics; electronic techniques; design problems in electronic measurement of physical quantities encountered in research. Two lec and one 3-hr lab per wk. Prereq: 222 and Math 200 for 411; 411 for 412.

Phys **413 Advanced Physics Laboratory** (2 cr). Two 3-hr labs per wk. Prereq or coreq: 412.

Phys **431-432 Thermodynamics and Kinetic Theory** (3 cr). Laws of thermodynamics, kinetic theory, and their application to topics in physics; material chosen to prepare students for advanced study in statistical physics. Coreq: 360.

Phys **443 Optics** (3 cr). Geometrical optics and photometry, interference, diffraction, double refraction, and polarization; applications to modern optical instruments. Prereq: 114 or 222, Math 200.

Phys **444 Quantum Optics** (3 cr). Theory and applications of lasers, optical spectrum analyzers, electro-optic modulators, and detectors; modern optical concepts and techniques; spatial and temporal coherence, holography, spatial filtering and data processing, and light-scattering spectroscopy. One lec and two 2-hr labs per wk. Prereq: 221-222, or 114 and Math 180.

Phys **445 Optics Laboratory** (1 cr). Lab to accompany 443. Experiments in optics of lenses, photometry, lasers, interferometry, and polarized light. One 3-hr lab per wk.

Phys **N460 Atomic and Nuclear Physics** (3 cr). Concepts; methods of determining fundamental constants of atomic physics, structure of the nucleus, processes of transformation, nuclear reactions, particle accelerators, fission, and nuclear reactors.

Phys **N461 Structure of Matter** (3 cr). See Chem N461.

Phys **N462 Electronics** (3 cr). Emphasis on radio and other communication devices; to make the high-school teacher conversant with this area of modern physics and help him answer students' questions.

Phys **463-R464 Introduction to Solid State** (3 cr). Physics of bulk matter; structure and types of solids, elastic and thermal properties of solids, electrical and magnetic properties of solids, theory of conduction in metals and semiconductors. Coreq: 322.

Phys **465 Introduction to Nuclear Physics** (3 cr). Elementary particle, structure of the nucleus, processes of transformation, interaction of nuclear radiation with matter, nuclear reactions, particle accelerators, fission, nuclear reactors, and cosmic rays. Prereq: 360.

Phys **466 Introduction to Nuclear Physics Laboratory** (1 cr). Lab to accompany 465. One 3-hr lab per wk.

Phys **N467 Elementary Particles** (3 cr). Recent theoretical work and experimental methods.

Phys **R471 Introduction to Theoretical Physics** (3 cr). Vector and tensor methods in conjunction with Newtonian and Lagrangian methods in solving problems of mechanical systems. Prereq: general physics, differential equations, and perm.

Phys **N480 Professional Problems** (1-6 cr, max 6). Individual study in any field of physics. Prereq: perm.

Phys **491 Proseminar** (1 cr). Recent developments. Prereq: sr standing in physics.

Phys **498 Research** (1-6 cr, max 6). Undergraduate thesis. Prereq: jr standing in physics and perm of dept.

Phys **499** (s) **Directed Study** (cr arr). Prereq: perm.

Phys **500 Master's Research and Thesis** (cr arr).

Phys **501** (s) **Seminar** (cr arr). Prereq: perm.

Phys **502** (s) **Directed Study** (cr arr). Prereq: perm.

Phys **R506 Radiological Shielding and Design Concepts** (3 cr). Radiation shielding and engineering design principles of materials, structures, and facilities. Prereq: basic differential and integral calculus, and perm.

Phys **507-508 Modern Techniques of Science Instruction in Physics** (2 cr). Same as Ed 587-588. Emphasis on extent and nature of subject-matter material for secondary schools and colleges.

Phys **511-512 Techniques of Experimental Physics** (3 cr). Development of experimental techniques and skills in active research fields; foundation for any field of physics. Nine hrs of lab per wk. Prereq: 412 and perm.

Phys **521 Advanced Mechanics** (3 cr). Classical mechanics; Lagrange's and Hamilton's principle, two-body problem, rigid body motion, special relativity, canonical transformation, Hamilton-Jacobi theory, small oscillations, and Lagrangian and Hamiltonian formulations for continuous systems and fields. Prereq: 322.

Phys **531 Statistical Mechanics** (3 cr). Classical statistical mechanics of Maxwell, Boltzmann, and Gibbs; Maxwell-Boltzmann distribution law; Boltzmann's H-theorem, quantum statistical mechanics; Bose-Enstein and Fermi-Dirac statistics; applications to problems in thermodynamics. Prereq: 431, 551 or perm.

Phys **541-542 Electromagnetic Theory** (3 cr). Including Maxwell's equations, electrostatics, magnetostatics, currents and their interactions, general theory of emission, propagation and absorption of electromagnetic waves, boundary value problems, relativistic formulation of electrodynamics. Prereq: 322, 342.

Phys **551-552; 553 Quantum Mechanics** (3 cr). Phys 551-552: physical basis; Schroedinger wave formulation, Heisenberg matrix formulation, transformation theory, approximation methods, radiation theory, theory of scattering; some applications to atomic systems. Phys 553: relativistic quantum mechanics, field theory and quantum electrodynamics; applications to theory of radiation, pair production, and scattering. Prereq: 322, 360 for 551-552; 552 for 553.

Phys **ID561 Atomic Spectra and Atomic Structure** (3 cr). Experimental methods for the production and investigation of spectra, interpretation of spectral series, stationary states, spinning electrons and fine line structure, and vector models; Zeeman and Stark effects; intensity of spectral lines. Prereq: 351 or 551.

Phys **ID562 Molecular Spectra** (3 cr). Molecular spectra and their relations to molecular structure; emphasis on diatomic and triatomic molecules. Prereq: ID561 or perm.

Phys **563-564 Solid State Physics** (3 cr). Modern theory of metals, semiconductors, and insulators; crystal structure, thermal, electrical, and magnetic properties of solids, band theory of solids, crystal imperfections, semiconductors, superconductivity, and photoconductivity. Prereq: 342; prereq or coreq: 551.

Phys **WS565-ID566 Nuclear Physics** (3 cr). WSU 565. Nuclei and nuclear interactions from a theoretical and experimental viewpoint, properties of nuclei, two-body problems, complex nuclei, nuclear spectroscopy, nuclear reactions, interaction of nuclei with

radiation, beta decay, nuclear shell structure, nuclear models, mesons and meson theory; topics in high energy physics. Prereq: 465, and 351 or 551.

Phys **571-572 Theoretical Physics** (3 cr). Methods and problems. Prereq: 322 or perm.

Phys **581** (s) **Topics in Advanced Physics** (1-9 cr, max 9). Topics of interest to students and staff. Three lec per wk.

Phys **R585-R586 Fundamental Reactor Kinetics** (3 cr). Complex plane transformations, transfer functions for various systems; derivation of reactor kinetics equations; analysis of nuclear feedback systems; statistical control theory as applied to nuclear systems. Prereq: perm.

Phys **R587 Reactor Physics for Engineers** (3 cr). Review of nuclear physics, nuclear fission, chain reaction, and reactor theory. Prereq: Math 310 or equiv.

Phys **R588 Experimental Nuclear Physics** (3 cr). Experimental methods of interpretation of experimental measurements to determine the static and dynamic properties of nuclei. Prereq: 360 and perm.

Phys **R589 Advanced Reactor Theory** (3 cr). Integrodifferential Boltzmann equation, integral Boltzmann equation; Pn approximation; double Pn approximation; diffusion theory as obtained from transport theory; microscopic hetrogeneous reactor theory, small source theory; reactor kinetics; perturbation theory; burnable poisons and control rod theory. Prereq: perm.

Phys **599** (s) **Research** (cr arr). Prereq: perm.

Phys **600 Doctoral Research and Dissertation** (cr arr).

Phys **601** (s) **Seminar** (cr arr). Prereq: perm.

Phys **602** (s) **Directed Study** (cr arr). Prereq: perm.

Phys **603** (s) **Independent Study** (cr arr). Prereq: perm.

Physiology

Professors S. Beck, Christian, Le Tourneau, Petersen, L. W. Roberts, Wiese; Associate Professors Boe, Bull, S. Davis, Ferguson, Mead, G. Porter, Sasser, H. W. Smith; Assistant Professors Meyer, O'Keeffe, Oslund, Rees, Rourke.

Teaching and research programs in physiology are available in several colleges and departments of the university. Master's and doctoral programs with concentrations in animal and plant physiology are available through the Department of Animal Industries, the Department of Biological Sciences, and the Department of Plant and Soil Sciences.

The following courses are available for those students interested in animal and plant physiology and related areas. Full course descriptions are found under the designated course sections.

ANIMAL PHYSIOLOGY

Anl **451 Endocrine Physiology** (3 cr).

Anl **452 Physiology of Reproduction and Lactation** (3 cr).

Anl **453 Physiology of Reproduction and Lactation Laboratory** (1 cr).

Anl **457 Physiology and Endocrinology of Early Pregnancy** (2 cr).

Anl **511 Animal Nutrition** (3 cr).

Anl **512 Energy Metabolism** (3 cr).

Anl **513 Microbiology and Physiology of Ruminant Nutrition** (3 cr).

Anl **514 Physiology of Non-Ruminant Nutrition** (3 cr).

Anl **551 Advanced Endocrine Physiology** (3 cr).

Anl **552 Experimental Reproductive Physiology** (3 cr).

Bact **503 Physiology of Bacteria** (2-4 cr).

Ent **484 Insect Anatomy and Physiology** (4 cr).

Ent **582 Insect Physiology** (4 cr).

PE **418 Physiology of Exercise** (3 cr).

PE **518 Advanced Principles of Physiological Assessments of Human Performance** (3 cr).

Psych **341 Physiological Psychology** (3 cr).

VS **371 Anatomy and Physiology** (4 cr).

Zool **119 Human Anatomy and Physiology** (5 cr).

Zool **315 Cell Physiology** (4 cr).

Zool **411 Comparative Vertebrate Reproduction** (3 cr).

Zool **412 Comparative Vertebrate Reproduction Laboratory** (1 cr).

Zool **416 Mammalian Physiology** (4 cr).

Zool **417 Endocrine Physiology** (3 cr).

Zool **513 Comparative Animal Physiology** (3 cr).

PLANT PHYSIOLOGY

Biochem **461 Plant Biochemistry** (3 cr).

Biochem **462 Plant Biochemistry Laboratory** (1 cr).

Bot **311 Plant Physiology** (3 cr).

Bot **413 Mineral Nutrition** (3 cr).

Bot **512 Plant Growth Substances** (3 cr).

PlSc **202 Plant Propagation** (3 cr).

PlSc **312 Agriclimatology** (3 cr).

PlSc **401 Crop Physiology** (3 cr).

PlSc **514 Physiology of Disease** (4 cr).

PlSc **516 Environmental Plant Physiology** (3 cr).

PlSc **517 Tree Physiology** (3 cr).

PlSc **586 Properties and Function of Herbicides** (2 cr).

Soils **446 Soil Fertility** (3 cr).

Soils **448 Mineral Nutrition** (3 cr).

Soils **515 Chemistry of Plant Nutrients** (3 cr).

Soils **546 Advanced Soil Fertility** (3 cr).

Plant Sciences

Lucas Calpouzos, Head, Dept. of Plant and Soil Sciences (112 Ag. Sci. Bldg.). Professors Calpouzos, Ensign, Erickson, Fenwick, Finley, Guthrie, Helton, Pope, Seely, Watson; Associate Professors Boe, Murray; Assistant Professors Campbell, Oslund.

PlSc **102 Plant Sciences in Agriculture** (3 cr). Importance and distribution of economic plants; relationship of plants to man's welfare; basic plant growth processes, plant relationships and development.

PlSc **104 Plant Sciences Laboratory** (2 cr). Greenhouse operation, plant culture and propagation; crop identification, uses, distribution, and growth responses to environmental variables and growth regulators. Two 2-hr labs per wk.

PlSc **201 Turfgrass Management** (2 cr). Adaptation, characteristics, and utilization of turf grasses, management principles and physiological bases for the establishment and maintenance of turf.

PlSc **204 Propagation and Culture of Ornamental Plants** (4 cr). Propagation, culture, classification, and uses of plants to enhance man's environment; emphasis on application. Two lec and two 3-hr labs per wk.

PlSc **299 (s) Directed Study** (1-2 cr, max arr). Prereq: perm.

PlSc **303 Principles of Plant Pathology** (3 cr). Symptoms, causes, and control of plant diseases.

PlSc **307 Field Crop Production** (3 cr). Environment, management, quality, and utilization of field crops adapted to Idaho and the Pacific Northwest. Two lec and one 2-hr lab per wk; one 1-day field trip.

PlSc **308 Forage Crops** (2 cr). Production, management, and utilization of annual and perennial forage plants for green manure, hay, and pasture.

PlSc **314 General Genetics** (3 cr). Same as Biol 351 and Genet 314. See Biol 351 for description.

PlSc **338 Weed Control** (3 cr). Biological, chemical, and cultural control of weeds. Two lec and one 2-hr lab per wk.

PlSc **399 (s) Directed Study** (1-2 cr, max 2). Prereq: perm.

PlSc **400** (s) **Seminar** (1 cr). Prereq: perm.

PlSc **401 Crop Physiology** (3 cr). Principles of crop management and their relationship to physiology of vegetative and reproductive growth of crop plants. Prereq: Bot 311 recommended.

PlSc **402 Undergraduate Research** (1-2 cr, max 2). Prereq: perm.

PlSc **404 Plant Disease Identification and Control** (4 cr). Experiments in phytopathology; recognition of symptoms, isolation and identification of pathogenic agents, host-pathogen interactions, and methods of control. Two lec and two 3-hr labs per wk. Prereq: 303 or equiv.

PlSc **405 Biology of Weeds** (3 cr). Alt/yrs 73-74. Classification, identification, and distribution of weeds; morphology, anatomy, physiology, and ecology. One lec and two 2-hr labs per wk; one 1-day field trip.

PlSc **438 Pesticides in the Environment** (2 cr). See Ent 438.

PlSc **446 Plant Breeding** (3 cr). Alt/yrs 73-74. Same as Genet 446. Application of genetic principles to the improvement of crop plants. Two lec and one 2-hr lab per wk. Prereq: 314.

PlSc **461 Pomology** (3 cr). Alt/yrs 74-75. Production and management of tree fruit, physiology of the tree and stored fruit. Three lec per wk; one 2-day field trip. Prereq: perm.

PlSc **463 Olericulture** (3 cr). Alt/yrs 73-74. Production and management of vegetable

crops, including potatoes, sugar beets, and vegetable seed crops. Three lec per wk; one 2-day field trip. Prereq: Biol 203 or perm.

PlSc **465 Crop Production and Management** (3 cr). Integration of factors relating to efficient production of farm crops and crop management practices.

PlSc **480 Field Trip** (1 cr). Five-day field trip to production areas. Prereq: perm.

PlSc **499** (s) **Directed Study** (1-2 cr, max 2). Prereq: perm.

PlSc **500 Master's Research and Thesis** (cr arr).

PlSc **501** (s) **Seminar** (cr arr). Prereq: perm.

PlSc **502** (s) **Directed Study** (cr arr). Prereq: perm.

PlSc **508 Ecology of Soil-Borne Plant Pathogenic Organisms** (3 cr). Effects of climate, crop management, and microbial associations on the prevalence and pathogenic activity of soil-borne plant pathogenic organisms.

PlSc **512 Plant Virology** (3 cr). Nature and properties of plant viruses as related to pathogenic activity. One lec and two 2-hr labs per wk.

PlSc **514 Physiology of Disease** (4 cr). Physiological aspects of parasitism, pathogenesis, and host-parasite interactions. Three lec and one 2-hr lab per wk.

PlSc **516 Environmental Plant Physiology** (3 cr). Advanced study in crop physiology. Prereq: perm.

PlSc **517 Tree Physiology** (3 cr). Alt/yrs 73-74. The physiology of woody perennial plants of economic importance. Prereq: Bot 311.

PlSc **519 Genetics Literature** (2 cr). Same as Genet 519. Prereq: 314.

PlSc **520 Advanced Crop Production** (1-3 cr, max 6). Specialized training in selected phases of crop production and management.

PlSc **530** (s) **Research Methods** (2 cr, max 4). Normally offered in plant pathology, horticulture, plant breeding, and weed control. Individual and group training and experience.

PlSc **532 Advanced Weed Studies** (1-3 cr, max 6). Specialized training in selected phases.

PlSc **534 Cytogenetics** (3 cr). Alt/yrs 74-75. Same as Genet 534. Chromosomal behavior, polyploidy, chromosomal aberrations, and mutagens in relation to genetics. Two lec and one 3-hr lab per wk. Prereq: 314.

PlSc **536 Properties and Functions of Herbicides** (2 cr). Physical and chemical properties and mode of action of herbicides, and their effect on plant structure, internal mechanisms, processes, and sites of action. Prereq: 338 or perm.

PlSc **538 Pesticide Toxicology** (3 cr) See Ent ID538.

PlSc **597** (s) **Practicum** (cr arr). Prereq perm

PlSc **598** (s) **Internship** (cr arr). Prereq: perm.

PlSc **599** (s) **Research** (cr arr). Prereq: perm.

PlSc **600 Doctoral Research and Dissertation** (cr arr).

PlSc **601** (s) **Seminar** (cr arr). Prereq: perm.

PlSc **602** (s) **Directed Study** (cr arr). Prereq: perm.

PlSc **603** (s) **Independent Study** (cr arr). Prereq: perm.

Political Science

Sydney Duncombe, Chairman, Dept. of Political Science and Public Affairs Research (207 Admin. Bldg.). Professors Borning, Duncombe, Hosack, Martin; Assistant Professors Blank, Rouyer; Instructor Higginbottom.

PREREQUISITES: Two-semester courses in this field may be taken in either order. Students may enroll in second-semester courses without having had the first. Ordinarily PolSc 105 or six credits in other lower-division courses in political science are required for registration in upper-division courses; exceptions by permission.

PolSc **101 American Government** (3 cr). Political processes and major political institutions in American national government, including basic constitutional concepts; includes basic models for analysis of democracy and policy-making. Also offered by correspondence study.

PolSc **C102 American Government** (3 cr). Policy issues and functions.

PolSc **105 Elements of Political Science** (3 cr). Primarily for majors. Principles and nature of the discipline, comparative processes, ideas, problems in government, and politics in the modern world.

PolSc **152 Politics and Pollution** (1 cr). Political, governmental, and administrative aspects of overcoming air, water, and other types of pollution of our environment. Also offered by correspondence study.

PolSc **153 Politics and Peace** (1 cr). Political and governmental aspects of American foreign policy and the search for peaceful solutions to world issues.

PolSc **154 Politics and the Economy** (1 cr). Political aspects of governmental policies in the fields of business, labor, and agriculture.

PolSc **155 Politics and Contemporary Issues** (1 cr). Consult the departmental office for course topic currently offered.

PolSc **200** (s) **Seminar** (cr arr). Prereq: perm.

PolSc **237 International Politics** (3 cr). Such basic principles as nationalism, militarism, internationalism, and problems that result therefrom; introduction to other courses in the area.

PolSc **275 American State Government** (3 cr).

State politics, parties, interest groups, constitutions, legislative, executive, and judicial branches, federal-state relations; key issues of state politics — taxation, education, water, and welfare. Also offered by correspondence study.

PolSc **276 American Local Government** (3 cr). Organization and problems of cities, counties, school districts, and other local units, community power, key functions and issues in local government-planning, urban renewal, race relations, poverty, and transportation. Also offered by correspondence study.

PolSc **285 Systems of Parliamentary Democracy** (3 cr). Basic elements of the British system and others, including responsible ministry, executive-legislative dynamics, recent political development. Also offered by correspondence study.

PolSc **286 Autocratic Political Systems** (3 cr). Basic elements of the Soviet system and others, including nature and role of the party, operations of government, status of the individual, recent political developments.

PolSc **299** (s) **Directed Study** (cr arr). Prereq: perm.

PolSc **341 World Politics** (3 cr). Recent developments in international politics, chief elements in current foreign policies of major world powers.

PolSc **400** (s) **Seminar** (cr arr). Prereq: perm.

PolSc **425 Western Political Thought** (3 cr). Evolution of key concepts and themes from ancient Greeks to modern political philosophers.

PolSc **426 Recent Political Thought** (3 cr). Modern political ideas and their role in domestic and world politics, major contemporary ideologies and currents of thought.

PolSc **428 American Political Thought** (3 cr). Political philosophy in America in pertinent writing and movements throughout our history, ideas of dissent, prevalent concepts of various eras.

PolSc **430 Political Participant Internship** (1-9 cr, max 9). Directed student internship as a participant-observer in the political process, work during a political campaign with a political candidate, party, or interest group. Prereq: perm.

PolSc **431 Political Parties** (3 cr). Public opinion and the political process, party machines, spoils system, nominating methods, conduct of elections.

PolSc **432 The Legislative Process** (3 cr). Theories of representation, recruitment of legislators, legislative organization and behavior, structures of power, relationship to the executive, lobbying, and role in the political system.

PolSc **433 Public Opinion and Electoral Behavior** (3 cr). Review of psychological and sociological concepts in the opinion-formation process, opinion measurement and basic techniques of survey research, and examination of linkages between public opinion and policy in a democratic society.

PolSc **434 Interest Groups** (3 cr). Interest groups, their organizational patterns, pressure-group activities in their relation to our political system and to the public interest.

PolSc **435 Political Research Methods and Approaches** (3 cr). Science in political science; computer analysis in political research; behavioral approaches to political phenomena — systems analysis, decision-making, communications, survey research, content analysis, aggregate date analysis, and social background analysis.

PolSc **436 Political Participation** (1 cr). Planning a political career, understanding the political environment of your constituency, identification of issues, campaign organization and techniques, responsibilities and political opportunities in elective office. Prereq: 12 cr in political science and perm.

PolSc **438 Conduct of American Foreign Policy** (3 cr). Processes by which our foreign policy is made and executed, roles of pressure groups, Congress, the President, Department of State and its Foreign Service, their effect upon specific policies.

PolSc **440 Principles of International Law and Organization** (3 cr). Chief agencies of international cooperation, past and present, sources and uses of international law, evolution of general principles of international law; development of the UN.

PolSc **443 Contemporary Far Eastern Politics** (3 cr). Problems of the area, their sources and proposed solutions, as presented by Orientals; conflict of interest of Powers in Eastern Asia, situation of China and Japan.

PolSc **446 The Chinese Empire** (3 cr). Comparative study of the oldest continuous political entity existing today; aspects of traditional Chinese culture whose political connotations presumably contributed to this continuity.

PolSc **451 Presidential and Administrative Decision-Making** (3 cr). Administrative institutions and relationships in the executive branch of government; dynamics of decision-making at the White House and departmental levels; role played by staff agencies in national government.

PolSc **452 Administrative Law and Regulation** (3 cr). Rule-making, adjudication, and other modes of regulation as practiced by administrative agencies; judicial review and Congressional oversight of administrative acts.

PolSc **453 Public Management Techniques** (3 cr). Staff techniques important to persons entering many types of administrative work in government and other agencies, personnel, management, surveys, data processing, budgeting, purchasing, and public relations.

PolSc **454 Administrative Organization and Behavior** (3 cr). Characteristics of individual decision-making, behavior of small work groups and organization theory, leadership in administration.

PolSc **457 Staff Management Techniques in State Government** (4 cr). Primarily for students planning to enter state government administration. Personnel, budgeting, management surveys, data processing, purchasing, and public relations.

PolSc **458 Management Internship** (1-9 cr, max 9). Directed internship in an agency of federal, state, or local government or special projects involving federal, state, or local government; supervised work in management practices; students are placed in positions commensurate with their abilities and interests. One credit will be given for each week of internship work. Prereq: perm.

PolSc **459 Legislative Internship** (1-9 cr, max 9). Directed internship in a national, state, municipal, or corporate legislative body. Supervised work experience. Report required. Prereq: perm.

PolSc **467 Constitutional Law** (3 cr). The Supreme Court as a constitutional policy-maker; constitutional principles concerning judicial review, federalism, implied powers, due process, equal protection, civil rights, and civil liberties.

PolSc **469 The Judicial Process** (3 cr). Judicial and legal processes in American government and politics; court structure, procedures, and the administration of justice; judicial behavior and decision-making; selection of judges; socio-political theories of law.

PolSc **483 Modernization and Political Change** (3 cr). Analysis of the general process of modernization and of political change as a factor of that process, theories of political development, problems of identity, integration, stability, and revolution in Third World countries.

PolSc **484 Political Systems of South Asia** (3 cr). Comparative analysis of the political process in India, Pakistan, Ceylon, and Nepal; historical development and cultural and social influences on politics are considered along with political institutions and political behavior.

PolSc **485 African Political Systems** (3 cr). Same as AfrAm 485. Origins, structure, and working of selected African political systems; problems of development and stability.

PolSc **493-494 Seminar in Urban Studies** (2 cr). See Inter 493-494.

PolSc **499** (s) **Directed Study** (cr arr). Prereq: perm.

PolSc **500 Master's Research and Thesis** (cr arr).

PolSc **501** (s) **Seminar** (cr arr). Areas normally offered include American politics, American foreign policy, African and Asian politics, community power and politics, American political thought, public law, public administration, and political development. Consult the time schedule for specific seminars currently offered. One 2-day field trip is authorized for the seminar in public administration. Prereq: perm.

PolSc **502** (s) **Directed Study** (cr arr). Consult the time schedule for areas currently offered. Prereq: perm.

PolSc **503** (s) **Workshop** (cr arr). Prereq: perm.

PolSc **531 Seminar in American Political Institutions** (3 cr). History of social and economic bases in the development of American political institutions and government.

PolSc **555 Seminar in Comparative Public Administration** (3 cr). Administrative process in foreign nations and its relation to governmental, economic, social institutions, administrative aspects of U.S. governmental relations with other nations, art of overseasmanship.

PolSc **580 Seminar in Administration and Contemporary Issues** (3 cr). See Inter 580.

PolSc **585 Seminar in African Politics** (3 cr). Intensive analysis of the political process and political change in selected regions of Africa.

PolSc **590 Scope and Methods of Political Science** (3 cr). Relation of political science to other disciplines, systems of analysis, scientific methods and traditional approaches, and research strategies appropriate to particular political problems.

PolSc **591 American Government and Politics** (3 cr). Review of significant issues and methodological problems in the field.

PolSc **592 Comparative Government** (3 cr). Review of significant issues and methodological problems in the field.

PolSc **593 International Relations** (3 cr). Review of significant issues and methodological problems in the field.

PolSc **594 Political Thought** (3 cr). Review of significant issues and methodological problems in the field.

PolSc **595 Public Administration** (3 cr). Review of significant issues and methodological problems in the field.

PolSc **597** (s) **Practicum** (cr arr). Prereq: perm.

PolSc **598** (s) **Internship** (cr arr). Prereq: perm.

PolSc **599** (s) **Research** (cr arr). Prereq: perm.

PolSc **600 Doctoral Research and Dissertation** (cr arr).

PolSc **601** (s) **Seminar** (cr arr). See 501 for areas normally offered. Prereq: perm.

PolSc **602** (s) **Directed Study** (cr arr). Prereq: perm.

PolSc **603** (s) **Independent Study** (cr arr). Prereq: perm.

Psychology

Victor E. Montgomery, Dept. Head (210 Educ. Bldg.). Professors Crandall, Montgomery; Assistant Professors Bergquist, Emery, Gregory, Lehman, Mohan, Rees.

PREREQUISITE: Psych 100 is prerequisite to all other courses in this field. Unless a prerequisite is specifically stated, the prerequisite to all graduate courses is a major in psychology or permission of the department.

Psych **100 Introduction to Psychology** (3 cr). Intro to psychological topics, including sensation and perception, learning and thinking, motivation, personality and adjustment, social processes, psychological testing; emphasis on fundamental principles. Also offered by correspondence study.

Psych **200** (s) **Seminar** (cr arr). Prereq: perm.

Psych **201-202 General Experimental Psychology** (4 cr). Primarily for majors and minors. Psych 201: statistics, sensation, perception, and conditioning. Psych 202: physiological, learning, social psychology, developmental, and abnormal. Lab exercises and reports accompany each topic. Two lec and two 3-hr labs per wk.

Psych **205-206 Developmental Psychology** (3 cr). Psych 205: conception to preadolescence; genetics, anatomy, physiology, biological changes during development, learning, socialization, cognition, and personality. Psych 206: adolescence to maturity; psychosocial growth, biological changes, values, attitudes, independence, and emotional maturity. Also offered by correspondence study.

Psych **299** (s) **Directed Study** (cr arr). Prereq: perm.

Psych **301 The Exceptional Individual** (3 cr). Individuals who deviate from average mentally, physically, socially, and emotionally to such an extent that special treatment and services are needed; identification, diagnosis, treatment, training, and employment. Prereq: 205 or 206.

Psych **311 Abnormal Psychology** (3 cr). Nature, causes, treatment, and prevention of patterns of emotional disturbances and personality disorganization, including neuroses and psychoses. One or two 1-day field trips.

Psych **316 Industrial Psychology** (3 cr). Contributions of experimental, social, counseling, and clinical psychology to the every day problems of organizations; emphasis on industrial organizations.

Psych **317 Introduction to Statistics for the Behavioral Sciences** (3 cr). Same as InfSc 317. Descriptive statistics; elementary correlation analysis; sampling theory and statistical inference. Prereq: Math 111-112.

Psych **320 Social Psychology** (3 cr). The individual as he influences and is influenced by society; attitudes, prejudice, propaganda, cultural difference, personality, leadership, and crowd behavior.

Psych **400** (s) **Seminar** (cr arr). Prereq: perm.

Psych **402 Theory of Psychological Measurement** (3 cr). Measurement, techniques, and problems of response measurement, reliability and validity, theoretical and practical limits of behavior measurement. Prereq: 317.

Psych **418 Intermediate Statistics for the Behavioral Sciences** (3 cr). Same as InfSc 418. Theory and application of statistical methods in behavioral science; correlation, statistical inference, analysis of variance and covariance. Prereq: 317.

Psych **421 Educational Psychology** (3 cr). Application of psychological principles to the classroom situation. Also offered by correspondence study. Prereq: 205 or 206.

Psych **441 Physiological Psychology** (3 cr). Physiological bases of animal and normal human behavior. Prereq: Biol 201-202.

Psych **444 Sensation and Perception** (3 cr). Fundamental processes and variables involved in sensory experiences of animals and man. Prereq: 201-202.

Psych **455 Psychology of Motivation** (3 cr). Biological and social variables influencing the activation, direction, and self-maintenance of behavior. Prereq: 6 cr in psych.

Psych **461 Psychology of Personality** (3 cr). Theories of personality, basic concepts, techniques of measurement, and experimental methods; the normal personality. Prereq: one adv course in psych.

Psych **481 Mental Deficiency** (3 cr). Primarily for students planning professional careers in this or closely-related area. History, nature, diagnosis, etiologies, clinical types, and management of mentally deficient individuals. One 1-day field trip. Prereq: 205 or 206, and 301, 311, and perm.

Psych **490 Pyschology of Learning** (3 cr). Experimental literature on the nature and conditions of behavior change. Prereq: sr standing and 12 cr in psych.

Psych **498 History and Systems of Psychology** (3 cr). Origin and development of psychology within philosophy and science; development and elaboration of modern systems. Prereq: sr standing and 15 cr in psych and social science or perm of dept.

Psych **499** (s) **Directed Study** (cr arr). Prereq: perm.

Psych **500 Master's Research and Thesis** (cr arr).

Psych **501** (s) **Seminar** (cr arr). Prereq: perm.

Psych **502** (s) **Directed Study** (cr arr). Prereq: perm.

Psych **503 Advanced Experimental Psychology Laboratory** (3 cr, max arr). Advanced laboratory procedures for manipulation and control of variables involved in research. Max three cr in any one content area.

Psych **504 Theory and Research in Physiological Psychology** (3 cr). Critical analysis of classical and contemporary literature.

Psych **505 Theory and Research in Learning** (3 cr). Critical analysis of classical and contemporary literature.

Psych **506 Theory and Research in Perception and Cognition** (3 cr). Critical analysis of classical and contemporary literature.

Psych **507 Theory and Research in Personality** (3 cr). Critical analysis of classical and contemporary literature.

Psych **508 Theory and Research in Motivation** (3 cr). Critical analysis of classical and contemporary literature.

Psych **509 Theory and Research in Developmental Psychology** (3 cr). Critical analysis of classical and contemporary literature.

Psych **510 Theory and Research in Social Psychology** (3 cr). Critical analysis of classical and contemporary literature.

Psych **511 Psychological Evaluation I** (3 cr). Assessment of the general intelligence capacities of the individual; relevant history, concepts, and supervised practice in test administration; interpretation and reports.

Psych **513 Mental Health** (3 cr). Critical and historical review of current concepts of positive mental health; applications to treatment, prevention, and growth toward individual maturity. Prereq: 205, 311, 461, and perm.

Psych **515-516 Quantitative Methods and Experimental Design** (3 cr). Advanced quantitative methods and factorial experimental design methods analyzed in the context of contemporary psychological research. Prereq: 418 or equiv.

Psych **530 Introduction to Clinical Psychology** (3 cr). Practical, theoretical, research, and professional aspects of clinical psychology; breadth of the area; social-professional issues.

Psych **540 Psychological Evaluation II** (3 cr) Projective techniques with supervised practice in administration, scoring, and interpretation of the three most frequently used devices.

Psych **550** (s) **Workshop** (cr arr). Prereq: perm.

Psych **571 Psychological Evaluation IV** (2-6 cr, max 6). Clinical assessment of the individual; integration of the various measures of behavior, quantitative and qualitative, to provide sensitive, relevant, and insightful descriptions of behavior. Prereq: 511, 530, 540, and perm of dept.

Psych **597** (s) **Practicum** (cr arr). Prereq: perm.

Psych **598** (s) **Internship** (cr arr). Prereq: perm.

Psych **599** (s) **Research** (cr arr). Prereq: perm.

Psych **601** (s) **Seminar** (cr arr). Prereq: perm.

Psych **602** (s) **Directed Study** (cr arr). Prereq: perm.

Psych **603** (s) **Independent Study** (cr arr). Prereq: perm.

Radio-Television

Peter A. Haggart, Acting Dept. Chairman (5 Radio-TV Center). Professor Law; Associate Professor Haggart; Assistant Professors Byrd, Campbell; Instructors Bondurant, Houlberg.

RadTV **141 Introduction to Radio-Television Broadcasting** (3 cr). History, organization, operation, and regulation of radio and television stations and networks.

RadTV **200** (s) **Seminar** (cr arr). Prereq: perm.

RadTV **203** (s) **Workshop** (cr arr). Prereq: perm.

RadTV **253 Recording and Broadcasting Techniques** (3 cr). Procedures for audio and video; uses and limitations of broadcasting equipment.

RadTV **282 Introduction to Television Production** (3 cr). Basic production tools and theories; studio control equipment, sets, lighting, composition and sound; students assist in KUID-TV productions. Two lec and one lab per wk. Prereq: 253 or perm.

RadTV **285 Announcing I** (2 cr). Voice control, pronunciation, enunciation, articulation, timing, phrasing, and board operations; work required on KUID-FM and/or KUID-TV. Two lec and one lab per wk.

RadTV **287 Station Writing** (2 cr). Writing for radio and television; script format, termin-

ology, and commercial writing; all types of writing assignments encountered on small market radio and television stations.

RadTV **299** (s) **Directed Study** (cr arr). Prereq: perm.

RadTV **311 Advanced Broadcasting Techniques and FCC Regulations** (2 cr). Operation and maintenance of broadcasting equipment; preparation for FCC license. Prereq: 253 or perm.

RadTV **322 Educational Uses of Radio and Television** (2 cr). Open to non-majors. Broadcast media in educational, instructional, informational, and public relations applications.

RadTV **400** (s) **Seminar** (cr arr). Prereq: perm.

RadTV **403** (s) **Workshop** (cr arr). Prereq: perm.

RadTV **488 Cinematography for Television** (3 cr). Basics of 16mm motion picture production and theory as they apply to the television industry; documentary and news film techniques. Three lec and one lab per wk. Prereq: 282, Photo 281, or perm.

RadTV **491 Announcing II** (2 cr). Various types of announcing duties and execution of each; work required on KUID-FM and/or KUID-TV. Two lec and one lab per wk. Prereq: 285 or perm.

RadTV **492 Advanced Television Production** (3 cr). Planning and execution of complete television programs; work required on KUID-TV. Two lec and one lab per wk. Prereq: 282 or perm.

RadTV **493 Commercial Broadcasting** (3 cr). Place of sales in broadcasting; duties of station reps, ad agencies; station coverage, rate cards, contracts, sales promotion, and ratings. Prereq: 141, 282, or perm.

RadTV **494 Radio-Television News** (3 cr). Techniques of editing, writing, and producing news programs; use of wire copy, news policies, codes, and legal applications. Prereq: 287 or perm.

RadTV **499** (s) **Directed Study** (cr arr). Prereq: perm.

Religious Studies

Stanley W. Thomas, Coordinator (412 Faculty Office Bldg.). Affiliate Professor Thomas; Lecturers Gleed, Schumacher, Weston.

The following nonsectarian courses are offered by two privately-sponsored agencies adjacent to the campus: the Idaho School of Religion and the L.D.S. Institute of Religion. While these teaching centers are not part of the university, they secure the university's approval of courses and instructors.

RelSt **104 Biblical History and Thought** (3 cr). Comprehensive study of the salvation history, persons, and theology of the two Testaments to give a total view of the biblical books.

RelSt **106 Essentials of Christianity** (2 cr). Principles of the Christian religion from its foundation until modern times.

RelSt **131 Religion and the Meaning of Existence** (3 cr). Intro to religion in today's world; emphasis upon its social and psychological implications for the individual.

RelSt **133 Religion and Marriage** (2 cr). Religious viewpoints as they relate to dating, courtship, and family life.

RelSt **186 Dynamics of Religious Leadership** (2 cr). Charismatic authority, bureaucratic structure and processes of routinization, and their effect upon religious expression.

RelSt **190** (s) **Great Religious Thinkers** (1 cr, max 4). Life and thought of major contributors to the world's religious traditions, such as Augustine, Calvin, Gandhi, Luther, and Wesley. Consult the time schedule for the special emphasis each semester.

RelSt **200** (s) **Seminar** (cr arr). Prereq: perm of coord.

RelSt **273 World Religions** (2 cr). Main beliefs of Islam, Hinduism, Buddhism, Confucianism, Judaism, and Christianity within the context of the internationalization of culture.

RelSt **282 The New Morality** (2 cr). Development of religious ethics in the West and its bearing upon contemporary expressions.

RelSt **284 Religion and World Problems** (1 cr). Viewpoints concerning such issues as war and peace, population and environment, identity and alienation considered in international perspective.

RelSt **299** (s) **Directed Study** (cr arr). Prereq: perm of coord.

RelSt **321 Contemporary Theological Thought** (2 cr). Recent developments in Christian theology, writings of such men as Teilhard de Chardin, Dietrich Bonhoeffer, and Paul Tillich.

RelSt **322 Religious Institutions** (2 cr). Comparative study of contemporary religious institutions, such as Baptist, Lutheran, and Roman Catholic churches in America; special attention to reform and unity movements.

RelSt **323 Religion and Society** (2 cr). Analysis of the societal manifestation of religion, sociological significance of schisms, "sect"

and "church" in sociological theory. Prereq: 131 or perm.

RelSt **400** (s) **Seminar** (cr arr). Prereq: perm of coord.

RelSt **490 Technology and Human Values** (2-3 cr). See Inter 490.

RelSt **499** (s) **Directed Study** (cr arr). Prereq: perm of coord.

Social Science

Robert E. Hosack, Coordinator (207 Admin. Bldg.). Professors Caldwell, Fletcher, Hosack, Montgomery, Rolland, Sprague.

SocSc **101 Man in a Nuclear Age** (2 cr). See Inter 101.

SocSc **103 Introduction to Black Culture** (2 cr). Same as AfrAm 103. Black contributions, particularly to American society; emphasis on the concept of identity and the problems of alienation treated in both historic and contemporary perspective. See related courses in anthropology, English, history, and music.

SocSc **185 Study Tour Abroad** (1-9 cr, max 9). Participation in a tour conducted by a member of the University of Idaho faculty providing direct observation of the political, economic, and social life of one or more foreign countries. Students pay own expense. Max one cr per wk. Prereq: grad from high school.

SocSc **200** (s) **Seminar** (cr arr). Prereq: perm of coord.

SocSc **203** (s) **Workshop** (cr arr). Prereq: perm.

SocSc **299** (s) **Directed Study** (cr arr). Prereq: perm of coord.

SocSc **385 Study Tour Abroad** (1-9 cr, max 9). See 185. Prereq: jr standing or perm.

SocSc **400** (s) **Seminar** (cr arr). Prereq: perm of coord.

SocSc **403** (s) **Workshop** (cr arr). Prereq: perm.

SocSc **499** (s) **Directed Study** (cr arr). Prereq: perm of coord.

SocSc **501** (s) **Seminar** (cr arr). Prereq: perm of coord.

SocSc **502** (s) **Directed Study** (cr arr). Prereq: perm of coord.

SocSc **503** (s) **Workshop** (cr arr). Prereq: perm of coord.

SocSc **597** (s) **Practicum** (cr arr). Prereq: perm.

SocSc **598** (s) **Internship** (cr arr). Prereq: perm.

SocSc **599** (s) **Research** (cr arr). Prereq: perm.

Sociology

Roderick Sprague, Head, Dept. of Sociology/Anthropology (101 Graduate Center). Associate Professor Chapin (Social Work); Assistant Professors Beeson, Carlson, Johnson.

PREREQUISITE: Ordinarily three credits in lower-division courses in sociology are required for registration in upper-division courses in this field; exceptions by permission.

Soc **110 Introduction to Sociology** (3 cr). Basic concepts, principles, processes, including socialization, primary groups, race relations, the family, religion, and population. Also offered by correspondence study.

Soc **200** (s) **Seminar** (cr arr). Prereq: perm.

Soc **203** (s) **Workshop** (cr arr). Prereq: perm.

Soc **230 Social Problems** (3 cr) (130). Concepts relating technological and institutional changes to current social problems. Also offered by correspondence study.

Soc **240 Introduction to Social Welfare** (3 cr). Analysis of the forces which have led to current social welfare practices. At least one field trip. Prereq: 110 or 130.

Soc **241 Contemporary Social Welfare Organization** (3 cr). Public and private social welfare agency services and programs. Two field trips. Prereq: 240.

Soc **299** (s) **Directed Study** (cr arr). Prereq: perm.

Soc **310 Rural Sociology** (3 cr). Rural-urban relationships, role of agricultural class in industrial society, number, origin, distribution, and composition of rural population. Two 1-day field trips. Also offered by correspondence study.

Soc **311 Urban Sociology** (3 cr). Population, spatial, social patterns characteristic of modern urban communities. One 1-day field trip.

Soc **312 Sociology of Organizations** (3 cr). Analysis of positions, roles, norms, and authority structures in traditional, formal, complex, and bureaucratic organizations.

Soc **313 Collective Behavior** (3 cr). Theoretical analysis of group behavior which emerges spontaneously in response to critical and unrestricted situations.

Soc **320 Marriage and the Family** (3 cr). His-

torical and economic background; marriage and the family today from a cross-cultural perspective; conditions affecting them in America. Also offered by correspondence study.

Soc **321 The Community** (3 cr). Origins, types, structural and functional patterns, and processes of the community. Two 1-day field trips. Also offered by correspondence study.

Soc **322 Racial and Ethnic Relations** (3 cr). See Anthr 322.

Soc **330 Sociology of Youth** (3 cr). Assessment of contemporary youth, their aspirations, outlook, influence, distinctive social patterns, and deviant behavior. Also offered by correspondence study.

Soc **331 Criminology** (3 cr). Behavior systems and deviant patterns; modern penal institutions and methods; crime prevention. One 1-day field trip.

Soc **400** (s) **Seminar** (cr arr). Prereq: perm.

Soc **403** (s) **Workshop** (cr arr). Prereq: perm.

Soc **410 Introduction to Social Research** (3 cr). Principal methods of data collection, analysis, and interpretation. Prereq: Psych 317 or comparable introductory statistics.

Soc **411 Contemporary Sociological Theory** (3 cr). Schools and trends of sociological thought.

Soc **412 Social Structure and Personality** (3 cr). Development of identity and self concepts from social interaction.

Soc **421 Population and Human Ecology** (3 cr). Theories and methods of population analysis, migration patterns, and the implications of overpopulation for world resources.

Soc **430 Social Control** (3 cr). The means by which social groups exact conformity, including force, persuasion, rewards, and deprivation; an examination of the role of the communications media.

Soc **431 Problems of Aging People** (2-3 cr). Social, psychological, and physical problems related to enforced leisure and the aging process. Includes 24 hrs of field work with aging when taken for 3 cr. May be concurrent with 441 with perm.

Soc **440 Methods of Social Work** (3 cr). Characteristics of the profession of social work; basic knowledge and skills for interviewing and working with individuals, families, and groups. Prereq: 240 and perm.

Soc **441-442 Field Experience** (3-4 cr, max 8). Two-hr seminar per wk, plus supervised experience in selected social agencies one day per wk or 6-wk block placement. Concurrent enrollment in 440 integrates theory with practice. Prereq or coreq: 440 and perm.

Soc **493-494 Seminar in Urban Studies** (2 cr). See Inter 493-494.

Soc **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under the general supervision of a faculty member. Graded on the basis of P or F. Prereq: perm of dept.

Soc **499** (s) **Directed Study** (cr arr). Prereq: perm.

Soc **500 Master's Research and Thesis** (cr arr).

Soc **501** (s) **Seminar** (cr arr). Subjects normally offered are methods of sociological research, contemporary social problems, and social theory. Prereq: perm.

Soc **502** (s) **Directed Study** (cr arr). Subjects normally offered are sociological theory, demography and human ecology, and race relations. Prereq: perm.

Soc **503** (s) **Workshop** (cr arr). Prereq: perm.

Soc **597** (s) **Practicum** (cr arr). Prereq: perm.

Soc **598** (s) **Internship** (cr arr). Prereq: perm.

Soc **599** (s) **Research** (cr arr). Prereq: perm.

Soils

Lucas Calpouzos, Head, Dept. of Plant and Soil Sciences (112 Ag. Sci. Bldg.). Professors Fosberg, Lewis; Associate Professors Harder, Jones; Assistant Professor Naylor.

Soils **205 General Soils** (3 cr). Physical, biological, and chemical properties of soils and their relationships to plant growth. Prereq: Chem 111 or equiv; coreq for agriculture students: 206.

Soils **206 General Soils Laboratory** (1 cr). One 2-hr lab per wk. Coreq: 205.

Soils **344 Soil Conservation and Management** (3 cr). Alt/yrs 74-75. Relationships of soil type, slope, climate, and erosion to land capability; conservation and management practices for erosion control. Two 1-day field trips. Prereq: 205.

Soils **401 Undergraduate Research** (1-2 cr, max 4). Individual study. Prereq: sr standing and perm.

Soils **408 Forest Soils** (2 cr). See FWR 408.

Soils **412 Soil Chemistry** (4 cr). Alt/yrs 74-75. Chemical properties of soil and their measurement, including ion exchange, fixation reactions, soil testing techniques, and total elements present. Two lec and two 3-hr labs per wk. Prereq: 205, Chem 253.

Soils **413 Water Quality** (2 cr). Alt/yrs 73-74. Water chemistry and interaction between water and soils. Prereq: Chem 253 or equiv, or perm.

Soils **417 Soil Clay Mineralogy** (2 cr). Alt/yrs 74-75. Structure, chemical, and physical properties of clay minerals found in soils. Prereq: Chem 112 or 114.

Soils **425 Soil and Aquatic Microbiology** (3 cr). See Bact 425.

Soils **435 Soil Physics** (3 cr). Physical properties of soils and their relationships to moisture, aeration, and temperature; cultural practices and erosion problems. Two lec and one 3-hr lab per wk. Prereq: 205.

Soils **446 Soil Fertility** (3 cr). Alt/yrs 73-74. Principles of soil fertility maintenance; availability of plant nutrients and their relationship to plant growth and fertilization practices. Prereq: 205.

Soils **448 Mineral Nutrition** (3 cr). Alt/yrs 73-74. See Bot 413.

Soils **454 Soil Development and Classification** (3 cr). Factors influencing soil development and their relationship to soil properties; methods for soil profile descriptions, classification, and interpretations. Two lec and one 2-hr lab per wk; two 1-day field or one 2-day field trips. Prereq: 205.

Soils **490 Proseminar** (1 cr, max 2). Prereq: jr standing and perm.

Soils **500 Master's Research and Thesis** (cr arr).

Soils **501** (s) **Seminar** (cr arr). Prereq: perm.

Soils **502** (s) **Directed Study** (cr arr). Prereq: perm.

Soils **505 Advanced Laboratory Techniques** (4 cr). See Biochem 505.

Soils **507 Advanced Forest Soils** (3 cr). See FWR 521.

Soils **ID511 Soil Organic Matter** (2 cr). Alt/yrs 74-75. Formation, chemical properties, and significance of the soil organic fraction. Prereq: 412, Bact 425, and a course in organic chemistry, or perm.

Soils **512 Advanced Soil Chemistry** (3 cr). Alt/yrs 73-74. Theory of chemical properties of soil colloidal systems. Prereq: 412 and course in physical chemistry, or perm.

Soils **515 Chemistry of Plant Nutrients** (3 cr). Alt/yrs 73-74. Chemistry of plant nutrients in the soil and relationship to uptake and use by plants. Prereq: 205, Chem 253, or perm.

Soils **WS536 Advanced Soil Physics** (3 cr). Alt/yrs 73-74. WSU 511. Physics and physical chemistry of the soil-water system. Two lec and one 3-hr lab per wk. Prereq: course in soil physics and physical chemistry or perm.

Soils **546 Advanced Soil Fertility** (3 cr). Alt/yrs 74-75. Methods used in the evaluation of soil fertility, experimental techniques, and interpretations of results. Prereq: 446 or 515, or perm.

Soils **555 Advanced Soil Genesis and Classification** (3 cr). Alt/yrs 73-74. Genesis, classification, and interpretation of soils; field investigations emphasizing the interrelationships to development of soil properties, their classification, and interpretation. Two lec and one 3-hr lab per wk; one 3-day or three 1-day field trips. Prereq: 454 or perm.

Soils **597** (s) **Practicum** (cr arr). Prereq: perm.

Soils **598** (s) **Internship** (cr arr). Prereq: perm.

Soils **599** (s) **Research** (cr arr). Prereq: perm.

Soils **600 Doctoral Research and Dissertation** (cr arr).

Soils **601** (s) **Seminar** (cr arr). Prereq: perm.

Soils **602** (s) **Directed Study** (cr arr). Prereq: perm.

Soils **603** (s) **Independent Study** (cr arr). Prereq: perm.

Special Education

Laurance B. Carlson, Dept. Head (112 Educ. Bldg.). Associate Professors Carlson, Potter; Assistant Professor Nickelsburg.

SpEd **190 Special Education Laboratory** (1 cr, max 6). Supervised observation and participation with exceptional children. Graded on the basis of P or F.

SpEd **200** (s) **Seminar** (cr arr). Prereq: perm.

SpEd **299** (s) **Directed Study** (cr arr). Prereq: perm.

SpEd **375 Education of Exceptional Children** (3 cr). Methods, materials, curriculum, and procedures for facilitating growth of crippled children, those defective in speech, hearing, or vision, the maladjusted or mentally handicapped. Also offered by correspondence study.

SpEd **400** (s) **Seminar** (cr arr). Prereq: perm.

SpEd **403** (s) **Workshop** (cr arr). Prereq: perm of dept.

SpEd **450 Children with Behavioral Disorders** (3 cr). Contrasting normal and deviant personality development; classical and contem-

porary description of deviant behavior; relationship of community and family interaction to deviant behavior; functional analysis of behavior.

SpEd **451 Education of Emotionally Disturbed Children** (3 cr). Models of organizing and teaching the emotionally disturbed; techniques of classroom management; techniques of behavior modification.

SpEd **476 Education of Severely Mentally Retarded Children** (3 cr). Organization of special classes in public school programs for severely mentally retarded children; development of teaching materials and techniques; emphasis on community organization and parent education. Prereq: 375 or Psych 301.

SpEd **477-478 Teaching the Mentally Retarded I-II** (3 cr). SpEd 477: problems and curricular approaches. SpEd 478: techniques and instructional materials. Prereq for 477: 375 or perm; prereq for 478: 477 or perm.

SpEd **480 Practicum** (9 cr). Directed teaching in classes for exceptional children. Graded on the basis of P or F. Prereq: perm of dept. (Submit application to director of clinical experiences in teacher education by December 1 of school year prior to enrolling.)

SpEd **487 Speech Correction Methods** (3 cr). Functional and organic speech disorders; functions and activities of classroom teachers in aiding children with speech handicaps.

SpEd **497 Teaching Gifted Children** (3 cr). Identification and teaching of gifted children in elementary schools.

SpEd **499** (s) **Directed Study** (cr arr). Prereq: perm.

SpEd **500 Master's Research and Thesis** (cr arr).

SpEd **501** (s) **Seminar** (cr arr). Prereq: perm.

SpEd **502** (s) **Directed Study** (cr arr). Prereq: perm.

SpEd **503** (s) **Workshop** (cr arr). Prereq: perm.

SpEd **522 Diagnostic and Remedial Instruction** (3 cr). Methods and materials; problems of accelerations as well as retardations. Prereq: Ed 430 or teaching experience.

SpEd **541 Mental Retardation Trends and Issues** (3 cr). Current research; innovative approaches to solutions; development of comprehensive community programs.

SpEd **542 Guidance of Exceptional Children** (3 cr). Personal and social problems of exceptional children and their families; techniques of working with them; working with parent groups.

SpEd **545 Community Service Seminar** (3 cr). Analysis of needed ancillary services; planning for and implementing community services; role of the educator on the interdisciplinary team.

SpEd **546 Assessment of Learning Disorders** (3 cr). Evaluation of techniques of assessment of handicapped children.

SpEd **548 Special Education Curriculum** (3 cr). Problems relating to the programming of handicapped; different curriculum approaches; practice in developing curricula for handicapped children.

SpEd **549 Communication Disorders of Handicapped Children** (3 cr). Analysis of language disorders in handicapped children; identification of sensory deficits; techniques for correction; theory of communication and its relationship to communication disorders.

SpEd **597** (s) **Practicum** (cr arr). Prereq: perm.

SpEd **598** (s) **Internship** (cr arr). Supervised field experience in an appropriate public or private agency. Graded on the basis of P or F. Prereq: perm.

SpEd **599** (s) **Research** (cr arr). Prereq: perm.

SpEd **600 Doctoral Research and Dissertation** (cr arr).

SpEd **601** (s) **Seminar** (cr arr). Prereq: perm.

SpEd **602** (s) **Directed Study** (cr arr). Prereq: perm.

SpEd **603** (s) **Independent Study** (cr arr). Prereq: perm.

Speech

Paul L. Miles, Dept. Chairman (213 Univ. Classroom Ctr.). Assistant Professors Jenness, Mendoza, Miles.

Sp **109 Intercollegiate Forensics** (1 cr, max 4). Preparation and intercollegiate competition on the national debate topic and in individual speaking events.

Sp **111 Great Speakers on Great Issues** (2 cr). Great speakers of the Western World; history and criticism of the public address; such speakers as Churchill, Hitler, Roosevelt, Disraeli, Gladstone, and others.

Sp **112 Great Speakers on Great Issues** (2 cr). Great speakers of the Eastern World; history and criticism of the public address; such speakers as Gandhi, Nehru, Nasser, Mao Tse-Tung, various African leaders, and others.

Sp **131 Fundamentals of Speech** (2 cr). Skills

and techniques of effective speaking; preparation, delivery, and listening.

Sp **151 Voice, Diction, and Oral Interpretation** (2 cr). Use of the voice and body in communicating the intellectual and emotional meaning of literature.

Sp **200** (s) **Seminar** (cr arr). Prereq: perm.

Sp **203** (s) **Workshop** (cr arr). Prereq: perm.

Sp **209 Argumentation** (3 cr). Analysis, reasoning, types of evidence, organization, and refutation in debate.

Sp **232 Informative Speaking** (3 cr). Practice in preparation and delivery of various types of informative speeches: technical reports, abstracts, lecture demonstrations, humorous; students choose subjects in special interest area. Prereq: 131 or perm.

Sp **262 Parliamentary Law and Procedure** (2 cr). Practice of speech under parliamentary conditions.

Sp **299** (s) **Directed Study** (cr arr). Prereq: perm.

Sp **309 Intercollegiate Forensics** (1 cr, max 4). Advanced training for intercollegiate competition on the national debate topic and individual event.

Sp **331 Persuasive Speech** (3 cr). Oral style; psychology of attention and suggestion; other speech problems; preparation and presentation of speeches; emphasis on speech to persuade.

Sp **351 Advanced Oral Interpretation** (3 cr). Advanced study of prose, poetry, and dramatic literature for the purpose of refining skills in communicating emotional and intellectual meaning to an audience.

Sp **362 Discussion and Conference Methods** (2 cr). Responsibilities of the chairman and participants; group discussion of current problems; evidence, fallacies, and types of reasoning.

Sp **370 Speech and Social Control** (3 cr). Psychology of persuasion and other aspects of speech as a means of social control.

Sp **375 Business and Industrial Communication** (3 cr). Basic principles of communication in business and industry.

Sp **391 Propaganda and Public Opinion** (2 cr). Sources and psychology of propaganda and its relation to the formation of public opinion.

Sp **400** (s) **Seminar** (cr arr). Prereq: perm.

Sp **403** (s) **Workshop** (cr arr). Prereq: perm.

Sp **421 Introduction to Rhetorical Theory** (3 cr). Development of modern rhetorical theory; contributions of Aristotle, Cicero, Quintibian, Campbell, Blair, Whately, Adams, and contemporary rhetoricians.

Sp **422 British Public Address** (3 cr). Alt/yrs. History and criticism of British public address; specifically concerned with the speeches, speakers, and circumstances that influenced British history.

Sp **424 American Public Address** (3 cr). History and criticism of American public address; specifically concerned with the speeches, speakers, and circumstances that influenced American history from the colonial period to the present.

Sp **440 Speech for Teachers** (3 cr). Speech problems that confront the teacher in the classroom; speech pedagogy.

Sp **480 General Semantics** (3 cr). Alt/yrs. Basic relationships between language and the people who create, use, and respond to it.

Sp **488 Theory in Communication** (3 cr). Alt/yrs. Interdisciplinary approach to understanding the process of communication.

Sp **499** (s) **Directed Study** (cr arr). Prereq: perm.

Sp **501** (s) **Seminar** (cr arr). Prereq: perm.

Sp **502** (s) **Directed Study** (cr arr). Prereq: perm.

Sp **503** (s) **Workshop** (cr arr). Prereq: perm.

Theatre Arts

Edmund M. Chavez, Dept. Head (U-Hut 104). Professor Chavez; Associate Professor Sears; Assistant Professor Schattschneider.

ADVANCED PLACEMENT: Courses in this subject field which are vertical in content are: 105-106-272-305-306-407-408.

ThA **101 Introduction to the Theatre** (2 cr). For non-majors. Theatre history; recent trends in staging techniques and architecture; elements of production design; analysis of selected plays.

ThA **102 Stage Makeup** (1 cr). Principles and practices; practical lab experience. Limited to twenty students. Prereq: perm.

ThA **105-106 Basics of Performance** (2 cr). Work on improvisation; presentation of play scenes. ThA 105: acting techniques in relaxation, observation, imagination, and sense memory. ThA 106: emphasis on stage speech, breathing, projection, resonance, pitch, and articulation; international phonetic alphabet. Prereq: perm.

ThA **108 Introduction to Media** (2 cr). For majors and students concurrently enrolled in other theatre arts courses. Intro to drawing, design, graphics, painting, and other media designed specifically for the theatre arts student; preparation for design and technical classes, promotional graphics, and related areas.

ThA **125 Summer Theatre I** (2-4 cr, max 4). Theatre production, including public presentation of several plays. Max ten cr in 125 and 395 combined. Prereq: perm of dept.

ThA **130 Drama-Television Production I** (1-2 cr, max 2). Rehearsal performance of a drama-television production; aspects of production; taping for presentation. Prereq: perm of dept.

ThA **150 Convocation** (0 cr). For majors. Attendance at designated drama labs and events. Graded on the basis of P or F. One session per wk.

ThA **163 Technical Production** (4 cr) (Dr 263). Drafting methods, set construction, props, sound, painting, and use of tools.

ThA **190 Theatre Practice I** (1 cr, max 4). Open to non-majors. Practical experience in all aspects of theatre practice.

ThA **200** (s) **Seminar** (cr arr). Prereq: perm.

ThA **203** (s) **Workshop** (cr arr). Prereq: perm.

ThA **264 Stage Lighting** (4 cr). Equipment, methods of distributing light, color theory, basic electricity, reflection and absorption, and special effects.

ThA **265 Children's Theatre** (3 cr). Alt/yrs Selection, preparation, and presentation of theatre for children; story telling; recreational and special occasion programs.

ThA **266 Creative Dramatics** (2 cr). Alt/yrs. Selection, preparation, and presentation of creative dramatics; practical application through working with children on the elementary-school level.

ThA **271 Play Analysis** (3 cr). Critical intro to theatre arts; tragic and comic genres; analysis of contemporary theatre systems; emphasis on modern movements in theatre.

ThA **272 Intermediate Acting** (3 cr). Interpretation of roles; methods in characterization; techniques for developing a character. Prereq: perm.

ThA **299** (s) **Directed Study** (cr arr). Prereq: perm.

ThA **305 Stage Movement** (3 cr). Alt/yrs. Rhythm, pantomime, and selected characterization methods as basics for stage movement in interpreting classic and modern drama. Prereq: perm.

ThA **306 Advanced Acting** (3 cr). Alt/yrs. Intense textual and characterization study of a specified play; theory and practice in the major stage dialects. Prereq: perm.

ThA **320 Advanced Stage Lighting** (2 cr). Poetic and realistic functions of stage lighting; design of lighting for several plays. Prereq: 264.

ThA **330 Drama-Television Production II** (1 cr, max 4). Continuation of 130. Prereq: perm of dept.

ThA **362 Costume for the Stage** (3 cr). Alt/yrs. Costume design and construction for theatrical productions; development of period costumes and production problems.

ThA **364 Scene Design and Technical Problems** (3 cr). Methods and techniques of stage design, including perspective, rendering, and styles of design; technical problems of specific productions.

ThA **390 Theatre Practice II** (1 cr, max 4). Open to non-majors. Continuation of 190. Set construction, costumes, lights, and properties.

ThA **395 Summer Theatre II** (2 cr, max 8). Continuation of 125. Max ten cr in 125 and 395 combined. Prereq: perm of dept.

ThA **400** (s) **Seminar** (cr arr). Prereq: perm.

ThA **403** (s) **Workshop** (cr arr). Prereq: perm.

ThA **407-408 Styles of Acting** (3 cr). Alt/yrs. ThA 407: cultural backgrounds, manners, and customs in classic acting styles from the Greeks through Shakespeare. ThA 408: Restoration theatre through 20th century styles. Prereq: perm.

ThA **420 Production Management** (3 cr). Alt/yrs. Publicity and promotion, business management, box office organization, house management, bids, contracts, and budget problems in theatre organization.

ThA **467-468 The Theatre** (3 cr). Survey of European and American theatres, dramatists, and actors.

ThA **471-472 Directing** (3 cr). Organization and techniques involved in directing. ThA 471: preparation of a play from casting to performance. ThA 472: emphasis on staging and interpreting the play; work in composition, picturization, movement, and rhythm. Prereq: perm of dept.

ThA **499** (s) **Directed Study** (cr arr). Prereq: perm.

ThA **500 Master's Research and Thesis** (cr arr).

ThA **501** (s) **Seminar** (cr arr). Prereq: perm.

ThA **502** (s) **Directed Study** (cr arr). Prereq: perm.

ThA **503** (s) **Workshop** (cr arr). Prereq: perm.

ThA **505 Summer Theatre III** (2-8 cr, max 8). Theatre production, including public presentation of several plays; emphasis on the responsibilities of the graduate student, including assisting the director, serving as crewhead, and acting. Prereq: 20 cr in theatre arts and perm of dept.

ThA **ID510 Costume Design and Rendering Techniques** (2 cr). Emphasis on developing rendering techniques applicable to costume design. Prereq: 362.

ThA **ID515 Advanced Stage Costuming** (2 cr). Design responsibility for a major production. Prereq: perm of dept.

ThA **520 Advanced Directing** (3 cr). Genres of tragedy, comedy, drama, and melodrama; directorial problems in staging arena and musical productions.

ThA **ID522 Directing the Period Play** (3 cr). Interpreting and staging the period play in major dramatic periods; social and cultural view of each period.

ThA **524 The Modern Theatre** (3 cr). History of movements, personalities, and representative plays from the Duke of Saxe-Meiningen to the theatre of cruelty.

ThA **530 Scene Design II** (3 cr). Survey of historical periods and architectural styles and their practical application to design problems. Prereq: 263, 364.

ThA **ID535 Advanced Scene Design** (3 cr). Design responsibility for a major production. Prereq: perm of dept.

ThA **ID560 Seminar in Dramatic Criticism** (3 cr). Analysis of past and present day criticism of drama.

ThA **WS567 The Forms of Drama: Tragedy** (3 cr). WSU Sp 567. Development of tragedy from its origins to the present.

ThA **WS568 Seminar in Theatre** (3 cr, max arr). WSU Sp 568. Research in a specific area of theatre.

ThA **WS569-WS570 American Theatre and Drama I-II** (3 cr). WSU Sp 569-570. Fall: American theatre and drama from colonial origins. Spring: same from 1850 to the present.

ThA **597** (s) **Practicum** (cr arr). Prereq: perm.

ThA **598** (s) **Internship** (cr arr). Prereq: perm.

ThA **599** (s) **Research** (cr arr). Prereq: perm.

Veterinary Science

Floyd W. Frank, Dept. Head (22 Vet. Sci. Bldg.). Professors Ardrey, Frank; Assistant Professor Stauber.

VS **200** (s) **Seminar** (cr arr). Prereq: perm.

VS **203** (s) **Workshop** (cr arr). Prereq: perm.

VS **299** (s) **Directed Study** (cr arr). Prereq: perm.

VS **371 Anatomy and Physiology** (4 cr). Structure and function of tissues and organ systems of domestic and wild animals. Three lec and one 2-hr lab per wk.

VS **400** (s) **Seminar** (cr arr). Prereq: perm.

VS **403** (s) **Workshop** (cr arr). Prereq: perm.

VS **452 Diseases and Care of Laboratory Animals** (3 cr). Alt/yrs 74-75. Vertebrate animal species commonly employed as laboratory animals; diseases, sanitation, environmental control, and general care. Two lec and one 2-hr lab per wk.

VS **462 Meat Inspection and Veterinary Hygiene** (3 cr). Alt/yrs 73-74. Antemortem recognition of signs indicative of disease and postmortem examination for pathological changes; differentiation of those conditions which may or may not render the carcass suitable for human consumption; sanitation of processing plants for domestic animals and poultry. Two lec and one 3-hr lab per wk; two 1-day field trips.

VS **474 Animal Disease** (3 cr). Causes, transmission, susceptibility, symptoms, diagnosis, prevention, and control of major infectious disease and parasites of domestic animals. Prereq: 371, Bact 250.

VS **481 Virology** (3 cr) (Bact 509). Same as Bact 481. Emphasis on pathogenesis and host-virus relationship. Prereq: Bact 304; prereq or coreq: Bact 409.

VS **499** (s) **Directed Study** (cr arr). Prereq: perm.

VS **500 Master's Research and Thesis** (cr arr).

VS **501** (s) **Seminar** (cr arr). Prereq: perm.

VS **502** (s) **Directed Study** (cr arr). Prereq: perm.

VS **503** (s) **Workshop** (cr arr). Prereq: perm.

VS **512 Principles of Comparative Pathology** (4 cr). Alt/yrs 74-75. Structural and functional alterations in disease; elementary tumor pathology. Three lec and one 2-hr lab per wk. Prereq: background in anatomy, physiology, and/or histology desirable.

VS **516 Methods of Animal Experimentation**

(4 cr). Alt/yrs 73-74. Methods of experimentation, including anesthesia, sedation, surgical technique, euthanasia, germ-free animals, drug administration, physiological measurements, radiation, and electronic monitoring of physiological phenomena. Two lec and two 3-hr labs per wk. Prereq: 371 or Zool 324.

VS **597** (s) **Practicum** (cr arr). Prereq: perm.

VS **598** (s) **Internship** (cr arr). Prereq: perm.

VS **599** (s) **Research** (cr arr). Prereq: perm.

Vocational Teacher Education

Professors Kessel (Business Education), Kindschy (Agricultural Education); Associate Professors Hipple (Counselor Education), Lawrence (Agricultural Education), Woolums (Adult Education); Assistant Professors Holup (Distributive Education), Kiehn (Home Economics); Instructor Miller (Home Economics).

MAJORS: Trade and industrial education, and vocational-technical education majors fulfill their major requirements from the courses listed in this section.

RELATED FIELDS: For other course offerings in vocational teacher education, see agricultural education, business education (office occupations, and distributive education), guidance and counseling, and home economics.

VocEd **200** (s) **Seminar** (cr arr). Prereq: perm.

VocEd **270, 370, 470 Technical Competence I, II, III** (1-10 cr, max 10 each course). Credits may be awarded to students who are recommended by the State Department of Vocational Education, in cooperation with the University of Idaho, as qualified to teach in the technical phases of a vocational subject matter area. Prereq for 270: 9 cr in residence in vocational teacher education. Prereq for 370: completion of jr yr in vocational teacher education. Prereq for 470: enrollment in the final semester of the degree program in vocational teacher education. Credits for technical competency will not qualify toward fulfilling senior residency requirements. Grades for successful completion for 270, 370, and 470 will be entered as P (pass).

VocEd **299** (s) **Directed Study** (cr arr). Prereq: perm.

VocEd **322 Vocational Guidance** (3 cr). See Guid 322.

VocEd **351 Principles of Vocational Education** (2 cr). See AgEd 351.

VocEd **400** (s) **Seminar** (cr arr). Prereq: perm.

VocEd **403** (s) **Workshop** (cr arr). Graded on the basis of P or F. Prereq: perm.

VocEd **420 Evaluation in Vocational Education** (3 cr). See IEd 420.

VocEd **450 Industrial Safety** (3 cr). See IEd 450.

VocEd **451 School Shop Planning and Administration** (3 cr). See IEd 451.

VocEd **461 Occupational and Job Analysis** (3 cr). Methods, techniques, and procedures in analyzing occupations and jobs into their basic elements.

VocEd **462 Vocational Education Curriculum** (3 cr). See IEd 462. Prereq: 461 or perm.

VocEd **472 Vocational Education Methods** (3 cr). See IEd 472.

VocEd **480 Advanced Technical Competency** (1-6 cr, max 6). Experiences to enable the individual to gain depth in technical competency beyond the basic certification requirements, and to maintain skills in harmony with current industrial practice. Prereq: perm.

VocEd **481 Foundations of Vocational Education** (2 cr). Business-industry and individual needs as related to the various approaches to vocational education.

VocEd **493 Teaching Distributive Education** (3 cr). See BusEd 493.

VocEd **494 Distributive Education Materials** (2 cr). See BusEd 494.

VocEd **495 Supervising DECA Programs** (2 cr). See BusEd 495.

VocEd **496 Directed Work Experience** (2 cr). See BusEd 496.

VocEd **497 Coordination Techniques** (3 cr). See BusEd 497.

VocEd **499** (s) **Directed Study** (cr arr). Prereq: perm.

VocEd **500 Master's Research and Thesis** (cr arr).

VocEd **501** (s) **Seminar** (cr arr). Prereq: perm.

VocEd **502** (s) **Directed Study** (cr arr). Prereq: perm.

VocEd **503** (s) **Workshop** (cr arr). Prereq: perm.

VocEd **513 Organization of Vocational Education** (2 cr). Federal, state, and local organization of the support and conduct of vocational programs.

VocEd **524 Issues in Distributive Education** (3 cr). See BusEd 524.

VocEd **540 Occupational Orientation Programs** (3 cr). Design of programs for occupational orientation and experimentation.

VocEd **570 Development of Vocational Education** (3 cr). Vocational education programs from ancient apprenticeship to current practices.

VocEd **597** (s) **Practicum** (cr arr). Application of theories and techniques; supervised field experiences in selected settings. Graded on the basis of P or F. Prereq: perm.

VocEd **598** (s) **Internship** (cr arr). Supervised experience in teacher education, administration, supervision, or ancillary services in vocational education. Graded on the basis of P or F. Prereq: perm.

VocEd **599** (s) **Research** (cr arr). Prereq: perm.

Zoology

Doyle E. Anderegg, Head, Dept. of Biological Sciences (115 Life Sci. Bldg.). Professor Schell; Associate Professors Ferguson, Forbes, Johnson, Larrison, Mead, Rabe; Assistant Professors Murphy, Rourke, Wallace.

Zool **119 Human Anatomy and Physiology** (5 cr). Three lec and two 2-hr rec-labs per wk.

Zool **323 Comparative Vertebrate Embryology** (4 cr). Organogeny, ovulation, fertilization, cleavages, hormonal control, experimental methods; frog, chick, and pig development. Two lec and two 3-hr labs per wk. Prereq: Biol 202.

Zool **324 Comparative Vertebrate Anatomy** (4 cr). Dissection; general vertebrate anatomy; evolution of organ systems. Two lec and two 3-hr labs per wk. Prereq: Biol 202.

Zool **336 Histological Technique** (2 cr). Methods of fixing, sectioning, staining, and mounting. Two 3-hr labs per wk. Prereq: Biol 202.

Zool **N404 Economic Zoology** (2 cr). Economic relations of animals to man; means of determining economic values; theory of control; esthetic and cultural uses of animals.

Zool **411 Comparative Vertebrate Reproduction** (3 cr). Major events in reproductive cycles of vertebrates, using mammals as the basic example and contrasting their reproductive processes with those of fish, amphibians, reptiles, and birds. Three lec per wk. Prereq: Biol 202 and course in zoology.

Zool **412 Comparative Vertebrate Reproduction Laboratory** (1 cr). Lab study of the estrous cycle and pregnancy in the rat and the hormonal control of these phenomena. One 3-hr lab per wk. Prereq or coreq: 411 or Anl 452.

Zool **415 Cell Physiology** (4 cr) (315). Fundamental activities of cells. Three lec and one 3-hr lab per wk. Prereq: organic chemistry, Biol 202.

Zool **416 Mammalian Physiology** (4 cr). Organs and organ systems of vertebrates; emphasis on mammals. Three lec and one 3-hr lab per wk. Prereq: Biol 202 and organic chemistry.

Zool **417 Endocrine Physiology** (3 cr). See Anl 451.

Zool **427 Vertebrate Histology and Organology** (4 cr). Tissues and minute structure of chief mammalian organs. Two lec and two 3-hr labs per wk. Prereq: 324 or perm.

Zool **436 Limnology** (3 cr). See FWR 415.

Zool **N438 Aquatic Biology** (3 cr). Problems and factors affecting populations of plants and animals in aquatic environment, sampling methods and identification of aquatic organisms. Four lec and two 3- hr labs per wk; field labs. Prereq: perm.

Zool **478 Ethology** (2 cr). Introduction to the natural behavior of wild animals, emphasizing the descriptive aspects. Two lec per wk; three 1-day field trips. Prereq: upper-div natural history course.

Zool **481 Ichthyology** (3 cr). Same as FWR 411. Taxonomy, anatomy, physiology, distribution, and ecological relationships of fishes. Two lec and one 3-hr lab per wk; two 1-day field trips; field labs. Prereq: Biol 202.

Zool **482 Natural History of Birds** (3 cr). Habits, adaptations ecology, distribution, classification, field and lab identification, economic values, conservation, and relation to man's culture; birds of Idaho and the Pacific Northwest. Two lec and one 3-hr lab per wk; two 1-day field trips. Prereq: Biol 202 or perm.

Zool **483 Natural History of Mammals** (3 cr). Classification, distribution, ecology, food habits, economic importance, conservation, and relation to man's culture; mammals of Idaho and the Pacific Northwest. Two lec and one 3-hr lab per wk. Prereq: Biol 202 or perm.

Zool **484 Invertebrate Zoology** (5 cr). Freshwater, marine, terrestrial invertebrates; morphology, ecology, and evolution. Three lec and two 3-hr labs per wk; one 5-day field trip. Prereq: Biol 202 or perm.

Zool **N485 Biology of Warm-Blooded Vertebrates** (3 cr). Ecological factors affecting populations and communities as demonstrated by local field studies. Prereq: perm.

Zool **N486 Biology of Cold-Blooded Vertebrates** (3 cr). Systematics and evolution of fishes, amphibians, and reptiles. Four lec and two 3-hr labs per wk. Prereq: perm.

Zool **487 Protozoology** (3 cr). Classification, morphology, physiology, and ecology of pro-

tozoa. Two lec and one 3-hr lab per wk. Prereq: Biol 202.

Zool **488 Parasitology** (3 cr). Animal parasites, emphasis on those of man, identification and preservation of local forms. Two lec and one 3-hr lab per wk. Prereq: Biol 202 or perm.

Zool **489 Herpetology** (3 cr). Evolution, taxonomy, natural history, and biology of amphibians and reptiles. Two lec and one 3-hr lab per wk. Prereq: Biol 202.

Zool **499** (s) **Directed Study** (cr arr). Prereq: perm.

Zool **500 Master's Research and Thesis** (cr arr).

Zool **501** (s) **Seminar** (cr arr). Prereq: perm.

Zool **502** (s) **Directed Study** (cr arr). Prereq: perm.

Zool **503** (s) **Workshop** (cr arr). Prereq: perm.

Zool **504 Colloquium** (1 cr, max 2).

Zool **513 Comparative Animal Physiology** (3 cr). Alt/yrs 73-74. Physiology, morphology, evolution, and ecology of various animal groups. Prereq: 415 or 416.

Zool **536 Hydrobiology** (4 cr). Alt/yrs 73-74. Freshwater ecology; water chemistry, primary and secondary production, micro-invertebrates, investigation of nearby lotic and lentic environments. Three lec and one 3-hr lab per wk; field labs. Prereq: perm.

Zool **538 Zoogeography** (2 cr). Same as Geog 526. Dynamics and causes of distribution of animals in time and space. Prereq: perm.

Zool **600 Doctoral Research and Dissertation** (cr arr).

Zool **601** (s) **Seminar** (cr arr). Prereq: perm.

Zool **602** (s) **Directed Study** (cr arr). Prereq: perm.

Zool **603** (s) **Independent Study** (cr arr). Prereq: perm.

GAUL!

Cooperative Extension Service

James L. Graves, Director (217 Ag. Sc. Bldg.).

THE COOPERATIVE EXTENSION SERVICE was first financed by the Smith-Lever Act of Congress, approved May 8, 1914, to help people of the United States improve their farms, homes, and communities. The Idaho legislature approved the cooperative extension service concept in 1915. In 1917, additional state legislation brought county commissioner boards into the three-way partnership of financing and cooperation.

The headquarters of the Cooperative Extension Service is at Moscow. District offices are located at Boise, Twin Falls, Pocatello, and Moscow.

Agricultural and home economics agents work in forty-two of Idaho's forty-four counties, plus the Fort Hall and Nez Perce Indian Reservations. Area agents and/or specialists, those who work in several adjoining counties with farmers and ranchers who produce specific crops and livestock, are headquartered in Burley, Blackfoot, Idaho Falls, Caldwell, Soda Springs, Twin Falls, Coeur d'Alene, and St. Anthony.

Agents live and work in the areas to which they are assigned by mutual agreement of the university and the counties involved. They are backed by a corps of resource people. They receive training in subject matter from state extension specialists located in Moscow, Boise, Caldwell, and Twin Falls. These specialists, in turn, are kept up to date by research scientists of the College of Agriculture and the U.S. Department of Agriculture.

The educational work of the Cooperative Extension Service is no longer only for farm families. Town and city residents benefit from information about lawn and garden care, insect control, landscaping, family health, clothing, home furnishings, nutrition, and home maintenance. Low-income families receive specialized help.

More and more urban youth discover 4-H and its rewards each year. More than 22,000 young Idahoans from city and county are enrolled in 4-H clubs supervised by over 4,000 volunteer leaders.

Idaho Extension Homemaker Council clubs are found in nearly every county. Membership totals over 20,000.

Idaho's Cooperative Extension Service has progressed considerably since its beginning many years ago. Its programs have been adjusted, expanded, changed, and enlarged, always with the needs of the people in mind.

Agricultural Experiment Station

Steve E. Zobrisky, Acting Director (115 Ag. Sc. Bldg.).

THE IDAHO AGRICULTURAL EXPERIMENT STATION was established in 1892 as a division of the College of Agriculture and has the responsibility to conduct

research in all areas of agriculture and agriculturally-related businesses. The experiment station is the research division of the college and is administratively coordinated with the teaching and extension divisions of the college.

The Agricultural Experiment Station is composed of all departments of the college with the exception of the Department of Agricultural Education. Thus, most of the teaching faculty in the college also have part-time appointments in the experiment station. Several staff members on campus are assigned to full-time research, and thus do not share dual appointments with the teaching division. A few individuals have dual appointments between teaching and extension; selected individuals have a three-way appointment among teaching, research, and extension.

The Idaho agricultural research program is state-wide. Research activities are conducted with all major agricultural commodities and resources and in all major livestock and crop producing areas. The headquarters for the research program is on the campus of the University of Idaho. In addition, there are seven branch locations in strategic agricultural areas in the state where resident research personnel are located.

The Idaho Agricultural Experiment Stations share the responsibility of developing and training future scientists through the graduate fellowship programs. Currently there are over one hundred graduate students enrolled in the College of Agriculture of which about forty-five hold graduate assistantships. These appointments are for an average of two years, during which time the students conduct research as a part of the graduate training.

Engineering Experiment Station

H. Sidwell Smith, Director (131 Janssen Engr. Bldg.); Richard E. Warner, Associate Director.

THE ENGINEERING EXPERIMENT STATION was authorized in June 1928. Its function is to expedite and administer the College of Engineering research program which is an integral part of the college's academic and service effort. The research program in engineering is conducted by the regular faculty and students of the college. There is no separate research facility or a separate research staff.

The College of Engineering requires that any research it undertakes have academic significance. This precludes work which is limited to applying already available knowledge or methods to given problems in previously demonstrated ways. However, a large part of the college's research program deals with developing new knowledge needed to attack the state's problems or devising new methods or applications for using existing knowledge to the benefit of the state.

Most of the funds in support of research come from sources other than university appropriations. These funds are the result of research contracts with various local, state, and federal agencies and private industry. Information regarding research capabilities is available upon request.

Forest, Wildlife and Range Experiment Station

John H. Ehrenreich, Director (201 FWR Bldg.); Edwin W. Tisdale, Associate Director; Maurice G. Hornocker, Leader, Cooperative Wildlife Research Unit; Donald W. Chapman, Leader, Cooperative Fisheries Unit.

ALL MEMBERS OF THE FACULTY of the College of Forestry, Wildlife and Range Sciences are also on the staff of the experiment station, on joint teaching-research appointments. Other members of the station staff include full-time research associates and technicians, as well as graduate-student appointees.

The program of the experiment station is closely connected with the graduate training program of the college. Forty of the sixty-five graduate students currently enrolled in the college are on assistantships provided through station projects.

The station staff conducts research on a wide variety of problems in the areas of forest management, wood technology, range management, wildlife, and fisheries. Funds for the station are provided by the university, by several state departments, and by grants from federal and other outside sources. Currently about sixty percent of these funds come from outside sources.

Water Resources Research Institute

C. C. Warnick, Director (B34 Engr. Bldg.); E. L. Michalson, Associate Resource Economist; E. W. Trihey, Administrative Assistant.

THE WATER RESOURCES RESEARCH INSTITUTE was established in 1963 and operates principally as an interdisciplinary effort. It has the following objectives:

1. To increase, improve, and coordinate the efforts of the various university divisions and departments concerned with water resources research by assisting in (a) defining problem areas; (b) encouraging and promoting team efforts between different disciplines; and (c) assisting in the planning and implementation of interdisciplinary research in cooperation with federal, state, and private agencies.

2. To strengthen and coordinate undergraduate and graduate programs and course offerings so that the university can supply well-trained teachers and leaders capable of coping with the complex water problems at the local, state, regional, and national levels by: (a) encouraging the use of improved teaching techniques and the upgrading of the staff; (b) developing logical sequences of courses to maximize teaching efforts; (c) conducting interdisciplinary seminars to acquaint students and faculty with the broad aspects of water resources; and (d) bringing outstanding authorities to the campus for seminars and conferences.

3. To gather, disseminate, and coordinate ideas and research findings between the university and various federal and state agencies and local and civic groups interested in water resources by: (a) publishing quality reports

of findings; (b) sponsoring or appearing at meetings and workshops to serve all interests; and (c) building and maintaining a library which will be a central source of information to all concerned.

The institute was funded in 1965 to function with other like institutes under the federal Water Resources Research Act of 1964 (Public Law 379-88). It was established as one of the first fourteen such institutes in the nation and as such has a mission to conduct competent research in relation to water resources and to train scientists and engineers through such research.

Research Council and Research Foundation

Ronald W. Stark, Coordinator of Research (111 Morrill Hall); R. Bruce Higgins, Assistant Coordinator of Research.

THE RESEARCH COUNCIL was established to foster research in all legitimate ways, to encourage and assist research workers to coordinate the various research programs being carried on by the university, and to administer certain research funds. The Steering Committee of the Research Council is composed of representative Idaho citizens whose guidance and advice concerning the Short-Term Applied Research (STAR) program assures Idaho of a research program geared closely to the needs of the state.

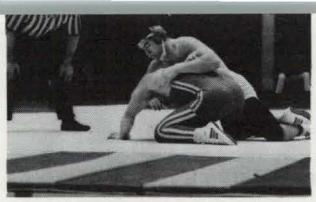
The Idaho Research Foundation, Inc., is a separate legal entity which implements and administers the provisions of the university copyright and patent policy. Its purpose is to protect the interests of the inventor, the public, and the university, and to handle copyrights, publications, and inventions growing out of individual and/or university research efforts.

Bureau of Business and Economic Research

Norman C. Olson, Director (211-A Admin. Bldg.).

AN INTEGRAL PART of the university, the Bureau of Business and Economic Research takes responsibilities in the general area of business and economics. The bureau's work is primarily in applied research of immediate interest to the state's business and economy. Some of the work of the bureau could be classified as professional service aimed at developing the state's resources and providing some of the conditions for engaging university staff and students on the state's problems and orienting them to the economic climate.

The bureau maintains a full-time staff and has a flexibility which can be geared to a variety of projects. When problems submitted to the bureau result in broad projects requiring various research specialists, they can usually be borrowed from other divisions of the university. In some instances this is done through inter-divisional cooperation. The availability of suitable personnel is, of course, one of the principal factors in determing whether specific work will be undertaken. The bureau is organized on the basis of projects and work underway, rather than by departments.



Work of the bureau is reported in various ways. There are two series of occasional publications — the research report and the monograph. Publications, however, are mainly reports on research. Currently one of the major responsibilities of the bureau is the revision and up-dating of the *Idaho Statistical Abstract*. Study projects have been in the area of highway economics, credit and finance, Indian affairs, taxation, employment, general statistics, and industrial development. A new development is the *Idaho Business and Economic Review*, which was first published in April 1970. This periodical provides an additional avenue for publication of business and economic subjects of interest to the state and the nation.

Bureau of Educational Research and Service

Everett V. Samuelson, Director (301 Educ. Bldg.).

THE BUREAU OF EDUCATIONAL RESEARCH AND SERVICE was established to conduct research, to facilitate research among College of Education faculty members and graduate students, and to be of assistance to local school districts and to other educational institutions. Research, study, and statistical facilities are made available to students and faculty through the bureau. The Upward-Bound Program, designed to help youth from low-income families achieve a college education, is housed in the bureau.

Bureau personnel have cooperated with local school districts and with the Idaho State Department of Education in such things as school district surveys, the development and implementation of programs under federal acts, school district reorganization studies, and certification studies. Research reports or monographs of these and other activities are published through the bureau.

The Bureau of Educational Research and Service is financed in part through cost-reimbursement funds from state and federal sources.

Idaho Bureau of Mines and Geology

Rolland R. Reid, Director (206 Mines Bldg.).

THE IDAHO BUREAU OF MINES AND GEOLOGY functions primarily as a research and service organization in fields pertaining to the mineral industry of the state. Cooperative relations are maintained with federal agencies working in this area, particularly the U.S. Bureau of Mines and the U.S. Geological Survey.

Geological and mineral engineering field studies of a reconnaissance nature as well as those designed to obtain detailed information of particular areas and commodities are conducted throughout the state. Reports are issued incorporating the results of such investigations.

The bureau maintains laboratories in the College of Mines Building where research designed to find better or more economical methods for processing ores and mineral products is conducted.

Idaho Mining Research Bureau

Rolland R. Reid, Director (206 Mines Bldg.).

IN ADDITION TO THE USUAL DEPARTMENTAL research, the Idaho Mining Research Bureau has been established as a department of the College of Mines to conduct applied research. Industry problems requiring special capabilities and interdisciplinary study not usually available in most industrial organizations are referred to this bureau for investigation. The staff provides the dual functions of applied research and of specialized teaching in both undergraduate and graduate courses in the college. Facilities, such as detailed ventilation and environmental laboratories, are provided for special research projects and these later become available for graduate student research and teaching. Funds and projects are derived from government and private sources wishing to promote work on specific problems.

Bureau of Public Affairs Research

Boyd A. Martin, Director (108 Admin. Bldg.); H. Sydney Duncombe, Associate Director; James B. Weatherby, Assistant Director.

THE BUREAU OF PUBLIC AFFAIRS RESEARCH functions as an integral part of the Department of Political Science and Public Affairs Research. In its twelve years of existence, the bureau has completed thirty-three major research studies: sixteen on city government, four on county government, three on the state legislature, five on state and local government, and five compilations of election statistics.

In addition to its research function, the bureau has, in recent years, entered into the area of providing training service on a large scale. Since 1968 the bureau has sponsored short courses and workshops for city mayors and councilmen, county commissioners and clerks, city fiscal officers, legislative budget committee members, local law enforcement administrators, and tax assessors and appraisers. The bureau has conducted a series of workshops for secondary teachers of Idaho state and local government, has developed a high school text and a supplementary reader on Idaho state and local government and politics. In addition to the short courses and workshops, the bureau provides consulting services to state and local agencies. Bureau personnel have assisted personnel of the Idaho Budget Division, the Idaho Fiscal Budget Committee, the Idaho Committee on Accounting and Data Processing Systems, the Idaho Constitutional Revision Committee, and the Idaho Citizens Committee on the State Legislature.

In its training and research activities, the bureau has maintained close cooperative relationships with similar agencies within other institutions of higher learning in the state. The bureau has sponsored a number of training programs in cooperation with the Government Research Institute at Idaho State University, and has also worked closely with the departments of Political Science at

Boise State College, the College of Idaho, Ricks College, and Northwest Nazarene College.

Inquiries from public and private sources are continually directed to the bureau. Bureau staff members respond to all inquiries and provide information in response to specific questions when the information is available. The bureau has developed a current library of publications from Idaho and other states which it maintains through reciprocal exchange agreements with other bureaus and state agencies throughout the nation.

Institute of Human Behavior

Boyd A. Martin, Director (108 Admin. Bldg.).

THE MAJOR OBJECTIVES of the Institute of Human Behavior are: to engage in research to gain more knowledge concerning man's behavior, whether economic, political, social, psychological, or physiological, for the purpose of gaining a deeper understanding of violence and war, hoping that the causes of his behavior are subject to social control; to disseminate and make available to students by publications, conferences, and courses knowledge that man now possesses, which will enable the student to gain an introduction to, and a deeper understanding of, current problems of violence and war. Both of these objectives are based on the assumption that violence and war represent major threats to the continuation of organized society.

Center for Business Development

Lawrence H. Merk, Director (111 Ad. Bldg.).

THE CENTER'S MISSION is to assist business and industry in such a manner as to create and maintain a high level of employment in the state of Idaho. To accomplish this mission the center utilizes the knowledge and talent available at the University of Idaho and other institutions of higher education in the state. Management services and technical assistance are provided to business and industry through consultation, seminars, special research studies, and publications.

Computer Services

H. Ward Crowley, Director (338 Admin. Bldg.).

ADMINISTRATIVE DATA PROCESSING, established in 1953 as the Statistical Service Center, and the Computer Center, established in 1962, were combined in 1970 to form Computer Services. This center provides facilities for instructional, research, and computational needs of members of the university community, for federal, state, and other governmental agencies, and for other groups

and individuals when this service appears to be in the best interests of the university and the state of Idaho.

The center is equipped with an IBM 360 model 40 with tape, disk, card, and printer, a 360 model 20 computer, and other subsidiary equipment. It maintains a library of computer programs and provides consulting assistance in programming and in the use of the library and other computer facilities. A keypunch and vertification service is also available.

Short courses in computer languages, job control, and related subjects are offered periodically. Formal courses in programming and computer science are offered by the departments of Mathematics, Business, General Engineering, and Electrical Engineering.

Faculties of the University

Ernest W. Hartung, President; Robert W. Coonrod, Academic Vice President; George H. Belt, Chairman of the Faculty Council (1972-73); R. Bruce Bray, Secretary of the University Faculty.

THE UNIVERSITY FACULTY is constituted of the president, vice presidents, deans, professors, associate professors, assistant professors, instructors (including those professors, associate professors, assistant professors, and instructors whose titles have research or visiting designations, e.g., "assistant research professor," and "visiting associate professor," etc.), and such administrative and service officers as the president may designate. *(Constitution of the University Faculty, Article II, Section 1.)*

In the broader sense, the General Faculty also includes members of the Cooperative Extension Faculty, the Affiliate Faculty, and emeriti. Members of these groups are also listed below in recognition of their many contributions to the university and to the state of Idaho; however, they do not vote in meetings of the University Faculty.

Off-campus personnel are identified with an asterisk (*). The date following a name indicates the beginning of service at the university. When two dates are given, the second, in parentheses, is the date of promotion to the academic rank shown.

All appointments shown are as of October 1, 1972.

M. Audrey Aaron, 1971, Associate Professor of Foreign Languages and Literatures (Spanish); A.B., 1934, Mount St. Scholastica; A.M., 1950, Ph.D., 1952, Johns Hopkins.

David L. Adams, 1971, Associate Professor of Forestry (Management); B.S., 1959, Oklahoma State; M.F., 1961, Idaho; Ph.D., 1969, Colorado State.

Douglas Q. Adams, 1972, Assistant Professor of English; B.A., 1968, M.A., 1971, Ph.D., 1972, Chicago.

***Robert C. Alldaffer**, 1955 (1971), Associate Extension Professor and Caribou County Extension Agricultural Agent, Soda Springs; B.S.Ag., 1950, Idaho.

Gerald M. Allen, 1972, Instructor in Forest Management; B.S., 1969, M.S., 1971, Humboldt State.

Ralph K. Allen, 1970, Assistant Professor of Geography; B.A., 1965, California State (Long Beach); M.A., 1967, San Fernando State.

***Alvin R. Aller**, 1958 (1968), Associate Professor Emeritus of Botany; B.S., 1931, Bethany; M.S., 1932, Kansas State; Ph.D., 1949, Oregon State. Emeritus since 1972.

Florence D. Aller, 1962 (1971), Professor of Home Economics (Home Management-Family Life); Department Head, 1971-; A.B., 1930, Bethany-Penial; M.S., 1947, Oregon State; Ed.D., 1962, Idaho.

Harold C. Amos, 1954 (1972), Associate Professor of Industrial Education; B.Sc.M.E., 1952, Nebraska; M.S.M.E., 1958, Idaho.

Doyle E. Anderegg, 1967, Professor of Biology; Head, Department of Biological Sciences, 1967-; B.Sc., 1952, M.Sc., 1957, Ph.D., 1959, Ohio State.

George A. Anderson, 1961, Controller; B.S.Bus., 1958, M.Acctg., 1966, Idaho; C.P.A.

Guy R. Anderson, 1946 (1968), Professor of Bacteriology; Bacteriologist; Adviser, Pre-Medical Studies; Director, WAMI Medical Program; B.S.Ag., 1942, M.S.Ag., 1947, Idaho; Ph.D., 1956, Washington State.

***Joanne K. Anderson**, 1968 (1971), Extension Instructor and Latah County Extension Home Economist, Moscow; B.S.Ed., 1968, Idaho.

***Lynne A. Anderson**, 1972, Affiliate Professor of Business, NRTS, Idaho Falls; B.A., 1965, M.B.A., 1968, Utah State.

***Moselle Anderson**, 1967 (1971), Assistant Extension Professor and Extension Home Economist for the Fort Hall Indian Reservation, Fort Hall; B.S., 1967, Idaho State.

***Newton R. Anderson**, 1967, Affiliate Professor of Mechanical Engineering, NRTS, Idaho Falls; B.S., 1958, M.S., 1965, Kansas State.

***Paul B. Anderson**, 1971, Affiliate Professor of Mining Engineering and Metallurgy, NRTS, Idaho Falls; B.S., 1962, Gustavus Adolphus; M.S., 1967, North Dakota State.

***Ruth Anderson**, 1946 (1960), Associate Professor Emerita of Office Administration; B.A., 1926, M.S.Ed., 1941, Idaho. Emerita since 1970.

John P. Anduiza, 1966, Assistant Director of Admissions; B.A., 1964, St. Martins.

***Jeanene B. Annest**, 1970 (1971), Extension Instructor and Extension Home Economist for Blaine, Camas, and Lincoln Counties, Shoshone; B.A., 1969, Idaho State.

Ahmed A. Araji, 1968 (1972), Associate Professor of Agricultural Economics (Production Economics); Associate Agricultural Economist; B.S., 1962, M.Sc., 1964, Nebraska; Ph.D., 1968, Missouri.

Eldon D. Archambault, 1971, Professor of Education; B.A., 1945, Northern Iowa; M.A., 1948, Ph.D., 1967, Iowa.

William B. Ardrey, 1939 (1945), Professor of Veterinary Science; Veterinary Microbiologist; B.S., 1934, Monmouth; M.S., 1936, Ph.D., 1939, Michigan State.

***James G. Arendts**, 1970, Affiliate Professor of Civil Engineering, NRTS, Idaho Falls; B.S., 1966, M.S., 1968, Ph.D., 1969, Iowa State.

Terry R. Armstrong, 1969 (1971), Associate Professor of Education; B.S., 1959, Southern Mississippi; M.Nat.Sc., 1963, Ed.D., 1969, Idaho.

Walter L. Ashland, Jr., 1970, Associate Professor of Landscape Architecture; B.S.L.A., 1951, Rhode Island School of Design; M.L.A., 1968, Massachusetts.

***Nancy I. Atkinson**, 1943 (1972), Catalog Librarian Emerita with rank of Professor (Head, Catalog Department, 1943-1972); A.B., 1935, A.B.L.S., 1936, Michigan. Emerita since 1972.

***Jorg A. L. Augustin**, 1968, Associate Research Professor of Food Science and Biochemistry, Aberdeen; Diplomierter Ingenieur Agronom, Eidgenoessische Technische Hochschule, 1955, Zurich; M.S., 1957, Illinois; Ph.D., 1964, Michigan State.

Jasper R. Avery, 1959 (1962), Assistant Professor of Mechanical Engineering; B.S.M.E., 1957, Idaho.

***James W. Bailey**, 1953 (1972), Professor of Veterinary Science, Veterinarian, Extension Professor, and Extension Veterinarian Emeritus; B.Ed., 1935, Western Illinois; D.V.M., 1943, Texas A & M. Emeritus since 1972.

Everett M. Baily, 1961 (1970), Associate Professor of Electrical Engineering; B.S.E.E., 1961, M.S.E.E., 1964, Idaho; Ph.D., 1968, Stanford.

Philip T. Bain, 1970 (1972), Assistant Professor of Guidance and Counseling; Associate Registrar; B.A., 1965, Muskingum; M.Ed., 1967, Ph.D., 1970, Ohio.

***G. Orien Baker**, 1935 (1946), Professor Emeritus of Soils; B.S., 1923, M.S., 1924, Washington State. Emeritus since 1966.

William H. Baker, 1948 (1958), Professor Emeritus of Botany (Head, Department of Biological Sciences, 1956-1967); B.S., 1935, M.S., 1942, Ph.D., 1949, Oregon State. Emeritus since 1972.

Donald C. Baldridge, 1969, Assistant Professor of History (Latin American History); B.A., 1960, Idaho; Ph.D., 1971, Arizona.

Jo Ann Baldridge, 1972, Assistant Registrar; B.A., 1968, Southern State (Arkansas); M.A., 1972, Idaho.

***Jon M. Baldwin**, 1969, Affiliate Professor of Chemistry, NRTS, Idaho Falls; A.B., 1962, Thomas Moore; Ph.D., 1967, Illinois.

***Fred J. Balkovetz**, 1968, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.S., 1965, M.S., 1967, Montana State.

***William C. Banks**, 1927 (1949), Professor Emeritus of English; A.B., 1926, M.A., 1937, Washington. Emeritus since 1968.

David S. Barber, 1968, Assistant Professor of English; A.B., 1962, Hamilton; M.A., 1963, Ph.D., 1968, Michigan.

Erol Barbut, 1967, Assistant Professor of Mathematics; B.A., 1963, California (Berkeley), M.A. 1965, Ph.D., 1967, California (Riverside).

***Carolyn S. Barnes**, 1969 (1971), Extension Instructor and Extension Area 4-H Specialist, Twin Falls; B.A., 1969, Northwest Nazarene.

Dorothy T. Barnes, 1969, Assistant Professor of Music (Voice); B.Mus., 1948, M.Mus., 1964, Idaho.

Willard Barnes, 1965 (1970), Associate Professor of History (American History); B.S.Ed., 1949, M.S.Ed., 1950, Idaho; Ph.D., 1968, Washington State.

William P. Barnes, 1957 (1963), Professor of Mechanical Engineering; Chairman, Nuclear Engineering Committee; B.S.M.E., 1947, Idaho; M.M.E., 1949, Yale; Ph.D., 1973, Illinois; P.E.

John L. Barnhart, 1934-35, 1956 (1957), Associate Professor of Food Science; Associate Food Scientist; B.S., 1930, Pennsylvania State; M.S., 1932, West Virginia; Ph.D., 1940, Pennsylvania State.

William F. Barr, 1947 (1958), Professor of Entomology; Entomologist; B.S., 1945, M.S., 1947, Ph.D., 1950, California (Berkeley).

James L. Barrus, 1949 (1967), Assistant Professor of Chemistry; Director of General Chemistry Laboratories; B.S., 1949, Wyoming; M.S., 1956, Idaho.

Charles G. Bartell, 1950 (1968), Professor of Architecture; B.Arch., 1949, Washington; M.S.Arch., 1950, Columbia.

***V. Forest Baston**, 1967, Affiliate Professor of Chemistry, NRTS, Idaho Falls; B.S., 1960, Ph.D., 1965, Wyoming.

LeRoy O. Bauer, 1956 (1961), Professor of Music (Conducting, Violin, Viola); B.S.Mus.-Ed., 1941, Wisconsin (Milwaukee); M.Mus., 1946, Northwestern.

***Joan M. Baune**, 1965-67, 1968 (1971), Assistant Extension Professor and Extension Home Economist for the Nezperce Indian Reservation, Lapwai; B.S.H.Ec., 1965, Idaho.

***Bruce M. Beardsley**, 1970, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.S., 1955, Brigham Young.

***Mabel R. Beattie**, 1925 (1965), Professor Emerita of Foreign Languages (Latin, French); B.A., 1923, Idaho; M.A., 1925, Radcliffe. Emerita since 1967.

Richard J. Beck, 1957 (1971), Associate Director of Libraries with rank of Professor; B.A., 1949, St. Thomas; B.S.L.S., 1950, M.A., 1955, Minnesota.

Sidney M. Beck, 1951 (1972), Professor of Bacteriology; Bacteriologist; A.B., 1941, M.A., 1948, Brigham Young; Ph.D., 1951, Pennsylvania State.

Richard W. Beeson, 1972, Assistant Professor of Sociology; B.A., 1960, M.A., 1962, Ph.D., 1971, New Mexico.

***Joseph M. Beeston**, 1961, Affiliate Professor of Metallurgy, NRTS, Idaho Falls; B.S., 1949, Ph.D., 1953, Utah.

George M. Bell, 1949 (1955), Professor of Law; B.S., 1935, Utah State; J.D., 1940, George Washington.

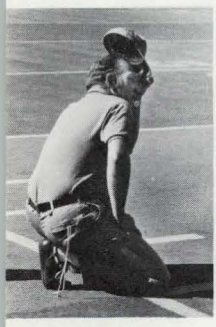
H. Frank Bell, 1972, Assistant Professor of Naval Science; B.S., 1969, Middle Tennessee State.

Roy A. Bell, 1950 (1961), Associate Professor Emeritus of Photography; B.A., 1938, M.A., 1954, Idaho. Emeritus since 1972.

T. Donald Bell, 1957, Professor of Animal Science; Animal Scientist (Head, Department of Animal Science, 1957-1970); B.S.Ag., 1932, M.S.Ag., 1936, Idaho; Ph.D., 1939, Wisconsin.

Thomas O. Bell, 1966-1970, 1971 (1971), Professor of Education; Department Head, 1971-; B.A., 1953, M.A., 1958, Idaho State; Ed.D., 1966, Utah State.

Gladys I. Bellinger, 1960, Professor of Home Economics (Child Development); B.S., 1933, Kansas State (Emporia); M.S., 1948, Ph.D., 1950, Cornell.



George H. Belt, Jr., 1965 (1969), Associate Professor of Forestry (Watershed Management); B.S., 1960, North Carolina State; M.F., 1962, Yale; D.F., 1968, Duke.

***Steven J. Bengston**, 1967, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.S., 1964, M.S., 1966, Oregon.

Ralph L. Benke, 1972, Assistant Professor of Business; B.S., 1962, Washington State; M.B.A., 1972, Washington.

John A. Berg, 1968 (1971), Assistant Professor of Architecture; B.A., 1958, Iowa; B.Arch., 1967, Massachusetts Institute of Technology.

***Jack D. Berggren**, 1971, Affiliate Professor of Business Administration, NRTS, Idaho Falls; B.S., 1957, John Brown; M.B.A., 1971, Idaho.

William H. Bergquist, 1969, Assistant Professor of Psychology; Executive Director, Center for Human and Organizational Research and Development; A.B., 1962, Occidental; M.A., 1964, Ph.D., 1970, Oregon.

***Herbert A. Berman**, 1952 (1957), Professor Emeritus of Law; A.B., 1924, J.D., 1927, Harvard. Emeritus since 1967.

Michael R. P. Berman, 1972, Assistant Professor of Naval Science; B.A., 1964, M.B.A., 1966, Humboldt State.

***Eugene L. Berry**, 1968, Affiliate Professor of Business, NRTS, Idaho Falls; B.S., 1953, South Dakota; M.S., 1968, Idaho.

***Ray M. Berry**, 1947, Professor Emeritus of Education; A.B., 1917, Illinois College; M.A., 1932, Columbia; Ed.D., 1942, Stanford, Emeritus since 1966.

Gerard A. Bessette, 1969, Instructor in Foreign Languages and Literatures (Classics); B.A., 1963, Assumption; M.A., 1965, California (Berkeley).

Nedavia Bethlahmy, 1968, Affiliate Professor of Forest Hydrology, U.S. Forest Service, Moscow; B.S., 1939, Pennsylvania State; M.S., 1940, Yale; Ph.D., 1956, Cornell.

Edith Betts, 1951 (1968), Professor of Physical Education; Chairman, Physical Education for Women; B.S., 1943, Wisconsin; M.S., 1951, Smith; Ph.D., 1968, Oregon.

***Jane D. Betts**, 1967 (1971), Extension Instructor and Washington County Extension Home Economist, Weiser; B.S.H.Ec., 1967, Idaho.

Ronald D. Bevans, 1970 (1972), Associate Professor of Architecture; B.Arch., 1964, Nebraska; M.Arch., 1965, Washington.

Wendy A. Bie, 1968-1970, 1971, Instructor in English; B.A., 1965, Iowa; M.A., 1968, Idaho.

William R. Biggam, 1959 (1966), Professor of Industrial Education; Chairman, Industrial Education; B.S., 1947, Minnesota (Duluth); M.A., 1948, Minnesota (Minneapolis); Ed.D., 1957, Bradley.

William A. Billingsley, 1954 (1967), Professor of Music (Theory, Composition, Trumpet); B.Mus.Ed., 1952, M.Mus., 1953, Drake.

Landon A. Bilyeu, 1971, Assistant Professor of Music (Theory, Piano); B.Mus., 1962, Centenary; M.Mus., 1964, Tulsa.

Richard T. Bingham, 1958, Affiliate Professor of Forest Genetics, U.S. Forest Service, Moscow; B.S.For., 1942, Idaho.

Charles O. Birchmier, 1971, Assistant Professor of Naval Science; B.S., 1967, Idaho.

Donald T. Bishop, 1965 (1970), Assistant Professor of Geology; Mining Engineer; B.S.-Geol., 1962, M.S.Geol., 1964, Wyoming.

Guy W. Bishop, 1957 (1970), Professor of

Entomology; Entomologist; B.S., 1951, M.S., 1953, Oregon State; Ph.D., 1958, Washington State.

Elwood G. Bizeau, 1967 (1972), Associate Professor of Wildlife Management; Assistant Leader, Idaho Cooperative Wildlife Research Unit; B.S., 1948, Oregon State; M.S.For., 1951, Idaho.

Theodore C. Bjornn, 1966 (1972), Professor of Fishery Management; Assistant Leader, Idaho Cooperative Fishery Unit; B.S., 1956, Utah State; M.S., 1957, Idaho; Ph.D., 1966, Utah State.

James L. Black, 1966, North Idaho Regional Director and University Coordinator of Continuing Education; B.A., 1949, M.S., 1953, Idaho; Ed.D., 1969, Washington State.

Robert E. Black, 1954 (1971), Associate Extension Professor and District Extension Supervisor, Moscow; B.S.Ag., 1950, Arkansas; M.S.Ag., 1964, Idaho.

Leslie M. Blair, 1971, Assistant Professor of Chemical Engineering; B.S., 1964, Pennsylvania State; M.S., 1966, Ph.D., 1968, Illinois.

Robert H. Blank, 1971, Assistant Professor of Political Science; B.A., 1965, Purdue; M.A., 1969, Ph.D., 1971, Maryland.

Paul L. Blanton, 1958 (1972), Professor of Architecture; Head, Department of Art/Architecture, 1971-; B.S., 1957, Idaho; M.Arch., 1963, California (Berkeley).

George L. Bloomsburg, 1961 (1969), Professor of Agricultural Engineering and Engineering Science; Chairman, Engineering Science; B.S.Ag.E., 1957, M.S.Ag.E., 1959, Idaho; Ph.D., 1964, Colorado State; P.E.

***Ruth H. Boas**, 1958 (1967), Assistant Professor Emerita of English; B.A., 1925, M.A., 1928, Idaho. Emerita since 1968.

Gene E. Bobeck, 1967 (1972), Associate Professor of Metallurgy; B.A., 1952, Knox; M.S., 1956, Iowa State; Ph.D., 1970, Denver.

Larry E. Bobisud, 1967 (1970), Associate Professor of Mathematics; B.S., 1961, College of Idaho; M.S., 1963, Ph.D., 1966, New Mexico.

***Glenn L. Bodily**, 1946 (1971), Associate Extension Professor and Owyhee County Extension Agricultural Agent and Chairman, Marsing; B.S.Ag., 1939, M.S.Ag., 1939, Idaho.

Arthur A. Boe, 1967 (1972), Associate Professor of Plant Sciences; Associate Plant Physiologist; B.S., 1962, Ph.D., 1966, Utah State.

***Darrel G. Bolz**, 1971, Assistant Extension Professor and Washington County Extension Agricultural Agent, Weiser; B.S.Ag., 1966, M.S., 1970, Idaho.

John G. Bond, 1968, Professor of Geology; Senior Geologist; B.S., 1954, Idaho; M.S., 1959, Ph.D., 1962, Washington.

Cecil W. Bondurant, 1962 (1968), Instructor in Radio/Television; Senior Staff Engineering Technician; B.S., 1952, American Television Institute of Technology.

***James A. Bondurant**, 1969, Affiliate Professor of Agricultural Engineering, Snake River Conservation Research Center, U.S. Department of Agriculture, Kimberly; B.S., 1949, Kansas State; M.S., 1951, Nebraska.

***Lalia P. Boone**, 1965, Professor Emerita of English (Linguistics); B.A., 1938, East Texas State; M.A., 1947, Oklahoma; Ph.D., 1951, Florida. Emerita since 1972.

Bernard C. Borning, 1949 (1962), Professor of Political Science; B.A., 1936, Ph.D., 1951, Minnesota.

Leo F. Boron, 1971, Instructor in Mathematics; B.S., 1944, M.A., 1946, Michigan.

***J. Lawrence Botsford**, 1949, Associate Professor Emeritus of Mathematics; A.B., 1925, Washington; Ph.D., 1933, California Institute of Technology. Emeritus since 1970.

***Alfred W. Bowers**, 1949 (1959), Professor Emeritus of Anthropology/Sociology; B.S., Beloit; M.S., Ph.D., Chicago. Emeritus since 1967.

***Richard R. Boyce**, 1972, Affiliate Professor of Industrial Education, NRTS, Idaho Falls.

Raymond J. Boyd, Jr., 1963, Affiliate Professor of Silviculture, U.S. Forest Service, Moscow; B.S., 1948, M.F., 1950, Colorado State.

***William H. Boyer**, 1930 (1951), Professor of Psychology and Department Head Emeritus (Head, Department of Psychology, 1946-1966); B.S., 1929, M.S., 1930, Idaho; Ph.D., 1936, George Peabody. Emeritus since 1966.

B. J. Brabham, 1970, Associate Professor of Law, B.A., 1951, Texas A & M; LL.B., 1956, Texas; M.A., 1962, North Texas State; LL.M., 1966, New York.

***Charles T. Brackney**, 1972, Associate Extension Professor and Provincial Agricultural Adviser, Viet Nam; B.S., 1943, M.S., 1949, Kansas State.

R. Bruce Bray, 1961 (1967), Associate Professor of Music (Music Education); Secretary of the University Faculty, 1968-; B.A., 1949, M.Mus., 1955, Oregon.

James E. Brickell, 1964, Affiliate Professor of Forest Mensuration, U.S. Forest Service, Moscow; B.S., 1961, Washington State; M.F.R., 1971, Washington.

Ethel M. Bright, 1972, Affiliate Professor of Education; B.S.Ed., 1970, M.Ed., 1972, Idaho.

***Charles R. Brinkman**, 1968, Affiliate Professor of Metallurgy, NRTS, Idaho Falls; B.A., 1960, M.S., 1961, Ph.D., 1966, Utah.

***William J. Brockelbank**, 1943 (1945), Professor Emeritus of Law; B.A., 1919, Haverford; LL.B., 1923, Harvard; LL.M., 1932, Mont-

pelier; Doctor en Droit, 1934, Paris. Emeritus since 1965.

***Charles E. Brockway**, 1965, Assistant Research Professor of Civil Engineering (Water Resources), Twin Falls; B.S.C.E., 1959, Idaho; M.S.C.E., 1960, California Institute of Technology.

Dennis G. Brown, 1971, Assistant Professor of Chemistry; B.A., 1965, Whitman; Ph.D., 1969, Illinois.

***Gene S. Brown**, 1972, Extension Instructor and Area Extension Community Resource Development Specialist, Twin Falls; B.S., 1963, M.F., 1972, Idaho.

***Max W. Brown**, 1972, Affiliate Professor of Accounting, NRTS, Idaho Falls; B.S., 1953, Ricks College; M.S., 1970, Utah State.

***Melvin J. Brown**, 1973, Affiliate Professor of Soil Sciences, Snake River Conservation Research Center, U.S. Department of Agriculture, Kimberly; B.S., 1960, Utah State; M.S., 1963, California (Riverside)

Michael E. Browne, 1967, Professor of Physics; Department Chairman, 1967-; B.S., 1952, Ph.D., 1955, California (Berkeley).

***Robert M. Brugger**, 1956, Affiliate Professor of Physics, NRTS, Idaho Falls; B.S., 1951, Colorado College; M.S., 1953, Ph.D., 1955, Rice.

***Steven D. Brumley**, 1971, Affiliate Professor of Business Administration, NRTS, Idaho Falls; B.S., 1965, J.D., 1968, Nebraska.

***Glenn S. Brunson**, 1971, Affiliate Professor of Nuclear Engineering, NRTS, Idaho Falls; B.S., 1945, U.S. Military Academy; M.S., 1950, Princeton.

Merlyn A. Brusven, 1965 (1971), Associate Professor of Entomology; Associate Entomologist; B.S., 1959, M.S., 1961, North Dakota State; Ph.D., 1965, Kansas State.

***James A. Buckham**, 1956, Affiliate Professor of Chemical Engineering, NRTS, Idaho Falls; B.S., 1945, M.S., 1948, Ph.D., 1953, Washington.

Janice I. Buckner, 1971, Assistant Extension Professor and Extension Clothing Specialist, Moscow; B.S., 1966, M.S., 1970, North Dakota State.

Bruce P. Budge, 1955-1957, 1968-1969, 1972, Professor of Accounting; Department Chairman, 1972-; B.S.Bus., 1953, M.S., 1957, Idaho; Ph.D., 1968, Minnesota.

Richard C. Bull, 1967 (1972), Associate Professor of Animal Science; Associate Animal Scientist; B.S., 1957, M.S., 1960, Colorado State; Ph.D., 1966, Oregon State.

***Marlene M. Bunderson**, 1957-1967, 1970 (1971), Associate Extension Professor and Bear Lake County Extension Home Economist, Paris; B.S., 1955, Ricks; M.S., 1957, Utah State.

G. Ellis Burcaw, 1966 (1970), Associate Professor of Museology; Director, University Museum, 1966-; Director, Intercultural Programs; B.A., 1943, Maryville (Tenn.).

***Mildred E. Burlingame**, 1942 (1963), Associate Professor Emerita of Psychology; A.B., 1925, M.A., 1927, Stanford; Ph.D., 1930, Minnesota. Emerita since 1969.

Vernon H. Burlison, 1946 (1971), Extension Professor and Extension Forester, Moscow; B.S.For., 1943, M.S.For., 1949, Idaho.

John R. Busch, 1970, Assistant Professor of Agricultural Engineering; Assistant Agricultural Engineer; B.S.Ag.E., 1965, Colorado State; M.S., 1967, Idaho.

Corlann G. Bush, 1967, Coordinator of Intercultural Programs, 1970-; B.A., 1965, Bowling Green State; M.S., 1967, Montana State.

Roland O. Byers, 1954 (1962), Professor of General Engineering; Chairman, General Engineering; B.S., 1946, M.S., 1949, Ohio.

William A. Byrd, 1965 (1968), Assistant Professor of Radio/Television; Coordinator, Instructional TV; Production and Promotion Director, KUID-TV; B.A., 1954, Whitman; M.S., 1956, Syracuse.

***Louis C. Cady**, 1922 (1938), Professor of Chemistry and Dean Emeritus (Dean, Graduate School, 1953-1965); B.S.Ch.E., 1925, M.S., 1927, Idaho; Ph.D., 1934, Wisconsin. Emeritus since 1966.

Harry H. Caldwell, 1948 (1965), Professor of Geography; B.A., 1941, Clark; M.S., 1946, Nebraska; Ph.D., 1951, Clark.

***Robert H. Callihan**, 1967, Assistant Research Professor of Plant Sciences (Weed Science), Aberdeen; B.S.Ag., 1957, Idaho; M.S., 1961, Oregon State.

***Mark B. Calnon**, 1945 (1971), Associate Extension Professor and Ada County Extension Agricultural Agent, Boise, B.S.Ag., 1940, Idaho.

Lucas Calpouzos, 1971, Professor of Plant Sciences; Head, Department of Plant and Soil Sciences, 1971-; Plant Pathologist; B.S., 1950, Cornell; Ph.D., 1955, Harvard.

James E. Calvert, Jr., 1967 (1971), Associate Professor of Mathematics; A.B., 1963, California (Berkeley); M.A., 1964, Ph.D., 1966, California (Davis).

Arden R. Campbell, 1972, Assistant Professor of Plant Sciences; Assistant Plant Geneticist; B.S., 1965, M.S., 1967, Purdue; Ph.D., 1970, Iowa State.

Colin Campbell, 1962 (1969), Catalog Librarian with rank of Instructor; B.A., 1957, New Hampshire; M.L.S., 1961, Rutgers.

David C. Campbell, 1972, Assistant Professor of Economics; B.Comm., 1955, British Columbia; M.A., 1967, San Francisco State; M.S., 1969, Ph.D., 1971, California (Berkeley).

Howard E. Campbell, 1963, Professor of Math-

ematics; Department Chairman, 1963-; B.S., 1946, M.S., 1947, Ph.D., 1949, Wisconsin.

Joyce B. Campbell, 1972, Assistant Professor of Radio/Television; A.B., 1958, Stanford; M.A., 1969, San Francisco State.

John E. Carlson, 1970, Assistant Professor of Sociology; B.S., 1964, M.A., 1969, Ph.D., 1972, Washington State.

Laurance B. Carlson, 1968 (1971), Associate Professor of Special Education; Department Head, 1969-; B.A., 1957, Northern Colorado; M.Ed., 1964, Montana; Ed.D., 1968, Northern Colorado.

***Gene P. Carpenter,** 1966, Assistant Research Professor of Entomology; Assistant Entomologist, Twin Falls; B.Sc., 1955, Oklahoma State; M.S., 1961, Ph.D., 1963, Oregon State.

***Frederick O. Cartan,** 1965, Affiliate Professor of Chemistry, NRTS, Idaho Falls; B.S., 1951, California (Berkeley); Ph.D., 1959, Montana State.

***David L. Carter,** 1969, Affiliate Professor of Soils, Snake River Conservation Research Center, U.S. Department of Agriculture, Kimberly; B.S., 1955, M.S., 1956, Utah State; Ph.D., 1960, Oregon State.

***John N. Carter,** 1973, Affiliate Professor of Soil Sciences, Snake River Conservation Research Center, U.S. Department of Agriculture, Kimberly; B.S.Ag., 1943, Missouri; M.S., 1948, Ph.D., 1950, Illinois.

***Louise A. Carter,** 1923, Dean of Women Emerita (Dean of Women, 1944-1958); B.A., 1915, Washington; M.A., 1926, Columbia. Emerita since 1958.

Sherman F. Carter, 1969, Professor of Business; Financial Vice President/Bursar, 1969-; Treasurer, Board of Regents; B.S., 1956, Georgia; M.B.A., 1958, Syracuse; Ph.D., 1968, American.

***John W. Cary,** 1969, Affiliate Professor of Soils, Snake River Conservation Research Center, U.S. Department of Agriculture, Kimberly; B.S., 1956, M.S., 1958, Colorado State; Ph.D., 1961, Utah State.

***Gail A. Cazier,** 1961, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.S., 1953, Ricks; M.S., 1961, Idaho.

Samuel S. M. Chan, 1963 (1970), Associate Professor of Mining Engineering; B.S., 1957, Cheng Kung; M.S.Min.E., 1960, M.S.Geol., 1962, Missouri School of Mines & Metallurgy; Ph.D., 1966, Idaho.

Zaye Chapin, 1968, Associate Professor of Sociology (Social Work); B.A., 1948, California (Los Angeles); M.S.W., 1964, Southern California.

Donald W. Chapman, 1964, Professor of Fishery Management; Leader, Idaho Cooperative Fishery Unit; B.S., 1953, M.S., 1957, Ph.D., 1961, Oregon State.

Edmund M. Chavez, 1951 (1972), Professor of Theatre Arts; Department Head, 1968-; B.A., 1949, Southwest Texas State; M.F.A., 1951, Texas.

Gabriel J. Cherem, 1972, Assistant Professor of Forestry (Recreation); B.S., 1969, M.S., 1971, Michigan.

***Virgil A. Cherrington,** 1928 (1946), Professor of Bacteriology and Department Head Emeritus (Head, Department of Bacteriology, 1946-1970); B.S., 1928, Iowa State; M.S., 1930, Idaho; Ph.D., 1941, Iowa State. Emeritus since 1970.

***Thomas J. Chester,** 1939 (1971), Extension Professor and District Extension Agent Supervisor, Pocatello; B.S.Ag., 1938, Idaho.

Thomas J. Chouinard, 1971, Affiliate Professor of Business, NRTS, Idaho Falls, B.S., 1964, Woodbury.

***Lynn J. Christensen,** 1970, Affiliate Professor of Engineering, NRTS, Idaho Falls; B.S., 1958, Iowa State; M.S., 1965, Ph.D., 1968, Idaho.

Charles O. Christenson, 1964 (1972), Associate Professor of Mathematics; B.A., 1958, M.A., 1960, Kansas; Ph.D., 1964, New Mexico State.

Ross E. Christian, 1956 (1967), Professor of Animal Science; Animal Scientist; B.S., 1947, Pennsylvania State; M.S., 1949, Ph.D., 1951, Wisconsin.

***Oscar O. Christianson,** 1949, Professor Emeritus of Bacteriology; A.B., 1928, St. Olaf; M.D., 1932, Rush. Emeritus since 1970.

Russell L. Chrysler, 1959, Professor of Marketing (Chairman, Department of Business, 1969-1973); B.B.A., 1932, M.A., 1937, Minnesota; Ph.D., 1953, Northwestern.

***Ramsey C. K. Chun,** 1972, Affiliate Professor of Civil Engineering, NRTS, Idaho Falls; B.S., 1966, M.S., 1967, Ph.D., 1971, California (Berkeley).

***Leon J. Church,** 1972, Extension Instructor and Minidoka County Extension Agricultural Agent, Rupert; B.S., 1972, Idaho.

Robert W. Clark, 1956 (1971), Professor of Accounting (Department Chairman, 1969-1972); B.S.Bus., 1956, M.S.Bus., 1958, Idaho; C.P.A.

***Rosalee Clayton,** 1971, Extension Instructor and Extension Home Economist for Butte and Custer Counties, Arco; B.A., 1971, Idaho State.

***George W. Cleveland,** 1934-1945, 1950-1957, 1961, (1971), Associate Extension Professor and Extension Dairyman, Boise; B.S., 1931, Utah State.

Donald F. Clifton, 1957 (1968), Professor of Metallurgy; B.S., 1940, Michigan College of Mining and Technology; Ph.D., 1957, Utah.

John I. Cobb, 1969, Associate Professor of Mathematics; B.A., 1960, Florida State; M.A., 1961, Ph.D., 1966, Wisconsin.

Padraic J. Cohee, 1970, Instructor in Foreign Languages and Literatures (French), B.A.,

1959, M.A., 1965, California (Los Angeles).

***Joseph W. Cole,** 1957 (1971), Associate Extension Professor and Cassia County Extension Agricultural Agent, Burley; B.S.Ag., 1950, Idaho.

***E. Jean Collette,** 1931 (1954), Professor Emerita of Drama; B.A., 1928, M.A., 1932, Idaho. Emerita since 1967.

***Rex M. Collier,** 1966, Professor Emeritus of Psychology; B.A., 1927, Iowa; M.S., 1929, Ph.D., 1934, Northwestern. Emeritus since 1970.

***James B. Colson,** 1960, Affiliate Professor of Electrical Engineering, NRTS, Idaho Falls; B.S., 1957, Utah; M.S., 1959, New York.

Paul C. Conditt, 1961 (1969), Head, Acquisitions Department, University Library, with rank of Assistant Professor; B.A., 1956, Trinity (San Antonio); M.S., 1958, Columbia.

***William H. Cone,** 1924 (1947), Professor of Chemistry and Department Head Emeritus (Head, Department of Physical Sciences, 1947-1959); B.S., 1924, M.S., 1927, Idaho; Ph.D., 1936, Washington. Emeritus since 1964.

James H. Cooley, 1957 (1968), Professor of Chemistry; B.A., 1952, M.S., 1954, Middlebury; Ph.D., 1958, Minnesota.

Don H. Coombs, 1973, Professor of Communications; Director, School of Communication, 1973-; B.A., 1953, M.A., 1957, Iowa; Ph.D., 1968, Stanford.

Robert W. Coonrod, 1969, Professor of History (Russian History); Vice President for Academic Affairs, 1969-; B.S., 1942, Southwest Missouri State; M.A., 1947, Ph.D., 1950, Stanford.

***Robert D. Copp,** 1972, Affiliate Professor of Business, NRTS, Idaho Falls; B.S., 1965, B.S., 1966, Washington State; M.B.A., 1970, Idaho.

Gilbert L. Corey, 1949-1954, 1957 (1961), Professor of Agricultural Engineering; Agricultural Engineer (Chairman, Department of Agricultural Engineering, 1966-1972); B.S., 1948, M.S., 1949, Ph.D., 1965, Colorado State; P.E.

***Jay E. Couch,** 1967 (1970), Assistant Professor of Education; Resident Clinical Supervisor, North Idaho; B.S.Ed., 1951, M.Ed., 1952, Prof. Cert. Ed., 1965, Idaho.

Cleon C. Cowin, 1945, Instructor Emeritus in Chemistry; B.S., 1921, William Jewell; M.S., 1932, Idaho. Emeritus since 1965.

James E. Crandall, 1967 (1971), Professor of Psychology; B.A., 1955, M.P.S., 1956, Colorado, Ph.D., 1963, Oregon.

Frank A. Cronk, 1972, Instructor in Art; B.Arch., 1965, M.A., 1967, Idaho.

Bert C. Cross, 1962 (1972), Professor of Journalism; Department Chairman, 1962-; B.A., 1947, Washington; M.S., 1951, Oregon.

H. Ward Crowley, 1956 (1969), Professor Emeritus of Mathematics (Director, Computer Services, 1962-1973); B.A., 1931, M.A., 1932, Washington State; ScM., 1937, Brown; Ph.D., 1965, Washington State. Emeritus since 1973.

***Helen H. Cunningham,** 1961, Assistant Research Professor Emerita of Home Economics Research; Assistant Home Economist; B.S., 1928, Idaho; M.S., 1938, Iowa State. Emerita since 1972.

Nelson S. Curtis, 1969, Assistant Professor of Art; B.F.A., 1963, Memphis Academy of Arts; M.F.A., 1969, Idaho.

***John H. Cushman,** 1919 (1927), Professor Emeritus of English; B.A., 1913, Brown; M.A., 1914, Harvard. Emeritus since 1961.

Geraldine A. Dacres, 1959 (1971), Associate Professor of Office Administration; B.S.Com.Ed., 1945, M.S.Bus.Ed., 1963, Idaho.

***Jerome J. Dahmen,** 1947 (1968), Research Professor of Animal Science; Superintendent, Caldwell Branch Experiment Station; B.S.-Ag., 1947, Idaho; M.S., 1952, Ph.D., 1966, Oregon State.

***Gordon H. Dailey,** 1946 (1971), Associate Extension Professor and Latah County Extension Agricultural Agent, Moscow; B.S.-Ag., 1934, Idaho.

***Paul D. Dalke,** 1947, Professor Emeritus of Wildlife Management; B.S.F., 1925, M.S.F., 1928, Ph.D., 1934, Michigan. Emeritus since 1967.

***Clarence E. Dallimore,** 1955, Assistant Research Professor of Plant Sciences (Plant Pathology), Aberdeen; B.S., 1940, Utah State; M.S., 1943, Nebraska.

Harry E. Davey, Jr., 1950-1952, 1961, Dean of Men, 1968-; B.S., 1939, U.S. Naval Academy; M.Ed., 1964, Idaho.

Jack L. Davis, 1967, Assistant Professor of English; B.A., 1957, M.A., 1959, Washington State; Ph.D., 1967, New Mexico.

***James R. Davis,** 1968 (1972), Associate Research Professor of Plant Sciences (Plant Pathology), Aberdeen; A.B., 1956, California (Riverside); M.S., 1961, Ph.D., 1967, California (Davis).

Joseph T. Davis, Jr., 1969, Assistant Professor of Aerospace Studies; B.S.For., 1961, Georgia.

Karen R. Davis, 1969, Assistant Research Professor of Food Science (Foods and Nutrition); B.S., 1963, M.S., 1969, Wyoming.

Lawrence W. Davis, Jr., 1968 (1970), Associate Professor of Physics; B.A., 1952, Pomona; B.S., 1956, California Institute of Technology; Ph.D., 1961, Stanford.

***Raynold D. Davis,** 1961 (1971), Associate Extension Professor and Bonner County Extension Agricultural Agent, Sandpoint; B.S.-Ag., 1951, Idaho.

Steven L. Davis, 1973, Associate Professor of Animal Nutrition; Associate Animal Scientist; B.S., 1964, M.S., 1966, Idaho; Ph.D., 1969, Illinois.

Richard L. Day, 1961 (1966), Associate Professor of Geography; A.B., 1948, M.A., 1950, Clark; Ph.D., 1959, Illinois.

***Leslie L. Dean,** 1950 (1968), Research Professor of Plant Sciences (Plant Pathology), Twin Falls; B.S.Ag., 1942, M.S.Ag., 1947, Idaho; Ph.D., 1951, Purdue.

***John A. Dearien,** 1969, Affiliate Professor of Civil Engineering, NRTS, Idaho Falls; B.S., 1962, M.S., 1963, Arkansas; Ph.D., 1968, Missouri.

***Cedric G. d'Easum,** 1949 (1971), Associate Extension Professor and Extension Editor Emeritus; B.A., 1930, Idaho. Emeritus since 1972.

Charles O. Decker, 1946, Director of Student Financial Aids, 1971- (Dean of Students, 1960-1971); B.A., 1940, Antioch; M.A., 1942, Northwestern.

***Donald M. Decker,** 1971, Affiliate Professor of English, NRTS, Idaho Falls; A.B., 1951, M.A., 1952, Brigham Young.

***Richard W. Decker,** 1972, Affiliate Professor of Nuclear Engineering, NRTS, Idaho Falls; B.S., 1953, Rochester.

Glenn H. Deitschman, 1970, Affiliate Professor of Silviculture, U.S. Forest Service, Moscow; B.S., 1947, Minnestoa; M.F., 1948, Pennsylvania State.

Hendrik De Jong, 1972, Associate Professor of Law; A.B., 1966, J.D., 1969, Chicago.

Donald Del Mar, 1971, Associate Professor of Business; B.S., 1960, Maryland; M.A., 1967, D.B.A., 1970, Oklahoma.

Robert E. Denton, 1966, Affiliate Professor of Forest Entomology, U.S. Forest Service, Moscow; B.A., 1948, State University College of Forestry (Syracuse, N.Y.); M.F., 1950, Michigan.

***Merrill E. Deters,** 1940, Professor Emeritus of Forestry (Director, University Experimental Forest, 1940-1971); B.S., 1928, M.S., 1930, Ph.D., 1935, Minnesota. Emeritus since 1971.

Philip A. Deutchman, 1968, Assistant Professor of Physics; B.S., 1959, M.A., 1961, New Mexico; Ph.D., 1967, Oregon.

***Kenneth A. Dick,** 1931 (1947), Professor of Accounting and Vice President Emeritus (Vice President for Financial Affairs, 1961-1967); B.S.Bus., 1931; M.S.Bus., 1938, Idaho; M.-B.A., 1951, Stanford; C.P.A. Emeritus since 1967.

***Billy R. Dickey,** 1965, Affiliate Professor of Chemical Engineering, NRTS, Idaho Falls; B.S., 1954, M.S., 1962, Ph.D., 1964, Texas A &M.

Paul F. Dierker, 1966 (1971), Associate Professor of Mathematics; B.S., 1960, Dayton; M.S., 1963, Ph.D., 1966, Michigan State.

Michael J. Di Noto, 1970, Assistant Professor of Economics; B.A., 1967, M.A., 1969, New York State (Buffalo).

John E. Dixon, 1954 (1964), Associate Professor of Agricultural Engineering; Associate Agricultural Engineer; B.S.Ag., 1951, B.S.-Ag.E., 1951, Oregon State; M.S.Ag.E., 1957, Idaho; P.E.

Clifford I. Dobler, 1941 (1968), Professor of Business Law; B.S., 1938, J.D., 1941, M.A., 1950, Idaho.

***Joseph L. Dobson,** 1967 (1971), Extension Instructor and Kootenai County Extension Agricultural Agent, Coeur d'Alene; B.S.Ag., 1966, Idaho.

***Dexter R. Douglas,** 1969, Affiliate Professor of Plant Sciences (Plant Pathology), U.S. Department of Agriculture, Aberdeen; B.S., 1961, Kent State; M.S., 1965, Wyoming; Ph.D., 1968, Minnesota.

Edmund H. Dowling, 1971, Assistant Professor of Naval Science; B.A., 1956, St. Lawrence; B.S., 1965, Canisius.

Richard J. Dozier, 1971, Assistant Professor of English; B.A., 1960, Harvard; M.A., 1964, Duke.

Philip Drew, 1972, Visiting Assistant Professor of Architecture; B.Arch., 1966, New South Wales.

Jeanette L. Driskell, 1972, Instructor in English; Director, Tutorial Services; B.A., 1969, Lewis-Clark; M.A., 1971, Idaho.

H. Sydney Duncombe, 1962 (1969), Professor of Political Science; Chairman, Department of Political Science and Public Affairs Research, 1972-; Associate Director, Bureau of Public Affairs Research; B.A., 1948, Yale, M.P.A., 1955, Syracuse; Ph.D., 1963, Washington.

***Charles S. Dunham,** 1959 (1971), Assistant Extension Professor and Area 4-H Specialist, Pocatello; B.S.Ag., 1957, Idaho; M.S., 1967, Colorado State.

Darrell W. Dunham, 1972, Assistant Professor of Law; B.A., 1968, J.S., 1971, Willamette; LL.M., 1972, Harvard.

Alfred C. Dunn, 1941 (1955), Professor of Art (Graphic Design); B.S., 1936, Idaho; M.F.A., 1950, California College of Arts and Crafts.

Mary H. DuPree, 1971, Instructor in Music (Music Literature); B.A., 1966, Hollins; M.A., 1971, North Carolina (Chapel Hill).

***Edward P. Duren,** 1960 (1971), Associate Extension Professor and Area Extension Livestock Agent for Bear Lake, Caribou, and Franklin Counties, Soda Springs; B.S.Ag., 1957, Kansas State; M.S.Ag., 1959, Idaho.

***Donald D. DuSault,** 1923 (1927), Assistant Professor of Chemistry and Registrar Emeritus (Registrar, 1944-1962); B.S., 1923, M.S., 1926, Idaho. Emeritus since 1962.

***Ruth G. Dyer,** 1964 (1971), Associate Extension Professor and Bannock County Extension Home Economist, Pocatello; B.S., 1950, Minnesota.

*James I. Eakin, 1956-1960, 1965 (1971), Assistant Extension Professor and Blaine County Extension Agricultural Agent, Hailey; B.S., 1951, Utah State.

John O. Early, 1971, Associate Extension Professor and Extension Agricultural Economist (Marketing Information), Moscow; B.S., 1950, Ohio State; M.S., 1956, Colorado State; Ph.D., 1971, Ohio State.

Anton A. Eder, 1972, Instructor in Architecture; B.S., 1963, Stanford; B.Arch., 1972, Idaho.

*Fred L. Edmiston, 1967 (1971), Assistant Extension Professor and Custer County Extension Agricultural Agent, Challis; B.S.Ag., 1964, Idaho.

*Herbert M. Edwards, 1947 (1971), Associate Extension Professor and Elmore County Extension Agricultural Agent, Mountain Home; B.S.Ag., 1947, Idaho.

Louis L. Edwards, Jr., 1961 (1971), Professor of Chemical Engineering; B.S.Ch.E., 1958, Rensselaer Polytechnic; M.S.Ch.E., 1960, Delaware; Ph.D., 1966, Idaho.

*Robert T. Eggen, 1970, Affiliate Professor of Bacteriology, St. Luke's Hospital, Spokane, Wa.; B.Sc., 1950; M.D., 1954, Alberta.

John H. Ehrenreich, 1971, Professor of Forestry (Ecology); Dean, College of Forestry, Wildlife and Range Sciences, 1971-; Director, Forest, Wildlife and Range Experiment Station; B.S., 1951, M.S., 1954, Colorado State; Ph.D., 1956, Iowa State.

Jack B. Elliot, 1969, Associate Professor of Naval Sciences; B.S.Bus., 1951, Idaho.

Karen H. Elwood, 1960, Instructor in English; B.A., 1956, Washington State.

Ronald D. Ensign, 1952 (1955), Professor of Plant Sciences; Plant Breeder (Associate Director, Agricultural Experiment Station, 1955-1972); B.S., 1946, Northwest Missouri State; M.S., 1949, Colorado State; Ph.D., 1952, Cornell.

Albert W. Erickson, 1970, Professor of Wildlife Management and Zoology; Director, Wilderness Research Center; B.S., 1954, M.S., 1955, Ph.D., 1964, Michigan State.

*L. F. Erickson, 1969, Affiliate Professor of Civil Engineering, Idaho Department of Highways, Boise; B.S.C.E., 1937, Idaho.

Lambert C. Erickson, 1945 (1964), Professor of Plant Sciences; Weed Scientist; B.S., 1940, Minnesota; M.S., 1943, Wyoming; Ph.D., 1962, Minnesota.

*Keith E. Evans, 1970, Affiliate Professor of Entomology, U.S. Department of Agriculture, Twin Falls; B.S.Ag., 1938, Idaho.

Dale O. Everson, 1962 (1967), Professor of Statistics; Statistician; B.S.Ag., 1952, M.S.-Ag., 1956, Idaho; Ph.D., 1960, Iowa State.

*Arthur W. Fahrenwald, 1919 (1929), Research Professor of Metallurgy and Dean Emeritus (Dean, College of Mines, 1934-1954); B.S.Met.E., 1914, South Dakota School of Mines and Technology; E.M., 1916, New Mexico Institute of Mining and Technology; LL.D., 1970, Idaho. Emeritus since 1960.

George L. Falkenhagen, 1970, Associate Professor of Mechanical Engineering; B.S.M.E., 1962, M.S.M.E., 1966, Washington State; Ph.D., 1970, Virginia.

C. Michael Falter, 1969 (1972), Associate Professor of Fishery Management; B.S., 1964, Kansas State; M.S., 1966, Pittsburgh; Ph.D., 1969, Idaho.

Melvin W. Farley, 1953 (1966), Professor of Education; Director, Clinical Experiences in Teacher Education; A.B., 1940, Westmar; A.M., 1948, South Dakota; Ph.D., 1953, Nebraska.

*Ralph H. Farmer, 1927 (1928), Professor of Finance and Dean Emeritus (Dean, School of Business Administration, 1928-1950); A.B., 1916, Oberlin. Emeritus since 1963.

*Colette W. Farrar, 1956, Associate Extension Professor Emerita (Home Demonstration Agent for the Fort Hall Indian Reservation, Fort Hall, 1956-1967); B.S., 1942, Oregon State. Emerita since 1967.

*Marion Featherstone, 1931-1946, 1948 (1950), Associate Professor Emerita of Home Economics; B.S.Ed., 1925, Idaho; M.A.Ed., 1931, Southern California. Emerita since 1967.

Harry S. Fenwick, 1956 (1971), Professor of Plant Sciences; Plant Pathologist; Extension Professor, Moscow; B.S., 1949, M.S., 1953, Montana State; Ph.D., 1956, Oregon State.

J. Homer Ferguson, 1964 (1970), Associate Professor of Zoology; B.S., 1958, Sul Ross State; Ph.D., 1964, Arizona.

*Lenora S. Fields, 1969 (1971), Extension Instructor and Canyon County Extension Home Economist, Caldwell; B.S.H.Ec., 1968, Idaho.

*Edward A. Fiez, 1970 (1971), Assistant Extension Professor and District Extension Dairyman, Caldwell; B.S., 1963, Fresno State; M.S., 1970, Idaho.

Arthur M. Finley, 1950 (1955), Professor of Plant Sciences (Head, Department of Plant Sciences, 1955-1971); Plant Pathologist; B.S., 1941, M.A., 1948, Ph.D., 1950, Missouri.

John C. Fiske, 1970, Assistant Professor of Foreign Languages and Literatures (French); A.B., 1930, Harvard; A.M., 1940, Columbia; Ph.D., 1954, Harvard.

William D. Fitzgerald, 1966, University Physician; Director, Student Health Service, 1966-; B.S., 1939, Millsaps; M.D., 1943, Tulane.

Delbert W. Fitzsimmons, 1959 (1971), Professor of Agricultural Engineering; Department Chairman, 1972-; Agricultural Engineer,

B.S.Ag.E., 1959, M.S.Ag.E., 1962, Idaho; Ph.D., 1970, Washington State; P.E.

***Norman D. Fitzsimmons,** 1955 (1971), Associate Extension Professor and Clearwater County Extension Agricultural Agent, Orofino; B.S.Ag., 1952, M.S.Ag., 1968, Idaho.

***David S. Fjeld,** 1967, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.A. 1962, Concordia; M.S., 1966, Wyoming.

Max E. Fletcher, 1958 (1965), Professor of Economics (Department Chairman, 1968-1972); B.A., 1946, Washington; M.A., 1949, Idaho; Ph.D., 1957, Washington.

Marvin W. Foiles, 1970, Affiliate Professor of Silviculture, U.S. Forest Service, Moscow; B.S., 1947, Colorado State.

***Richard F. Foley,** 1957 (1968), Associate Research Professor of Plant Sciences (Plant Pathology), Parma; B.S., 1948, M.S., 1949, New Hampshire; Ph.D., 1955, Cornell.

***Carolyn A. Folz,** 1945 (1972), Law Librarian Emerita with rank of Associate Professor; A.B., 1929, Evansville; B.S.L.S., 1933, Illinois; M.A., 1939, Idaho. Emerita since 1972.

***William E. Folz,** 1935 (1945), Professor of Agricultural Economics and Department Head Emeritus (Head, Department of Agricultural Economics 1950-1971); B.S., 1927, Evansville; M.S., 1933, Ph.D., 1935, Illinois. Emeritus since 1972.

O Clifford Forbes, 1957 (1967), Associate Professor of Zoology; A.B., 1950, Humboldt State; M.A., 1952, Ph.D., 1958, California (Berkeley).

Rose L. Forbes, 1965, Assistant Professor of Home Economics (Foods); B.S., 1962, M.S., 1964, Pennsylvania State.

Katheryn M. Foriyes, 1967 (1969), Assistant Professor of English; B.S., 1965, Wisconsin State (La Crosse); M.F.A., 1967, Iowa.

Margaret W. Fosberg, 1966, Superintendent of Nurses, Student Health Service; R.N., 1944, Emory University School of Nursing.

Maynard A. Fosberg, 1949 (1972), Professor of Soil Science (Soil Genesis and Classification); Soil Scientist; B.S., 1948, M.S., 1949, Ph.D., 1963, Wisconsin.

***Zeph H. Foster,** 1963 (1972), Professor of Education; Resident Clinical Supervisor, Boise; B.A., 1951, Walla Walla; M.S.Ed., 1956, Ed.D., 1963, Idaho.

Floyd W. Frank, 1955 (1965), Professor of Veterinary Science; Department Head, 1967-; Veterinarian; B.S., 1951, D.V.M., 1951, Ph.D., 1963, Washington State.

***Delance F. Franklin,** 1942, Research Professor of Horticulture; Superintendent, Parma Branch Experiment Station; B.S.Ag., 1942, M.S.Ag., 1955, Idaho.

***Hilda Frederick,** 1935, Associate Extension Professor Emerita (District Home Demonstration Agent, 1935-1941; Home Demonstration Agent, 1953-1955; Home Management Specialist, 1955-1966); B.S., 1929, Utah State; M.A., 1934, California. Emerita since 1966.

***Kenneth R. Frederiksen,** 1951 (1968), Associate Research Professor of Animal Science; Associate Animal Scientist, Dubois; B.S.-Ag., 1950, Idaho; M.S., 1961, Colorado State.

***Mark L. Freer,** 1969 (1972), Assistant Professor of Education; Resident Clinical Supervisor, Lewiston; A.B., 1959, Miami; M.Ed., 1968, Idaho.

Donald K. Fronek, 1968, Instructor in Electrical Engineering; B.A., 1960, B.S., 1964, Washington State; M.S., 1968, Idaho; P.E.

Marian I. Frykman, 1947 (1969), Professor of Music (Literature, Piano, Organ); B.S.Mus.-Ed., 1938, M.A., 1950, Minnesota.

***Richard L. Fuehrer,** 1970 (1971), Extension Instructor and Twin Falls County Extension Agricultural Agent, Twin Falls; B.S.Ag., 1970, Idaho.

Robert R. Furgason, 1957 (1967), Professor of Chemical Engineering; Department Chairman, 1963-; B.S.Ch.E., 1956, M.S.Ch.E., 1958, Idaho; Ph.D., 1961, Northwestern; P.E.

Malcolm M. Furniss, 1963, Affiliate Professor of Forest Entomology, U.S. Forest Service, Moscow; B.S., 1950, California (Berkeley); M.S., 1966, Idaho.

Homer I. Futter, 1949-1950, 1954 (1971), Associate Extension Professor and Latah County Extension Agricultural Agent, Moscow; B.S.Ag., 1948, Idaho.

George Gagon, 1947, University Engineer; Director, Physical Plant; B.S.C.E., 1936, Idaho; P.E.

***Harold F. Gallagher,** 1971, Affiliate Professor of Industrial Education, NRTS, Idaho Falls; B.S., 1943, Detroit; M.S., 1947, Michigan.

***Duane D. Gallinger,** 1970 (1971), Assistant Extension Professor and Power County Extension Agricultural Agent, American Falls; B.S., 1958, M.S., 1965, Wyoming.

***George F. Gardner,** 1965 (1971), Associate Extension Professor and Oneida County Extension Agricultural Agent, Malad; B.S.Ag., 1953, M.S.Ag., 1957, Idaho.

***Max A. Gardner,** 1961 (1971), Associate Extension Professor and Payette County Extension Agricultural Chairman and Agent, Payette; B.S.Ag., 1960, M.S.Aq., 1961, Idaho.

***Jay G. Garner,** 1946 (1971), Associate Extension Professor and Area Extension Potato Specialist, Blackfoot; B.S.Ag., 1943, Idaho.

***Richard W. Garner,** 1964, Affiliate Professor of Physics, NRTS, Idaho Falls; B.S., 1958, Oklahoma; M.S., 1963, Idaho.

Verl G. Garrard, 1946 (1970), Associate Professor of Chemistry; B.S.Ch.E., 1945, M.S., 1952, Idaho; Ph.D., 1967, Utah.

Alan L. Geiger, 1971, Visiting Assistant Professor of Physics; B.E.S., 1964, Cleveland State; M.A., 1966, Ph.D., 1969, Case Western Reserve.

***Floyd C. Gephart,** 1958 (1971) Assistant Extension Professor and Idaho County Extension Agricultural Agent, Grangeville; B.S. Ag., 1952, M.S.Ag., 1966, Idaho.

Shaikh M. Ghazanfar, 1968 (1972), Associate Professor of Economics; B.A., 1962, M.A., 1964, Ph.D., 1968, Washington State.

***Raphael S. Gibbs,** 1934-1936, 1946 (1953), Professor Emeritus of Journalism (Director of Information and University Editor, 1949-1970); B.A., 1934, Idaho. Emeritus since 1970.

***Catherine C. Gilbert,** 1961, Professor Emerita of Foreign Languages (French); B.A., 1917, Ohio Wesleyan; M.A., 1918, Ohio State. Emerita since 1965.

***Chad C. Gibson,** 1968 (1971), Assistant Extension Professor and Adams County Extension Agricultural Agent, Council; B.S.Ag., 1965, Idaho; M.S., 1967, Nevada.

Gene W. Gibson, 1966, Instructor and Research Associate in Animal Science; B.S.Ag., 1965, M.S., 1971, Idaho.

Nicholas F. Gier, 1972, Assistant Professor of Philosophy; B.A., 1966, Oregon State; M.A., 1969, Ph.D., 1973, Claremont Graduate.

***Fred H. Gilbert,** 1970 (1971), Assistant Extension Professor and District Extension Animal Scientist, Twin Falls; B.S., 1959, California Polytechnic; M.S., 1962, Nevada.

Philip N. Gilbertson, 1969, Assistant Professor of English; B.A., 1965, Augustana (Sioux Falls); Ph.D., 1971, Kentucky.

***Eugene Giles,** 1948 (1958), Professor Emeritus of Psychology (Counselor Education and School Psychology); B.A., 1926, M.A., 1926, Washington State; Ph.D., 1947, Washington. Emeritus since 1966.

Campbell M. Gilmour, 1970, Professor of Bacteriology; Head, Department of Bacteriology and Biochemistry, 1970-; Bacteriologist; B.S.A., 1941, M.S.A., 1945, British Columbia; Ph.D., 1949, Wisconsin.

Arthur R. Gittins, 1955 (1969), Professor of Entomology; Department Head, 1968-; Entomologist; B.Sc., 1952, Alberta; M.S.Ag., 1955, Idaho; Ph.D., 1963, Montana.

***Karen M. Glenn,** 1968 (1971), Assistant Professor of Education; Resident Clinical Supervisor, Twin Falls; B.S.Ed., 1963, M.Ed., 1966, Idaho.

E. Bruce Godfrey, 1970, Assistant Research Professor of Agricultural and Forestry Economics; B.S., 1967, M.S., 1967, Utah State; Ph.D., 1970, Oregon State.

Vernon H. Goerke, 1972, Visiting Professor of Electrical Engineering; A.B., 1928, Sterling; Sc.M., 1931, Brown.

Roy H. Goetschel, Jr., 1969, Assistant Professor of Mathematics; B.S., 1954, Northwestern; M.S., 1958, De Paul; Ph.D., 1966, Wisconsin.

Cecil V. Gold, 1972, Instructor in Music (Music Literature, Clarinet); B.Mus., 1969, Nebraska; M.Mus., 1972, Idaho.

Eugene F. Golis, 1963 (1971), Associate Professor of Management; A.B., 1955, Vermont; M.B.A., 1961, Denver.

***Rex I. Gooch,** 1946 (1971), Extension Professor and Jefferson County Extension Agricultural Agent, Rigby; B.S.Ag., 1941, Utah State.

***Robert A. Goodell,** 1960, Affiliate Professor of Mechanical Engineering, NRTS, Idaho Falls; B.S., 1956, Brigham Young; M.S.M.E., 1961, Idaho.

***C. Douglas Gordon,** 1969 (1972), Affiliate Professor of Fishery Management, Vancouver, B.C.; B.Sc., 1963, M.Sc., 1966, British Columbia; Ph.D., 1970, Idaho.

Janice S. Gorton, 1971 (1972), Assistant Professor of Physical Education; Teacher's Certificate, 1962, London; B.S., 1970, M.S., 1971, Oregon.

***Sergio R. Gossmann,** 1963, Affiliate Professor of Electrical Engineering, NRTS, Idaho Falls; B.S., 1955, Texas; M.S., 1962, Idaho.

Edgar H. Grahn, 1941-1943, 1946 (1962), Professor of Chemistry; Associate Dean, Graduate School; B.S., 1941, Puget Sound; M.S., 1948, Idaho; Ph.D., 1955, Illinois.

***Elna H. Grahn,** 1947 (1969), Associate Professor Emerita of Mathematics; B.S., 1935, M.S., 1941, Wisconsin. Emerita since 1969.

Douglas L. Grant, 1968 (1971), Professor of Law; B.A., 1962, Iowa; J.D., 1967, Colorado.

***Erwin Graue,** 1928 (1935), Professor Emeritus of Economics; B.S., 1923, Ph.D., 1928, Cornell. Emeritus since 1965.

James L. Graves, 1949 (1971), Extension Professor; Associate Dean, College of Agriculture, 1972-; Director, Cooperative Extension Service, Moscow; B.S.Ag., 1949, Idaho; M.S., 1962, Wisconsin.

***Charlotte L. Gray,** 1946-1948, 1958 (1971), Associate Extension Professor and Nez Perce County Extension Home Economist, Lewiston; B.S.H.Ec., 1945, Idaho.

Earl E. Gray, 1962 (1966), Associate Professor of Electrical Engineering, B.S.E.E., 1955, M.E.E., 1960, Colorado State.

Leon G. Green, 1940 (1952), Professor of Physical Education (Principles, Administration, Problems); Head, Department of Health, Physical Education and Recreation, 1951-; Chairman, Physical Education for Men; B.S. Ed., 1937, M.S.Ed., 1940, Idaho; Ed.D., 1953, New York.

William R. Green, 1965 (1967), Assistant Pro-

fessor of Mining Engineering; Mining Engineer; B.S., 1962, Idaho; M.S., 1964, Nevada.

William S. Greever, 1949 (1958), Professor of History (American History); Department Head, 1956-; A.B., 1938, Pomona; A.M., 1940, Ph.D., 1949, Harvard.

Cedric E. Gregory, 1968, Professor of Mining Engineering; B.E., 1931, B.A., 1944, Adelaide; B.Econ., 1960, M.E., 1960, Ph.D., 1966, Queensland; P.E.

Robert J. Gregory, 1972, Assistant Professor of Psychology; B.A., 1966, Washington; Ph.D., 1972, Minnesota.

Terry L. Gregory, 1971, Instructor in Animal Science; B.S.; 1970, Idaho.

Merland W. Grieb, 1956 (1969), Associate Professor of Chemistry; B.S., 1942, M.S., 1949, Idaho; Ph.D., 1953, Illinois.

***Roger W. Griebe,** 1970, Affiliate Professor of Mechanical Engineering, NRTS, Idaho Falls; B.S., 1964, M.S., 1966, Ph.D., 1968, Purdue.

***Dorothy K. Grieve,** 1969 (1971), Assistant Extension Professor and Gooding County Extension Home Economist, Gooding; B.S.H.Ec., 1948, Idaho.

***Earl S. Grimmett,** 1969, Affiliate Professor of Chemical Engineering, Idaho Nuclear Corp., Idaho Falls; B.S.Ch.E., 1943, M.S.Ch.E., 1948, Idaho.

***Robert J. Gross,** 1968 (1971), Extension Instructor and Washington County Extension Agricultural Agent and Chairman, Weiser; B.S., 1965, Washington State.

***Milton Grover,** 1942, Assistant Extension Professor Emeritus (Oneida County Extension Agricultural Agent, 1942-1966); B.S., 1934, M.S., 1942, Idaho. Emeritus since 1966.

Donald A. Gustafson, 1944 (1965), Professor of Chemistry; B.S., 1937, Ph.D., 1945, Washington.

James W. Guthrie, 1952 (1969), Professor of Plant Sciences; Plant Pathologist; B.S., 1949, M.S., 1950, Utah State; Ph.D., 1952, Wisconsin.

Donald F. Haber, 1969, Associate Professor of Engineering Science and Civil Engineering (Systems); B.S.E., 1956, M.S.E., 1960, Missouri; Ph.D., 1966, Oklahoma State; P.E.

***Mildred Haberly,** 1941, Extension Professor Emerita (Home Demonstration Agent, 1941-1944; State Nutrition Specialist, 1944-1952; State Home Demonstration Leader, 1953-1966); B.S., 1928, Oregon State; M.S., 1941, Washington. Emerita since 1966.

***Frank E. Hackler,** 1946, Associate Extension Professor Emeritus (Extension Agricultural Agent for Washington County, 1946-1971); B.S., 1942, Oregon State. Emeritus since 1971.

W. Kent Hackmann, 1967 (1972), Associate Professor of History (English History); B.A., 1959, Yale; M.A., 1962, Ph.D., 1969, Michigan.

***Buford W. Haff,** 1972, Affiliate Professor of Business, NRTS, Idaho Falls; B.S., 1949, Kansas State; M.S., 1972, Idaho.

Jack I. Hagen, 1965, Associate Research Professor of Electrical Engineering; B.S., 1948, M.S., 1949, Oregon State.

Wayne R. Hager, 1971 (1972), Assistant Professor of Chemical Engineering; B.S., 1963, Utah; Ph.D., 1972, Idaho.

Peter A. Haggart, 1963 (1971), Associate Professor of Radio/Television; Acting Department Chairman, 1972-; Program Director, KUID-TV; B.A., 1959, South Dakota; M.A., 1963, Kansas.

Richard A. Hagood, 1972, Affiliate Professor of Civil Defense Education, U.S. Office of Civil Defense, Moscow; A.B., 1964, Northwest Nazarene; M.S., 1968, Oregon.

Richard R. Hahn, 1967 (1969), Assistant Professor of Music (History, Flute); B.A., 1964, B.Mus., 1964, Washington State; M.Mus., 1966, Wisconsin.

Sandra L. Hahn, 1970, Instructor in Music (Piano); B.A., 1962, Washington State; M.Mus., 1964, Wisconsin.

Chester D. Hall, 1967 (1970), Assistant Professor of Physical Education and Recreation; Swimming Coach; B.S.Ed., 1959, M.Nat.Sc., 1963, Idaho.

Christopher J. Hall, 1971, Professor of Mining Engineering; B.Sc., 1949, Ph.D., 1951, London.

Forrest H. Hall, 1946 (1960), Professor of Civil Engineering (Structures); B.S., 1939, Colorado State; M.S.C.E., 1940, California Institute of Technology.

***Grant B. Hall,** 1950 (1971), Extension Professor and District Extension Supervisor, Boise; B.S.Ag., 1950, M.Ag., 1960, Idaho.

***Richard F. Hall,** 1967 (1970), Associate Research Professor of Veterinary Science; Associate Extension Professor and Extension Veterinarian, Caldwell; B.S.Ag., 1953, Idaho; D.V.M., 1958, Washington State.

Theodore L. Hall, 1968, Lecturer in Law; B.A., 1957, Minnesota (Duluth); J.D., 1960, Minnesota (Minneapolis).

William B. Hall, 1965 (1969), Professor of Geology; A.B., 1950, Princeton; M.S., 1951, Cincinnati; Ph.D., 1961, Wyoming.

***Leonard Halland,** 1921, Instructor Emeritus in Physics; B.S.M.E., 1919, M.S.M.E., 1928, Idaho. Emeritus since 1960.

John H. Hallaq, 1970, Assistant Professor of Business; B.S., 1963, M.B.A., 1964, California (Los Angeles); Ph.D., 1972, Washington.

David A. Hamilton, Jr., 1970, Affiliate Professor of Forest Mensuration, U.S. Forest Service, Moscow; B.S., 1965, Iowa State.

***George Hamilton,** 1968 (1971), Assistant Extension Professor and Clark County Exten-

sion Agricultural Agent, Dubois; B.S.Ag., 1966, Idaho.

Joel R. Hamilton, 1970, Assistant Professor of Agricultural Economics; Assistant Agricultural Economist; B.S., 1966, Wisconsin; M.S., 1971, Ph.D., 1971, California (Berkeley).

***Lee W. Hamilton,** 1952 (1971), Assistant Extension Professor and Extension Agricultural Agent for the Fort Hall Indian Reservation, Fort Hall; B.S.Ag., 1952, Idaho; M.A., 1961, Colorado State.

Richard G. Hannaford, 1970, Assistant Professor of English; B.A., 1963, Puget Sound; M.A., 1966, Ph.D., 1970, Indiana.

***Henry C. Hansen,** 1925 (1940), Assistant Professor Emeritus of Dairy Science (Bacteriology and Chemistry of Dairy Products); B.S.Ag., 1925, M.S.Ag., 1929, Idaho; Ph.D., 1936, Iowa State. Emeritus since 1954.

***Ivy L. Hansen,** 1946, Assistant Extension Professor Emerita (Extension Home Economist for Bonneville County, 1946-1964; for Oneida County, 1964-1970); B.S., 1929, Utah State. Emerita since 1970.

***Robert H. Hansen,** Affiliate Professor of Business, NRTS, Idaho Falls; M.B.A., 1967, Utah State.

David G. Hanson, 1965, Affiliate Professor of Civil Defense Education, U.S. Office of Civil Defense, Moscow; A.B., 1959, Northwest Nazarene; M.S.T., 1967, Cornell.

***D. Jay Hanson,** 1968 (1971), Assistant Extension Professor and Bonneville County Extension Agricultural Agent, Idaho Falls; B.S.Ag., 1968, Idaho.

***Beverly A. Hansten,** 1966 (1971), Extension Instructor and Owyhee County Extension Home Economist, Marsing; B.A., 1969, Idaho State.

Roger W. Harder, 1947 (1959), Associate Professor of Soil Science (Soil Fertility); Associate Soils Scientist; B.A., 1942, M.S., 1947, Wisconsin.

Roderick R. Hardies, 1965 (1969), Science/Technology Librarian with rank of Assistant Professor; B.A., 1940, Washington; M.A., 1952, Columbia; M.L.S., 1955, Washington.

***Harry C. Harmsworth,** 1944 (1953), Professor Emeritus of Sociology; A.B., 1928, M.A., 1932, Northern Colorado; Ph.D., 1943, Southern California. Emeritus since 1967.

Robert D. Harris, 1959 (1968), Associate Professor of History (European History); B.A., 1951, Whitman; M.A., 1953, Ph.D., 1959, California.

Ernest W. Hartung, 1965, President; A.B., 1938, Dartmouth; A.M., 1940, Ph.D., 1944, Harvard; LL.D., 1965, Rhode Island; LL.D., 1966, College of Idaho.

Alan E. Harvey, 1965, Affiliate Professor of Forest Pathology, U.S. Forest Service, Moscow; B.S., 1960, College of Idaho; M.S., 1962, Idaho; Ph.D., 1968, Washington State.

***Kent R. Hastings,** 1970, Affiliate Professor of Business, NRTS, Idaho Falls; B.S., 1964, Colorado; M.A., 1967, Western State.

Cecil W. Hathaway, 1955-1956, 1960 (1972), Professor of Civil Engineering (Transportation); B.S.C.E., 1955, Idaho; M.E., 1958, California (Berkeley); P.E.

***Hubert E. Hattrup,** 1941 (1953), Professor of Electrical Engineering and Department Head Emeritus (Head, Department of Electrical Engineering, 1953-1966); B.S.E.E., 1930, E.E., 1946, Idaho; P.E. Emeritus since 1971.

Harold F. Haupt, 1963, Affiliate Professor of Forest Hydrology, U.S. Forest Service, Moscow; B.S.For., 1948, M.S.For., 1951, Idaho.

***E. Malcolm Hause,** 1948 (1963), Professor Emeritus of History and Political Science; B.A., 1922, Union; M.A., 1924, Nebraska; Ph.D., 1936, Northwestern. Emeritus since 1966.

***James N. Hawkins,** 1970 (1971), Extension Instructor and Bannock County Extension Agricultural Agent, Pocatello; B.S.Ag., 1969, Idaho.

Robert C. Haynes, 1955 (1964), Associate Professor of Agricultural Education (Farm Mechanics); B.S.Ag., 1938, M.S.Ag., 1957, Idaho.

***William F. Hazen,** 1970 (1971), Extension Instructor and Camas County Extension Agricultural Agent, Fairfield; B.S.Ag., 1969, Idaho.

Richard C. Heimsch, 1972, Assistant Professor of Bacteriology; Assistant Bacteriologist; B.A., 1965, Miami (Ohio); M.S., 1971, Wisconsin, Ph.D., 1972, Oregon State.

Audus W. Helton, 1951 (1963), Professor of Plant Sciences; Plant Pathologist; B.A., 1947, M.S., 1949, Ohio Wesleyan; Ph.D., 1951, Oregon State.

Morris L. Hemstrom, 1959 (1968), Associate Professor of Animal Sciences; Associate Animal Scientist; Associate Extension Professor and Extension Animal Scientist, Moscow; B.S., 1950, Colorado State; M.S., 1958, Nebraska.

Douglass M. Henderson, 1972, Assistant Professor of Botany; B.A., 1965, Fresno State; Ph.D., 1972, Washington.

Eleanor K. Heningham, 1966 (1969), Associate Professor of English; A.B., 1931, Mount Holyoke; M.A., 1932, Ph.D., 1937, New York.

***John A. Henry,** 1963 (1971), Associate Extension Professor and Canyon County Extension Agricultural Agent, Caldwell; B.S.Ag., 1954, M.S.Ag., 1962, Idaho.

George G. Hespelt, 1957 (1966), Associate Professor of Electrical Engineering; B.S.E.E., 1953, Idaho; M.S.E.E., 1964, Oregon State.

***Donald L. Hess,** 1971, Extension Instructor and Extension Manpower Agent for Franklin and Oneida Counties, Malad; B.S., 1970, Brigham Young.

***L. Ann Hess,** 1967 (1971), Extension Instructor and Kootenai County Extension Home Economist, Coeur d'Alene; B.S.H.Ec., 1967, Idaho.

John E. Hickman, 1968, Special Projects Officer; B.S.Bus., 1939, Colorado.

P. Scott Higginbottom, 1969, Instructor in Political Science; B.A., 1962, Kansas; J.D., 1965, Vanderbilt.

***Robert E. Higgins,** 1946 (1971), Associate Extension Professor, Twin Falls; B.S.Ag., 1941, M.S.Ag., 1959, Idaho.

***Herman G. Hilfiker,** 1936 (1970), Extension Professor Emeritus (Extension Agricultural Agent for Bannock County, 1936-1938; for Bingham County, 1938-1941; for Ada County, 1941-1970); B.S.Ag., 1933, Idaho. Emeritus since 1970.

A. Jean Hill, 1968 (1972), Assistant Professor of Guidance and Counseling; Dean for Student Advisory Services, 1972-; B.Mus.Ed., 1964, M.S., 1966, Indiana; Ed.D., 1972, Washington State.

***Archie D. Hill,** 1967, Affiliate Professor of Electrical Engineering, NRTS, Idaho Falls; B.S., 1955, Utah; M.S., 1965, Idaho.

Zoe A. Hill, 1972, Instructor in Architecture; B.A., 1971, Washington State.

***Russell G. Hillman**, 1950 (1971), Associate Extension Professor and Fremont County Extension Agricultural Agent, St. Anthony; B.S.Ag., 1950, Idaho.

John L. Hipple, 1970 (1972), Assistant Professor of Guidance and Counseling; Student Counselor; B.A., 1961, Iowa; M.Ed., 1962, Idaho State; Ph.D., 1970, Iowa.

Thomas E. Hipple, 1969 (1972), Associate Professor of Guidance and Counseling; Chairman, Guidance and Counseling; B.S., 1954, Northern Illinois; M.S., 1959, Wisconsin; Professional Certificate, 1964, Missouri; Ph.D., 1970, Kent State.

Minoru Hironaka, 1954 (1972), Professor of Range Management; B.S., 1952, Utah State; M.S.For., 1954, Idaho; Ph.D., 1963, Wisconsin.

***Kenneth Hoag,** 1935 (1948), Professor Emeritus of English; B.A., 1924, M.A., 1926, Michigan. Emeritus since 1967.

Charles W. Hodgson, 1945, Associate Professor of Animal Science; Associate Animal Scientist; B.S.Ag., 1934, Idaho; M.S., 1936, Arizona; Ph.D., 1940, Michigan State.

Raymond J. Hoff, 1962, Affiliate Professor of Forest Genetics, U.S. Forest Service, Moscow; B.A., 1957, Western Washington State; Ph.D., 1968, Washington State.

Dwight S. Hoffman, 1938 (1959), Professor of Chemical Engineering; Assistant to the Dean, College of Engineering, 1963-; B.S.Ch.E., 1938, M.S., 1947, Idaho; P.E.

Theodore E. Hoffman, 1972, Assistant Research Professor of Agricultural Information; Assistant Extension Professor; Assistant Agricultural Editor; B.A., 1950, South Dakota; M.A., 1966, Missouri.

***Paul H. Hofhine,** 1972, Affiliate Professor of Electrical Engineering, NRTS, Idaho Falls; B.S., 1962, Utah; M.S., 1967, Idaho.

Arland D. Hofstrand, 1959 (1962), Assistant Professor of Wood Utilization; B.S.For., 1950, M.S.For., 1952, Idaho.

***George W. Hogg,** 1970, Affiliate Professor of Chemical Engineering, NRTS, Idaho Falls; B.S., 1958, Iowa State; M.S., 1965, Ph.D., 1968, Idaho.

Dorothy S. Hole, 1957 (1971), Associate Extension Professor and Assistant State 4-H Club Leader, Moscow; B.S., 1936, Oregon State; M.Ed., 1967, Colorado State.

Ronald L. Holmes, 1969 (1971), Assistant Professor of Philosophy; B.A., 1964, Occidental; M.A., 1968, California (Los Angeles).

***Donald D. Holt,** 1972, Affiliate Professor of Education, Portland, Ore., Public Schools; B.S., 1955, M.Ed., 1963, Oregon; Ed.D., 1972, Idaho.

John P. Holup, 1971, Assistant Professor of Distributive Education; B.S., 1966, M.S., 1969, Bowling Green State.

***Janice K. Holwell,** 1971, Extension Instructor and Fremont County Extension Home Economist, St. Anthony; A.S., 1968, Casper; B.S., 1970, Wyoming.

***Hugh W. Homan,** 1965 (1971), Associate Extension Professor and Area Extension Entomologist for Canyon, Owyhee, and Payette Counties, Caldwell; B.S.Ed., 1957, M.S., 1965, Idaho.

Robert D. Hook, 1968 (1969), Public Service Librarian with rank of Assistant Professor; B.A., 1964, Chico State; M.A., 1968, San Jose State.

***Ivan C. Hopkins,** 1959 (1971), Associate Extension Professor and Lincoln County Extension Agricultural Agent, Shoshone; B.S.Ag., 1956, Idaho.

***Anton S. Horn,** 1946 (1971), Associate Extension Professor and Extension Horticulturist, Boise; B.S.Ag., 1937, Kansas State; M.S., 1941, Illinois.

Maurice G. Hornocker, 1968 (1972), Professor of Wildlife Management; Leader, Idaho Cooperative Wildlife Research Unit; B.S., 1960, M.S., 1962, Montana; Ph.D., 1967, British Columbia.

Robert E. Hosack, 1943 (1953), Professor of Political Science (Chairman, Department of Social Sciences, 1947-1969; Department of Political Science and Public Affairs Research, 1969-1972); A.B., 1932, Wooster; A.M., 1934, Chicago; Ph.D., 1951, Duke.

***Roy W. Hosking,** 1968, Affiliate Professor of Business, NRTS, Idaho Falls; B.S., 1954, Purdue; M.B.A., 1961, Washington.

John R. Hoskins, 1967, Professor of Mining Engineering; Head, Department of Mining Engineering and Metallurgy, 1968-; B.S.Min.E., 1947, Idaho; Ph.D., 1962, Utah.

Charles F. Houlberg, 1972, Instructor in Radio/Television; B.S., 1969, Southern Illinois; M.S., 1972, Brooklyn.

***Bette A. Hovey,** 1968 (1971), Extension Instructor and Power County Extension Home Economist, American Falls; B.S., 1968, Idaho State.

John P. Howe, 1956 (1968), Professor of Wood Utilization; A.B., 1935, Amherst; M.S., 1955, Yale; Ph.D., 1966, Michigan.

***Arol D. Howes,** 1973, Assistant Research Professor of Animal Nutrition, Caldwell; B.A., 1964, M.S., 1966, Ph.D., 1969, Washington State.

Benjamin F. Huggins, 1972, Instructor and Research Associate in Food Science; B.S., 1953, Idaho.

***Edward D. Hughes,** 1969, Affiliate Professor of Mechanical Engineering, NRTS, Idaho Falls; B.S., 1963, M.S., 1967, Ph.D., 1969, North Carolina State.

***Allan S. Humpherys,** 1969, Affiliate Professor of Agricultural Engineering, Snake River Conservation Research Center, U.S. Department of Agriculture, Kimberly; B.S., 1954, M.S., 1960, Utah State.

Kenneth E. Hungerford, 1942-1945, 1946 (1959), Professor of Wildlife Management; B.S.For., 1938, Idaho; M.S., 1940, Connecticut; Ph.D., 1952, Michigan.

Roger D. Hungerford, 1970, Affiliate Professor of Forest Pathology, U.S. Forest Service, Moscow; B.S.For., 1963, Idaho.

***Donnell W. Hunter,** 1971, Affiliate Professor of English, NRTS, Idaho Falls; B.A., 1954, Ricks; M.S., 1960, Utah.

Lorraine E. Huppert, 1968 (1969), Head, Serials Department, University Library, with rank of Assistant Professor; B.A., 1963, North Carolina (Greensboro); M.S.L.S., 1968, North Carolina (Chapel Hill).

***Millard W. Ickes,** 1969, Affiliate Professor of Veterinary Science, Veterinarian, Nampa; B.S., 1943, Nebraska; D.V.M., 1950, Colorado State.

Carlton L. Iiams, 1961 (1971), Professor of Foreign Languages and Literatures (German); Department Chairman, 1965-; A.B., 1950, M.A., 1952, Ph.D., 1956, California (Berkeley).

Thomas E. Ingerson, 1968 (1970), Associate Professor of Physics; A.B., 1960, California (Berkeley); Ph.D., 1965, Colorado.

Melbourne L. Jackson, 1953 (1962), Research Professor of Chemical Engineering (Dean, Graduate School, 1965-1970); B.S., 1941, Montana State; Ph.D., 1948, Minnesota.

***Frank H. Jacobs,** 1954 (1971), Extension Professor and Madison County Extension Agricultural Agent, Rexburg; B.S.Ag., 1948, Idaho.

John A. Jacobs, 1970, Assistant Professor of Animal Science; Assistant Animal Scientist; B.S., 1963, M.S., 1965, Kentucky; Ph.D., 1970, Wyoming.

Richard T. Jacobsen, 1963 (1972), Associate Professor of Mechanical Engineering; B.S.M.E., 1963, M.S.M.E., 1965, Idaho; Ph.D., 1972, Washington State; P.E.

Donald R. Jampsa, 1972, Assistant Professor of Guidance and Counseling; B.A., 1961, Pacific Lutheran; M.Ed., 1966, Illinois.

***Allen S. Janssen,** 1931 (1946), Professor of Civil Engineering and Dean Emeritus (Dean, College of Engineering and Director, Engineering Experiment Station, 1946-1967); B.Arch., 1930, B.S.C.E., 1933, M.S.C.E., 1937, Idaho; P.E. Emeritus since 1972.

***Dwight S. Jeffers,** 1935, Professor of Forestry and Dean Emeritus (Dean, School of Forestry, 1935-1953); A.B., 1906, Illinois Wesleyan; M.F., 1911, Ph.D., 1935, Yale. Emeritus since 1953.

***William G. Jeffery,** 1969, Affiliate Professor of Economics, NRTS, Idaho Falls; B.A., 1964, Carroll; M.A., 1967, Washington State.

Tom E. Jenness, 1969 (1971), Assistant Professor of Speech; B.S., 1962, M.A., 1969, Brigham Young.

Alfred W. Jensen, 1968 (1971), Assistant Professor of Foreign Languages and Literatures (Spanish); B.A., 1963, Utah State; M.A., 1965, Wisconsin.

***Marvin E. Jensen,** 1969, Affiliate Professor of Agricultural Engineering, Snake River Conservation Research Center, U.S. Department of Agriculture, Kimberly; B.S., 1951, M.S., 1952, North Dakota State; Ph.D., 1965, Colorado State.

***Pansy S. Jensen,** 1959 (1971), Assistant Extension Professor and Valley County Extension Home Economist, Donnelly; B.S., 1932, Linfield.

***Susan C. Jirele,** 1971, Extension Instructor and Lewis County Extension Home Economist, Nezperce; B.S., 1969, Mankato.

***Erling J. Johannesen,** 1945 (1971), Associate Extension Professor and Gem County Extension Agricultural Agent, Emmett; B.S.Ag., 1945, Idaho.

Hugo H. John, 1972, Professor of Forestry (Operations); Associate Dean, College of Forestry, Willdlife and Range Sciences, 1972-; B.S., 1959, M.S., 1961, Ph.D., 1964, Minnesota.

Charles L. Johnson, 1971, Instructor in Foreign Languages and Literatures (Spanish); B.S., 1961, Tennessee; M.A., 1967, California (Los Angeles).

Donald R. Johnson, 1968, Associate Professor of Biology; B.A., 1953, M.S., 1958, Idaho; Ph.D., 1962, Colorado State.

Frederick D. Johnson, 1952 (1972), Professor of Forestry (Ecology); B.S., 1950, Oregon State; M.S.For., 1952, Idaho.

***Hyrum G. Johnson,** 1955 (1971), Assistant Extension Professor and Bear Lake County Extension Agricultural Agent, Paris; B.S.Ag., 1952, Utah State; M.S.Ag., 1955, Idaho.

***J. Hugo Johnson**, 1918, Professor of Electrical Engineering and Department Head Emeritus (Head, Department of Electrical Engineering, 1918-1953); B.A., 1909, B.S.E.E., 1911, Wisconsin. Emeritus since 1957.

Kenneth A. Johnson, 1969, Assistant Professor of Sociology; B.A., 1966, M.A., 1967, Inter-American (Puerto Rico).

***Lynn F. Johnson,** 1968, Associate Research Professor of Agricultural Engineering, Aberdeen; B.S.Ag.E., 1953, M.S.Ag.E., 1958, Idaho.

Maurice E. Johnson, 1958 (1971), Associate Extension Professor and State 4-H Club Leader, Moscow; B.S.Ag., 1956, M.S.Ag., 1957, Idaho.

Lawrence H. Johnston, 1967, Professor of Physics; A.A., 1938, Los Angeles City College; A.B., 1940, Ph.D., 1950, California (Berkeley).

Richard A. Johnston, 1969, Director of Alumni Relations; B.S., 1953, Idaho.

***Irving J. Jolley,** 1937-1946, 1947 (1947), Professor Emeritus of Chemistry (Chairman, Pre-Medical and Pre-Dental Studies, 1953-1971); B.S., 1930, Ph.D., 1940, Washington. Emeritus since 1971.

Arlene T. Jonas, 1971, Instructor in Home Economics; B.S., 1953, M.S.H.Ec., 1971, Idaho.

***Earl G. Jones,** 1970, Affiliate Professor of Accounting, NRTS, Idaho Falls; B.S., 1947, Ricks; M.S., 1968, Idaho.

Harold L. Jones, 1969, Assistant Professor of Accounting; B.S., 1948, Indiana; M.B.A., 1964, Harvard; C.P.A.

J. Preston Jones, 1967, Associate Professor of Soil Science (Soil Fertility); Associate Soil Scientist; B.S., 1957, Mississippi State; M.S., 1960, Ph.D., 1965, Arizona.

Robert L. Jones, 1968, Professor of Law; A.B., 1948, Harvard; J.D., 1951, Michigan.

Robert W. Jones, 1958 (1966), Associate Professor of Geology; B.S., 1950, M.S., 1957, Ph.D., 1959, Washington.

W. Howard Jones, 1969, Assistant Professor of Music (History, Cello, String Bass); B.S., 1961, M.Ed., 1969, Oregon.

***Marilyn E. Jordan**, 1967 (1971), Assistant Extension Professor and Elmore County Extension Home Economist, Mountain Home; B.S.H.Ec., 1944, Iowa State; M.S., 1967, Oregon.

***Harry L. Judd,** 1955 (1971), Associate Extension Professor and Benewah County Extension Agricultural Agent, St. Maries; B.S.Ag., 1954, Idaho.

Frank S. Junk, 1949 (1956), Associate Professor of Civil Engineering; B.S.C.E., 1937, Iowa; M.S.C.E., 1950, Idaho; P.E.

***Franklin H. Just,** 1965, Affiliate Professor of Engineering, NRTS, Idaho Falls; B.S., 1958, Utah State; M.S.E.E., 1963, Idaho.

***Richard E. Kaiser,** 1968, Affiliate Professor of Nuclear Engineering, NRTS, Idaho Falls; B.S., 1959, Northwestern; M.S., 1961, Ph.D., 1967, Kansas State.

***R. Loren Kambitsch,** 1946 (1971), Extension Professor and Nez Perce County Extension Agricultural Agent, Lewiston; B.S.Ag., 1943, Idaho.

Paul F. Kaus, 1955 (1970), Associate Professor of Education; Director, Summer Sessions and Special Programs; B.A., 1951, North Idaho (Lewiston); M.Ed., 1954, Ed.D., 1966, Washington State.

Robert J. Kearney, 1964 (1968), Associate Professor of Physics; B.S., 1957, M.S., 1959, New Hampshire; Ph.D., 1964, Iowa State.

Donald J. Kees, 1954 (1972), Professor of Guidance and Counseling; Director, Student Counseling Center, 1965-; B.S., 1951, M.S., 1952, Idaho; Ed.D., 1967, Washington State.

***Thomas B. Keith,** 1947 (1949), Professor Emeritus of Animal Science; B.S.Ag., 1924, Idaho; M.S., 1926, Illinois; Ph.D., 1933, Pennsylvania State. Emeritus since 1966.

***Joseph H. Keller,** 1968, Affiliate Professor of Chemistry, NRTS, Idaho Falls; B.S., 1956, Washington (Md.); M.S., 1958, Pennsylvania State.

Edward L. Kelly, 1962 (1969), Research Professor of Education; B.S.Ed., 1953, M.Ed., 1954, Pennsylvania State; Ed.D., 1962, Illinois.

Gwendolyn N. Kelly, 1972, Instructor in Education; B.A., 1961, Denver; M.S., 1972, Idaho.

Joseph T. Kelly, 1970, Assistant Professor of Education; B.S., 1958, Nebraska; M.A., 1965, Denver; Ed.D., 1970, California (Berkeley).

***Virgil D. Kennedy,** 1945 (1971), Associate Extension Professor and Extension Community Resource Development Specialist, Boise; B.S.Ag., 1940, Oregon State; M.S.Ag., 1942, Iowa State.

***Sam G. Kenzy,** 1969, Affiliate Professor of Veterinary Science, Washington State University; B.S., 1934, South Dakota State; D.V.M., 1942, M.S., 1948, Ph.D., 1950, Iowa State.

***Thomas S. Kerr,** 1924 (1928), Professor of Political Science/Business Law and Dean Emeritus (Dean, College of Letters and Science, 1937-1955); A.B., 1913, Indiana; J.D., 1918, Michigan. Emeritus since 1955.

Elizabeth Kessel, 1965 (1968), Assistant Professor of Home Economics (Home Manage-

ment-Equipment); B.S., 1948, Wisconsin State (Stevens Point); M.S.H.Ec., 1964, Idaho.

Robert M. Kessel, 1957-1959, 1960 (1966), Professor of Office Administration and Business Education; Chairman, Department of Office Administration, 1960-; B.E., 1946, Wisconsin State (Whitewater); M.S., 1951, Ph.D., 1957, Wisconsin.

Shirley O. Kiehn, 1968, Assistant Professor of Home Economics (Education-Foods); B.A., 1943, B.Ed., 1949, M.A.T., 1967, Washington State.

Dwight L. Kindschy, 1947 (1961), Professor of Agricultural Education; Department Head, 1961-; B.S.Ag., 1939, Montana State; M.S., 1946, Iowa State; Ed.D., 1960, Washington State.

Gerald F. King, 1972, Assistant Professor of Military Science; B.A., 1964, Idaho State; M.A., 1972, Richmond.

John G. King, 1972, Instructor in Watershed Management; B.S., 1969, M.S., 1972, Minnesota.

Eric B. Kirkland, 1947 (1966), Professor of Physical Education (Recreation, Administration); B.S., 1937, M.Ed., 1946, Washington.

***Mary B. Kirkwood,** 1930 (1954), Professor Emerita of Art; B.A., 1926, Montana; M.F.A., 1930, Oregon. Emerita since 1970.

O. E. Kjos, 1965 (1972), Professor of Guidance and Counseling; B.S., 1942, North Dakota (Ellendale); M.Ed., 1949, Colorado State; Ed.D., 1954, Missouri.

Ronald J. Klimko, 1968 (1971), Associate Professor of Music (Theory, Orchestra, Bassoon); B.Mus.Ed., 1959, Milton; M.Mus., 1963, Ph.D., 1968, Wisconsin.

George W. Klontz, 1972, Professor of Fishery Management; B.S., 1955, M.S., 1959, Washington; D.V.M., 1963, Washington State.

Edward T. Knecht, 1969, Director of Athletics; B.A., 1950, Toldeo; M.S., 1957, Michigan.

Joseph E. Knight, 1970, Assistant Professor of English; B.A., 1964, San Francisco; M.A., 1970, D.A., 1970, Ph.D., 1972, Oregon.

***Lawrence L. Knight,** 1970, Affiliate Professor of Bacteriology, St. Luke's Hospital, Boise; B.S.Pre-Med., 1956, Idaho; M.D., 1958, Washington.

Richard R. Knight, 1967 (1969), Associate Professor of Wildlife Management; B.S., 1956, M.S., 1960, Montana State; Ph.D., 1968, Minnesota.

Charles R. Knowles, 1970, Assistant Professor of Geochemistry; Microprobe Analyst; M.S., 1964, Chicago.

John W. Knudsen, 1972, Assistant Professor of Economics; B.A., 1962, St. Olaf; Ph.D., 1970, Minnesota.

***Walter J. Kochan,** 1955 (1970), Research Professor of Plant Sciences (Plant Physiology), Parma; B.S., 1950, M.S., 1952, Utah State; Ph.D., 1955, Rutgers.

***Edward F. Koester,** 1950 (1971), Extension Professor and Gooding County Extension Agricultural Agent, Gooding; B.S.Ag., 1947; M.S., 1968, Idaho.

Fred E. Kohl, 1950 (1971), Extension Professor and Extension Program Leader, Moscow; B.S.Ag., 1950, Idaho; M.S., 1966, Ph.D., 1968, Wisconsin.

***Robert A. Kohl,** 1969, Affiliate Professor of Soils, Snake River Conservation Research Center, U.S. Department of Agriculture, Kimberly; B.S., 1958, Purdue; M.S., 1960, Ph.D., 1962, Utah State.

***John J. Kolar,** 1956 (1968), Associate Research Professor of Plant Sciences (Crop Management), Twin Falls; B.S., 1950, M.S., 1952, Montana State; Ph.D., 1955, Iowa State.

***Gary E. Korth,** 1971, Affiliate Professor of Metallurgy, NRTS, Idaho Falls, B.S., 1963, Ph.D., 1968, Utah.

Demetrius J. Koubourlis, 1971, Assistant Professor of Foreign Lanaguages and Literatures (Russian); B.A., 1963, Sacramento State; Ph.D., 1967, Washington.

***James E. Kraus,** 1941 (1946), Professor of Plant Sciences and Dean Emeritus (Dean and Director, College of Agriculture, Agricultural Experiment Station, and Cooperative Extension Service, 1955-1972); B.S., 1932, Colorado State; M.S., 1934, Wisconsin; Ph.D., 1940, Cornell. Emeritus since 1972.

Ruth A. Krukar, 1971, Instructor in Library Science; B.A., 1965, Washington; Ed.M., 1971, Washington State.

***Glenn R. Kunkel,** 1956 (1971), Associate Extension Professor and Extension Agricultural Agent for the Fort Hall Indian Reservation, Fort Hall; B.S.Ag., 1935, Idaho.

***Jay F. Kunze,** 1959, Affiliate Professor of Physics, NRTS, Idaho Falls; B.S., 1954, M.S., 1955, Ph.D., 1958, Carnegie-Mellon.

***Sharon E. LaFray,** 1970 (1971), Extension Instructor and Jerome County Extension Home Economist, Jerome; B.A., 1970, Idaho State.

***Clifford E. Lampman,** 1928, Professor Emeritus of Poultry Science; B.S.Ag., 1921, Wisconsin. Emeritus since 1965.

***Birely J. Landis,** 1972, Affiliate Professor of Entomology, Entomology Research Division, U.S. Department of Agriculture, Yakima, Wa.; B.Sc., 1927, Miami (Ohio); M.Sc., 1929, Ohio State.

Richard H. Lane, 1971, Assistant Professor of Anthropology; B.A., 1965, Johns Hopkins; M.Phil., 1968, Yale.

Alfred L. Langan, 1972, Instructor in Education; Director, Upward Bound Program; B.A.Ed., 1971, B.A., 1971, Eastern Washington State.

Jane E. Langenes, 1971, Assistant Dean for

Student Advisory Services; Ph.B., 1967, North Dakota; M.A., 1969, Ohio State.

Earl J. Larrison, 1949 (1957), Associate Professor of Zoology; B.S., 1941, M.S., 1946, Washington.

***Dorrell C. Larsen,** 1956 (1971), Associate Extension Professor and Extension Irrigationist, Boise; B.S.Ag.E., 1952, Idaho; P.E.

Ronald E. Larsen, 1972, Research Associate in Geology with rank of Instructor; B.S., 1960, Wisconsin (Madison).

***James M. Larson,** 1969, Affiliate Professor of Industrial Education, NRTS, Idaho Falls; B.S., 1959, Brigham Young; M.S., 1969, Idaho.

***Jay R. Larson,** 1968, Affiliate Professor of Mechanical Engineering, NRTS, Idaho Falls; B.S., 1955, Illinois; M.S., 1960, Washington; Ph.D., 1964, Purdue.

***Austin M. Lashbrook,** 1967, Professor Emeritus of Foreign Languages (Classics); A.B., 1942, Western Kentucky State; M.A., 1948, Kentucky; Ph.D., 1960, Pennsylvania. Emeritus since 1971.

Calvin W. Lathen, 1967 (1970), Assistant Professor of Physical Education and Recreation; B.A., 1963, M.P.E., 1967, Idaho State.

Gordon A. Law, 1961 (1971), Professor of Radio/Television (Department Head, 1962-1972); A.B., 1955, Denver; M.S., 1956, Syracuse; Ed.D., 1962, Washington State.

John A. Lawrence, 1972, Associate Professor of Agricultural Education; B.S., 1950, M.S., 1966, Idaho.

***Mary A. Lawroski,** 1965 (1971), Associate Extension Professor and Bonneville County Extension Home Economist, Idaho Falls; B.S., 1955, Arkansas; M.S., 1959, Pennsylvania State.

Charles D. Leaphart, 1965, Affiliate Professor of Forest Pathology, U.S. Forest Service, Moscow; B.S., 1948, Montana; M.F., 1949, Ph.D., 1954, Yale.

***Marshall J. LeBaron,** 1947 (1971), Research Professor of Plant Sciences (Crop Management); Superintendent, Branch Experiment Station, Twin Falls; Extension Professor, Twin Falls; B.S.Ag., 1947, M.S.Ag., 1950, Idaho.

Stanley A. LeClair, 1972, Instructor in Education; B.S., 1970, M.Ed., 1972, Wyoming.

***Glen E. Leggett,** 1969, Affiliate Professor of Soils, Snake River Conservation Research Center, U.S. Department of Agriculture, Kimberly; B.S., 1950, M.S., 1951, Utah State; Ph.D., 1957, Washington State.

Robert E. Lehman, 1972, Assistant Professor of Psychology; B.A., 1967, Michigan; M.A., 1970, Ph.D., 1972, Oregon.

Robert R. Leonard, 1966, Associate University Physician; M.D., 1948, Indiana.

Duane J. Le Tourneau, 1953 (1963), Professor of Biochemistry; Biochemist; B.S., 1948, M.S., 1951, Ph.D., 1954, Minnesota.

***Adah Lewis,** 1923, Associate Professor Emerita of Home Economics, B.S., 1907, M.S. 1909, Kansas State. Emerita since 1958.

Glenn C. Lewis, 1947 (1967), Professor of Soil Science (Soil Chemistry); Soil Scientist; B.S.Ag., 1945, M.S.Ag., 1947, Idaho; Ph.D., 1962, Purdue.

William H. Leyden, 1971, Assistant Professor of English; B.A., 1958, Dublin; M.A., 1966, San Diego State; Ph.D., 1971, Oregon.

Leon P. Lind, 1951 (1972), Associate Professor of Communications; Director, Audio-Visual and Photography Center, 1971-; B.S., 1951, M.A., 1956, Idaho.

Karl H. Lindeborg, 1959 (1969), Professor of Agricultural Economics; Agricultural Economist; B.S., 1947, Royal Veterinary & Agricultural College (Copenhagen); M.S., 1956, Utah State; Ph.D., 1959, Oregon State.

***Blaine Linford,** 1961 (1971), Associate Extension Professor and District Extension Agent Supervisor, Twin Falls; B.S., 1942, Wyoming.

Al J. Lingg, 1969, Assistant Professor of Bacteriology; Assistant Bacteriologist; B.S., 1964, M.S., 1966, Ph.D., 1969, Kansas State.

***Miriam H. Little,** 1930, Assistant Professor Emerita of Music; B.Mus., 1918, B.F.A., 1923, Nebraska; M.A., 1940, Idaho. Emerita since 1957.

***Mabel Locke,** 1930-1936, 1947 (1957), Professor Emerita of Physical Education (Head, Department of Physical Education for Women, 1947-1953; Chairman, Physical Education for Women, 1953-1969); B.S., 1929, Northwestern; M.S., 1936, Wisconsin. Emerita since 1971.

Glen R. Lockery, 1947 (1955), Professor of Music (Choir, Voice); B.A., 1940, B.Mus., 1942, Lawrence; M.A., 1947, Columbia.

Howard Loewenstein, 1958 (1968), Professor of Forestry (Soils); B.S., 1952, Colorado State (Ft. Collins); Ph.D., 1955, Wisconsin.

Norman R. Logan, 1947 (1968), Professor of Music (Choir, Music Education, Voice); B.S., 1947, M.S.Mus.Ed., 1947, Idaho; M.Mus., 1963, Southern California.

Richard S. Long, 1946-1956, 1958, Manager of the University Bookstore, 1966-; B.S.Bus., 1949, Idaho.

Roger B. Long, 1966, Associate Professor of Agricultural Economics; Associate Agricultural Economist; B.S., 1955, M.F., 1959, Ph.D., 1963, Minnesota.

Robert P. Lottman, 1966 (1971), Professor of Civil Engineering; B.S.C.E., 1954, Polytechnic Institute of Brooklyn; M.S.C.E., 1956, Purdue; Ph.D., 1965, Ohio State.

Robert R. Loucks, 1967 (1971), Assistant Extension Professor and Lemhi County Extension

Agricultural Agent, Salmon; B.S.Ag., 1965, Idaho.

***T. E. Ludden,** 1950, Affiliate Professor of Bacteriology, Deaconess Hospital, Spokane, Wa.; B.A., 1939, Willamette; M.D., 1943, Oregon; M.S., 1948, Minnesota.

Gary A. Lynch, 1964 (1970), Associate Professor of Economics; Department Chairman, 1972-; B.A., 1960, St. Joseph's; Ph.D., 1970, Washington State.

Douglas MacFarlane, 1963 (1967), Assistant Professor of Physical Education; B.A.Ed., 1953, Washington; M.Ed., 1958, Oregon State.

***Hall M. Macklin,** 1935 (1948), Professor of Music and Department Head Emeritus (Head, Department of Music, 1948-1969); B.Mus., 1931, Illinois; M.Mus., 1938, Idaho. Emeritus since 1969.

Craig MacPhee, 1957 (1966), Professor of Fishery Management; B.A., 1947, M.A., 1949, British Columbia; Ph.D., 1954, Washington.

Gail M. Maddock, 1972, Affiliate Professor of Education; B.A., 1969, California (Santa Barbara); M.S.P.A., 1971, Washington.

Robert W. Maddox, 1967 (1969), Catalog Librarian with rank of Instructor; B.S., 1951, Southwest Missouri; M.L.S., 1967, Brigham Young.

John A. Magee, Jr., 1971, Professor of Aerospace Studies; Department Head, 1971-; B.S., 1950, U.S. Military Academy; M.B.A., 1958, Harvard.

Frances B. Maib, 1951 (1959), Professor of Education; Chairman, Elementary Education; B.S., 1935, Central Washington State; M.A., 1943, Ed.D., 1950, Washington.

***Norman A. Main,** 1972, Affiliate Professor of Business, NRTS, Idaho Falls; B.S., 1970, Idaho State.

Gary K. Maki, 1969 (1972), Associate Professor of Electrical Engineering; B.S., 1965, Michigan Technological; M.S., 1968, Ph.D., 1969, Missouri.

***Harold E. Malde,** 1971, Affiliate Professor of Geology, U.S. Geological Survey, Boulder, Colo.; A.B., 1947, Willamette.

James S. Malek, 1968 (1970), Associate Professor of English; B.A., 1963, Earlham; A.M., 1966, Ph.D., 1968, Chicago.

***J. D. Mankin,** Assistant Extension Professor and Owyhee County Extension Agricultural Agent, Marsing; B.S., 1949, New Mexico State; M.S., 1951, Colorado State.

Paul Mann, 1948 (1959), Professor of Electrical Engineering; B.S.E.E., 1938, M.E.E., 1951, Idaho; P.E.

Jean C. Marlatt, Instructor in Office Administration; B.S.Bus., 1942, M.S.Bus.Ed., 1953, Idaho.

Gerald E. Marousek, 1962 (1971), Professor of Agricultural Economics; Agricultural Economist; B.S., 1951, M.S., 1954, South Dakota State; Ph.D., 1960, Oklahoma State.

Don A Marshall, 1950 (1953), Professor of Agricultural Economics; Associate Dean and Director of Resident Instruction, College of Agriculture, 1953-; B.S., 1937, M.S., 1938, Oklahoma State; Ph.D., 1947, Cornell.

***Neldon H. Marshall,** 1967, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.S., 1958, Brigham Young; M.S., 1966, Idaho.

Dwaine J. Marten, 1964, Assistant Professor of Physical Education (Health); B.S., 1958, Bemidji State; M.S., 1960, Southern Illinois.

Boyd A. Martin, 1938 (1948), Borah Distinguished Professor of Political Science; Director, Bureau of Public Affairs Research; Director, Institute of Human Behavior (Dean, College of Letters and Science, 1955-1970); B.S., 1936, Idaho; A.M., 1937, Ph.D., 1943, Stanford.

James W. Martin, 1946, Professor of Agricultural Engineering; Agricultural Engineer (Head Department of Agricultural Engineering, 1946-1966); B.S.E.E., 1933, B.S.Ag.E., 1937, Kansas State; M.S., 1938, Iowa State; P.E.

Neil E. Martin, 1966, Affiliate Professor of Forest Pathology, U.S. Forest Service, Moscow; B.S., 1961, Iowa State; M.S., 1963, South Dakota State.

***Truman W. Massee,** 1973, Affiliate Professor of Soil Sciences, Snake River Conservation Research Center, U.S. Department of Agriculture, Kimberly; B.S., 1952, M.S., 1953, Oregon State.

***Robert G. Matlock** 1967, Affiliate Professor of Physics, NRTS, Idaho Falls; B.S., 1960, Washington; Ph.D., 1966, Colorado.

***Gilbert Matsen,** 1942, Associate Extension Professor Emeritus (Extension Agricultural Agent for Gem County, 1942-1945; for Payette County, 1945-1971); B.S.Ag., 1940, Idaho. Emeritus since 1971.

***Patricia Maughan,** 1971, Extension Instructor and Twin Falls County Extension Home Economist, Twin Falls; B.S., 1963, Utah State.

***Henry F. Mayland,** 1969, Affiliate Professor of Soils, Snake River Conservation Research Center, Kimberly; B.S., 1960, M.S., 1961, Wyoming; Ph.D., 1965, Arizona.

Guy T. McAlexander, 1930, Extension Professor Emeritus (Extension Agricultural Agent for Benewah County, 1930-1936; for Latah County, 1936-1944; District Extension Agent Supervisor, 1944-1965); B.S., 1928, Colorado A & M. Emeritus since 1965.

***Carol M. McCandless,** 1955 (1971), Assistant Extension Professor and Jefferson County Extension Home Economist, Rigby; B.S., 1955, Utah State.

***John W. McCaslin,** 1972, Affiliate Professor of Mining Engineering, NRTS, Idaho Falls; B.S.Ch.E., 1940, Kansas.

Walter T. McCauley, 1966 (1969), Social Science and Documents Librarian with rank of Assistant Professor; B.A., 1957, Murray State; M.A.L.S., 1958, George Peabody.

***John A. McClure,** 1967, Affiliate Professor of Physics, NRTS, Idaho Falls; B.S., 1956, Geneva; M.S., 1957, Rochester; Ph.D., 1962, Virginia Polytechnic.

Frank P. McCreary, 1964-1968, 1970, Assistant to the President for Development and University Relations, 1972-; B.A., 1965, Idaho.

Jack E. McCroskey, 1973, Professor of Animal Science; Head, Department of Animal Industries, 1973-; Animal Scientist; Extension Professor and Extension Animal Scientist; B.S., 1953, M.S., 1959, Ph.D., 1961, Oklahoma State.

William B. McCroskey, 1964-1966, 1971 (1971), Assistant Professor of Architecture; B.Arch., 1960, Montana State.

***Robert E. McDole,** 1969, Assistant Research Professor of Soil Science (Soil Management); Assistant Soil Scientist, Aberdeen; B.S., 1952, Oregon State; M.S., 1968, Ph.D., 1969, Idaho.

Geral I. McDonald, 1966, Affiliate Professor of Forest Pathology, U.S. Forest Service, Moscow; B.S., 1963, Ph.D., 1969, Washington State.

Ronald E. McFarland, 1970, Assistant Professor of English; A.A., 1962, Brevard; B.A., 1963, M.A., 1965, Florida State; Ph.D., 1970, Illinois.

Martin E. McGrane, 1972, Assistant Professor of Journalism; B.A., 1966, Drake; M.S., 1972, Iowa State.

***Hugh C. McKay,** 1951 (1967), Research Professor of Plant Sciences (Crop Management); Superintendent, Tetonia Branch Experiment Station; B.S.Ag., 1935, M.S.Ag., 1941, Idaho.

Maryann E. McKie, 1956, Instructor in English; B.S., 1950, Southern Idaho; M.A., 1956, Idaho.

Walter H. McLeod, 1972, Associate Professor of Law; Law Librarian, 1972-; B.S., 1941, New York; J.D., 1962, Wm. Mitchell College of Law; M.L.L., 1972, Washington.

***Galen M. McMaster,** 1955 (1972), Research Professor of Agricultural Engineering; Irrigationist, Aberdeen; B.S.Ag.E., 1950, M.S.Ag.E., 1964, Idaho; P.E.

John L. McMullen, 1951 (1967), Associate Professor of Botany; Assistant Dean, College of Letters and Science, 1969-; B.Ed., 1934, Eastern Illinois State; M.S., 1948, Ph.D., 1966, Washington State.

***Lewis M. McNay,** 1972, Affiliate Professor of Geology, U.S. Bureau of Mines, Spokane, Wa.; B.S., 1963, M.S., 1966, American (Washington, D.C.).

Judy A. McNevin, 1972, Instructor in Forestry (Recreation); B.A., 1971, M.A., 1972, Idaho.

***G. Elbert McProud,** 1940, Associate Professor of Agricultural Education and Extension Studies and Training Specialist Emeritus (Extension Agricultural Agent for Clearwater County, 1940-1943; for Boundary County 1943-1945; for Latah County, 1945-1946); B.S., 1934, M.S., 1940, Idaho. Emeritus since 1971.

Rodney A. Mead, 1968 (1972), Associate Professor of Zoology; A.A., 1958, Sierra; A.B., 1960, M.A., 1962, California (Davis); Ph.D., 1966, Montana.

***Randy P. Mecham,** 1971, Extension Instructor and Extension Manpower Agent for Bear Lake and Caribou Counties, Soda Springs; B.S., 1971, Utah State.

Shirley R. Medsker, 1967, Assistant Professor of Home Economics (Textiles-Weaving); B.S.H.Ec., 1958, M.A.H.Ec., 1964, Wayne State (Detroit).

***Walter F. Megahan,** 1972, Affiliate Professor of Agricultural Engineering and Entomology, U.S. Forest Service, Boise; B.S., 1957, M.S., 1960, Syracuse; Ph.D., 1968, Colorado State.

Barbara R. Meldrum, 1965 (1967), Associate Professor of English; B.A., 1956, Westmont; M.A., 1957, Ph.D., 1964, Claremont.

Albert R. Menard, Jr., 1967, Professor of Law; Dean, College of Law, 1967-; A.B., 1936, Georgia; J.D., 1941, Columbia.

Nancy L. Mendoza, 1957 (1969), Assistant Professor of Speech; B.A., 1952, Lake Forest; M.S., 1957, Wisconsin.

Lawrence H. Merk, 1967 (1972), Lecturer in Business; Director, Center for Business Development, 1971-; B.S., 1961, Oregon State; M.A., 1963, Washington.

Gordon B. Meyer, 1970, Assistant Research Professor of Poultry Science; Assistant Extension Professor and Extension Poultry Scientist, Moscow; B.S., 1965, Minnesota; M.S., 1968, Ph.D., 1970, Wisconsin.

Edgar L. Michalson, 1969, Associate Professor of Agricultural Economics; Associate Resource Economist; B.S., 1956, Oregon State; M.S., 1959, Ph.D., 1963, Pennsylvania State.

Elinor L. Michel, 1967-1970, 1971, Instructor in English; B.S., 1963, Washington State; M.A., 1966, Arkansas.

Dora H. Mih, 1972, Catalog Librarian with rank of Assistant Professor; B.A., 1957, National Taiwan; M.L.S., 1959, California (Berkeley).

Paul L. Miles, 1965 (1969), Assistant Professor of Speech; Department Chairman, 1972-; B.S., 1962, Brigham Young; M.A., 1964, Arizona; Ed.D., 1971, Idaho.

***Betty Miller,** 1969 (1971), Assistant Extension Professor and Franklin County Extension Home Economist, Preston; B.S., 1959, Brigham Young.

Daniel L. Miller, 1972, Professor of Military Science; Department Head, 1972-; B.A., 1947, Friends; M.Ed., 1950, Ph.D., 1960, Indiana.

*Joanne M. Miller, 1971, Extension Instructor and Bonner County Extension Home Economist, Sandpoint; B.S., 1971, Brigham Young.

*John C. Miller, 1970 (1971), Assistant Extension Professor and Extension Meats Specialist, Caldwell; B.S., 1962, Texas Technological; M.S., 1964, Missouri; Ph.D., 1968, Pennsylvania State.

*John J. Miller, 1952, Professor and Chairman of Physics Emeritus; B.A., 1924, M.A., 1927, Ph.D., 1936, Texas. Emeritus since 1967.

Laura J. Miller, 1970, Instructor in Home Economics; B.A., 1950, Washington State.

*Richard L. Miller, 1969, Affiliate Professor of Metallurgy, NRTS, Idaho Falls; B.A., 1957, M.S., 1960, Arizona State; Ph.D., 1968, Utah.

Sidney W. Miller, 1959 (1970), Associate Professor of Education; Director, Career Planning and Placement Center, 1963-; B.S.Ed., 1952, M.S.Ed., 1959, Idaho.

*William D. Miller, 1954, Affiliate Professor of Business; Resident Director, Education Program, National Reactor Testing Station, Idaho Falls; B.S., 1940, Brigham Young; M.S., 1949, California (Berkeley).

James H. Milligan, 1972, Assistant Professor of Civil Engineering; B.S., 1963, Ph.D., 1969, Utah State.

*Edward F. Mink, 1957 (1971), Associate Extension Professor and Idaho County Extension Agricultural Agent, Grangeville; B.S.Ag., 1956, Idaho.

John E. Mirus, 1971, Assistant Professor of Military Science; B.B.A., 1964, Gonzaga.

Walter L. Moden, Jr., 1957 (1969), Associate Research Professor of Agricultural Engineering; Associate Agricultural Engineer; B.A.Ag.E., 1957, Kansas State; M.S.Ag.E., 1961, Idaho; P.E.

Philip J. Mohan, 1971, Assistant Professor of Psychology; B.A., 1957, Redlands; M.A., 1961, Los Angeles State; Ph.D., 1967, Claremont.

Myron P. Molnau, 1969, Assistant Professor of Agricultural Engineering; B.Ag.E., 1961, M.S., 1963, Minnesota; Ph.D., 1969, Iowa State; P.E.

*Beverly W. Montgomery, 1969 (1971), Assistant Extension Professor and Canyon County Extension Home Economist, Caldwell; B.S.H.Ec., 1964, Idaho.

Victor E. Montgomery, 1963 (1966), Professor of Psychology; Department Chairman, 1965-; A.B., 1948, Duke; M.S., 1949, Washington State; Ph.D., 1952, Northwestern.

John E. Montoure, 1961 (1968), Associate Professor of Food Science; Department Head, 1971-; Associate Food Scientist; B.S., 1954, M.S., 1955, Wisconsin; Ph.D., 1961, Washington State.

Michael W. Moody, 1972, Assistant Professor of Foreign Languages and Literatures (Spanish); B.A., 1962, M.A., 1966, Ph.D., 1969, Washington.

*Chester A. Moore, 1949, Professor of Civil Engineering and Department Head Emeritus (Head, Department of Civil Engineering, 1949-1966); B.S., 1922, Massachusetts Institute of Technology; P.E. Emeritus since 1966.

*Clarence A. Moore, 1966, Affiliate Professor of Civil Engineering, NRTS, Idaho Falls; B.S. 1954, M.S., 1960, Texas Technological.

William C. Moore, 1930-1946, 1964 (1971), Associate Professor of Business; B.S., 1930, M.A., 1936, Idaho.

David L. Moreland, 1971, Instructor in Art; B.A., 1968, Iowa; M.A., 1970, M.F.A., 1971, Wisconsin.

Bernice M. Morin, 1944, Director of Food Services; B.S., 1941, Montana.

James D. Morris, 1965 (1972), Associate Professor of Guidance and Counseling; Student Counselor; B.S.Ed., 1962, M.S.Ed., 1963, Idaho; Ed.D., 1970, Indiana.

*Glen A. Mortensen, 1963, Affiliate Professor of Nuclear Engineering, NRTS, Idaho Falls; B.S.Ch.E., 1955, Idaho; Ph.D., 1963, California (Berkeley).

*Douglas M. Morton, 1972, Affiliate Professor of Geology, Department of Geology, University of California at Riverside; A.B., 1958, California (Riverside); Ph.D., 1966, California (Los Angeles).

*Ralph J. Moss, 1954 (1971), Extension Professor and Bonneville County Extension Agricultural Agent, Idaho Falls; B.S., 1950, Utah State.

Auttis M. Mullins, 1970, Professor of Animal Science, Dean, College of Agriculture 1972- (Head, Department of Animal Industries, 1970-1972); B.S., 1953, M.S., 1954, Kentucky; Ph.D., 1957, Missouri.

Paul Muneta, 1959 (1968), Associate Professor of Food Science; Associate Food Scientist; B.S., 1953, Montana State; Ph.D., 1959, Cornell.

Bruce D. Murphy, 1972, Assistant Professor of Zoology; B.S., 1965, M.S., 1969, Colorado State; Ph.D., 1971, Saskatchewan.

Robert P. Murphy, 1971, Assistant Professor of English; B.A., 1963, Yale; M.A., 1968, Ph.D., 1971, Virginia.

Glen A. Murray, 1971 (1972), Associate Professor of Plant Sciences; Associate Crop Physiologist; B.S., 1962, M.S., 1963, Montana State; Ph.D., 1967, Arizona.

Roberta K. Myers, 1970, Assistant Professor of Home Economics; B.A., 1968, Idaho; M.A., 1970, Wisconsin.

*Robert E. Narum, 1968, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.A., 1963, M.A., 1966, Colorado.

Richard J. Naskali, 1967, Assistant Professor

of Botany; B.Sc., 1957, M.S., 1961, Ph.D., 1969, Ohio State.

Denny V. Naylor, 1966, Assistant Professor of Soil Science (Soil Chemistry); Assistant Soil Scientist; B.S., 1959, M.S., 1961, Idaho; Ph.D., 1966, California (Berkeley).

***Marjorie M. Neely,** 1957, Dean of Women Emerita (Dean of Women, 1957-1971); B.A., 1948, Eastern Washington State; M.S., 1950, Ohio. Emerita since 1971.

***Ralph T. Nelsen,** 1972, Affiliate Professor of Education, Portland, Ore., Public Schools; B.S., 1956, Oklahoma A & M; M.S., 1968, Portland State; Ed.D., 1972, Idaho.

Charles K. Nelson, 1969, Assistant Professor of General Engineering; B.S., 1965, M.Ed., 1968, Idaho.

***Karl E. Nelson,** 1970, Affiliate Professor of Food Science, Young's Dairy Products Co., Twin Falls; B.S.Ag., 1966, M.S., 1968, Idaho.

Milo G. Nelson, 1970, Humanities Librarian with rank of Assistant Professor; B.A., 1960, Drake; M.A., 1967, M.L.S., 1970, Wisconsin.

Robert F. Nelson, 1971, Visiting Associate Professor of Chemistry; A.A., 1961, Wright; B.A., 1963, Northwestern; Ph.D., 1966, Kansas.

Ralph J. Neuhaus, 1967, Assistant Professor of Mathematics; B.A., 1961, St. Ambrose; M.S., 1963, Ph.D., 1967, Iowa.

Shirley A. Newcomb, 1949 (1972), Professor of Home Economics (Food-Nutrition), B.S.H.Ec., 1944, Nebraska; M.S., 1951, Idaho.

Joseph Newton, 1932 (1945), Professor of Metallurgy; Assistant Dean, College of Mines, 1970-; B.S.Met.E., 1930, Montana College of Mineral Science and Technology; M.S.Met.E., 1931, Idaho.

***Jerome J. Ney,** 1968 (1971), Assistant Extension Professor and Nez Perce County Extension Agricultural Agent, Lewiston; B.S.Ag., 1965, M.S., 1966, Idaho.

Robert T. Nickelsburg, 1970, Assistant Professor of Special Education; A.A., 1955, Concordia (N.Y.); B.A., 1957, Valparaiso; M.A., 1961, M.S., 1965, Denver; Ed.D., 1970, Northern Colorado.

***Elsine Nielsen,** 1942 (1953), Associate Professor Emerita of Home Economics; B.S., 1926, Utah State; M.S., 1931, Iowa State. Emerita since 1967.

***Niels K. Nielsen,** 1972, Visiting Research Professor of Plant Sciences (Potato Physiology), Aberdeen; B.S., 1961, Royal Veterinary and Agricultural College (Copenhagen.)

Ralph Nielsen, 1964 (1969), Catalog Librarian with rank of Assistant Professor; B.A., 1954, Alberta; B.L.S., 1958, Toronto.

***Charles Noble,** 1966, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.A., 1961, M.A., 1965, New Mexico.

***Mary N. Nordlund,** 1955 (1971), Extension Professor and Bingham County Extension Home Economist, Blackfoot; B.S., 1942, Brigham Young.

John T. Norgord, 1948 (1959), Associate Professor of Mechanical Engineering; B.S., 1948, Washington; M.S.E., 1951, Michigan; P.E.

Robert J. Nuccitelli, 1971, Assistant Professor of Military Science; B.A., 1965, Norwich.

***Becky L. Nunnelley,** 1972, Extension Instructor and Clearwater County Extension Home Economist, Orofino; B.A., 1972, Iowa State.

***A. Norman Nybroten,** 1939-1948, 1958 (1958), Professor Emeritus of Economics (Associate Director, Bureau of Business and Economic Research, 1958-1972); B.Ed., 1935, Wisconsin State (Plattville); Ph.D., 1941, Wisconsin. Emeritus since 1972.

***Carl F. Obenchain,** 1965, Affiliate Professor of Chemical Engineering, NRTS, Idaho Falls; B.S., 1958, Oregon State; M.S., 1961, Ph.D., 1964, Michigan.

James F. O'Callaghan, 1970, Instructor in English; B.A., 1967, Seattle; M.A., 1969, Washington.

***Richard E. Ohms,** 1957 (1968), Associate Extension Professor and Extension Potato Specialist, Twin Falls; B.S.Ag., 1950, M.S.Ag., 1952, Idaho; Ph.D., 1955, Illinois.

Lawrence E. O'Keeffe, 1965 (1969), Assistant Professor of Entomology; Assistant Entomologist; B.S., 1956, M.S., 1958, North Dakota State; Ph.D., 1965, Iowa State.

Leila S. Old, 1967 (1972), Associate Professor of Home Economics (Clothing); Ed.B., 1937, California (Los Angeles); B.S., 1941, Oregon State; M.A., 1942, Southern California; Ed.D., 1964, Washington State.

***Ella L. Olesen,** 1920, Registrar Emerita. Emerita since 1944.

David E. Olson, 1969, Assistant Professor of Electrical Engineering; B.S.M.E., 1962, Michigan Technological; Ph.D., 1969, Utah.

***L. Neil Olson,** 1971, Extension Instructor and Valley County Extension Agricultural Agent, Donnelly; B.S., 1960, California State Polytechnic.

Norman C. Olson, 1971, Professor of Management; Dean, College of Business and Economics, 1971-; Director, Bureau of Business and Economic Research; B.S., 1947, M.S., 1949, Ph.D., 1959, Wisconsin.

Clayton R. Oslund, 1972, Assistant Professor of Plant Sciences; Assistant Crop Physiologist; B.S., 1958, Minnesota; M.A., 1965, Michigan; Ph.D., 1971, Minnesota.

***H. Robert Otness,** 1950 (1959), Professor Emeritus of Psychology; B.S., 1931, M.S.Ed., 1932, Idaho; Ph.D., 1939, New York. Emeritus since 1971.

***Brent G. Ovard,** 1971, Extension Instructor and Lewis County Extension Agricultural

Agent, Nez Perce; B.A., 1969, Weber State; M.S., 1971, Utah State.

Glenn B. Owen, 1964, Director of Institutional Services, 1970-; B.S., 1936, Idaho; M.B.A., 1954, Pennsylvania (Wharton School of Finance and Commerce).

***Edward W. Owens,** 1955, Research Professor of Plant Sciences (Crop Management); Superintendent, Aberdeen Branch Experiment Station; B.S.Ag., 1949, M.S.Ag., 1951, Idaho; Ph.D., 1954, Cornell.

Warren S. Owens, 1968 (1969), Dean, Instructional Services, 1970-; Director of Libraries with rank of Professor; B.A., 1943, Kalamazoo; M.A., 1949, Chicago; M.A.L.S., 1953, Michigan.

***Howard E. Packenham,** 1931 (1957), Associate Professor Emeritus of English; B.A., 1920, College of Idaho; M.A., 1933, Idaho. Emeritus since 1964.

***Charles G. Painter,** 1954 (1968), Associate Research Professor of Soil Science (Soil Fertility); Associate Soil Scientist, Parma; B.S., 1947, Colorado State; M.S., 1948, Michigan State.

***Kenneth M. Papenfuss,** 1970, Affiliate Professor of Business, NRTS, Idaho Falls; B.A., 1955, M.A., 1959, Montana.

Clem H. Parberry, 1953 (1961), Associate Professor of Physical Education (Administration); B.S.Ed., 1935, Pacific; M.S.Ed., 1957, Idaho.

William R. Parish, 1947 (1964), Professor of Electrical Engineering; B.S.E.E., 1944, Iowa State; M.S.E.E., 1952, Idaho.

Evangeline Parker, 1971, Instructor in Physical Education; B.S., 1966, M.A., 1968, California State Polytechnic.

William H. Parks, 1972, Associate Professor of Finance; B.A., 1957, M.A., 1960, Ph.D., 1967, Michigan State.

***Joan K. Parr,** 1971, Extension Instructor and Cassia County Home Economist, Burley; B.S.H.Ec., 1968, California State Polytechnic (San Luis Obispo).

Robert R. Parton, 1967, Director of Housing, 1967-; B.A., 1951, Denver.

Arthur D. Partridge, 1960 (1969), Professor of Forestry (Pathology); B.S., 1953, Maine; M.S., 1956, Ph.D., 1957, New Hampshire.

George Patsakos, 1970, Assistant Professor of Physics; A.B., 1962, Columbia; Ph.D., 1969, Stanford.

***Joseph J. Pavek,** 1965, Affiliate Professor of Plant Sciences (Plant Genetics), U.S. Department of Agriculture, Aberdeen; B.S., 1955, M.S., 1960, Minnesota; Ph.D., 1965, Wisconsin.

Edson R. Peck, 1962, Professor of Physics; B.A., 1936, M.S., 1937, Northwestern; Ph.D., 1945, Chicago.

***Stephen L. Peebles,** 1960 (1971), Assistant Extension Professor and Area Extension Livestock Agent for Fremont and Madison Counties, St. Anthony; B.S.Ag., 1955, Idaho.

Vance E. Penton, Jr., 1960 (1972), Associate Professor of Mechanical Engineering; Research Technician; B.S.M.E., 1960, M.S.M.E., 1965, Idaho.

***Allan Perry,** 1942, Instructor in Communications and Supervisor of the Audio-Visual Center Emeritus; B.S., 1925, Whitman; M.S.Ed., 1949, Idaho. Emeritus since 1966.

Charlie F. Petersen, 1943 (1957), Professor of Poultry Science; Poultry Scientist (Head, Department of Poultry Science, 1961-1970); B.S.Ag., 1940, M.S.Ag., 1946, Idaho.

***Daylene R. Petersen,** 1971, Extension Instructor and Payette County Extension Home Economist, Payette; B.A.H.Ec.Ed., 1971, Northwest Nazarene.

***Doran A. Peterson,** 1959 (1971), Associate Extension Professor and Ada County Extension Agricultural Agent, Boise; B.S.Ag., 1940, Idaho.

Floyd H. Peterson, 1969, Professor of Music (History, Orchestra); Director, School of Music, 1969-; B.Mus., 1952, M.Mus., 1953, Northwestern; Mus.Ed.D., 1963, Indiana.

Hazel C. Peterson, 1971, Associate Professor of Physical Education; B.S., 1949, M.S., 1955, Oregon; Ph.D., 1968, Ohio State.

Philip E. Peterson, 1952 (1961), Professor of Law (Dean, College of Law, 1962-1966); B.S., 1950, J.D., 1952, Illinois; LL.M., 1958, Harvard.

Franklin H. Pitkin, 1939 (1972), Professor of Forestry (Reforestation); Nursery Superintendent; B.S.For., 1939, M.F., 1958, Idaho.

T. Alan Place, 1970, Associate Professor of Mechanical Engineering; B.Sc., 1961, Nottingham (England); M.Eng., 1966, McMaster (Ontario); Ph.D., 1969, British Columbia.

***Peggy Pletcher,** 1968 (1971), Assistant Extension Professor and Ada County Extension Home Economist, Boise; B.S.H.Ec., 1953, Baylor.

Warren K. Pope, 1947 (1962), Research Professor of Plant Sciences (Plant Genetics); B.S., 1940, Ph.D., 1948, California (Berkeley).

Glen H. Porter, 1968 (1971), Associate Professor of Physical Education (Biodynamics); B.S., 1962, Idaho; M.S., 1965, Illinois; Ph.D., 1968, Wisconsin.

Richard A. Porter, 1962 (1971), Associate Professor of Chemistry; B.S., 1954, Northwestern; Ph.D., 1959, California (Los Angeles).

Roland W. Portman, 1949 (1971), Extension Professor and Extension Entomologist, Moscow; B.S., 1937, Colorado State; M.S., 1940, Kansas State.

Clarence J. Potratz, 1966 (1972), Associate Professor of Mathematics; B.A., 1957, Pacific

Lutheran; M.S., 1959, Idaho; Ph.D., 1966, Washington State.

Gretchen L. Potter, 1966 (1972), Associate Professor of Home Economics (Art-Home Furnishings); B.S.H.Ec., 1939, Idaho; M.A.T., 1966, Washington State.

Robert E. Potter, 1969, Visiting Associate Professor of Special Education; B.A., 1954, Montana; M.A., 1958, Columbia; Ed.D., 1963, Oregon.

J. Dan Powell, 1970, Associate Professor of Geology; B.S., 1956, M.S., 1958, Texas Technological; Ph.D., 1961, Texas.

Mary R. Prescott, 1971 (1972), Assistant Professor of Guidance and Counseling; Student Counselor; B.A., 1966, Morningside; M.S., 1968, Ph.D., 1971, Iowa State.

***Donald A. Price,** 1970, Affiliate Professor of Animal Science, U.S. Sheep Experiment Station, U.S. Department of Agriculture, Dubois; B.S., 1947, Kansas State; M.S., 1949, Colorado State; Ph.D., 1957, Oregon State.

***Theodore J. Prichard,** 1926 (1942), Professor of Architecture and Department Head Emeritus (Head, Department of Art and Architecture, 1926-1967); B.A., 1925, Minnesota; M.Arch., 1944, Harvard. Emeritus since 1967.

***Wilmer G. Priest,** 1946 (1971), Associate Extension Professor and Jerome County Extension Agricultural Agent, Jerome; B.S.Ag., 1946, Idaho.

Robert C. Probasco, 1968 (1970), Assistant Professor of Music (History, Theory, Oboe); B.Mus., 1966, Michigan; M.Mus., 1968, Nebraska.

Raymond L. Proctor, 1965 (1971), Associate Professor of History (European History); B.S., 1960, Maryland; M.A., 1962, Ph.D., 1966, Oregon.

***Stephen R. Pulley,** 1970, Affiliate Professor of Accounting, NRTS, Idaho Falls; B.S., 1967, M.S., 1969, Utah State.

Jan M. Pyle, 1972, Catalog Librarian with rank of Assistant Professor; B.S., 1956, Lewis and Clark; M.A.L.S., 1966, Washington.

Fred W. Rabe, 1965 (1972), Associate Professor of Zoology; B.S., 1950, M.S., 1955, Colorado State; Ph.D., 1963, Utah.

***J. Milford Raeder,** 1921 (1955), Professor Emeritus of Plant Sciences (Plant Pathology); B.S., 1915, M.S., 1920, Iowa State. Emeritus since 1960.

Dale R. Ralston, 1970, Assistant Professor of Hydrogeology; Hydrogeologist; B.S.C.E., 1964, Oregon State; M.S.Hydrogeol., 1967, Arizona.

***Peter D. Randolph,** 1959, Affiliate Professor of Physics, NRTS, Idaho Falls; B.S., 1950, M.S., 1952, Ph.D., 1958, Michigan.

***Warren W. Rasmussen,** 1973, Affiliate Professor of Soil Sciences, Snake River Conservation Research Center, U.S. Department of Agriculture, Kimberly; B.S., 1948, M.S., 1953, Utah State.

James C. Ratchye, 1970, Assistant Professor of Military Science; B.A., 1965, Montana.

Donald E. Rathbone, 1968, Professor of Electrical Engineering; Department Chairman, 1968-; B.S.E.E., 1951, Purdue; M.S.E.E., 1956, Northwestern; Ph.D., 1962, Pittsburgh.

Elmer K. Raunio, 1949 (1961), Professor of Chemistry; Dean, College of Letters and Science, 1970-; B.S., 1940, Wyoming; M.S., 1942, North Dakota State; Ph.D., 1949, Michigan.

James R. Reece, 1970, Instructor in Foreign Languages and Literatures (German); B.A., 1966, Pacific Lutheran; M.A., 1968, Oregon.

Eugene E. Reed, 1960 (1964), Professor of Foreign Languages and Literatures (German); B.A., 1947, Texas Christian; M.A., 1950, Ph.D., 1953, Texas.

Willis W. Rees, 1969, Assistant Professor of Psychology; B.A., 1964, California State (Long Beach); M.A., 1966, Ph.D., 1968, Arizona.

***L. Eugene Reese,** 1961, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.S., 1959, Idaho State; M.S., 1961, Brigham Young.

Gerald E. Rehfeldt, 1967, Affiliate Professor of Forest Genetics, U.S. Forest Service, Moscow; B.S., 1963, Utah State; M.S., 1965, Ph.D., 1967, Wisconsin.

Donald F. Reid, 1969; Director of Development, 1971; B.A., 1947, Central Methodist; M.A., 1949, M.Div., 1951, Yale.

Rolland R. Reid, 1955 (1965), Professor of Geology; Dean, College of Mines, 1965-; Director, Idaho Bureau of Mines and Geology; Director, Idaho Mining Research Bureau, B.S., 1951, M.S., 1953, Ph.D., 1959, Washington.

John W. Reilly, 1971, Assistant Professor of Military Science; B.A., 1965, Youngstown State.

***Charles L. Renberg,** 1954 (1971), Associate Extension Professor and Bannock County Extension Agricultural Agent, Pocatello; B.S.Ag., 1952, M.S.Ag., 1954, Idaho.

Malcolm M. Renfrew, 1959, Professor of Chemistry; Department Head, 1967-; B.S., 1932, M.S., 1934, Idaho; Ph.D., 1938, Minnesota.

***Villa R. Rexford,** 1962-1964, 1965 (1971), Assistant Extension Professor and Gem County Extension Home Economist, Emmett; B.S., 1962, M.S., 1968, Oregon State.

Robert G. Reynolds, 1963 (1970), Associate Professor of Accounting; B.S.Bus., 1949, Denver; M.S.Bus., 1952, Illinois, C.P.A.

Robert J. Reynolds, 1969, Assistant Professor of Economics; B.S., 1965, Ph.D., 1970, Northwestern.

Charles W. Rice, Jr., 1965, Manager of User Services, Computer Services, 1971-; B.S., 1962, Illinois Institute of Technology; M.S., 1963, Bucknell; C.D.P.

David G. Rice, 1969, Assistant Professor of Anthropology; B.A., 1965, Washington; M.A., 1967, Ph.D., 1972, Washington State.

Thomas E. Richardson, 1972, Associate Professor of Education (Higher Education); Vice President for Student and Administrative Services, 1972-; B.S., 1962, Montana State; M.Mus., 1964, Indiana; Ph.D., 1968, Florida State.

***Kent D. Richert,** 1970, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.S., 1959, M.S., 1962, Kansas.

***Kimber O. Ricks,** 1967, Affiliate Professor of Business, NRTS, Idaho Falls; B.B.A., 1965, Idaho State; M.S., 1966, Utah.

Jack R. Ridley, 1966 (1972), Associate Professor of Native American Affairs; Director, Center for Native American Development, 1972-; B.S., 1961, M.S., 1963, Nevada; Ph.D., 1966, California (Davis).

Anthony L. Rigas, 1966 (1967), Associate Professor of Electrical Engineering; B.S.E.E., 1958, M.S.E.E., 1962, Kansas.

Samuel M. Riley, 1970, Instructor in English; B.A., 1964, Seattle; M.A., 1968, Washington.

***Eugene M. Rinebold,** 1952-1958, 1965 (1971), Assistant Extension Professor and Area Extension Potato Specialist, Twin Falls; B.S.Ag., 1951, Idaho.

***Margaret Ritchie,** 1938, Professor Emerita of Home Economics; B.S., 1918, M.A., 1930, Columbia. Emerita since 1966.

***Charles W. Robbins,** 1973, Affiliate Professor of Soil Sciences, Snake River Conservation Research Center, U.S. Department of Agriculture, Kimberly; B.S., 1966, Brigham Young; M.S., 1971, Utah State.

Howard A. Robbins, 1969, Instructor in Music (Percussion); B.A., 1963, Whitworth.

George H. Roberts, 1957 (1969), Professor of Art; Chairman, Art; B.S., 1954, M.S., 1955, Wisconsin.

***J. Daniel Roberts,** 1943 (1971), Extension Professor and Franklin County Extension Agricultural Agent, Preston; B.S.Ag., 1939, Idaho.

Lorin W. Roberts, 1957 (1967), Professor of Botany; B.S., 1948, M.A., 1950, Ph.D., 1952, Missouri.

William S. Roberts, 1955, Manager, Administrative Data Processing, 1970-; B.B.A., 1940, Minnesota; B.Ed., 1950, Washington State.

***Carl R. Robertson,** 1969, Affiliate Professor of Business, NRTS, Idaho Falls; B.S., 1964, M.S., 1966, Montana State.

Robert E. Rocheleau, 1970, Associate University Physician; M.D., 1965, Wayne State (Detroit).

Siegfried B. Rolland, 1952 (1964), Professor of Social Sciences and History (American History); B.A., 1941, M.A., 1947, Wayne State (Detroit); Ph.D., 1952, Wisconsin.

***R. Robert Romanko,** 1957 (1968), Associate Research Professor of Plant Sciences (Plant Pathology), Parma; B.S., 1953, New Hampshire; M.S., 1955, Delaware; Ph.D., 1957, Louisiana State.

Alan Rose, 1969, Instructor in Foreign Languages and Literatures (French); B.A., 1968, University of the South.

Richard H. Ross, 1947 (1953), Professor of Dairy Science; Dairy Scientist (Head, Department of Dairy Science, 1960-1970); B.S., 1938, Pennsylvania State; M.S., 1940, West Virginia; Ph.D., 1947, Pennsylvania State.

Arthur W. Rourke, 1972, Assistant Professor of Biology; A.B., 1964, Lafayette; Ph.D., 1970, Connecticut.

Alwyn R. Rouyer, 1970 (1971), Assistant Professor of Political Science; B.A., 1963, Southwestern Louisiana; M.A., 1966, Georgetown; Ph.D., 1971, Tulane.

Galen O. Rowe, 1971, Associate Professor of Foreign Languages and Literatures (Classics); B.A., 1959, David Lipscomb; Ph.D., 1963, Vanderbilt.

William D. Royalty, 1969, Assistant Professor of Mathematics; B.A., 1959, M.S., 1964, Ph.D., 1969, Iowa.

***Howard B. Roylance,** 1950 (1971), Associate Extension Professor and Extension Agronomist, Boise; B.S.Ag., 1938, M.S.Ag., 1940, Idaho.

George R. Russell, 1947 (1966), Professor of Civil Engineering; Assistant Dean, College of Engineering, 1967-; B.S.C.E., 1943, C.E., 1960, Idaho; P.E.

***Sheila D. Ryan,** 1972, Extension Instructor and Caribou County Extension Home Economist, Soda Springs; B.S., 1970, Whitworth.

Ronald L. Sack, 1970, Associate Professor of Civil Engineering; B.S., 1957, M.S.C.E., 1958, Ph.D., 1964, Minnesota.

***Merle R. Samson,** 1946-1952, 1954 (1971), Associate Extension Professor and Canyon County Extension Agricultural Chairman and Agent, Caldwell; B.S.Ag., 1941, Idaho.

Everett V. Samuelson, 1963, Professor of Education; Dean, College of Education, 1963-; Director, Bureau of Educational Research and Service; B.A., 1948, Southwestern (Kansas); M.S., 1951, Kansas State; Ed.D., 1958, Kansas.

Robert L. Sargent, 1967 (1972), Associate Professor of Agricultural Economics; Associate Extension Professor and Extension Economist, Moscow; B.S., 1950, M.S., 1963, Ph.D., 1965, Montana State.

R. Garth Sasser, 1967 (1972), Associate Professor of Dairy Science; Associate Dairy Sci-

entist; B.S.Ag., 1961, M.S.Ag., 1963, Idaho; Ph.D., 1968, California (Davis).

Erwin A. Sauter, Jr., 1956 (1967), Associate Research Professor of Poultry and Food Science; Associate Poultry and Food Scientist; B.S., 1950, M.S., 1952, Ph.D., 1966, Washington State.

Carleton N. Savage, 1957 (1966), Associate Professor of Geology; Senior Geologist; A.B., 1938, Colby; M.S., 1940, Northwestern.

Gary C. Schattschneider, 1969-1971, 1972 (1971), Assistant Professor of Theatre Arts; B.A., 1967, M.A., 1968, Saint Cloud State.

Jay J. Scheldorf, 1966, Associate Professor of Chemical Engineering and Engineering Science; B.S.Ch.E., 1953, Illinois; M.S.Ch.E., 1954, Kansas State; Ph.D., 1958, Colorado.

Stewart C. Schell, 1949 (1963), Professor of Zoology; Chairman, Zoology; B.S., 1939, Kansas State; M.S., 1941, North Carolina State; Ph.D., 1949, Illinois.

John A. Schenk, 1961 (1971), Professor of Forest Entomology; Forest Entomologist; B.S.F., 1950, Michigan; M.S., 1956, Ph.D., 1961, Wisconsin.

Richard W. Schermerhorn, 1971, Professor of Agricultural Economics; Department Head, 1971-; Agricultural Economist; B.S.Ag., 1958, M.S., 1959, Georgia; Ph.D., 1962, Oregon State.

***Beverly J. Schlegel,** 1971, Extension Instructor and Boundary County Extension Home Economist, Bonners Ferry; B.A., 1970, Fresno State.

Richard F. Schmitz, 1970, Affiliate Professor of Forect Entomology, U.S. Forest Service, Moscow; B.S., 1957, Wisconsin (Milwaukee); M.S., 1965, Oregon State.

***Richard E. Schmuck,** 1960, Affiliate Professor of Physics, NRTS, Idaho Falls; B.A., 1951, M.A., 1953, Miami; M.S., 1957, Ph.D., 1959, Case.

***Arthur P. Schneider,** 1969, Affiliate Professor of Veterinary Science, Idaho Bureau of Animal Industry, Boise; B.S., 1938, D.V.M., 1938, Washington State.

***Sterling W. Schow,** 1944 (1971), Extension Professor and Power County Extension Agricultural Agent, American Falls; B.S.Ag., 1939, Utah State.

***Agnes Crawford Schuldt,** 1927-1930, 1946 (1965), Professor Emerita of Music (Piano, Music Literature), and Visiting Professor of Interdisciplinary Studies; B.Mus., 1924, M.Mus., 1927, Syracuse. Emerita since 1967.

Ervin G. Schuster, 1972, Assistant Professor of Forestry (Recreation); B.S., 1964, M.S., 1966, Minnesota; M.S., 1970, Ph.D., 1971, Iowa State.

Robert L. Schuster, 1967, Professor of Civil Engineering (Soil Mechanics); Department Chairman, 1967-; B.S.Geol., 1950, Washington State; M.S.Geol., 1952, Ohio State; M.S.C.E., 1958, Purdue; Dipl. (Soil Mech.), 1965, Imperial College of Science and Technology (London); Ph.D., 1960, Purdue; P.E.

***Donald R. Scott,** 1956 (1972), Associate Research Professor of Entomology; Associate Entomologist, Parma; B.S., 1948, M.S., 1952, Nebraska.

Morton W. Scripter, 1971, Professor of Geography; Department Head, 1971-; B.S., 1962, Southern Oregon; M.S., 1964, Ph.D., 1967, Wisconsin.

***Lloyd H. Scrivner,** 1948, Professor of Veterinary Science and Department Head Emeritus (Head, Department of Veterinary Science; 1948-1967); D.V.M., 1929, Colorado; M.S., 1939, Cornell. Emeritus since 1967.

Robert H. Seale, 1949-1950, 1951 (1966), Professor of Forestry (Economics) (Associate Dean, College of Forestry, Wildlife and Range Sciences, 1965-1972); B.S., 1940, California (Berkeley); M.S.For., 1942, Idaho; Ph.D., 1965, State University College of Forestry (Syracuse, N.Y.).

Francis Seaman, 1949 (1970), Professor of Philosophy; Chairman, Philosophy; Director, General Studies Program; B.S., 1943, M.A., 1947, Ph.D., 1951, Michigan.

Forrest E. Sears, 1966 (1972), Associate Professor of Theatre Arts; B.A., 1955, Redlands; M.F.A., 1958, Yale.

Clarence I. Seely, 1947 (1955), Professor of Plant Sciences; Weed Scientist; B.S., 1933, M.S., 1935, Washington State.

Donald W. Seelye, 1959 (1965), Associate Professor of Labor Relations; A.B., 1950, Indiana.

David E. Seiler, 1963-1964, 1966 (1971), Associate Professor of Music (Band, Music Education, Clarinet); B.Mus., 1961, M.Mus., 1964, Wisconsin.

***Cecil R. Shaber,** 1970, Affiliate Professor of Industrial Safety, NRTS, Idaho Falls; B.S., 1944, M.S., 1948, Oklahoma A & M.

William H. Shane, 1969 (1971), Assistant Extension Professor and Extension Studies and Training Specialist, Moscow; B.S.Ed., 1959, M.Ed., 1962, Ed.Spec., 1964, Idaho.

***D. Wayne Sharp,** 1963 (1971), Assistant Extension Professor and Ada County Extension Agricultural Agent, Boise; B.S.Ag., 1963, Idaho.

Lee A. Sharp, 1949 (1967), Professor of Range Management; B.S., 1948, M.S., 1949, Utah State; Ph.D., 1966, Oregon State.

David B. Shaw, 1968 (1972), Assistant Professor of General Engineering; B.S.Ag.E., 1966, Idaho.

George W. Sheldon, 1971, Associate Professor of Statistics and Management; Chairman, Department of Business, 1973-; B.B.A., 1961, M.B.A., 1964, Ph.D., 1971, Massachusetts.

Stanley A. Shepard, 1951-1954, 1961 (1971), Associate Director of Libraries with rank of

Professor; B.A., 1947, B.S., 1948, Rutgers; M.S.L.S., 1951, Columbia.

***Theodore A. Sherman,** 1931 (1957), Professor Emeritus of English; B.A., 1924, Stanford; M.A., 1933, Idaho. Emeritus since 1966.

***David S. Short,** 1971, Extension Instructor and Boundary County Extension Manpower Agent, Bonners Ferry; B.S., 1942, Oregon State.

Jean'ne M. Shreeve, 1961 (1967), Professor of Chemistry; B.A., 1953, Montana; M.S., 1956, Minnesota; Ph.D., 1961, Washington.

Robert H. Shreve, 1966, Professor of Education (Administration); Ph.B., 1936, Lawrence; M.A., 1941, Ed.D., 1955, Northern Colorado.

Willma C. Shryack, 1950 (1971), Associate Extension Professor and Extension Home Furnishings Specialist, Moscow; B.A., 1937, Northern Colorado; M.H.Ec., 1958, Oregon State.

Georgia H. Shurr, 1972, Visiting Assistant Professor of Foreign Languages and Literatures (French); B.S., 1964, East Carolina; M.A., 1967, Ph.D., 1971, North Carolina.

Everett F. Sieckmann, 1962 (1967), Professor of Physics; B.A., 1950, Doane; M.S., 1952, Florida State; Ph.D., 1960, Cornell.

Peter L. Siems, 1965 (1972), Professor of Geology; B.Sc., 1957, London; D.Sc., 1967, Colorado School of Mines.

Henry W. Silha, 1941 (1955), Associate Professor of Mechanical Engineering; B.S.M.E., 1940, Montana State; M.S.M.E., 1950, Idaho.

***Roy E. Simonds,** 1970, Affiliate Professor of Business, NRTS, Idaho Falls; B.S., 1946, Virginia; M.S., 1969, Idaho.

***Gale G. Simons,** 1970, Affiliate Professor of Mechanical Engineering, NRTS, Idaho Falls; A.A., 1959, Pratt; B.S., 1962, M.S., 1965, Ph.D., 1968, Kansas State.

***Ferrol B. Simpson,** 1961, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.S., 1950, M.S., 1952, Utah State.

***Orval D. Simpson,** 1961, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.S., 1950, Utah State; M.S., 1952, Idaho.

***William R. Simpson,** 1949 (1970), Research Professor of Plant Sciences (Plant Pathology), Parma; B.S.Ag., 1949, M.S.Ag., 1951, Idaho.

***Gilbert L. Singer,** 1970, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.S., 1963, Illinois; M.S., 1966, Northern Illinois.

Teoman Sipahigil, 1970, Assistant Professor of English; B.A., 1961, Earlham; M.A., 1963, Miami (Ohio); Ph.D., 1970, California (Los Angeles).

John B. Sita, 1965 (1968), Associate Professor of Foreign Languages and Literatures (Spanish, Linguistics); Maturita Classica, 1931, Liceo Balbo; Laurea (Doctorate), 1936, Venice.

Lynn J. Skinner, 1971, Assistant Professor of Music (Music Education); B.S., 1962, M.Mus., 1966, Ed.D., 1970, Utah State.

H. Eugene Slade, 1942, Business Manager, 1971-; B.S.Bus., 1943, Idaho.

***Louise L. Slade,** 1944 (1972), Catalog Librarian Emerita with rank of Associate Professor; B.S., 1942, B.S.L.S., 1943, Denver. Emerita since 1972.

William P. Sloan, 1955 (1969), Professor of Architecture; B.Arch., 1948, Rensselaer; M.C.P., 1961, Yale.

Stanley E. Slyter, 1956 (1963), Instructor, Herdsman, and Research Associate in Animal Science; B.S., 1954, Kansas State; M.S.Ag., 1964, Idaho.

Charles J. Smiley, 1962 (1967), Professor of Geology; B.A., 1951, Western Washington State; M.A., 1954, Ph.D., 1960, California (Berkeley).

***Alan J. Smith,** 1970, Affiliate Professor of Business, NRTS, Idaho Falls; B.S., 1965, M.S., 1967, Utah.

H. Sidwell Smith, 1967, Professor of Civil Engineering (Sanitary Engineering); Dean, College of Engineering, 1967-; Director, Engineering Experiment Station; B.S.C.E., 1935, M.S.C.E., 1961, Iowa; Ph.D., 1963, Iowa State; P.E.

Howard W. Smith, 1954 (1959), Associate Professor of Entomology; Associate Entomologist; B.S., 1937, M.S., 1938, New Hampshire; Ph.D., 1950, Ohio State.

James W. Smith, 1970, Visiting Assistant Professor of Architecture; B.Arch., 1970, M.S., 1970, California (Berkeley).

***Jay H. Smith,** 1969, Affiliate Professor of Soils, Snake River Conservation Research Station, U.S. Department of Agriculture, Kimberly; B.S., 1951, Brigham Young; M.S., 1953, Utah State; Ph.D., 1955, Cornell.

***LaMont Smith,** 1955 (1971), Associate Extension Professor and Minidoka County Extension Agricultural Agent, Rupert; B.S.Ag., 1951, M.Ag., 1968, Idaho.

Lewis B. Smith, 1967 (1970), Associate Professor of Education (Elementary Education); A.B., 1952, Hiram; M.Ed., 1957, Kent State; Ph.D., 1967, Wisconsin.

Richard R. Smith, 1967 (1970), Assistant Professor of Industrial Education; B.S.Ed., 1967, M.S.Ed., 1969, Idaho.

***Rosa Smith,** 1961 (1971), Assistant Extension Professor and Idaho County Extension Home Economist, Grangeville; B.S.H.Ec., 1956, Kansas State.

***Vance T. Smith,** 1941-1944, 1945 (1971), Extension Professor and Teton County Extension Agricultural Agent, Driggs; B.S.Ag., 1939, Idaho; M.S., 1941, Washington State.

Hervon L. Snider, 1949 (1953), Professor of Education; Associate Dean, College of Edu-

cation, 1970-; B.S.Ed., 1941, M.A., 1947, Ph.D., 1949, Nebraska.

***John A. Snider,** 1949 (1954), Professor Emeritus of Education (Elementary Education); B.S.Ed., 1930, M.S.Ed., 1938, Oklahoma; Ed.D., 1949, Colorado. Emeritus since 1968.

William H. Snyder, 1956 (1972), Professor of Landscape Architecture; B.S., 1948, South Dakota State; M.S., 1950, Illinois; M.L.A., 1970, California (Berkeley); M.F.A., 1972, Idaho.

***Charles W. Solbrig,** 1970, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.S.M.E., 1960, M.S., 1962, Ph.D., 1966, Illinois Institute of Technology.

Yogendra Soni, 1972, Instructor in Chemical Engineering; B.S., 1965, Delhi; M.S., 1972, Idaho.

Peet M. Soot, 1972, Visiting Assistant Professor of Chemical Engineering; B.S., 1966, Ph.D., 1970, Oregon State.

Kenneth M. Sowles, 1969 (1972), Associate Professor of Wood Utilization and Marketing; B.S.F., 1961, Northern Arizona; M.S., 1972, Idaho.

Richard J. Spangler, 1968, Assistant Professor of Chemistry; B.S., 1962, Wyoming; Ph.D., 1967, Wayne State (Detroit).

***Walter C. Sparks,** 1947 (1968), Research Professor of Plant Sciences (Plant Physiology), Aberdeen; B.S., 1941, M.S., 1943, Colorado State.

Robert J. Spevacek, 1968 (1970), Assistant Professor of Music (Band, Music Education, Low Brass); B.Mus., 1959, M.Mus., 1964, Wisconsin.

Ruth W. Spidahl, 1971, Extension Professor and State Extension Home Economics Leader, Moscow; B.S., 1947, Minnesota; M.S., 1965, North Dakota State.

***Emmet E. Spiker,** 1946 (1963), Assistant Professor Emeritus of Physics (Electron Microscopist); B.S., 1933, Idaho. Emeritus since 1966.

***H. Larry Spilker,** 1970, Affiliate Professor of Business, NRTS, Idaho Falls; B.S., 1965, J.D., 1968, Utah.

George G. Spomer, 1972, Associate Professor of Botany (Ecological Physiology); B.S., 1959, M.S., 1961, Ph.D., 1962, Colorado State.

Roderick Sprague, 1967 (1972), Professor of Anthropology; Head, Department of Sociology/Anthropology, 1968-; B.A., 1955, M.A., 1959, Washington State; Ph.D., 1967, Arizona.

***Floyd W. Spraktes,** 1964, Affiliate Professor of Metallurgy, NRTS, Idaho Falls; B.S.Met.E., 1952, Idaho.

Robert E. Sprecher, 1970, Assistant Professor of Trade-Technical Education; Chairman, Department of Vocational Teacher Education, 1972-; B.S., 1967, Kansas State (Pittsburg); M.Ed., 1968, Ph.D., 1970, Missouri.

Albert R. Stage, 1962, Affiliate Professor of Forest Management, U.S. Forest Service, Moscow; B.S., 1951, M.F., 1952, M.S., 1961, Ph.D., 1966, Michigan.

***William W. Staley,** 1928 (1945), Professor Emeritus of Mining Engineering; B.S.Min.E., 1925, New Mexico Institute of Mining and Technology; M.S.Met., 1929, Idaho; E.M., 1932, New Mexico Institute of Mining and Technology. Emeritus since 1966.

***Beatrice Stalker,** 1959 (1971), Associate Extension Professor and Ada County Extension Home Economist, Boise; B.S.H.Ec., 1930, Idaho.

Gilbert F. Stallknecht, 1968, Assistant Research Professor of Plant Sciences (Plant Physiology), Aberdeen; B.S., 1962, M.S., 1966, Ph.D., 1968, Minnesota.

Theodore E. Stanton, 1971, Assistant Professor of Journalism; B.A., 1951, Colgate; M.S., 1952, Columbia.

Ronald W. Stark, 1970, Professor of Forestry and Entomology; Coordinator of Research; Dean, Graduate School, 1970-; B.S., 1948, M.A., 1951, Toronto; Ph.D., 1958, British Columbia.

Erik H. Stauber, 1970, Assistant Professor of Veterinary Science; Assistant Veterinarian; D.V.M., 1966, Purdue.

Elias K. Stefanakos, 1968 (1972), Associate Professor of Electrical Engineering; B.S.E.E., 1964, M.S.E.E., 1965, Ph.D., 1969, Washington State.

***H. Walter Steffens,** 1929 (1947), Professor of Zoology and Academic Vice President Emeritus (Dean, Graduate School, 1951-1953; Executive Dean, 1953-1961; Academic Vice President, 1961-1969); B.S., 1929, M.S., 1930, Idaho; Ph.D., 1940, Harvard; LL.D., 1969, Idaho. Emeritus since 1969.

Raphael J. Steinhoff, 1965, Affiliate Professor of Forest Genetics, U.S. Forest Service, Moscow; B.S.For., 1959, Idaho; M.S., 1961, North Carolina State; Ph.D., 1964, Michigan State.

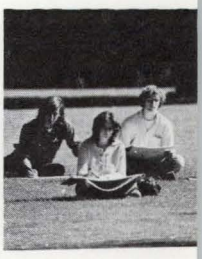
M. William Stellmon, 1964 (1971), Associate Professor of Agricultural Information; Associate Extension Professor; Agricultural Editor, 1971-; B.A., 1951, Montana; M.Ed., 1971, Idaho.

***Dorothy N. Stephens,** 1939 (1966), Extension Professor and State Home Economics Leader Emerita; B.S.H.Ec., 1930, Idaho; M.S., 1932, New York. Emerita since 1970.

***Gordon R. Stephenson,** 1965, Affiliate Professor of Geology, Northwest Watershed Research Center, U.S. Department of Agriculture, Boise; B.S., 1957, Augustana (Ill.); M.S., 1961, Washington State.

Emsley H. Stevens, 1969 (1972), Associate Professor of Electrical Engineering; B.S., 1961, M.S., 1963, Ph.D., 1970, Washington.

Elizabeth E. Stevenson, 1966 (1972), Associ-



ate Professor of Foreign Languages and Literatures (French); Assistant Dean, College of Letters and Science, 1971-; B.A., 1935, Vassar; Ph.D., 1939, Yale; M.A., 1969, Trinity.

Robert I. Stevenson, 1966, Professor of Law; B.A., 1934, LL.B., 1937, Yale.

Richard B. Stewart, 1969, Professor of Mechanical Engineering; Department Chairman, 1969-; B.S.M.E., 1946, M.S.M.E., 1948, Iowa; M.E., 1959, Colorado; Ph.D., 1966, Iowa; P.E.

Shannon L. Stewart, 1971, Instructor in English; B.A., 1955, M.A., 1971, Washington State.

***Edward S. Stimson,** 1947, Professor of Law and Dean Emeritus (Dean, College of Law, 1947-1962); A.B., 1920, B.S., 1920, A.M., 1922, Ohio State; J.D., 1927, S.J.D., 1932, Michigan. Emeritus since 1965.

Leo F. Storm, 1969, Professor of English; Department Chairman, 1969-; B.A., 1949, Washington; M.A., 1950, Edinburgh; Ph.D., 1958, Washington.

***Howard B. Stough,** 1925 (1930), Professor Emeritus of Zoology; A.B., 1907, Midland Lutheran; M.A., 1909, Kansas; Ph.D., 1925, Harvard. Emeritus since 1958.

***Clyde H. Stranahan,** 1943 (1971), Extension Professor and Kootenai County Extension Agricultural Agent, Coeur d'Alene; B.S.Ag., 1940, Idaho.

Charles R. Stratton, 1971, Assistant Professor of English; B.S., 1960, Carroll; M.S., 1968, Rensselaer; Ph.D., 1971, Wisconsin.

***Ben W. Studer,** 1960 (1971), Associate Extension Professor and Boundary County Extension Agricultural Agent, Bonners Ferry; B.S.Ag., 1958, Idaho.

***William J. Suitt,** 1970, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.S., 1964, Arkansas Polytechnic; M.S., 1967, South Dakota School of Mines and Technology.

John H. Sullivan, 1966 (1970), Associate Professor of Foreign Languages and Literatures (German); B.A., 1949, Oregon; M.A., 1951, Johns Hopkins; Ph.D., 1966, California (Berkeley).

Ping-Tsoong Sun, 1957 (1966), Associate Professor of Engineering Science and Civil Engineering (Statistics); B.S.M.E., 1937, Chiao-Tung; M.S.M.E., 1950, Tennessee; P.E.

***Donald W. Sunderman,** 1969, Affiliate Professor of Plant Sciences (Plant Breeding), U.S. Department of Agriculture, Aberdeen; B.S., 1950, M.S., 1951, Ph.D., 1960, Minnesota.

Robert L. Surles, 1972, Instructor in Foreign Languages and Literatures (Spanish); B.A., 1967, M.A., 1969, San Diego State.

Barry G. Swanson, 1972, Assistant Professor of Food Science; Assistant Food Scientist; B.S., 1966, M.S., 1970, Ph.D., 1972, Wisconsin.

***Elizabeth S. Sweeten,** 1970 (1971), Extension Instructor and Oneida County Extension Home Economist, Malad; B.S., 1958, Brigham Young.

***Howard C. Tankersley,** 1960 (1971), Associate Extension Professor and Community Resources and Development Leader, Boise; B.S.Ag., 1956, Idaho; M.S., 1970, Oregon.

Stephen L. Tanner, 1969, Assistant Professor of English; B.A., 1962, M.A., 1964, Utah; Ph.D., 1969, Wisconsin.

***Eugene Taylor,** 1920, Professor Emeritus of Mathematics; A.B., 1907, M.A., 1909, DePauw. Emeritus since 1950.

Roy E. Taylor, 1968 (1971), Assistant Extension Professor and Extension Agricultural Engineer, Moscow; B.S.Ag.E., 1948, Idaho; M.T.Sc., 1966, Idaho State.

Matt E. Telin, 1968, Registrar, 1970-; B.S., 1958, Western Montana; M.Ed., 1972, Idaho.

***William H. Tenney,** 1949, Associate Professor Emeritus of English; B.A., 1929, M.A., 1931, Oberlin; Ph.D., 1944, Michigan. Emeritus since 1971.

George W. Teresa, 1968, Associate Professor of Bacteriology; Associate Bacteriologist; B.S., 1952, Arkansas A & M; M.S., 1955, Arkansas; Ph.D., 1959, Kansas State.

David L. Thacker, 1954 (1968), Assistant Research Professor of Dairy Science; Assistant Dairy Scientist, Moscow; B.S.Ag., 1950, Idaho; M.S.Ag., 1952, Pennsylvania State.

***Wayne L. Thiessen,** 1962-1965, 1967 (1968), Assistant Research Professor of Soil Sciences; Assistant Extension Professor, Twin Falls; B.S.Ag., 1962, M.S.Ag., 1965, Idaho.

Charles M. Thomas, 1959 (1971), Associate Extension Professor and District Extension Area 4-H Specialist, Moscow; B.S.Ag., 1959, Idaho; M.Ex., 1971, Washington State.

Joe E. Thomas, 1961-1962, 1966 (1970), Associate Professor of Electrical Engineering; B.S.E.E., 1960, Wyoming; M.S.E.E., 1962, Idaho; Ph.D., 1970, Denver; P.E.

Stanley W. Thomas, 1954, Affiliate Professor of Religious Studies, Idaho School of Religion, Moscow; B.A., 1947, Maine; S.T.B., 1950, Ph.D., 1960, Boston.

Charles J. Thompson, 1965 (1968), Assistant Professor of Physical Education; Supervisor, Service Program; B.S.P.E., 1962, Wisconsin State (La Crosse); M.S.P.E., 1965, Indiana.

***Larry G. Thompson,** 1971, Affiliate Professor of English, NRTS, Idaho Falls; B.A., 1965, M.A., 1967, Brigham Young.

***Victor N. Thompson,** 1970, Affiliate Professor of Business, NRTS, Idaho Falls; B.S.E.E., 1959, North Dakota State; M.S., 1970, Idaho.

William J. Thomson, 1968 (1972), Associate Professor of Chemical Engineering; B.Ch.E.,

1960, Pratt; M.S., 1961, Stanford; Ph.D., 1969, Idaho.

B. S. Thyagarajan, 1968, Professor of Chemistry; M.A., 1950, M.Sc., 1953, Ph.D., 1956, Madras.

Charles M. Tinder, 1971, Visiting Assistant Professor of Architecture; B.Arch., 1964, Illinois; M.Arch., 1965, Washington.

***Fred H. Tingey,** 1954, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.S., 1947, Utah State; M.S., 1949, Ph.D., 1951, Washington.

Edwin W. Tisdale, 1947 (1953), Professor of Range Management; Associate Director, Forest, Wildlife and Range Experiment Station; B.Sc., 1930, Manitoba; M.S., 1945, Ph.D., 1948, Minnesota.

***Paul J. Torell,** 1957 (1968), Associate Research Professor of Plant Sciences (Weed Science), Parma; B.S.Ag., 1952, M.S.Ag., 1954, Idaho.

***Devere Tovey,** 1938-1943, 1959 (1971), Assistant Extension Professor and Franklin County Extension Agricultural Agent, Preston; B.S.Ag., 1937, Idaho.

Weldon R. Tovey, 1962-1964, 1965 (1971), Associate Professor of General Engineering; Assistant Dean, College of Engineering, 1971-; B.S.M.E., 1961, M.Ed., 1964, Idaho; Ed.D., 1971, Brigham Young.

Dennis B. Trimble, 1972, Assistant Professor of Business; B.A., 1971, M.B.A., 1972, Washington State.

***Robert Tripp,** 1972, Affiliate Professor of Business, NRTS, Idaho Falls; B.S., 1942, Cincinnati; M.B.A., 1972, Idaho.

***Clifford M. Trump,** 1971, Affiliate Professor of Education, Southwest Regional Director of Continuing Education, Office of Higher Education, Boise; B.A., 1959, Kearney State; M.A., 1966, Arizona State; Ed.D., 1970, Wyoming.

***Charles M. Tschanz,** 1972, Affiliate Professor of Geology, U.S. Geological Survey, Denver, Colo.; B.S., 1949, Idaho; M.S., 1951, Stanford.

Mason Tung, 1962 (1970), Professor of English; B.A., 1951, Taiwan; M.A., 1958, Baylor; Ph.D., 1962, Stanford.

Robert L. Turner, 1957 (1966), Associate Professor of General Engineering; B.S.Ed., 1958, M.Ed., 1960, Idaho.

***Fenton H. Tyler,** 1972, Affiliate Professor of Business, NRTS, Idaho Falls; B.S., 1967, Brigham Young; M.S., 1972, Idaho.

Edmund E. Tylutki, 1956 (1963), Associate Professor of Botany; Director, National Science Foundation Summer Institute; B.S., 1951, M.S., 1952, Illinois; Ph.D., 1955, Michigan State.

***William S. Updegrove,** 1971, Affiliate Professor of Biophysics, NRTS, Idaho Falls; B.S., 1959, Pennsylvania State; Ph.D., 1970, Houston.

Glen G. Utzman, 1964, Lecturer in Accounting; B.A., 1961, Washington State; J.D., 1964, Idaho.

Phyllis M. Van Horn, 1972, Instructor in Foreign Languages and Literatures; Assistant Foreign Student Advisor; B.A., 1965, Austin; M.S., 1972, Idaho.

James K. VanLeuven, 1970, Assistant Professor of Journalism; B.S., 1964, M.S., 1966, Oregon.

***Carl G. Van Slyke,** 1970 (1971), Assistant Extension Professor and Bingham County Extension Agricultural Agent, Blackfoot; B.S.Ag., 1967, Idaho; M.S., 1970, Purdue.

Herbert J. Vent, 1960 (1965), Professor of Education (Elementary Education); B.S., 1941, M.S.Geog., 1942, Oregon; Ed.D., 1949, Stanford.

***Edward K. Vernon,** 1971, Affiliate Professor of Economics, NRTS, Idaho Falls; B.S., 1961, M.S., 1968, Brigham Young.

Dean L. Vettrus, 1961, General Manager, ASUI and Student Union Operations; B.S., 1961, B.A., 1961, Denver.

Norman Vieira, 1965 (1968), Professor of Law; A.B., 1959, Columbia; J.D., 1963, Chicago.

***Glenn E. Vogt,** 1969 (1971), Assistant Extension Professor and Extension Area Potato Specialist, Idaho Falls; A.A., 1962, North Idaho; B.S., 1964, California (Davis); M.S., 1966, Wisconsin.

Jack R. Voorhees, 1969, Professor of Naval Science; Department Head, 1969-; B.S., 1958, Washington; M.A., 1964, George Washington.

William L. Voxman, 1970 (1972), Associate Professor of Mathematics; B.A., 1960, M.S., 1964, Ph.D., 1968, Iowa.

Chien M. Wai, 1969, Assistant Professor of Chemistry and Geology (Geochemistry); B.S., 1960, Taiwan; Ph.D., 1967, California (Irvine).

Lily C. Wai, 1970, General Librarian with rank of Instructor; B.A., 1960, Tunghai (Taiwan); M.S., 1965, Illinois.

***Donald G. Waldhalm,** 1960 (1968), Associate Research Professor of Veterinary Science and Veterinary Microbiology, Caldwell; B.A., 1948, M.S., 1950, Minnesota; Ph.D., 1953, Illinois.

***Thomas R. Walenta,** 1947 (1953), Professor Emeritus of Law; B.S., 1926, Idaho; LL.B., 1933, Minnesota; LL.M., 1953, S.J.D., 1960, Illinois. Emeritus since 1967.

Delbert J. Walker, 1950 (1963), Associate Professor of Mathematics; A.B., 1935, Nebraska State; M.A., 1947, Nebraska.

***Deward E. Walker, Jr.,** 1967-1969, 1971, Affiliate Professor of Anthropology, Univer-

sity of Colorado; B.A., 1961, Ph.D., 1964, Oregon.

Diane B. Walker, 1968, Assistant Professor of Physical Education (Dance); Director, Center for Dance; B.F.A., 1960, Boston Conservatory; M.Ed., 1968, Colorado State.

***Helen L. Walker,** 1969, Affiliate Professor of Food Science, Washington State Dairy Council, Spokane, Wa.; B.A., 1947, Montana.

***Norman L. Walker,** 1969 (1971), Extension Instructor and Jefferson County Extension Agricultural Agent, Rigby; B.S.Ag., 1955, Idaho.

Alfred T. Wallace, 1967 (1971), Professor of Civil Engineering (Sanitary Engineering); B.S., 1959, Rutgers; M.S., 1960, Ph.D., 1965, Wisconsin; P.E.

Richard L. Wallace, 1967 (1969), Assistant Professor of Zoology; B.S., 1956, Washington State; M.S., 1961, Ph.D., 1969, Oregon State.

William M. Wallace, 1970, Assistant Science/Technology Librarian with rank of Instructor; B.S., 1968, Portland State; M.L.S., 1970, Oregon.

Roger P. Wallins, 1970, Assistant Professor of English; A.B., 1962, City College of New York; M.A., 1964, Ph.D., 1972, Ohio State.

T. Helaine Walsh, 1972, Instructor in Geology; B.S., 1969, Florida State; M.S., 1971, Montana State.

Charles W. Walton, 1961 (1969), Associate Professor of Music (Opera, History, Voice); B.Mus., 1956, M.Mus., 1961, Michigan.

***Arthur J. Walz,** 1948-1956, 1967 (1971), Associate Extension Professor and Area Extension Potato Specialist, Caldwell; B.S., 1942, M.S., 1948, California (Berkeley).

Chi-Wu Wang, 1960 (1967), Professor of Forestry (Genetics); B.S., 1933, National Tsing Hua (Peking); M.S., 1947, Yale; Ph.D., 1953, Harvard.

Ya-Yen Wang, 1960 (1972), Associate Professor of Mathematics; Analyst, Computer Services; B.S., 1956, Villa Maria; M.S., 1958, Florida; Ph.D., 1965, Idaho.

***Laron C. Warner,** 1946, Purchasing Agent Emeritus. Emeritus since 1965.

Richard E. Warner, 1966, Professor of Mechanical Engineering; Associate Director, Engineering Experiment Station; A.B., 1942, Miami; M.Sc.Ch.E., 1948, Ph.D., 1951, Ohio State; P.E.

Calvin C. Warnick, 1947 (1957), Professor of Civil Engineering (Water Resources); Director, Water Resources Research Institute; B.S.C.E., 1943, Utah State; M.S.C.E., 1947, Wisconsin; P.E.

***Daniel E. Warren,** 1929, Extension Professor and State 4-H Club Leader Emeritus; B.S., 1927, Idaho. Emeritus since 1968.

Jon G. Warren, 1966, Lecturer in Law; University Attorney; J.D., 1966, Idaho.

Richard I. Washburn, 1970, Affiliate Professor of Forest Entomology, U.S. Forest Service, Moscow; B.S., 1948, M.S., 1950, Colorado State.

Norman D. Waters, 1957 (1968), Assistant Research Professor of Entomology, A.A., 1948, Sacramento State; M.S., 1949, Ph.D., 1955, California (Berkeley).

Roscoe D. Watson, 1945 (1971), Professor of Plant Sciences; Plant Pathologist; B.S., 1935, M.S., 1937, Utah State; Ph.D., 1942, Cornell.

Fredrick J. Watts, 1968, Associate Professor of Civil Engineering (Hydraulics, Fluids, Water Resources); B.S.C.E., 1954, Iowa State; M.S.C.E., 1964, Ph.D., 1968, Colorado State; P.E.

***Joseph W. Watts,** 1940, Business Manager and Bursar Emeritus (Business Manager, 1961-1971; Bursar, 1967-1971); B.S.Bus., 1940, Idaho. Emeritus since 1971.

James B. Weatherby, 1972, Research Instructor in Political Science; Assistant Director, Bureau of Public Affairs Research; B.A., 1966, Northwest Nazarene; M.A., 1968, Idaho.

Charles A. Webbert, 1948 (1969), Head, Department of Special Collections and Archives, University Library, with rank of Associate Professor; B.A., 1937, Washington; B.S.L.S., 1940, George Peabody; M.S.L.S., 1947, Illinois.

***Gus A. Weibe,** 1969, Affiliate Professor of Agronomy, Collaborator, retired, U.S. Department of Agriculture Branch Experiment Station, Aberdeen; B.S.Ag., 1922, Idaho; M.S., 1925, Ph.D., 1933, California (Berkeley); D.Sc., 1969, Idaho.

***Edith S. Weighall,** 1971, Extension Instructor and Extension Home Economist for Madison and Teton Counties, Rexburg; B.S., 1971, Brigham Young.

Grant D. Wells, 1972, Assistant Professor of Agricultural Engineering; Assistant Agricultural Engineer; B.S., 1959, Michigan State; M.S., 1962, Cornell; Ph.D., 1972, Michigan State.

***Wade G. Wells,** 1934 (1971), Extension Professor and Extension Animal Scientist, Boise; B.S.Ag., 1939, Idaho.

***J. Frederick Weltzin,** 1944, Professor of Education and Dean Emeritus (Dean, College of Education, 1944-1963); B.A., 1925, B.S.Ed., 1925, M.S.Ed., 1927, Ph.D., 1929, Hum.D., 1958, North Dakota. Emeritus since 1967.

Richard F. Werner, 1971, Instructor in Music (Theory, Trumpet); B.Mus.Ed., 1968, M.A., 1970, Denver.

***Darrell Wesenberg,** 1969, Affiliate Professor of Plant Sciences (Plant Breeding), U.S. Department of Agriculture, Aberdeen; B.S., 1962, M.S., 1965, Ph.D., 1968, Wisconsin.

Arnold S. Westerlund, 1944 (1970), Professor of Art; B.A., 1938, M.A., 1939, Idaho.

***Dale T. Westermann,** 1970, Affiliate Professor of Soils, Snake River Conservation Research Center, U.S. Department of Agriculture, Kimberly; B.S., 1963, Colorado State; M.S., 1965, Ph.D., 1968, Oregon State.

***Milton B. Weston,** 1944 (1971), Associate Extension Professor and Bingham County Extension Agricultural Agent, Blackfoot; B.S., 1932, Utah State.

David L. Wetherell, 1971, Assistant Professor of Naval Science; B.S., 1965, Nebraska.

***Bert R. Wheeler,** 1971, Affiliate Professor of Nuclear Engineering, NRTS, Idaho Falls; B.S., 1952, Utah State; M.S., 1955, Purdue.

***Donald R. White,** 1968 (1971), Assistant Extension Professor and Kootenai, Bonner, and Benewah Counties Extension Farm Forester, Coeur d'Alene; A.B., 1953, Colby; B.S., 1958, Oregon State.

Richard S. White, 1972, Assistant Professor of Range Management; B.S., 1966, Humboldt State; M.S., 1968, Texas Tech.

***Albert E. Whitehead,** 1930 (1955), Professor Emeritus of Speech (Chairman, Speech, 1947-1972); B.A., 1929, Colorado; M.A., 1930, Ph.D., 1944, Wisconsin. Emeritus since 1972.

Robert H. Whiting, 1971, Instructor in Electrical Engineering; B.S.E.E., 1967, Idaho; M.S.E.E., 1968, Stanford.

Ed F. Wicker, 1963, Affiliate Professor of Forest Pathology, U.S. Forest Service, Moscow; B.S., 1959, Ph.D., 1965, Washington State.

***Charlene J. Wicks,** 1972, Extension Instructor and Minidoka County Extension Home Economist, Rupert; B.S., 1972, Montana State.

Alvin C. Wiese, 1946, Professor of Biochemistry; Biochemist (Head, Department of Agricultural Biochemistry and Soils, 1946-1972); B.S., 1935, M.S., 1937, Ph.D., 1940, Wisconsin.

***Ned Wilde,** 1961, Affiliate Professor of Electrical Engineering, NRTS, Idaho Falls; B.S., 1949, Milwaukee School of Engineering; M.S., 1951, Wisconsin.

***Willard J. Wilde,** 1924 (1945), Professor Emeritus of Accounting; B.S., 1923, Utah; M.S., 1924, California (Berkeley); C.P.A. Emeritus since 1964.

James D. Willett, 1968, Assistant Professor of Chemistry; A.B., 1959, California (Berkeley); Ph.D., 1965, Massachusetts Institute of Technology.

George A. Williams, 1957 (1965), Professor of Geological Engineering; Head, Department of Geology, 1965-; B.S., 1943, Texas (El Paso); Ph.D., 1951, Arizona.

Larry G. Williams, 1956 (1968), Associate Professor of Agricultural Engineering; Associate Agricultural Engineer; B.S.Ag.E., 1956, M.S.Ag.E., 1959, Idaho; P.E.

***Lewis M. Williams,** 1934, Extension Professor Emeritus (Jefferson County Extension Agricultural Agent, 1934-1950; District Extension Agent Supervisor, 1950-1967); B.S., 1925, Idaho. Emeritus since 1967.

Roy E. Williams, 1966 (1970), Professor of Hydrogeology; Hydrogeologist; B.S., 1961, M.A., 1962, Indiana; Ph.D., 1966, Illinois.

Henry Willmes, 1969, Assistant Professor of Physics; B.S., 1961, M.A., 1962, Ph.D., 1966, California (Los Angeles).

Esther H. Wilson, 1963 (1971), Associate Extension Professor and Extension Nutritionist, Moscow; B.S., 1936, Framingham State; M.S., 1949, Washington State.

***Jesse Wilson,** 1962 (1971), Associate Extension Professor and Canyon County Extension Agricultural Agent, Caldwell; B.S.Ag., 1961, Idaho.

Robert O. Winchester, 1970, Assistant Professor of Aerospace Studies; B.S.Nuc.Engr., 1965, Wyoming; M.S.Nuc.Engr., 1969, Air Force Institute of Technology.

***Bob V. Winkel,** 1971, Affiliate Professor of Civil Engineering, NRTS, Idaho Falls; B.S., 1965, Brigham Young; M.S., 1967, Ph.D., 1970, Colorado.

Fred H. Winkler, 1955 (1969), Professor of History and Political Science; A.A., 1943, A.B., 1947, M.A., 1948, Florida; Ph.D., 1957, Northwestern.

***Herbert A. Winner,** 1939 (1946), Professor of Agricultural Education and Department Head Emeritus (Head, Department of Agricultural Education, 1945-1968); B.S., 1927, Montana State; M.S., 1939, Iowa State. Emeritus since 1968.

***Ralph M. Wise,** 1960, Associate Research Professor Emeritus of Agricultural Biochemistry; B.S., 1928, McPherson. Emeritus since 1972.

Russell V. Withers, 1961 (1972), Professor of Agricultural Economics; Agricultural Economist; B.S., 1957, M.S., 1958, Utah State; Ph.D., 1962, Cornell.

***Ernest W. Wohletz,** 1937 (1949), Professor of Forestry and Dean Emeritus (Dean, College of Forestry, Wildlife and Range Sciences and Director, Forest, Wildlife and Range Experiment Station, 1953-1971); B.S., 1930, M.S., 1947, California (Berkeley). Emeritus since 1972.

Virginia Wolf, 1964, Assistant Professor of Physical Education; B.A., 1946, Earlham; M.S., 1950, Colorado.

***Mary L. Wood,** 1964 (1971), Assistant Extension Professor and Extension 4-H Specialist, Boise; B.S.Ag., 1953, Fresno State.

***George W. Woodbury,** 1935-1943, 1948 (1949), Professor Emeritus of Horticulture;

B.S., 1927, M.S., 1931, Michigan State; Ph.D., 1943, Cornell. Emeritus since 1969.

***Kathryn S. Woodbury,** 1953 (1962), Instructor Emerita in Foreign Languages; B.A., 1924, Elmira; M.A., 1930, Maine. Emerita since 1968.

Dennis E. Woodruff, 1966, Instructor and Research Associate in Food Science; B.S.Ag., 1966, Idaho.

Charles J. Woolson, 1971, Assistant Dean for Student Advisory Services; B.S., 1965, Michigan State; M.A., 1970, Central Michigan.

Edward C. Woolums, 1962 (1967), Associate Professor of Education; B.A., 1953, Ed.M., 1955, Ed.D., 1966, Colorado.

***Ruby A. Wortham,** 1947 (1957), Professor Emerita of Zoology; B.S., Oklahoma City; M.S., Michigan; Ph.D., Washington State. Emerita since 1964.

George T. Wray, 1969 (1970), Assistant Professor of Art; B.S., 1963, Moorhead State; M.F.A., 1969, California College of Arts and Crafts.

Larry K. Wriggle, 1965 (1969), Associate Professor of Education; B.A., 1954, M.Ed., 1960, Eastern Washington State; Ed.D., 1964, Washington State; M.F.A., 1971, Idaho.

***James L. Wright,** 1969, Affiliate Professor of Soils, Snake River Conservation Research Center, U.S. Department of Agriculture, Kimberly; B.S., 1959, M.S., 1961, Utah State; Ph.D., 1965, Cornell.

Lin-Yi Chin Wu, 1969, Instructor in Foreign Languages and Literatures (French); B.A., 1956, Peking; M.A., 1969, Washington State.

Ronald C. Wyse, 1972, Associate Professor of Law; B.A., 1960, J.D., 1965, California (Los Angeles).

***Stanley Yamamura,** 1961, Affiliate Professor Chemistry, NRTS, Idaho Falls; B.A., 1953, Hawaii; M.S., 1955, Ph.D., 1957, Iowa State.

William D. Yanaros, 1971, Assistant Professor of Naval Science; B.A., 1967, Michigan State.

***Bennie D. Yates,** 1969, Affiliate Professor of Mathematics, NRTS, Idaho Falls; B.S., 1967, M.S., 1968, Wyoming.

***Lawrence J. Ybarrondo,** 1969, Affiliate Professor of Mechanical Engineering, NRTS, Idaho Falls; B.S., 1960, Detroit; M.S., 1962, Northwestern; Ph.D., 1964, Georgia Institute of Technology.

***R. Aaron York,** 1947 (1971), Associate Extension Professor and Butte County Extension Agricultural Agent, Arco; B.S.Ag., 1947, Idaho.

Frank Young, 1947 (1950), Associate Professor of Physical Education; Director of Admissions, 1960-; B.S., 1937, Jamestown; M.S., 1947, Oregon.

***Willis R. Young,** 1971, Affiliate Professor of Nuclear Engineering, NRTS, Idaho Falls; A.B., 1959, M.S., 1962, Ph.D., 1965, California (Berkeley).

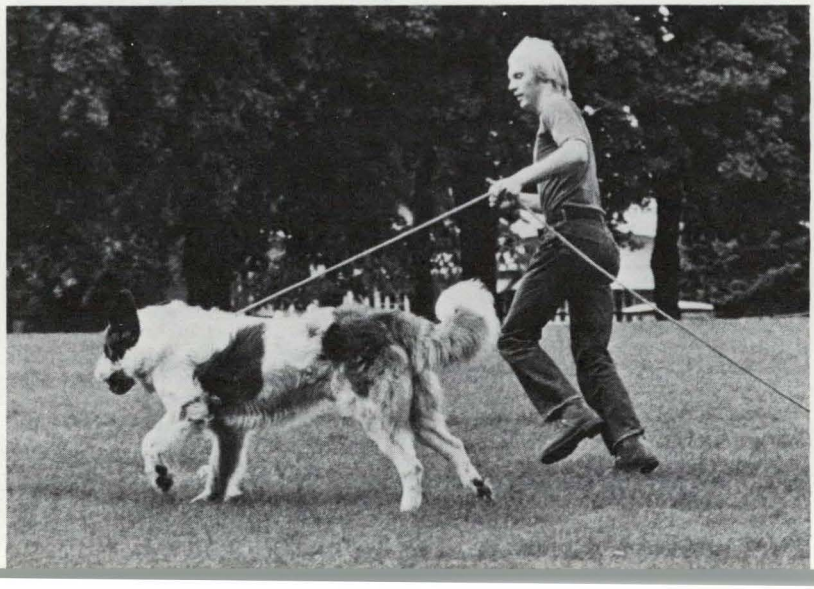
***Carol O. Youngstrom,** 1929 (1949), Extension Professor and Associate Director Emeritus, Cooperative Extension Service; B.S.Ag., 1928, Oregon State; M.S.Ag., 1930, Kansas State. Emeritus since 1970.

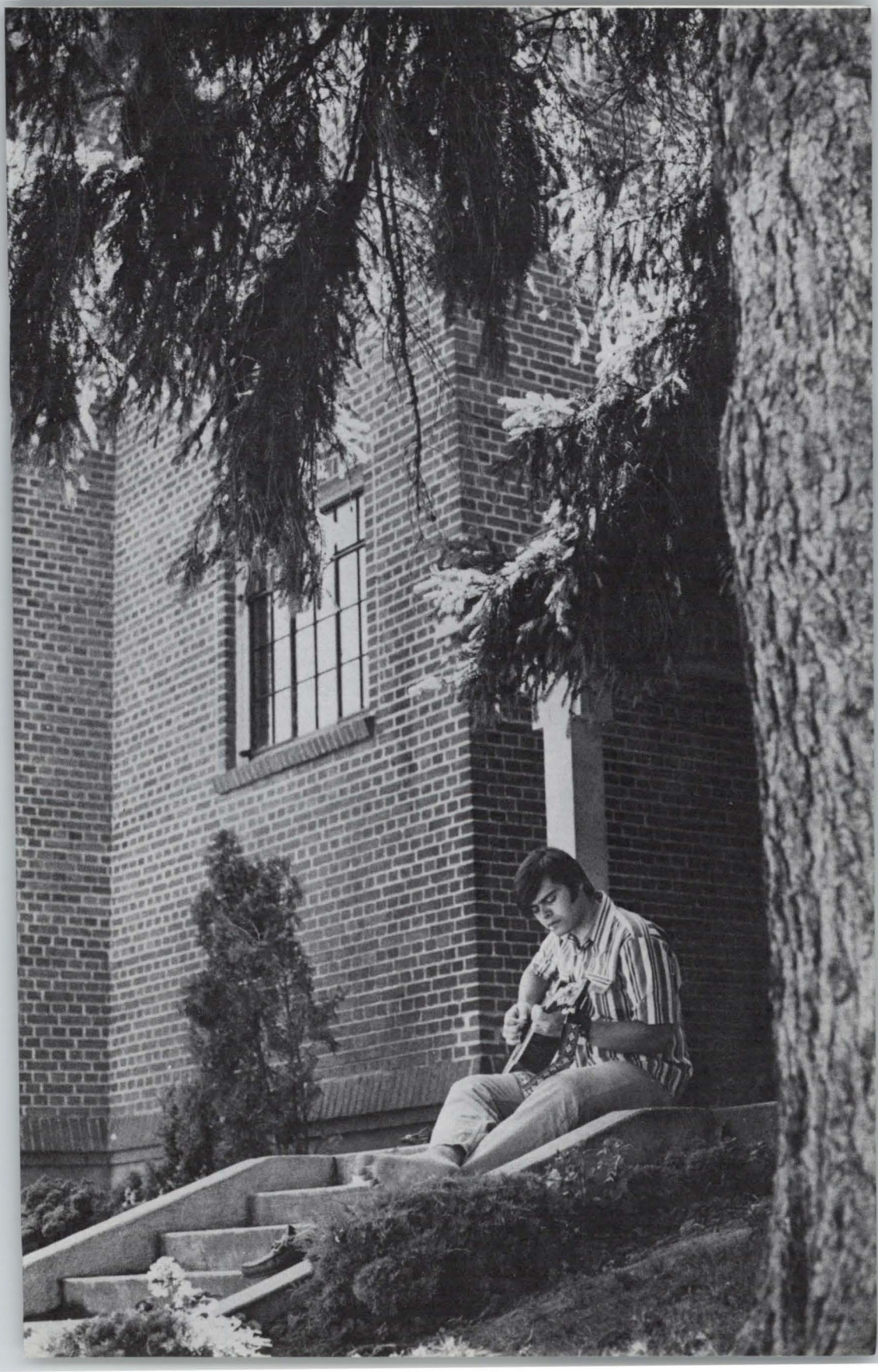
***Donald F. Youtz,** 1953 (1971), Associate Extension Professor and Twin Falls County Extension Agricultural Agent, Twin Falls; B.S., 1937, Wyoming.

Mary V. Zaehringer, 1953, Research Professor of Food Science; Food Scientist (Head, Department of Home Economics Research, 1967-1972); B.S., 1946, Temple; M.S., 1948, Ph.D., 1953, Cornell.

***Lee F. Zimmerman,** 1948, University Librarian Emeritus; B.A., 1924, Wisconsin; B.S.L.S., 1929, M.A., 1932, Illinois. Emeritus since 1967.

Steve E. Zobrisky, 1972, Acting Associate Dean, College of Agriculture; Acting Director, Agricultural Experiment Station; B.S., 1953, M.S., 1954, Ph.D., 1957, Missouri (Columbia).





Index

A

Abbreviations and symbols: key to, 155

Absence: from final examinations, 50; general regulations covering, 56; *see also* Leave of absence

Absentia courses: fees for, 30

Academic calendar, 6-7

Academic unit(s), high school: defined, 23; required for admission, 24

Accelerated courses: registration in, 43

Accident insurance: general provision for, 37

Accounting: courses in, 157; degrees offered in, 15; undergraduate curriculum in, 70

Accreditation, 13

Adding courses, 44-45

Administration: officers of, 8

Admission: after disqualification, 55; general regulations and procedures covering, 21; of lower-division students to upper-division courses, 42; of non-high school graduates, 23; of undergraduates to graduate courses, 43, 145; to adult education centers, 148; to classes, 42; to College of Education, 73; to College of Engineering, 92; to College of Forestry, Wildlife and Range Sciences, 98; to College of Law, 104; to College of Letters and Science, 111; to extension courses, 147; to Graduate School, 144; to teacher education program, 74, 141; to workshops, 43

Adult education centers: admission to, 148; credit limitations in, 148

Advanced placement, 25, 50

Advanced standing: admission to College of Law with, 106; admission with, 25

Advertising: undergraduate curricular option in, 129

Advising, 34

Aerospace studies: courses in, 158; *see also* Officer Education Program

Affiliate Faculty, 272

Afro-American studies: courses in, 157

Agribusiness: degrees offered in, 15; undergraduate curriculum in, 64

Agricultural biochemistry: *see* Biochemistry

Agricultural economics: courses in, 158; degrees offered in, 15, 18; undergraduate curriculum in, 65; undergraduate curricular option in, 64

Agricultural education: courses in, 160; degrees offered in, 15, 18; undergraduate curriculum in, 66

Agricultural engineering: courses in, 160; degrees offered in, 15, 18; undergraduate curriculum in, 96

Agricultural Experiment Station, 264

Agricultural mechanization: courses in, 161; undergraduate curricular option in, 64

Agricultural science: degrees offered in, 15; undergraduate curriculum in, 66

Agriculture, College of, admission to, 24; degrees and curricula offered in, 15-20, 64; general courses in, 158

Air Force OEP: *see* Aerospace studies

Algebra: high school units required in, 24

Alumni Association, 40

American studies: degrees offered in, 15; undergraduate curriculum in, 113

Animal industries: courses in, 162; degrees offered in, 18; undergraduate curricular options in, 65, 66

Anthropology: courses in, 164; degrees offered in, 15, 18; teaching minor in, 82; undergraduate curriculum in, 114

Application for degrees: general regulations covering, 57

Architecture: courses in, 166; degrees offered in, 16, 18; undergraduate curriculum in, 114

Army OEP: *see* Military science

Art: courses in, 167; degrees offered in, 16, 18; teaching major and minor in, 82; undergraduate curricula in, 115

Arts and law: combined curricula in, 122

Attendance regulations, 56

Auditors: fees for, 30; regulations covering, 42

B

Bacteriology: courses in, 168; degrees offered in, 16, 18; undergraduate curriculum in, 115; undergraduate curricular option in, 66

Biochemistry: courses in, 169; degrees offered in, 18; undergraduate curricular option in, 67

Biological sciences: degrees offered in, 18; teaching major and minor in, 82; *see also* Biology, Botany, Zoology

Biology: courses in, 170; degrees offered in, 16, 18; high school units required in, 24; undergraduate curricula in, 116

Board of Regents, 9

Bookkeeping: teaching minor in, 82

Books and supplies: estimated cost of, 28

Botany: courses in, 171; degrees offered in, 16, 18; undergraduate curricula in, 116

Business: courses in, 172; degrees offered in, 16, 18; general undergraduate curriculum in, 71; *see also* Agribusiness

Business and applied science: degrees offered in, 16; undergraduate curriculum in, 70

Business and Economic Research: Bureau of, 267

Business and Economics, College of: admission to, 24; degrees and curricula, 15-20, 69

Business and law: combined curriculum in, 71

Business Development: Center for, 270

Business education: courses in, 175; degrees offered in, 16, 18; teaching minor in, 82; undergraduate curriculum in, 77

C

Calendar: academic, 6-7

Career planning, 39

Catalog issue: time limit for graduation under, 53

Certification for teaching: recommendation for, 75, 142; through College of Education, 75, 142; through College of Letters and Science, 111

Challenge (credit by examination): fees covering, 31; procedures for, 46

Change(s): in regulations, 44; University's right to make, 59

Chemical engineering: courses in, 176; degrees offered in, 16, 18; undergraduate curriculum in, 96

Chemistry: courses in, 177; degrees offered in, 16, 18; teaching major and minor in, 83; undergraduate curricula in, 116-117

Child development: degrees offered in, 16; undergraduate curricula in, 120

Civil engineering: courses in, 180; degrees offered in, 16, 18; undergraduate curriculum in, 96

Class rating for undergraduates: credits required for, 56

Classes: absence from 56; admission to, 42; withdrawal from, 44-45, 49

Classical studies: degrees offered in, 16; undergraduate curriculum in, 117

Clothing, textiles, and design: degrees offered in, 16; undergraduate curriculum in, 120

Coaching: teaching minor in, 83

Communications: courses in, 183

Computer science: degrees offered in, 18

Computer Services, 270

Continuing Education: Division of, 146

Cooperative: Extension Service, 264; programs, 143; residence halls, 33

Correspondence study: admission to, 148; credit limitations in, 53; restrictions on, 42

Costs: *see* Expenses

Counseling Center, 37

Course numbering system, 155

Credit(s): by examination, 46; definition of, 45; for standing in the various classes, 56; limitations, 53; requirements for status as full-time student, 56-57; transfer of, 25

Cum laude: requirements for the awarding of, 54

Curricular requirements: fulfillment of, 53

D

Dance: teaching minor in, 83

Dean's list, 54

Deficiencies: admission with, 25

Degree applications, 57

Degree requirements: catalog applicable for, 53; for baccalaureate degrees, 51

Degrees granted, 14

Dental studies (pre-dental studies): degrees offered in, 16; undergraduate program and curriculum in, 124

Design: undergraduate curricular option in, 115

Diploma fee, 30

Disenrollment: *see* Withdrawal

Disqualification: scholastic, 55

Distributive education: degrees offered in, 16 18; undergraduate curriculum in, 77

Dormitories: *see* Housing

Dropping courses, 44-45

E

Earth science: degrees offered in, 18; teaching major in, 83

Economics: courses in, 183; degrees offered in, 16, 18; undergraduate curricula in, 71, 117; *see also* Agricultural economics

Education: courses in, 184; degrees offered in, 18

Education, College of: admission to, 24, 73; degrees and curricula in, 15-20, 77

Education: State Board of, 9

Educational Research and Service: Bureau of, 268

Electrical engineering: courses in, 188; degrees offered in, 16, 19; undergraduate curriculum in, 96

Elementary education: degrees offered in, 16, 19; undergraduate curriculum in, 78

Eligibility to reregister, 49, 56

Engineering: general courses in, 191; professional degrees offered in, 146

Engineering, College of: admission to, 24, 92; degrees and undergraduate curricula in, 15-20, 92

Engineering Experiment Station, 265

Engineering science: courses in, 192

English: all-university requirements in, 52; courses in, 192; degrees offered in, 16, 19; proficiency for foreign students, 27; teaching major and minor in, 83; undergraduate curriculum in, 118; units required for admission, 24

Entomology: courses in, 195; degrees offered in, 19; undergraduate curricular option in, 67

Environmental sciences, 111

Examination(s): absence from final, 50; admission by, 23, 25; for credit for examination, 46; for entering freshmen, 21; special final, 50

Excuses: for absences, 56

Expenses, 28

Extension courses: admission to, 147; credit limitations in, 53; grade points in, 48; removal of incompletes in, 49; restrictions on, 42

F

Faculty members, 272

Family housing, 34

Fees, 28

Fifth-year program of teacher education, 146

Final examinations: see Examinations

Finance: degrees offered in, 16; undergraduate curriculum in, 71

Financial aids, 38

Fishery management: degrees offered in, 19

Food and nutrition: degrees offered in, 16; undergraduate curriculum in, 119

Food science: courses in, 196; degrees offered in, 19; undergraduate curricular options in, 65, 67

Foreign languages and literatures: courses in, 197; *see also* French, German, Greek, Italian, Latin, Russian, Spanish

Foreign students: admission of, 26

Forest entomology: degrees offered in, 19

Forest genetics: degrees offered in, 19

Forest management: degrees offered in, 19

Forest pathology: degrees offered in, 19

Forest recreation: degrees offered in, 19

Forest resources: degrees offered in, 16; undergraduate curriculum in, 101

Forest soils: degrees offered in, 19

Forest, Wildlife and Range Experiment Station, 266

Forestry economics: degrees offered in, 19

Forestry science: degrees offered in, 19

Forestry, wildlife and range sciences: courses in, 200

Forestry, Wildlife and Range Sciences, College of: admission to, 24, 98; degrees and curricula, 15-20, 100

Fraternities, 33

French: courses in, 198; degrees offered in, 16, 19; teaching major and minor in, 84; undergraduate curriculum in, 118

Full-time student: credit requirements for, 56-57

G

General business: degrees offered in, 16; undergraduate curriculum in, 71

General regulations and procedures, 41

General requirements for baccalaureate degrees, 51

General studies: degrees offered in, 17; program in, 60

Genetics: courses in, 204

Geography: courses in, 205; degrees offered in, 17, 19; teaching major and minor in, 84; undergraduate curricula in, 118, 139

Geological engineering: degrees offered in, 17, 19; undergraduate curriculum in, 140

Geology: courses in, 207; degrees offered in, 17, 19; Idaho Bureau of Mines and, 269; teaching minor in, 84; undergraduate curriculum in, 139

Geometry: high school units required in, 24

German: courses in, 199; degrees offered in, 17, 19; teaching major and minor in, 84; undergraduate curriculum in, 118

Grades: disqualification because of, 55; explanation of, 47; reporting of, 48

Graduate School: admission to, 143; degrees offered by, 18

Graduation requirements: general, 51

Greek: courses in, 199

Guidance and counseling: courses in, 209; degrees offered in, 19

H

Health and accident insurance, 37

Health education: teaching minor in, 85

High school unit: defined, 23

History: courses in, 210; degrees offered in, 17, 19; teaching major and minor in, 85; undergraduate curricula in, 118

Home economics: courses in, 212; degrees offered in, 17, 19; undergraduate curricula in, 118-121

Honors, 54

Housing: costs of, 28, 33; requirements, 32

Human Behavior: Institute of, 270

Hydrology: courses in, 215; degrees offered in, 19; *see also* Agricultural engineering courses

I

Incompletes: explanation and removal of, 49

Industrial education: courses in, 215; degrees offered in, 17, 19; teaching minor in, 85; undergraduate curriculum in, 78

Information science: courses in, 217

Insurance: *see* Health and accident insurance

Interdisciplinary studies: courses in, 218; degrees offered in, 17; undergraduate curricula in, 121

Interior design: degrees offered in, 17, 19; undergraduate curriculum in, 121

International students: *see* Foreign students

Italian: courses in, 199

J-K

Journalism: courses in, 219; degrees offered in, 17; teaching minor in, 85; undergraduate curricula in, 128-129

Junior colleges: admission from, 25

Junior tanding: credits required for, 56

L

Landscape architecture: degrees offered in, 17; undergraduate curriculum in, 121; *see also* Architecture

Languages: *see* Foreign languages and literatures

Latin: courses in, 199; degrees offered in, 17; teaching major and minor in, 85; undergraduate curriculum in, 122

Latin American studies: degrees offered in, 17; undergraduate curriculum in, 122

Law: courses in, 220; curriculum in, 109; degrees offered in, 17, 19

Law, combined program: undergraduate curricula in, 122

Law, College of: admission to, 105

Leave of absence, 56

Letters and Science, College of: admission to, 24, 111; degrees and curricula in, 15-20, 112

Library, 13

Library science: courses in, 221; teaching minor in, 86

Living accommodations: *see* Housing

Load limitations: *see* Credit limitations

M

Majors offered by the University, 15

Management: degrees offered in, 17; undergraduate curriculum in, 71

Marketing: degrees offered in, 17; undergraduate curricula in, 71-72

Married students: housing for, 34

Mathematics: courses in, 221; degrees offered in, 17, 19; high school units required in, 24; teaching major and minor in, 86; undergraduate curricula in, 122-123

Matriculation, 41

Mechanical engineering: courses in, 224; degrees offered in, 17, 19; undergraduate curriculum in, 96

Medical studies (pre-medical studies): degrees offered in, 17; undergraduate curriculum in, 124

Medical technology: undergraduate curriculum in, 116

Men: housing requirements, 32

Metallurgical engineering: degrees offered, 17, 19; undergraduate curriculum in, 140; *see also* Metallurgy

Metallurgy: courses in, 226

Midsemester grades: report of, 48

Military science: courses in, 228; teaching minor in, 86; *see also* Officer Education Program

Mines, College of: admission to, 24; degrees and curricula in, 15-20, 139

Mines and Geology: Idaho Bureau of, 268

Mining: professional degrees in, 146

Mining engineering: courses in, 228; degrees offered in, 17, 19; undergraduate curriculum in, 140

Mining Research Bureau, 269

Museology: courses in, 230

Museum, 14

Music: courses in, 231; degrees offered in, 17, 19; special fees in, 30; teaching minor in, 86; undergraduate curricula in, 133-135

N

National Reactor Testing Station (Idaho Falls): graduate program at, 144; undergraduate program at, 149

Native American affairs: courses in, 236

Native American Development: Center for, 143

Naval science: courses in, 236; degrees offered in, 17; undergraduate curriculum in, 123; *see also* Officer Education Program

News-editorial: undergraduate curricular option in, 128

Non-high school graduates: admission of, 23

Non-matriculated status: admission to, 26

Nonresident instruction: maximum credit in, 42

Nonresidents: admission of, 23

Nuclear engineering: courses in, 236; degrees offered in, 19

Nursing studies (pre-nursing studies): programs in, 125

O

Office administration: courses in, 237; degrees offered in, 17; undergraduate curriculum in, 72

Office occupations education: degrees offered in, 17, 19; undergraduate curriculum in, 78; teaching minor in, 87

Officer Education Program, 151

Officers: administrative, 8

P-Q

Painting: undergraduate curricular option in, 115

Partial enrollment in Graduate School, 14

Pass-fail option, 43

Philosophy: courses in, 238; degrees offered in, 17, 19; undergraduate curricula in, 123

Photography: courses in, 239

Physical education: all-university requirements in, 52; courses in, 239; degrees offered in, 17, 19; teaching minor in, 87; undergraduate curricula in, 78-80

Physical sciences: degrees offered in, 19; teaching major in, 87

Physical therapy (pre-physical therapy): degrees offered in, 17; undergraduate curriculum in, 125

Physics: courses in, 242; degrees offered in, 17, 19; high school units required in, 24; teaching major and minor in, 87; undergraduate curricula in, 123

Physiology: courses in, 245

Placement services, 39

Plant sciences: courses in, 246; degrees offered in, 20; undergraduate curricular option in, 67

Political science: courses in, 247; degrees offered in, 17, 19; teaching major and minor in, 87; undergraduate curricula in, 124

Pre-dental studies: *see* Dental studies

Prelaw: *see* Law

Pre-medical studies: *see* Medical studies

Pre-nursing: *see* Nursing studies

Pre-physical therapy: *see* Physical therapy

Pre-veterinary medicine: *see* Veterinary science

Probation: scholastic, 54

Professional certificates: in education, 146

Professional degrees, 146

Psychology: courses in, 250; degrees offered in, 17, 19; teaching major and minor in, 88; undergraduate curricula in, 125

Public Affairs Research: Bureau of, 269

R

Radiological science: degrees offered in, 19

Radio-television: courses in, 251; degrees offered in, 17; undergraduate curricula in, 129

Radio-television news: undergraduate curricular option in, 129

Range management: degrees offered in, 19

Range resources: degrees offered in, 18; undergraduate curriculum in, 102

Range science: degrees offered in, 19

Real estate: undergraduate curriculum in, 72

Recreation: degrees offered in, 18; teaching minor in, 88; undergraduate curriculum in, 80; *see also* Forestry courses

Refund of fees, 31

Regents: Board of, 9

Registration: changes in, 44-45; fees, 28; general regulations and procedures for, 41

Regulations: general academic, 41

Reinstatement after disqualification, 55

Religious studies: courses in, 252

Repeat of courses, 48

Repeated absences: report of, 56

Requirements: University's right to change, 59

Research Council and Research Foundation, 267

Residence requirements for baccalaureate degree, 51

Resident status: defined, 29

Rhetoric and public address: undergraduate curricular option in, 130

Russian: courses in, 199; teaching major and minor in, 89

S

Scholarships: general information about, 38

Scholastic probation, 54

School administration: degrees offered in, 20

School psychology: degrees offered in, 20

Science: teaching major and minor in, 89

Sculpture: undergraduate curricular option in, 115

Second baccalaureate degree: requirements for, 53

Secondary education: degrees offered in, 18, 20; undergraduate curriculum in, 80

Secretarial studies: *see* Office administration

Senior standing: credits required for, 56

Services: student advisory, 36

Silviculture: degrees offered in, 20

Social science: courses in, 253; degrees offered in, 20; high school units required in, 24; teaching major and minor in, 89

Sociology: courses in, 253; degrees offered in, 18, 20; teaching minor in, 89; undergraduate curricula in, 125

Soils: courses in, 254; degrees offered in, 20; undergraduate curricular options in, 65, 67

Sophomore standing: credits required for, 56

Sororities, 33

Spanish: courses in, 199; degrees offered in, 18, 20; teaching major and minor in, 89; undergraduate curriculum in, 126

Special education: courses in, 255; degrees ofoffered in, 18, 20; teaching minor in, 90; undergraduate curriculum in, 80

Speech: courses in, 256; degrees offered in, 18; teaching major and minor in, 90; undergraduate curricula in, 129-130

Speech communication: undergraduate curricular option in, 130

Student: advisory services, 36; counseling, 34, 37; fees, 28; housing, 32

Summa cum laude: requirements for the awarding of, 54

Summer sessions, 148

Supplies and books: estimated cost of, 28

T

Teacher certification: recommendation for, 75, 142

Teacher education: admission to, 74, 141; continuance in, 74

Technical education: degrees offered in, 18; undergraduate curriculum in, 81

Television: *see* Radio-television

Theatre arts: courses in, 257; degrees offered in, 18, 20; teaching major and minor in, 90; undergraduate curricula in, 126

Time limit: for graduation under a particular catalog, 53

Trade and industrial education: degrees offered in, 18; undergraduate curriculum in, 81

Trade-technical education: degrees offered in, 20

Transcripts: fee for, 31; required for admission, 21, 23, 25

Transfer credit, 25

Transfer students: admission to University of, 25; catalog applicable to, 53

Trigonometry: high school units required in, 24

Tuition: nonresident, 29

U-V

Unit: high school, definition of, 23

Veterans' benefits, 38

Veterinary science: courses in, 259; degrees offered in, 20; undergraduate curricular option in, 68

Vocational education: degrees offered in, 20

Vocational teacher education: courses in, 260

Vocational-technical education: degrees offered in, 18; undergraduate curriculum in, 81

Vocational units: number permitted for admission, 24

W

Washington State University: cooperative course program with, 144

Water Resources Research Institute, 266

Watershed science: degrees offered in, 20

Wildlife management: degrees offered in, 20

Wildlife science: degrees offered, in, 20

Wildlife-fishery resources: degrees offered in, 18; undergraduate curriculum in, 102

Withdrawal: from classes, 44-45; procedures and regulations covering, 49; refund of fees, 31

Women: housing requirements, 32

Wood utilization: degrees offered in, 18, 20; undergraduate curriculum in, 102

X-Y-Z

Zoology: courses in, 261; degrees offered in, 18, 20; undergraduate curricula in, 127