University of Idaho

General Catalog Issue

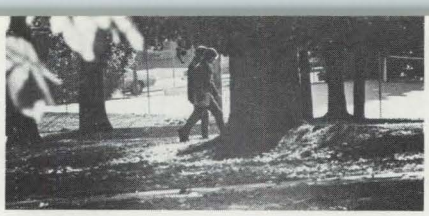
Bulletin 1972-73

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) 6486

Associated Students (student government) . . . . . Student Union Bldg. 6331

Career Placement . . . . . Director of the Career Planning and Placement Center (103 Adult Ed. Bldg.) 6121

Continuing Education (correspondence/extension) . . . . . Coordinator of Continuing Education (103 Adult Ed. Bldg.) 6486

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 . . . . . Coordinator of General Studies (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 . . . . . Business Manager (201 Ad. Office Bldg.) 6174

Student Activities . . . . . ASUI Program Adviser (Student Union Bldg.) 6484

Study Abroad . . . . . Director of Intercultural Programs (314 Ad. Bldg.) 6179

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 Educational 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 27
   - Student Housing 32
   - Student Services 34
   - Statement of Student Rights 40

3. **GENERAL REQUIREMENTS AND ACADEMIC PROCEDURES** .. 46

4. **COLLEGES, SCHOOLS, AND RELATED PROGRAMS** 61
   - General Studies Program 61
   - College of Agriculture 61
   - College of Business and Economics 68
   - College of Education 72
   - College of Engineering 91
   - College of Forestry, Wildlife and Range Sciences 97
   - College of Law 103
   - College of Letters and Science 109
     - School of Music 127
   - College of Mines 133
   - Graduate School 137
   - Summer Sessions and Continuing Education 140
   - Reserve Officers' Training Corps 145

5. **COURSE DESCRIPTIONS** 149
   - Course Numbering System and Key to Abbreviations and Symbols . 149
   - Courses (all subject fields arranged in alphabetical order) 150

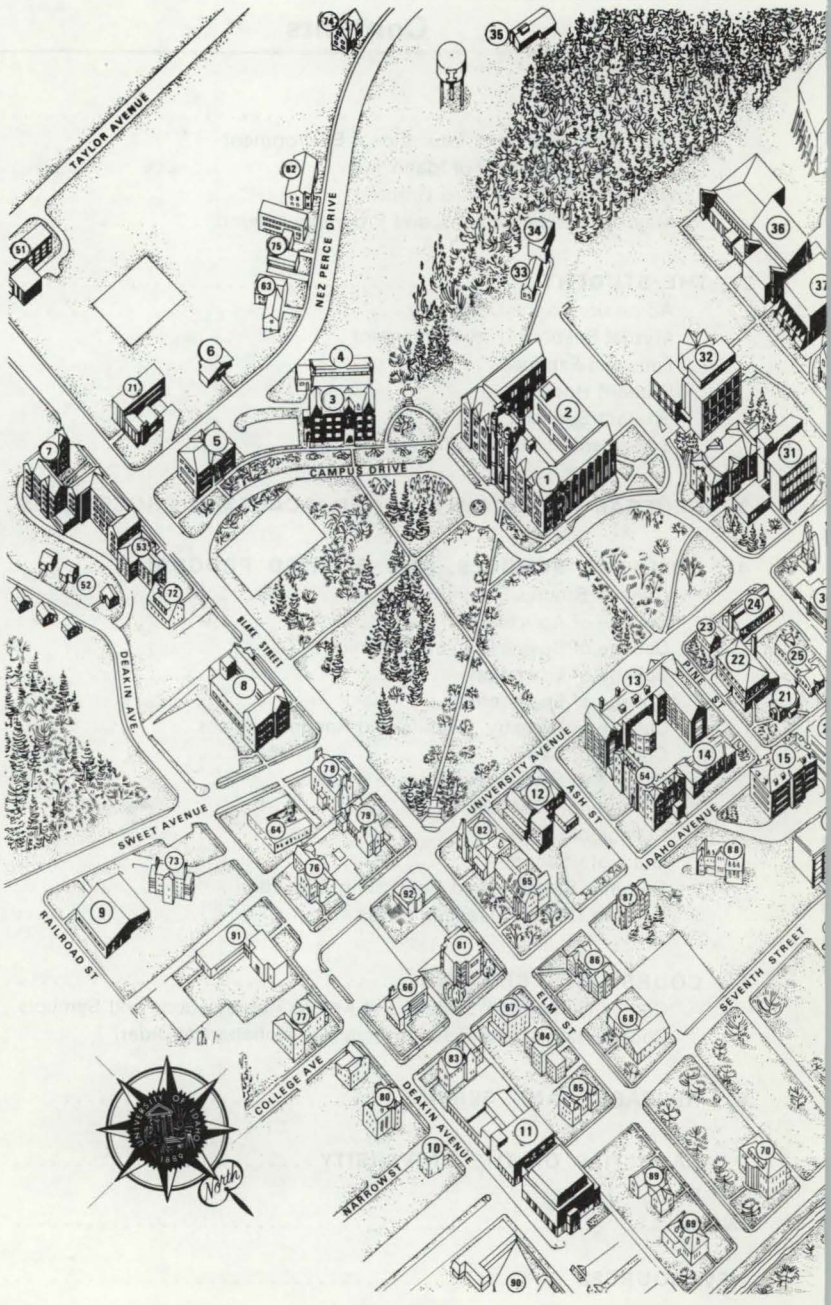
6. **RESEARCH AND SERVICE** 251

7. **FACULTIES OF THE UNIVERSITY** 259

INDEX 290

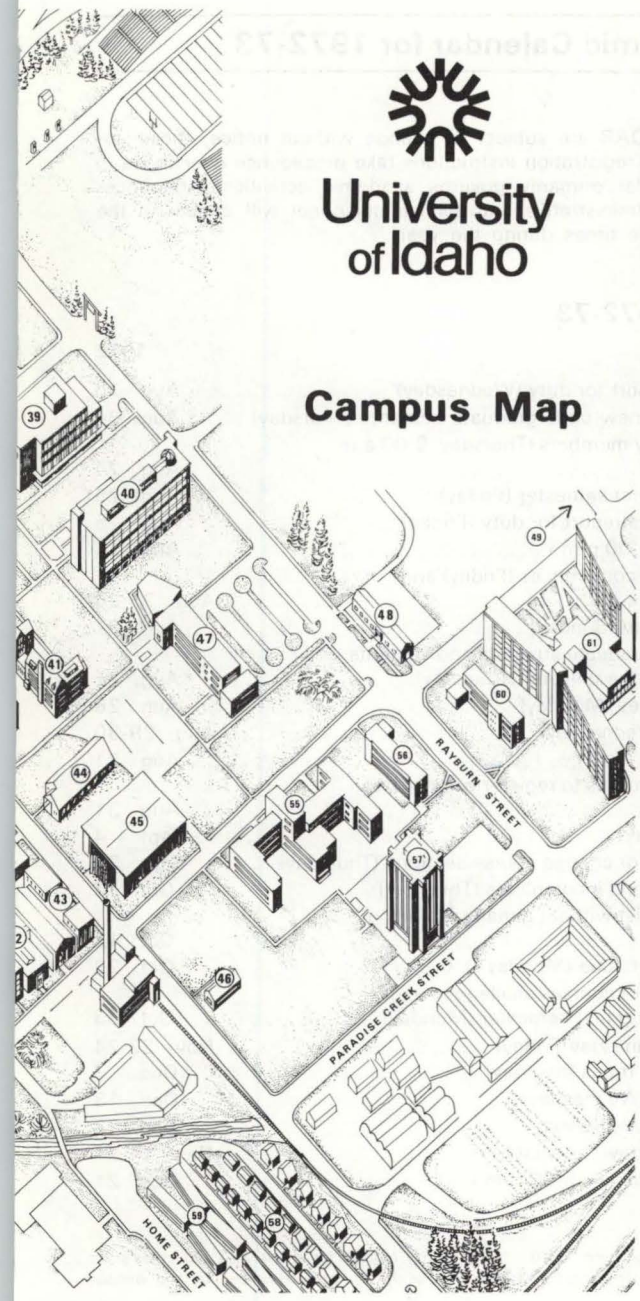
NEW COURSES 296

4 University of Idaho



University of Idaho

Campus Map



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. Black Student Union
11. Student Union and Bookstore
12. Student Health Service
13. Life Science Building
14. Museum
15. Morrill Hall
16. Mines Building
17. Buchanan Engineering Laboratory
18. Janssen Engineering Building
19. Entomology Building
20. Food Science Building
21. Satellite SUB
22. Adult Education Building
23. Drama Annex
24. U-Hut
25. Journalism Building
26. Faculty Office Building
27. Small Animals Laboratory
28. University Classroom Center
29. Agricultural Education Building
30. Agricultural Engineering Building
31. Art and Architecture Buildings
32. Education Building
33. Radio Building
34. Television Laboratory
35. President's House
36. Women's Health Education Building
37. Swimming Center
38. Memorial Gymnasium
39. Library
40. Physical Science Building
41. Graduate Center
42. Johnson Engineering Laboratory
43. Gauss Mechanical Engineering Laboratory
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. Information Center

RESIDENCE HALLS AND UNIVERSITY HOUSING

51. Campus Club
52. South Hill Homes
53. Steel House
54. Vandal Hall
55. Gault-Upham Hall
56. McConnell Hall
57. Theophilus Tower
58. Park Village Prefabs
59. Park Village Apartments
60. Shoup Hall
61. Wallace Residence Center

SORORITIES AND FRATERNITIES

Sororities

62. Alpha Gamma Delta
63. Alpha Chi Omega
64. Kappa Alpha Theta
65. Kappa Kappa Gamma
66. Pi Beta Phi
67. Delta Gamma
68. Gamma Phi Beta
69. Alpha Phi
70. Delta Delta Delta

Fraternities

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

RELIGIOUS INSTITUTES

90. St. Augustine's Catholic Center
91. LDS Institute
92. Campus Christian Center

Academic Calendar for 1972-73

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.

First Semester 1972-73

	1972
New faculty members report for duty (Wednesday)	Aug. 23
Residence halls open for new undergraduate students (Thursday)	Aug. 24
Orientation for new faculty members (Thursday, 9:00 a.m.-3:30 p.m.)	Aug. 24
Official opening date for first semester (Friday)	Aug. 25
Returning faculty members report for duty (Friday)	Aug. 25
Faculty meeting (Friday, 4:00 p.m.)	Aug. 25
Freshman pre-registration conferences (Friday) and orientation (Saturday)	Aug. 25-26
Transfer student orientation (Sunday)	Aug. 27
Residence halls open for graduate students and students previously enrolled in the university (Sunday)	Aug. 27
Pre-registration conferences (Monday)	Aug. 28
* Registration (Tuesday-Wednesday)	Aug. 29-30
Classes begin (Thursday)	Aug. 31
* Last day for graduate students to register without late fee (Thursday)	Aug. 31
Labor Day holiday (Monday)	Sept. 4
* Last day to add courses or change course sections (Thursday)	Sept. 21
Last day to remove or extend incompletes (Thursday)	Oct. 12
Last day to change study list without penalty for failing work (Thursday)	Oct. 12
Mid-semester grade reports due (Monday, 1:00 p.m.)	Oct. 23
Last day to report grades for courses challenged under regulation "D-4" during first semester (Monday)	Oct. 23
Thanksgiving recess (Wednesday-Friday)	Nov. 22-24
Last day to complete field trips (Thursday)	Dec. 7
Last day to drop courses (Wednesday)	Dec. 13
Study day — no classes (Wednesday)	Dec. 13
Final examinations (Thursday-Thursday)	Dec. 14-21
Winter recess begins (Thursday, 5:00 p.m.)	Dec. 21

*As provided in general regulation "B-10," students may register for accelerated and other short courses at any time up to and including the starting date of the course without petition and without late registration fee.

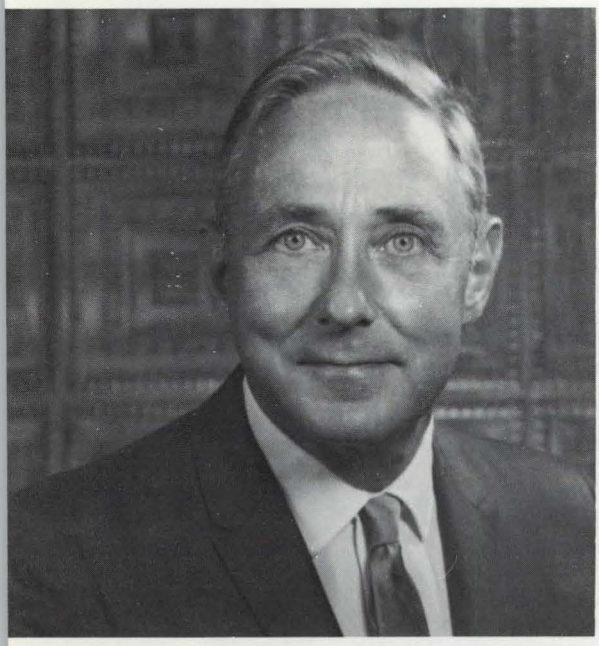
Second Semester 1972-73

	1973
Winter recess ends (Monday, 8:00 a.m.)	Jan. 15
Official opening date for second semester (Monday)	Jan. 15
Pre-registration conferences (Monday)	Jan. 15
* Registration (Tuesday-Wednesday)	Jan. 16-17
Classes begin (Thursday)	Jan. 18
* Last day for graduate students to register without late fee (Thursday)	Jan. 18
Last day to file applications for baccalaureate degrees to be conferred at the 1973 commencement (Monday)	Jan. 29
Last day to file applications for graduate degrees to be conferred at the 1973 commencement (Monday)	Feb. 5
* Last day to add courses or change course sections (Wednesday)	Feb. 7
Washington's Birthday holiday (Monday)	Feb. 19
Last day to remove or extend incompletes (Wednesday)	Feb. 28
Last day to change study list without penalty for failing work (Wednesday)	Feb. 28
Mid-semester grade reports due (Monday, 1:00 p.m.)	Mar. 19
Last day to report grades for courses challenged under regulation "D-4" during second semester (Monday)	Mar. 19
Spring vacation (Monday-Friday)	Mar. 19-23
Last day to deposit original, first copy, and abstract of thesis or dissertation with Graduate School for advanced degrees to be conferred at the 1973 commencement (Monday)	Apr. 16
Last day to complete field trips (Friday)	Apr. 27
Last day to drop courses (Thursday)	May 10
Study day — no classes (Thursday)	May 10
Final examinations (Friday-Friday)	May 11-18
Commencement (Sunday)	May 20

Summer Sessions 1973

Applications for regular eight-week session should be received by (Monday)	May 21
Forestry summer camp begins (Monday)	May 21
Summer pre-sessions	May 21-June 8
Memorial Day holiday (Monday)	May 28
Official opening date for regular eight-week summer session (Monday)	June 11
* Registration (Monday)	June 11
Classes begin (Tuesday)	June 12
Classes meet this date (Saturday)	June 16
Classes meet this date (Wednesday)	July 4
Holiday in lieu of Independence Day (Friday)	July 6
Last day to remove or extend incompletes (Monday)	July 23
Summer sessions close (Friday)	Aug. 3

* See footnote on opposite page.



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*

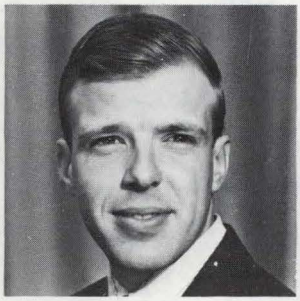
Warren S. Owens, *M.A.L.S.* . . . . . *Dean of Instructional Services/ Director of Libraries*

Matt E. Telin, *B.S.* . . . . . *Registrar*

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

Regents of the University of Idaho

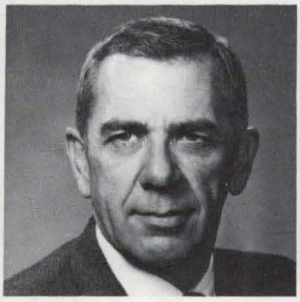
(March 1, 1972)



A. L. ALFORD, JR.
Lewiston (1973*)

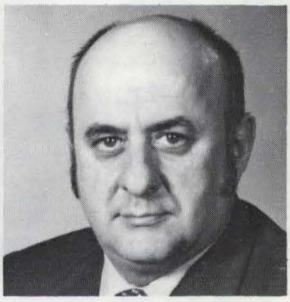
MALDEN T. DEATON
Pocatello (1974*)

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*)

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

*Date current appointment expires.

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

THE UNIVERSITY OF IDAHO was founded in 1889 by an act of the fifteenth legislature of the Idaho Territory. This action 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 the president. By 1971, the enrollment had grown to about 7,000 students. 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 32,000 degrees.

While the university has greatly expanded over the years, it is still geared toward education of the individual and the development of human awareness. In a rapidly-changing world, education must be flexible to be relevant. To provide more opportunities and flexibility for students, the university is increasing its offerings in interdisciplinary areas to supplement the curricula of the eight colleges.

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 training 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 can choose from over 130 undergraduate fields of study. The University of Idaho Graduate School offers the master's degree in seventy-eight areas and the doctorate in thirty, making it the state's leader in graduate education.

The faculty is composed of scholars holding advanced degrees from universities throughout the world. Particularly at the upper-division level their number is large enough in proportion to the student population to limit class size and to make opportunities available for more individualized instruction. Besides teaching, the faculty is actively involved in research, and faculty members often serve the community-at-large through consulting services and on-campus seminars. Typical examples of research and service agencies are the Cooperative Extension Service and the Water Resources Research Institute.

Many of the university's facilities for study in the different fields are among the best to be found. The J. E. Buchanan Engineering Laboratory features ad-

vanced equipment found in few other institutions in the nation. A further example is the newly-completed Forestry Building, excellently equipped for research and instruction, and considered by many to be the best forestry facility in the country. Architectural honors were awarded to the recently-built Women's Physical Education Building and adjoining Swimming Center.

The university's location at Moscow is definitely an advantage to many of the educational opportunities offered. Within a short drive from 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 forestry, wildlife, range, and other environmental sciences. The farmlands in the region are ideal for agricultural research, while for the interested student the locale offers much in the way of native American history and artifacts. For students of recreation 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 the library materials, programs, and course offerings between the two campuses make the entire area truly a university center.

Outside the classroom, there are many ways in which a student can enhance his 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 various standing committees of the faculty, 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 headquartered 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 challenge of 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, Council on Social Work, 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 65,000 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 exists to serve the campus, region, and state in all fields. It is an all-university service and its role is to teach, using objects, with no limitations as to subject field.

A busy schedule of changing, temporary exhibitions is maintained throughout the year except during vacation periods. The museum is open to visitors every afternoon. Exhibitions deal with many fields, including a wide range of the sciences and engineering, as well as anthropology, history, and the arts and crafts. In addition, students may learn about museums and museum work through actual experience and through courses in museology. (Museology is one of the subject matter areas within the Department of Sociology/Anthropology. See part 5 of this catalog for the courses offered.)

Students, alumni, employees, and other friends of the university can help to build the museum's collections of scientific, historic, 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 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, *B.S.**

PROFESSIONAL DEGREES IN ENGINEERING

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, Drama-Speech, Earth Science, English, French, Geography, German, History, Home Economics, Mathe-

matics, Music, Physics, Political Science, Social Sciences, Sociology-Anthropology, Spanish, *M.A.T.**

Master of Education, *M.Ed.*
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 Programming (Commercial), Computer Programming (Scientific), Health Physics, Management, Mathematics, 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 Drama
Advertising
see Journalism
Aerospace Studies (AFROTC)
Agribusiness—*B.S.Ag.*
Agricultural Economics Option
Agricultural Mechanization Option
Animal Industries Option
Food Science Option
Soils Option
Agricultural Biochemistry
see Agricultural Science
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.*
Agricultural Biochemistry Option
Animal Industries Option
Bacteriology Option
Entomology Option
Food Science Option
Plant Science Option
Range Livestock Management Option
Soils Option
Veterinary Science Option
Air Force ROTC
see Aerospace Studies
American Studies—*B.A.*

(Continued on next page)

16 University of Idaho

Animal Industries
see Agribusiness and Agricultural Science

Anthropology—*B.A.*

Applied Mathematics
see Mathematics

Applied Music
see Music and Music Education

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

Army ROTC
see Military Science

Art—*B.A., B.F.A.*
Art Education Option
Design 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.*
Distributive Education Option
General Business Option
Office Occupations Option

Cartography
see Geography

Chemical Engineering—*B.S.Ch.E.*

Chemistry—*B.S.*
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

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

Design
see Art

Dietetics
see Food and Nutrition

Distributive Education
see Business Education

Drama—*B.A., B.S., B.F.A.*
Acting-Directing Option
Technical Theatre Option

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

Education
see Agricultural Education, Art Education, Business Education, Elementary Education, Home Economics Education, Industrial Education, Music Education, Physical Education, Secondary Education, Special Education, Technical Education, and Vocational Teacher 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 Resources—*B.S.For.*
- Forest Business Option
- Forest Management Option
- Forest Science Option
- *see also* Range Resources, Wildlife-Fishery Resources, and Wood Utilization

Forest Products
- *see* Wood Utilization

French—*B.A.*

General Studies Program

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 (AROTC)

Mining Engineering—*B.S.Min.E.*

Music: Applied Music—*B.A.*

Music: Applied Instrumental—*B.Mus.*

Music: Applied Vocal—*B.Mus.*

Music: Composition—*B.Mus.*

Music: History and Literature—*B.A.*

Music: Theory—*B.A.*

Music Education: Instrumental—*B.Mus.*

Music Education: Vocal—*B.Mus.*

Music Education: Vocal-Instrumental—*B.Mus.*

Naval Science (NROTC)—*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

Office Occupations
- *see* Business Education

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.*

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.*

(Continued on next page)

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.Ed.*
Science and Law
see Law (Combined Program)
Sculpture
see Art
Secondary Education—*B.S.Ed.*
Social Work
see Sociology
Sociology—*B.A., B.S.*
Sociology: Social Work—*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.*
Statistics
see Mathematics
Technical Education—*B.S.Ed.*
Technical Theatre
see Drama
Trade and Industrial Education
see Vocational Teacher Education
Veterinary Science
see Agricultural Science
Vocational Teacher Education—*B.S.Ed.*
Trade and Industrial Option
Vocational-Technical Option
see also Agricultural Education, Distributive Education, Home Economics Education, and Office Occupations
Wildlife-Fishery Resources—*B.S.For.*
Wood Utilization—*B.S.For.*
Forest Products Option
Science-Engineering Option
Zoology—*B.A., B.S.*

ADVANCED AND GRADUATE

Agricultural Biochemistry—*Ph.D.*
M.S.
see also Chemistry
Agricultural Economics—*Ph.D.**, *M.S., M.Ag.*
see also Forestry Economics
Agricultural Education—*M.S., M.Ag.*
Agricultural Engineering—*Ph.D., M.S., 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
see Agricultural Biochemistry
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.*
includes Distributive Education and Office Occupations
Chemical Engineering—*Ph.D., M.S., M.Nuc.Sc.**, Ch.E.*
Chemistry—*Ph.D., M.S., M.Nuc.Sc.**, M.A.T.Chem.*
see also Agricultural Biochemistry, Chemical Engineering, and Physical Sciences
Civil Engineering—*Ph.D., M.S., C.E.*
Composition
see Music
Distributive Education
see Business Education
Drama—*M.A.*
see also Drama-Speech
Drama-Speech—*M.A.T.Dr.-Sp.*
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, Drama-Speech, Earth Science, Elementary Education, English, Geography, Guidance and Counseling, History, Home Economics, Industrial Education, Mathematics, Music, Physical Education, Physical Sciences, Physics, Political Science, School Administration, School Psychology, Secondary Education, Social Sciences, Sociology-Anthropology, Special Education, Trade-Technical Education, and Vocational Education

Electrical Engineering—*Ph.D., M.S., 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, Forestry 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

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.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
see Business Education

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

Physical Education—*M.S., M.Ed.*

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

(Continued on next page)

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 Drama-Speech

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, 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

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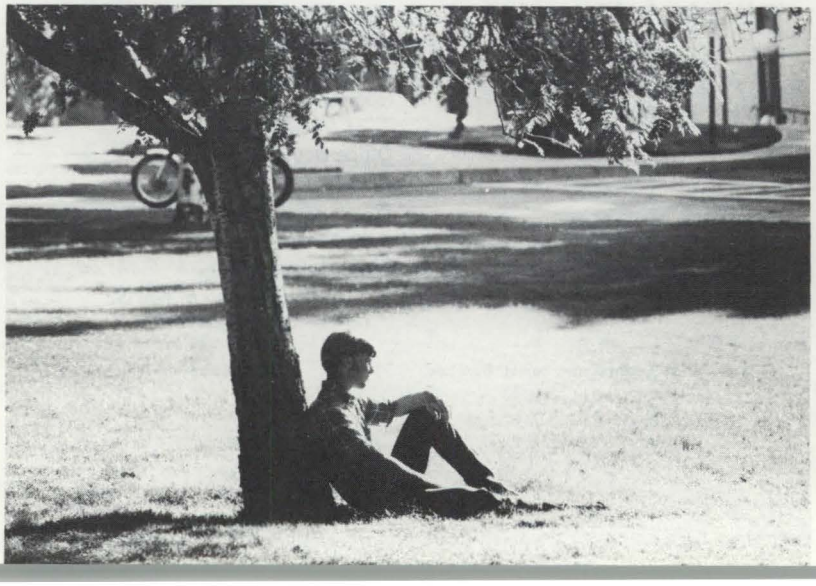
* Currently the doctoral major in economics is limited to the concentration in agricultural economics.

** The graduate majors in 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.



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 personal 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 non-resident 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 to him. 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 his registration fees for the semester for which he applied. If the applicant, once accepted, does not enroll at the university for the particular semester for which he applied for admission, he will not receive any refund or any 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 the 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 has been found eligible, a letter of acceptance and a physical examination report form will be sent to him. A permit to register will be among the registration materials furnished the applicant upon his 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 applied and was accepted, it will be necessary for him to submit a supplemental application if he should desire to enter at a later time.

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

(Continued on page 24)

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[6]
Unspecified academic units	1½	2	2		½	2	1
Total academic units	11	11	11	12	11	11	11
Additional academic, vocational, or elective units	4	4	4	3	4	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.

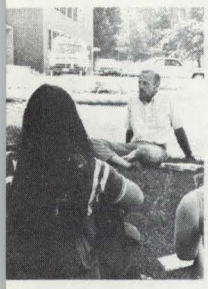
nonresident alumni of the university are eligible for admission if they are graduates of accredited high schools.

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 record of experience in the armed forces or in other 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.

(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 his eligibility for admission. It does, however, provide a basis for evaluating the adequacy of his preparation for advising him as to his choice of college or major, and for placement in certain college subjects. The required preparation for admission to the various colleges is set forth in the table on page 23.

(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.

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 computation of his grade-point average at the University of Idaho. (This revised procedure is effective for all students who entered the university at the time of or after initial registration for the 1971-72 academic year. 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 granted by other accredited institutions will be honored on transfer.

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 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 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 responsibility 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 on which he attests as to his status at any previously-attended institutions of higher education and certifies that he: (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 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 responsibility *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 1972-73 had not been set by the time this catalog went to press. The rates quoted in this section were in effect during the 1971-72 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.

The largest item in the estimated school expense is board and room which 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 $460.00 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 $75.00 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	173.00	173.00
Books, supplies, etc.	45.00 to 65.00	45.00 to 65.00
Room and board*	337.50 to 460.00	337.50 to 460.00
TOTAL**	$550.50 to 698.00	$955.50 to 1098.00

*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 $465.00 to meet initial payments, including the first installment on the board payment. Out-of-state students need an additional $400.00 to cover tuition. Personal checks, bank drafts, money orders, or travelers checks are all accepted by the university.

Student Fees

All students who register as regular students for undergraduate or graduate study pay the regular registration fees. Special fees are charged under the special conditions indicated below. Any person, other than a faculty or staff member, who registers for more than seven credits, or its equivalent, must pay the full registration fee.

Fees are payable in full at the time of registration on the scheduled registration days. Students registering late pay a late-registration fee.

Payment of the regular registration fee entitles all students registered for academic credit to the services maintained by the university for the benefit of students, subject to charges for special services. No reduction in fees can be made for students who may not desire to use any part of these services.

Regular Fees Per Semester

All students, except students in the College of Law (see that college section in part 4), who register for more than seven credits (or equivalent) pay the uniform registration fees. The payment includes all laboratory, course, and other charges, except those listed under "Special Fees," below.

Registration Fees ($173.00). The registration fees include all laboratory and course charges, including membership in the Associated Students of the University of Idaho (ASUI), except that a small greens fee is charged for using the golf course. If the student pays these fees for both semesters, he

is entitled to a yearbook without additional charge. Free clinic advice is furnished by the university physician, including privileges of the Student Health Service up to seven days per semester. When confinement exceeds seven days in any one semester, an additional $3.00 per day charge is made; also, additional charges are made for hospital meals, X-rays, special medicines, and special services. In addition, the registration fees entitle the student to physical education services, use of the Student Union Building, and services of the director of alumni relations. Student accident insurance coverage is also provided.

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 registration fees of $173.00, making a total of $573.00 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 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 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 his residence when his 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 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 home of record 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 his 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.

Late Registration Fee ($5.00).

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.

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, 401, 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.

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 his academic record without charge. Additional copies, when requested, are $1.00 per copy.

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.

Refund of Fees

Students who withdraw in accordance with the regulations governing withdrawals are entitled to the following refund of fees, except that $11.00 of registration fee is non-refundable once registration is completed.

A. When withdrawal is accomplished during period of registration and before the beginning of class. fees (less $11.00) are refunded in total.

B. 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.

C. 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.

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

Refunds are based upon date of 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 of men or the dean of women, as appropriate, for students who (1) are over twenty-one years 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 form C 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 admission 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. 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

Academic Advising

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 by such an act agrees to meet the requirements of a curriculum as specified by the faculty and the board of regents.

Each matriculating student is provided with the assistance of an adviser. The adviser is a faculty member established in his chosen field and is assigned because of his experience, interest, and desire to aid students in pursuing their objectives. The role of the adviser is to aid the student to evaluate further his career objectives and to help him select courses required in his selected curriculum.

In the event of uncertainty on the part of the student regarding career objectives or difficulty with required curricula, the student should be referred to the Student Counseling Center or to the Career Planning and Placement Center. The specialists at the Counseling Center or Placement Center provide further aid to the student in reaffirming or in modifying his career objectives and personal goals.

In all these matters, the primary responsibility rests with the student. His career objective is his personal choice and he is personally responsible for meeting the curriculum requirements as specified. The role of the adviser and the specialists at the Counseling Center or Placement Center is to assist the student.

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

In seeking the aid of the adviser, individual students must use discretion in the amount of time which they require of their adviser. 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 student is in the course that he should be taking that semester as determined by:

a. a standard curriculum that is either published in the cata-

log or distributed by the subject matter area, or

b. An individual program worked out either during the pre-registration period if the adviser's load is light enough so that time is available or during a curriculum advisement session at some other time.

2. To see that the registration pack is filled out properly.

B. **Curriculum Advisement.** Curriculum advisement is done by faculty members at a time convenient to the faculty member and to the student. The purposes are:

1. To provide the student with data to assist him in determining his goals within the framework of his chosen curriculum.

2. To assist the student in selecting the various options available within a given curriculum with a view to the student's goals in his chosen career.

3. To assist the student in selecting the elective courses best suited to support his basic curriculum and his other educational goals.

C. **Counseling and Career Planning.** Counseling is done by members of the faculty, the Counseling Center, and the Placement Center as the needs of the student require. The purpose is to assist individual students in understanding and resolving their educational, vocational, and personal problems.

Responsibilities.

A. The principal responsibilities of the student are:

1. To select an educational goal and the curriculum to follow in order to achieve that goal.

2. To be informed on rules and regulations in the catalog and with the requirements of his curriculum.

3. To take the initiative when the need arises to consult with his adviser before the problems become critical.

4. To take into account the advice given in regard to his curriculum.

5. When a change in goal or curriculum becomes desirable, to weigh the matter carefully, seek the services of the Counseling Center if necessary, make a decision, and follow that decision.

B. The principal responsibilities of the faculty member are:

1. To be informed on rules and regulations in the catalog.

2. To know his own curricula thoroughly.

3. To be aware of developments and opportunities in his 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 Counseling Center, and the Placement Center, to assist the student.

6. To be patient and to offer advice in a pleasant, accommodating, and professional manner.

7. To be available, by appointment and at an appropriate number of posted, scheduled office hours.

C. The principal duties of the administrators are:

1. In consultation with their faculties, to develop plans of preregistration 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 they 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 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.

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 communication 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.

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 talk over with the individual student his educational and vocational plans, personal problems, concerns about study skills, and any other matters of concern related to his 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 one day a week in the clinic. X-ray, laboratory, and physical therapy departments, and the hospital are staffed by qualified technicians and six graduate nurses. The hospital provides round-the-clock services.

A small fee is charged for X-ray and laboratory tests. The first week of hospitalization is free; thereafter, three dollars a day is charged. A file of specialists is available in Moscow and nearby cities when expert consultation 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 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 Personnel Office for such assistance.

Veterans' Benefits for Educational Assistance

A veteran is entitled to educational assistance if he has served at least 181 days of continuous active duty 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, undergraduates and graduate students must carry twelve credits or the equivalent.

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 regularly-enrolled student belongs) supports drama and music groups, and provides occasions for entertainment and participation. The University of Idaho competes in the Big Sky Conference in football, basketball, baseball, track, tennis, swimming, golf, cross country, skiing, and wrestling. Extensive intramural athletic programs are available for both men and women under the direction of the Physical Education Department. The ASUI operates an eighteen-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 employers. The center is organized to assist all University of Idaho graduates in obtaining employment according to their training, ability, and experience. At specific times throughout the year business, government, industry, and education 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 and who are sufficiently well-known by faculty members to be worthy of their recommendations. The initial contact with the Career Planning and Placement Center must be made by the students. There is no charge for this initial registration.

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.

Statement of Student Rights

THE FOLLOWING STATEMENT of student rights was adopted by the regents of the university, November 12, 1970. As a companion to this document, a codification of the rules and regulations covering the conduct of students on campus and at university-sponsored events is available. In addition, a revised code of conduct is in the process of formulation.

Preamble

The Board of Regents of the University of Idaho recognizes that all students enjoy the same inalienable rights as all citizens under the Constitution and laws of the United States. The board, therefore, adopts the following "Statement of Student Rights," the purpose of which is to guarantee basic and fundamental rights to students at the University of Idaho.

For purposes of applying this statement, a student is defined as any person who is regularly enrolled in the university as an undergraduate student, graduate student, or who is admitted as a non-matriculated student, and who is not a member of the faculty.

Section I—Freedom of Association

1. Students shall be free to organize and join associations to promote their common interests.

2. University approval shall not be required for the organization of any student association. The operation of such an association is subject to regulations necessary for the orderly scheduling of events, but in no case shall the views or objectives of the association be a basis for exercising these or other regulatory powers. In the event that university regulations are violated, disciplinary action will be taken only against individual students and not against the association. (*Note:* The intent of this paragraph is to allow students to join, organize, and form associations to promote their common interests. Students and student associations are not to use university facilities for unlawful means and are subject to rules regulating the use of university facilities. However, the views, objectives, and beliefs of the association shall not be used as a basis for subjecting the association to university regulations.)

3. Student associations may be required by the university to submit a current list of officers and objectives, but they shall not be required to otherwise disclose their membership.

Section II—Freedom of Inquiry and Expression

1. Students and student associations shall be free to examine and discuss all questions of interest to them and to express their opinions publicly or privately, subject only to civil and criminal law. (*Note:* This paragraph is in accordance

with the state and federal constitutions. Every aspect of the educational process should promote the free expression of ideas. At the same time, however, it should be made quite clear to the academic and larger community that in their public expressions, students or student associations speak only for themselves.)

2. Students shall be free to support causes by any lawful means. (*Note:* This paragraph means that students have the right to support any cause as long as that support is done by lawful means. However, in supporting a cause students and student associations cannot use unlawful means that would disrupt and endanger the essential operation of the university, violate the rights of others, or interfere with the orderly execution of duly authorized functions of the university.)

3. Student associations shall be free to invite and to hear any person at their meetings. (*Note:* The intent of this paragraph is to allow students and student associations to hear any speaker of their own choosing. Routine procedures required by the university before a guest speaker is invited to appear on campus should be designed only to insure that there is orderly scheduling of facilities and adequate preparation for the event. After the speaker is invited, the student association may be subject to limitations in cases of clear and present danger of immediate violence.)

4. All official student communications media shall have the right to establish and maintain internal control of operations and content, free from prior censorship. Only for proper and stated causes will editors and managers be subject to removal, and then only by procedures prescribed at a prior date. (*Note:* The intent of this paragraph is to allow student publications to print any material free from prior censorship. The editorial staff of the paper is subject to removal for breach of reasonable standards of journalism, such as libel, intentional distortion, and a reckless disregard for the facts. The ASUI Communications Board is responsible for insuring that all publications adhere to the laws and adhere to standards set forth by the ASUI regulations. Editors have editorial freedom, but editorial policy is made by Communications Board.)

Section III—Disciplinary Regulations

1. Disciplinary regulations may be enacted only to govern the conduct of students on campus or at authorized university activities. All such disciplinary regulations shall be approved by the faculty and shall be codified and published under the title of a "Student Code of Conduct."

2. Internal regulations of university residence halls need not be included in the student code of conduct, but shall otherwise conform with the provisions of this section.

3. No disciplinary regulation shall take effect until after it has been published. No *ex post facto* regulation shall be enacted. (*Note: Ex post facto* refers to an act committed before the regulation is in force. Thus, this paragraph prohibits punishment for an act committed before a regulation governing that act is in force.)

4. No disciplinary regulation shall discriminate against any student because of race, religion, or national origin, nor shall any regulation in any way deny to any student equal protection of the laws. No disciplinary regulation shall

discriminate irrationally, unreasonably, or invidiously on the basis of sex. (*Note:* While no regulation may discriminate in any way on the basis of race, religion, or national origin, the university may have a legitimate, rational, and reasonable interest in classifying students on the basis of sex. For example, a classification of male restrooms and female restrooms is rational and reasonable. Such regulations, however, may not discriminate irrationally, unreasonably, or invidiously.)

Section IV—Disciplinary Hearings and Procedures

1. "Disciplinary action" is defined as any penalty imposed for misconduct, including cheating and plagiarism. Disciplinary action, except that action necessary to stop a violation, shall not be taken against any student until his guilt has been ascertained at a fair and impartial hearing before a hearing body authorized by the faculty for that purpose. Basic requirements of due process and fair play must be observed. (*Note:* This paragraph makes clear that cheating and plagiarism are violations of disciplinary regulations. Action necessary to stop a violation means, for example, that the president could eject a group of students unlawfully occupying his office without first providing a hearing. Further disciplinary action must await completion of disciplinary hearings. Basic requirements of both procedural and substantive due process must be observed.)

2. Disciplinary hearings shall be commenced only for alleged violations of regulations that have been properly enacted and which are in force at the time of the violation.

3. Students who are suspected of violations may be questioned but the student must be informed at the beginning of such questioning of the right to remain silent. No form of coercion or harassment shall be used in questioning.

4. Neither the premises inhabited by students nor their personal possession shall be searched or seized in violation of federal or state law.

5. A disciplinary hearing may be waived and informal disposition of disciplinary action may be made by agreed settlement with the student or an order by the hearing board consented to by the student. If the student pleads guilty or fails to appear after receiving proper notice, an appropriate penalty may be imposed.

6. Except as provided in paragraph 5, the student charged with the violation:

(a) shall be entitled to a prompt hearing;

(b) shall be informed in writing of the specific charges for proposed disciplinary action;

(c) shall be given sufficient time to prepare for the hearing;

(d) shall state in writing whether he wishes the disciplinary hearing to be public or private.

7. During the disciplinary hearing and except as provided in paragraph 5, the student charged with the violation:

(a) may be assisted by an adviser of his choice;

(b) shall be given the opportunity to testify and to present evidence and witnesses on his behalf;

(c) shall have the opportunity to hear and question adverse witnesses;

(d) must have all testimony or evidence introduced in his presence unless he refuses to appear or fails to appear after having received proper notice;

(e) shall not be forced to testify against himself, and his refusal to testify shall not be considered as evidence against him.

8. The hearing board:

(a) shall disregard any evidence secured by improper questioning or by illegal search and seizure;

(b) shall assume the innocence of the student charged with the violation and shall place the burden of proof upon the party seeking disciplinary action;

(c) shall base its findings and decision exclusively upon proper evidence and testimony and upon facts which are universally regarded as true. (*Note:* Hearing boards should hear evidence on any disputed points. However, the board may itself take notice of facts that everyone agrees are true. For example, evidence does not have to be introduced to show that it was dark if the act in question is clearly shown to have occurred at midnight);

(d) must state its findings and its decision in writing.

9. A student may be expelled or suspended from school as a penalty for violating disciplinary regulations only if his misconduct seriously and critically endangers the essential operation of the university or the safety of members of the university community.

10. No student shall be tried twice for the same offense within the university system of disciplinary hearings.

11. Any party to a disciplinary hearing shall have to right to appeal the decision to the faculty or its duly authorized representative. Subsequent appeals may be taken to the board of regents when the board agrees to hear the appeal:

(a) A student found guilty of a disciplinary violation will be entitled to a new hearing if prejudicial error is found on appeal. If the appellate body affirms the action of the hearing body, the severity of the penalty shall not be increased.

(b) Except in extraordinary circumstances, any disciplinary action shall be held in abeyance until appeals have been completed.

(c) Appellate bodies may consider the validity of the regulations under which a disciplinary hearing was held, the compliance of the hearing body with provisions of this statement, and the adequacy of the hearing body findings and decision.

(d) Appellate bodies shall establish their own procedures which must include adequate notice to the parties and sufficient opportunity for the parties to prepare their arguments.

(e) The final appellate body authorized to represent the faculty pursuant to paragraph 11 of section IV shall consist of a standing Committee of Review composed of five members of the faculty. One member shall be from the faculty of the College of Law, and no two members shall be from the same college or other major division of the university. The members

shall be appointed by the president of the university after consultation with the chairman of Faculty Council and the president of the ASUI. The regular term of membership shall be two years and shall run from the beginning of the academic year to the beginning of the academic year two years thereafter. The first members of the committee to be selected following the adoption of this Statement of Student Rights shall be appointed as soon as convenient and serve until the beginning of an academic year to be designated by the president for each, in such manner as to establish a regular system of rotation whereby the terms of two committee members expire during one year and three in the next. A vacancy which occurs during a term shall be filled for the unexpired part thereof by appointment in the same manner as regular vacancies are filled.

Section V—Protection Against Improper Disclosure

1. Students shall be protected from improper disclosure of data from their disciplinary records. Such data shall only be made available:

(a) in cases of legal compulsion;

(b) when the student's written permission is secured:

(c) to persons within the university directly involved in the disciplinary proceedings established in this statement, and then only to the extent that consultation of the record is essential to determining the charge against the student or to determine penalties.

(d) Transcripts of academic records shall not contain information about disciplinary action except when such action affects the eligibility of the student to continue as a member of the academic community.

2. Information about a student contained in academic and counseling records shall be considered confidential. Specifically:

(a) Information about the views, beliefs, and associations of students acquired by instructors and advisors may be released only with the written consent of the student. Judgments of ability and character may be provided.

(b) Information accumulated in counseling students on personal problems of a private or confidential nature shall be available only to those persons authorized by the student's written permission.

3. Information in academic and counseling records may be released when:

(a) such release is legally compelled;

(b) the student gives written authorization for such release;

(c) faculty and staff members have adequate reasons, as defined by the faculty, to consult academic records;

(d) individual students are neither identified nor identifiable in statistical summaries of academic records.

Section VI—Construction and Enactment

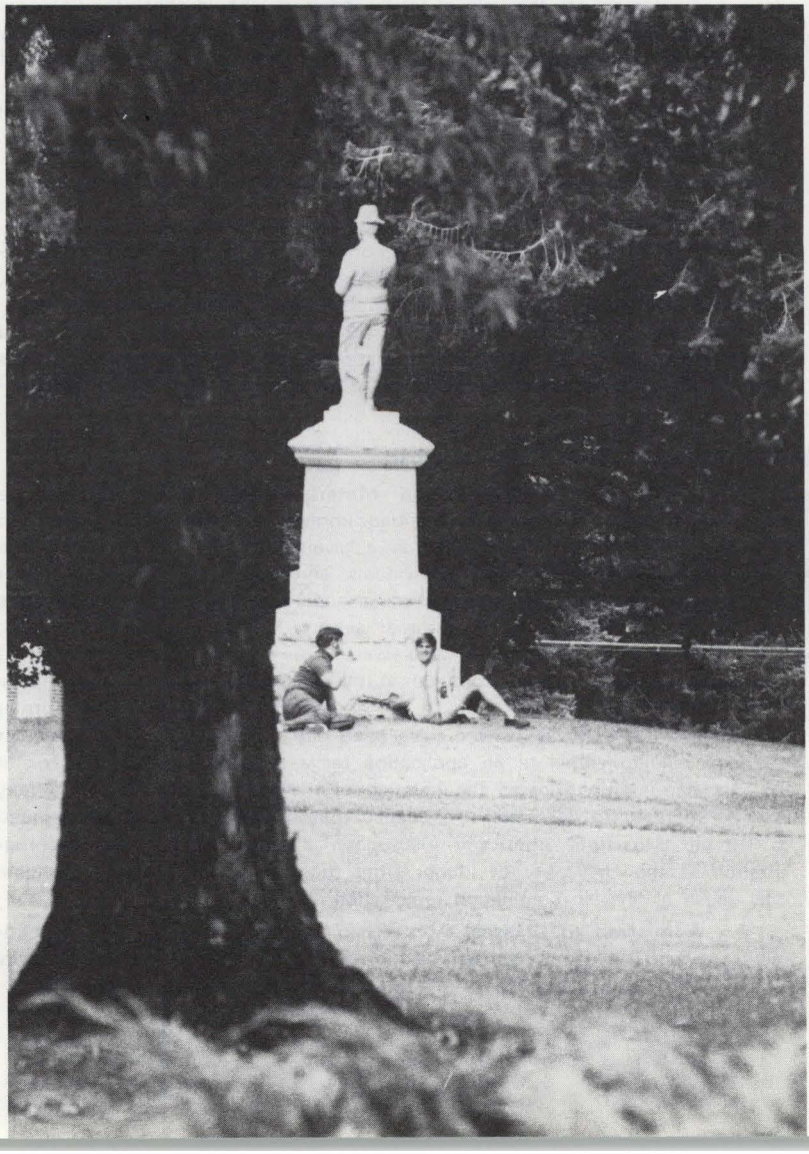
1. The enumeration of rights in this statement shall not be construed to deny or disparage other rights retained by students.

2. This Statement of Student Rights may be amended by the board of re-

gents. Proposals for amendments from the university community will be made upon a two-thirds (2/3) affirmative vote of the students voting in an election in which at least thirty-five per cent (35%) of the students vote, together with the affirmative vote of a majority of the faculty at a meeting at which a quorum was present.

3. No legislation enacted by students or the faculty shall supercede or conflict with the provisions of this Statement of Student Rights.

4. This statement shall take effect upon approval by the board of regents; except that the second sentence of section III, paragraph 1, and the first sentence of section III, paragraph 3, shall not take effect until the approval of a code of conduct by the board of regents.



General Requirements and Academic Procedures

THE FOLLOWING PROCEDURES AND REGULATIONS have been adopted to help students, faculty and staff members, and administrators successfully carry out the overall academic program of the university. Careful adherence to the items in this section will enable everyone concerned to cooperate effectively. It is the responsibility of the registration adviser, major professor, or dean to assist the student to understand and comply with academic procedures. The registrar assists by checking student records for compliance with catalog regulations. 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. The student is 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 the student successfully petitions the appropriate university committee.

Regulation "A"—Matriculation

An applicant for enrollment in any course offered by the university for college credit, except correspondence, extension, and non-matriculated categories, files 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 for him and his 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 immediately above. They are also prepared for every student enrolled in a given semester for his use in 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 been out of the school for a semester or longer should complete an application for a temporary permit to register at least one month prior to the opening of the term. Such individuals may also be required to complete a residence questionnaire and will be required to submit transcripts from any institutions attended since their last registration at the University of Idaho. Note that failure to meet the deadline may cause a delay in completing registration.

2. **Admission to Classes.** At the beginning of each semester or summer session the student, with the aid of his adviser, completes a trial study

list. The information is then transcribed to the student's official registration card which is approved by his academic dean. After receiving his class permit for each course to be taken for credit, for zero credit, or as an auditor, he files his complete official registration card with the registrar. After payment of fees, registration is complete. An instructor does not admit to class any individual whose name does not appear on the class roster, or one for whom he has not signed an "add" card.

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. The registrant is expected to do the assigned work of the course and attend its sessions. He receives a grade on the same basis as the other students and the grade is entered on his permanent record.

b. A student enrolled in a course for zero credit may take it on a pass-fail basis. 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 eligibility for academic disqualification or reinstatement.

e. Zero-credit students 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 courses for college credit only with the prior written approval of their academic deans. Credit for extension or correspondence courses will not be accepted without this written approval.

6. **Registration for Courses Without Completion of the Prerequisites.** If a student has not completed the stated prerequisite to a course for which he is otherwise eligible, he 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 the student who can meet the prerequisites and who is well prepared in his field of study. In such cases, the instructor of the upper-division course concerned may, with the concurrence of the student's adviser and his academic dean, authorize an 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 an undergraduate, a student with a baccalaureate degree must secure the permission of the dean of the undergraduate college and file a statement with the registrar indicating that he understands that his work will not be classified as graduate work and cannot be used toward an advanced degree at a later date.

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 and without late registration fee.

11. **Pass-Fail Option.**

a. With the approval of his adviser, an undergraduate student who has attained junior standing (sixty credits) and has a cumulative grade-point average of 2.00 or higher is permitted to enroll in one course per semester under this "pass-fail option." Courses which may be taken under the pass-fail option are those which are outside the student's major field *and* are not excluded from this option by the academic department in which the student is majoring. Courses in the latter category are those closely related to the major field. A maximum of twelve credits earned in courses under this regulation may be counted toward a baccalaureate degree. A grade of P will not be counted in the student's grade-point average. A grade of F shall be computed in the average. A student may add or drop a pass-fail option course in the same manner as a regular course. A student may change his option from pass-fail to a regular-course classification or vice versa if he does so prior to the last date for change of study list without having a grade recorded. A student may make this change by securing the approval of his adviser and dean and filing the study list without penalty for failing work.

b. The instructor of a course is not notified as to which students are enrolled in it under this pass-fail option. Grades under the pass-fail option are reported in the same manner as grades in courses taken on a regular basis. The registrar is charged with the responsibility of converting a grade of D or above in a course taken under the pass-fail option to a P on the student's grade report and on his transcript.

12. **Registration for Fewer Credits than Authorized.** Students may register for a particular course for fewer credits than the number indicated for a course in the time schedule (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 the catalog.

Regulation "C"—Changes in Registration

A student may change his registration in accordance with the following schedule. Students should contact their academic dean concerning changes in registration. All registration changes are effective or official 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 will not be accepted after the start of the scheduled final examination period.

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 through third week of classes.	Fourth through sixth week of classes.	Seventh to final week.
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	File form. No grade recorded.	File form. Grade recorded as withdrawal (W).	File form. Grade recorded as withdrawal (W) or failure (F).
Change in curriculum (major)	Anytime. File form. If filed after registration, the change will become effective at the next registration.		

Regulation "D"—Credit

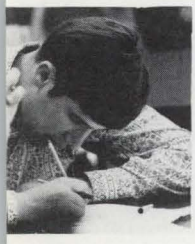
1. **Credit Defined.** Each course is evaluated by a system of semester credits related to time spent in class, laboratory, study/preparation, or field investigation. A credit is expected to require a total of three clock hours of scholarly activity per week throughout the semester. Ordinarily one hour 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 Limitation.**

a. A full-time undergraduate student may register for up to 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. The corresponding limitations during the regular eight-week summer session are ten and eleven respectively. (See also regulation "J-5.")

b. Student effort required per credit at the graduate level is considered to be greater than for undergraduate work. Accordingly, sixteen credits is considered to be a maximum and registration for more than sixteen credits by a student in the Graduate School must be justified by memorandum from the major professor. Summer registrations in the regular eight-week session are limited to roughly half the above for a normal registration of eight credits and a maximum of ten credits.



3. **Transfer Credit.** Credit is given for work completed in accredited higher institutions in accordance with the regulations covering the admission of transfer students.

4. **Challenging Courses (Credit by Examination).** Undergraduate students may petition to challenge courses given at the university covering work done in non-accredited institutions, high school, private study, or employment. Regulations governing these examinations are as follows:

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

b. The course shall not be one in which the student has been previously enrolled as an auditor.

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

d. The student must submit evidence to the instructor concerned that he has sufficient knowledge for the course in question. After the student has secured the approval of the instructor and the chairman of the department in which the course is offered, as well as the student's academic dean, he pays the required examination fee and the petition is then filed with the registrar. The registrar will check 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. The student must score C or higher to obtain credit. A passing grade is entered as a P and is not included in grade-point computations. If the student scores a D or F, there is no entry made on his transcript.

f. Results of the challenged courses must be submitted to the registrar no later than the date for reporting mid-semester grades.

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. **Grades in Undergraduate Courses.**

a. For purposes of reporting and record, the academic work of undergraduates 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" concerning the removal of incompletes); W—withdrawal according to proper procedure while the student is doing passing work or before he has established a definite record to the contrary (see regulation "C" concerning withdrawal procedures); P—pass (used in special situations and not counted in the grade-point average).

b. With reference to the phrase "special situations" in connection with the reporting of P (pass) grades in undergraduate courses, this means that P grades may be reported in those undergraduate courses which have been individually approved by the University Curriculum Committee and the faculty for the use of the P or F grading system. This grading system for each course for which it is authorized is stated in the course description, e.g., "Graded on the basis of P or F." Grades under the "pass-fail option" are not included in this regulation because the conversion of the regular letter grade is made by the registrar after the instructor turns in the class roster.

c. It is not permissible for instructors to use two different grading systems in the same undergraduate course. If a course has been approved for grading under the P or F system, students taking the course may be assigned only P or F grades. If it has not been approved for grading under the P or F system, only regular letter grades may be reported. No department or member of the instructional staff may mix the two grading systems, e.g., assign regular letter grades to students majoring in the department and assign P or F grades to non-majors.

d. Mid-semester grades in undergraduate courses must also conform to the above regulations. It is not permissible to report on the basis of P or F at mid-semester in a course which has not been approved for grading on this basis.

2. **Grades in Graduate Courses.** In courses numbered 500 and above, grades of A, B, C, D, F, W, or I (as defined in item "E-1,") must be reported, except as specified below:

a. A grade of P may be reported at the option of the department, on on a course-by-course basis in non-competitive graduate courses (seminars, directed study, and independent study). In those graduate 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 course, and the grading system will be uniform for all students in the course.

b. The grade of IP (in progress) is used to indicate progress in courses 500 (Master's Research and Thesis) and 600 (Doctoral Research and Dissertation). When the thesis or dissertation is finally accepted, the IP grades are removed and other grades are assigned according to the following procedure: 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 for which he registered

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 shall be 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 given for transfer, correspondence, extension, resident extension, advanced placement, credit by examination, or for courses graded on the basis of P or F. (This revised regulation "E-4" is effective for all students who entered the university at the time of or after initial registration for the 1971-72 academic year. 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 D or F in a course may repeat that course in an attempt to raise his grade. Regardless of the number of times such a course is repeated, all grades (except as specified below) are included in the computation of the student's cumulative grade-point average. The exception to this general rule is that a student who received F in a course at the University of Idaho while classified as a freshman may repeat the course once in residence for grade-point purposes, and when the course is thus repeated the second grade only counts in computing the student's cumulative grade-point average, although the first grade remains on the record. Prerequisite courses cannot be repeated after the completion of the advanced courses. (This regulation "E-5" is effective for all such repeated courses taken after September 1, 1969.)

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 given at the end of the semester only in case the student has been in attendance and done satisfactory work to a time within three weeks of the close of the semester, i.e., the end of the examination period, or within one week of the close of the summer session. It may not be given 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 given, the instructor shall indicate in writing with the class list what the student must do to remove the deficiency. The instructor shall also indicate with the foregoing written statement what permanent grade (A, B, C, D, F) is to be recorded on the student's transcript 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 in-

structor with the class list (see item 1 above) unless the student has previously filed with the registrar a permit-for-extension-of-time card, signed by his academic dean and the instructor concerned. In case an extension is granted, incompletes not made up before the expiration date automatically revert to the grade indicated by the instructor with the class list. 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 reregister is contingent upon removal of incompletes. In such cases an extension of time for removal of incomplete grades may not be granted. If the student becomes academically disqualified (see regulation "L") after removal of the incomplete, his registration may be cancelled.

3. **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 the student enrolls for residence courses, regulation "F-2" becomes applicable.

Regulation "G"—Withdrawal From the University

A student who wishes to withdraw from the university obtains an indefinite-leave-of-absence card from his academic dean and files it with the registrar. In the case of withdrawal, grades will be recorded in accordance with regulation "C." A student may not officially withdraw from the university after the start of the scheduled final examination period. The date the indefinite-leave-of-absence card is filed with the registrar is the official date of the withdrawal. (See "Refund of fees" in the Index.) A student who leaves the university without filing an indefinite-leave-of-absence card will receive a F in all courses in which he is registered.

Regulation "H"—Examinations

1. **Final Examinations.**

a. Final examinations will be given in those courses in which the instructor or the department concerned deem a final examination desirable. In those courses which have more than one section, the department and the various instructors will determine a uniform policy for all sections of the course. The examinations will be given in accordance with the schedule approved by the Faculty Council. Instructional personnel may deviate from the approved examination schedule only upon the recommendation of the appropriate college dean and the prior approval of the academic vice president.

b. Final grades for each course must be filed with the registrar within seventy-two hours after its scheduled examination period.

c. A student who misses a final examination without valid reason receives an F in the examination. A student who is unavoidably absent from a final examination shall present evidence in writing to the instructor con-

cerned to prove that the reasons for the absence are indeed compelling.

d. 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.

e. A student who involuntarily enters active duty in any of the armed forces within one month of the last day of a semester is permitted, at the discretion of his academic dean, to take early final examinations. Other students, on an individual basis, may be permitted to take early final examinations for compelling reasons clearly stated in writing; however, requests for early final examinations for students not involuntarily entering the armed forces must be approved by the instructor of the course, the chairman of the department and the dean of the college in which the course is offered.

2. **No-Examination Period.** No hour examinations or quizzes are to be given during lecture-recitation periods following the last Friday prior to the start of final examinations. Examinations during laboratory periods are permitted during this time, as well as examinations in certain courses (e.g., physical education activity courses, etc.) in which a final examination is not an appropriate test of the work covered.

Regulation "I"—Advanced Placement

1. With the approval of the chairman of the department concerned, a student may bypass a more elementary course and enroll in the more advanced 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 automatically receives credit and a grade of P for any bypassed courses in the same subject-matter area. Advisers should make sure that students are aware of this opportunity for obtaining advanced-placement credit.

2. A student who has completed a course at another institution after bypassing a lower vertically-related course but has 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"—Requirements for Degrees

A candidate for a baccalaureate degree must have met 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 colleges 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 a candidate is within forty credits of completing the total number of credits required for his degree, he must complete in residence, on the University of Idaho campus, a minimum of thirty-two credits in the curriculum and in the college from which he graduates. In addition to these thirty-two residence credits, a student may earn credits by correspondence, extension, advanced placement, credit by examination, or at another senior college or university. Exceptions are made for study abroad by prior approval of the student's academic dean. Senior-year residence in the combined program in law may be counted in either or both colleges concerned.

b. Students in the combined program in law must also do the work of the junior year either in the College of Letters and Science or the College of Business and Economics.

c. Candidates for pre-professional degrees (i.e., B.S.Pre-Med., etc.) which require the completion of professional courses not offered at the University of Idaho must complete their junior year in residence at the University of Idaho.

d. 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 English composition 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 course work in English composition 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," above. 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.

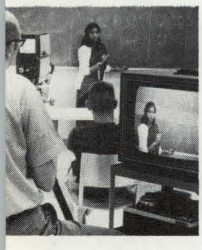
(4) Bypass Eng 101 and/or 201 under the procedures for advanced placement outlined in regulation "I."

b. *PHYSICAL EDUCATION*. Two activity courses, 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, a candidate must present a cumulative grade-point average of 2.00 or better for all residence courses attempted at the University of Idaho. See exception under regulation "E-5." (This revised regulation "J-4" is effective for all students who entered the university at the time of or after initial registration for the 1971-72 academic year. For regulations covering students who entered the university prior to the 1971-72 academic year, see the applicable catalog issue.)

5. **Credit Limitations.** A candidate may count toward a baccalaureate degree no more than thirty-two credits in any combination of credits earned by correspondence study, extension, advanced placement (including CLEP), or credit by examination, and no more than twelve credits earned under the pass-fail option (see regulation "B-11.")

6. **Assignment of Curricular Requirements (Catalog Issue).** In addition to fulfilling the general university requirements for degrees, as set forth in this regulation "J," a candidate must satisfy the particular requirements specified for his curriculum 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, a transfer student 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 he was 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 his degree.



7. **Application for Degrees.** A candidate for a degree or certificate must, at the beginning of his last semester or summer session in residence, file an application for the degree and pay the diploma fee. (See "Fees and Expenses" in part 2.) The last day for filing applications for baccalaureate degrees is the beginning of the third week of second semester. The last day for filing applications for graduate degrees is the beginning of the fourth

week of second semester. If applications are received by the registrar after these dates, there is an additional fee if the student wishes to receive his degree at the next commencement. No applications will be accepted less than thirty days prior to commencement. (See the academic calendar in the front of the catalog for exact dates.)

8. **Second Baccalaureate Degree.**

a. A student may concurrently receive two baccalaureate degrees from the university upon fulfilling the general university requirements for one baccalaureate degree and the subject-matter requirements for both. Each student planning to receive two baccalaureate degrees concurrently must submit a study plan for the approval of the dean(s) of the college(s) concerned prior to the end of his junior year. If the two degrees are offered by two distinct colleges of the university, the student must enroll in both colleges his last two semesters.

b. A student who has earned a baccalaureate degree at the University of Idaho and who wishes to receive a second baccalaureate degree must complete the subject-matter requirements for the second degree and earn at least sixteen credits while enrolled in the college granting the degree.

c. A student may return to the university and complete a second degree carrying the same name as one previously granted to him by the university, so long as the requirements of a different program of studies — different major — are satisfied.

d. A student who has a baccalaureate degree from another recognized institution and who wishes to earn a second baccalaureate degree at the University of Idaho must complete the subject-matter requirements for that degree. He must earn at the University of Idaho a minimum of thirty-two credits while enrolled in the college granting the degree.

Regulation "K"—Honors

Honors are awarded at graduation on the basis of the 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, credit by examination, advanced placement, or at another senior college or university. Credits earned in special programs, such as study abroad, which have the prior approval of the student's academic dean, may be included in the required minimum residence credits. Students receiving an average between 3.30 and 3.80 will be graduated *cum laude,* and those receiving 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.

Regulation "L"—Probation, Disqualification, and Reinstatement

1. **Probation.**

a. If, at the end of a semester, an undergraduate student attains a

cumulative grade-point average below that required for his rank, he is placed on academic probation for his next semester of enrollment and referred to his academic dean for advisement. The effect of this probationary status is to put the student on notice that if his cumulative record at the end of that next semester in residence is unsatisfactory he will be disqualified and ineligible to continue in the university.

b. If a student on academic probation attains a cumulative grade-point average higher than the minimum required for his rank, he is automatically removed from probation.

2. **Disqualification.** If at the end of a probationary semester an undergraduate student attains a cumulative grade-point average below that required by his rank, the student is placed on academic disqualification. To be eligible to register, the student must be reinstated.

3. **Reinstatement.**

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

b. After his first disqualification, a student may be automatically reinstated on probation by remaining out of the university for at least one semester.

c. A student who has been reinstated may continue to be reinstated with the approval of his dean so long as he attains a 2.00 or better grade-point average for each semester following his first disqualification.

d. If a student attends another institution while disqualified, he must meet requirements applying to the admission of transfer students in order to re-enter the university.

e. Any student who is disqualified and reinstated by his college is reinstated on academic probation.

4. **Dean's Referral.** Any undergraduate student who attains below a 1.50 grade-point average during a given semester without dropping his cumulative grade-point average below that required for his rank, receives a dean's referral. Although this does not affect his eligibility to register, the student is referred to his 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 reregister is contingent upon his removal of incomplete grades, he may not be granted an extension of time for such a removal.

7. **Summer Sessions.** If a student is disqualified at the end of a spring semester, it does not affect his eligibility to continue in the immediately

ensuing summer, but he 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 in the Graduate School.

Regulation "M"—Attendance

1. **General Attendance.** Class attendance is the responsibility of the student. This includes responsibility for making mutually-satisfactory arrangements with his instructor regarding course work missed.

2. **Official Absences.**

a. Official absences from classes for recognized activities, field trips, 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 registrar students who are repeatedly absent from class. A special form is available for this purpose.

Regulation "N"—Class Rating

The following table determines the class rating of undergraduate students:

Class Rating	Credits
Sophomore	26
Junior	60
Senior	94

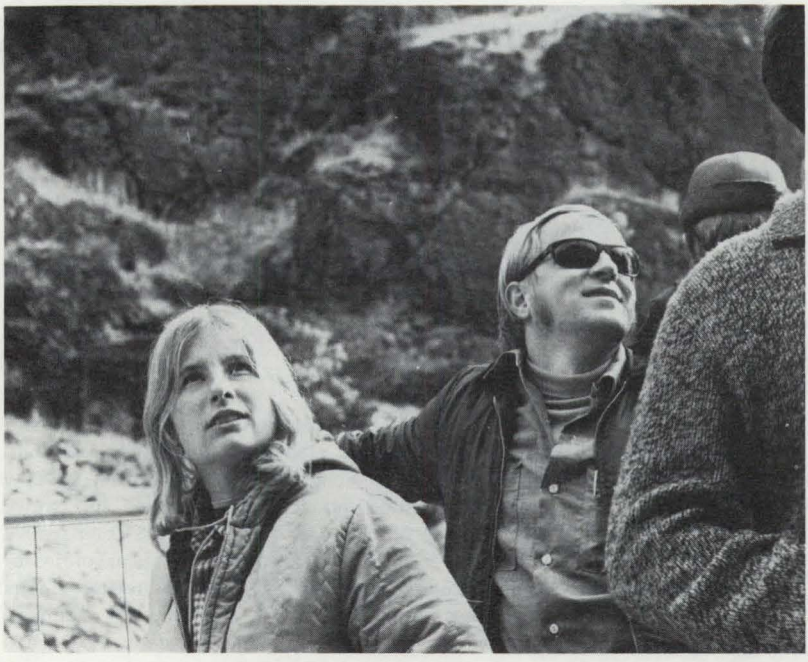
Regulation "O"—Miscellaneous

1. **Credit Requirements for Full-Time Students.** Undergraduate students are required to carry twelve or more credits to be classified as full-time students. A student in the Graduate School and in the College of Law is considered to be engaged in full-time study when registered for twelve credits of course and/or thesis work, or when registered for less than twelve credits but paying full enrollment fees and certified by his major professor and his academic dean as being engaged in the equivalent of twelve credits of study in the pursuit of course work, research, preparation for examinations, and other activities of an academic nature. The president, vice presi-

dent, and senators of the Associated Students of the University of Idaho are considered to be full-time students 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 Dishonesty.** Dishonesty in academic matters, such as cheating and plagiarism, is inconsistent with the process of education and will not be tolerated. Instructors are responsible for maintaining academic integrity in their courses, and may invoke penalties for academic dishonesty. If the penalties are deemed unfair, appeal may be initiated through the appropriate department chairman or academic dean, or through the student judicial system.

3. **Rights Reserved to the University.** The university and its divisions reserve the right to change fees, rules, and calendar regulating admission and registration, instruction in, and graduation from the university and its various divisions, and to change any other regulations affecting the student body. 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 because of facilities, to require 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

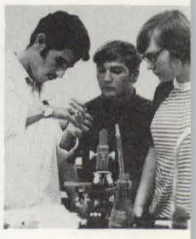
Francis Seaman, Coordinator (305-C Administration Bldg.)

THE GENERAL STUDIES PROGRAM was authorized in the fall of 1969 to allow students at all levels of competency to explore various academic areas before deciding in which college of the university they should enroll for a degree. It is an advisory program, rather than degree granting; however, credits and grade points earned while enrolled in the program may be applied toward a 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 coordinator.

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 for general studies. However, it should be noted that no student can graduate in general studies. To graduate, a student must transfer to a regular college of the university and fulfill all general university and college requirements for his degree. It is important that students realize that they may enroll in the general studies program for five semesters only. Furthermore, students should be aware that normally they may not transfer from general studies to any of the university's colleges unless they have a grade-point average of at least 2.00 ("C").

College of Agriculture

James E. Kraus, Dean (111 Ag. Sc. Bldg.); Don A Marshall, Associate Dean.

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 the student to choose elective courses that will add to his personal growth, help him understand the environment in which he lives, 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, Henry F. Gauss Mechanical Engineering Laboratory, Engineering Building, 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 biochemistry, agricultural economics, agricultural education, animal industries, bacteriology, entomology, food science, plant sciences, soils, and veterinary science.

Graduate study leading to the degree of Doctor of Philosophy is available in agricultural biochemistry, agricultural economics (as a concentration under the major in economics), bacteriology, 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

AGRICULTURAL EDUCATION

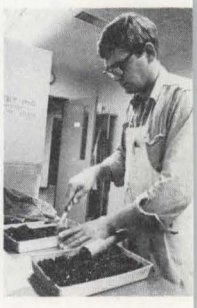
AGRICULTURAL SCIENCE—with options in agricultural biochemistry, animal industries, bacteriology, entomology, food science, plant science, soils, and veterinary science.

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. AgBiC 205, General Agricultural 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 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
Math 140-141 Coll Alg & Anal Trig	5
Speech	2
Ag 400 Seminar	1
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Advanced writing	3
Physical education activities	2
Biol 201 Intro to Life Science	4
Biol 202 Gen Zool, *or* 203 Gen Bot	4
Chemistry	8
Agricultural economics (may include Econ 251-252, Prin of Economics)	18
Accounting, business, and economics	15
Humanities and social sciences	14
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 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 Agr Business Management	3
Econ 251-252 Prin of Economics	6
Bus 324 Sales Management	3
Bus 365 Business Law	3
Soils 205-206 General Soils	4
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
Ag Mech 315 Irrigation & Drainage	2-3

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

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

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 Appl'd to Econ

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
Econ 251-252 Prin of Economics	6
Anl 205 Animal & Avian Nutrition	3
Anl 222 Livestock Brdg & Reprod	3
One of the following products courses	3-4
Anl 203 Live An Sel & Car Eval	
Anl 263 Meat Industry	
Anl 433 Poultry Products Tech	
FS 259 Food Prod Anal for Qual Cont	
Two of the following production courses	6
Anl 321 Beef Cattle Science	
Anl 322 Sheep Science	
Anl 323 Dairy Cattle Mgm't	
Anl 324 Horse Production	
Anl 326 Swine Science	
Anl 328 Commer Poultry & Egg Prod	
Anl 450 Proseminar	1

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
FS 101 Intro to Food Science	3
FS 201 Physical Prin of Food Proc	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
Ag 321 *or* Bus 231 Statistics	3-4
Acctg 131-132 Prin of Accounting	6
Bus 233 Intro to Computers	3
Bus 311 Intro to Mgm't Theory	3
Bus 365 Business Law	3
Econ 251-252 Prin of Economics	6
Bact 402 Food & Appl Microbiology	4

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
AgEc 208 Farm & Ranch Management	3
AgEc 219 Marketing Farm Products	3
AgEc 391 Ag Business Management	3
Acctg 131 Prin of Accounting	3
Econ 251-252 Prin of Economics	6
Bus 231 *or* Ag 321 Statistics	3-4
Soils 205-206 General Soils	4
Soils 344 Soil Conservation & Mgm't	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
Math 140-141 Coll Alg & Anal Trig	5
Speech	2
Ag 400 Seminar	1
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Advanced writing	3
Physical education activities	2
Biol 201 Intro to Life Science	4
Biol 202 Gen Zool, *or* 203 Gen Bot	4
Humanities and social sciences	14
Chemistry	8
Accounting, business, and economics	21
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

The remaining credits 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
391 Ag Business Mgm't
451 Land Resource Econ
477 Econ of Dev Countries
481 Agric Market Analysis
494 Math Anal Appl'd 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
Math 140-141 Coll Alg & Anal Trig	5
Speech	2
Ag 400 Seminar	1
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Advanced writing	3
Physical education activities	2
Biol 201 Intro to Life Science	4
Biol 202 Gen Zool, *or* 203 Gen Bot	4
Humanities and social sciences (may include Ed 468)	14
Chemistry	8
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
Math 140-141 Coll Alg & Anal Trig	5
Speech	2

(Continued on next page)

AGRICULTURAL SCIENCE (Cont.)

Ag 400 Seminar	1
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Advanced writing	3
Physical education activities	2
Biol 201 Intro to Life Science	4
Biol 202 Gen Zool, *or* 203 Gen Bot	4
Biology electives	7
Chemistry	11
Humanities and social sciences	14
Agriculture electives	12
Major field	20
Unspecified electives	38
	132

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

A. AGRICULTURAL 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 315 Gen Phys	3-4
Chem 112 Inorg Chem & Qual Anal	5
Chem 253 Quan Analysis	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 Anal Geom & Calc I	4
Math 190 Anal Geom & Calc II	4
Math 200 Anal Geom & Calc III	3
Phys 220 Engr Physics I—Mechanics	3
Phys 221 Engr Physics II—Elec & Mag	3
Phys 222 Engr Physics III—Wave Motion	3

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

C. 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	3
PlSc 314 *or* Biol 351 Gen Genetics	3
Anl 305 Principles of Nutrition	3
Anl 306 Applied Animal Nutrition	4
Anl 422 Animal Breeding	3
Anl 450 Proseminar	1
One of the following products courses	3-4
Anl 203 Live An Sel & Car Eval	
Anl 263 Meat Industry	
Anl 433 Poultry Products Tech	
FS 259 Food Prod Anal for Qual Cont	
One of the following production courses	3
Anl 321 Beef Cattle Science	
Anl 322 Sheep Science	
Anl 323 Dairy Cattle Mgm't	
Anl 324 Horse Production	
Anl 326 Swine Science	
Anl 328 Commer Poultry & Egg Prod	
Anl 451 Endo Physiology, *or* 452 Phys of Reprod & Lact	3-4

Note: Students concentrating in range livestock management are required to complete For 351, Elem of Range Mgm't; and For 452, Range Communities.

D. 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	4
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 Quant 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 Microbiology	3
Bact 409 Immunology & Serology	4
AgBiC 205 General Ag Biochem	4

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

E. ENTOMOLOGY OPTION

This option is designed for students who desire professional careers in the basic and applied fields of entomology (insect taxonomy, ecology, and physiology, and economic entomology). Departmental requirements to satisfy, in part, the general requirements listed above are:

Course	Credits
Ag 321 Biometry	3
*Bact 250 General Bacteriology	4
PlSc 303 Plant Pathology	4

Biol 202 General Zoology	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Biology electives	11
Chem 112 Inorg Chem & Qual Anal	5
Chem 277 Organ Chem I, *or* 275 Carbon Compounds	3
Physics	3
Ent 211 General Entomology	4
Ent 342 Insect Identification	4

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

F. 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
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
Ag 321 Biometry	3
Physics (general)	8
Bact 402 Food & Appl Microbiology	4
Math 180 Anal Geom & Calc I	4
Chem 253 Quant Anal	5
Organic chemistry	4

G. 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. Department requirements to satisfy, in part, the general requirements listed above are:

Course	Credits
Biol 203 General Botany	4
Courses strongly recommended:	
PISc 102 Plant Sciences in Ag	3
PISc 202 Plant Propagation	3
PISc 303 Plant Pathology	4
PISc 312 Agriclimatology	3
PISc 314 General Genetics	3
PISc 401 Crop Physiology	3

H. 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
Chem 112 Inorg Chem & Qual Anal	5
Chem 253 Quant Anal	5
Chem 277 Organ Chem I, *or* 275 Carbon Compounds	3
Math 180 Anal Geom & Calc I	4
Biol 203 General Botany	4
Bot 311 Plant Physiology	3
Bact 250 General Bacteriology	4
Geol 101-102 Physical Geology	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
Soils 446 Soil Fertility	3
Soils 454 Soil Dev & Classification	3

I. VETERINARY SCIENCE OPTION

Students preparing for admission to colleges of veterinary medicine or for careers in fields related to veterinary medicine should elect this option. Three sub-options are available.

1. Completion of ninety-nine credits at the University of Idaho; plus the successful completion of the first year of study (at least thirty-three credits in approved courses) at a recognized college of veterinary medicine to satisfy the senior year in residence.

2. Completion of the 132 credits required under the agricultural science curriculum.

3. Completion of ninety-nine credits at the University of Idaho; plus twelve months' training and experience in the theory and application of laboratory tests and research techniques in veterinary parasitology, veterinary microbiology, veterinary toxicology, blood chemistry, comparative immunology and serology, and laboratory animal care. Credit for this training (maximum thirty-three credits) to be granted under VS 498, Internship: Vet Med Tech. The internship must be undertaken in an approved laboratory.

Department requirements to satisfy, in part, the general requirements listed above 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 113-114-115-116 Gen Phys & Lab (not required in sub-option 2 or 3)	8

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 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. 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. 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 cumulative grade-point average is raised to this minimum level.

Economic principles and economic history may be counted in either the business or non-business groups below.

A. *BUSINESS AND ECONOMICS CORE REQUIREMENTS.*

Course	Credits
Acctg 131-132 Principles of Accounting	6
Accounting elective	3
Bus 101 Introduction to Business Enterprises	3
Bus 231 Statistics	4
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	6
Econ 321 Intermediate Microeconomic Analysis	3
Econ 372 Intermediate Macroeconomic Analysis	3
Economics elective	3
Additional business and economics courses, including those required in the major, to total fifty-two credits	9

B. *NON-BUSINESS COURSES.*

Course	Credits
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Eng 313 Business Writing	3
Math 111 Fund of Math, *or* 140-141 Coll Alg & Anal Trig	4-5

(Continued on next page)

Sp 131 Fundamentals of Speech	2
Literature	6
Natural science (physical or biological science)	4
Physical education activities	2
Social science, psychology, or economic geography	6
Foreign language/mathematics-English (see paragraph C below)	0-16
Additional non-business courses, including those required in the major, to total fifty-two credits	18-19

C. *FOREIGN LANGUAGE/MATHEMATICS-ENGLISH.* The basic requirement is proficiency in one foreign language, equivalent to that gained by completion of four semesters of college courses (through the intermediate level). This requirement may be satisfied by presenting four high school units in one foreign language. A student presenting two high school units may fulfill the requirement by completing a second year of the same language in the university. (Students may substitute Eng 150 and an additional semester of mathematics, Math 112 or 180, for the foreign language requirement.) *Note:* The requirements specified in this item normally will be completed during the freshman and sophomore years. In case of scheduling difficulties, adjustments may be made with the consent of the student's adviser.

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 advanced ROTC 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 233 Introduction to Computers	3
Bus 432 Quant Methods in Bus & Econ	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 Economics 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: eighteen credits in approved technical electives in agriculture, engineering, forestry, or mining. (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 four years, and in the College of Law for the last two. 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: 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: fifteen additional credits in economics courses numbered 300 or above, and additional credits in social sciences (other than economics), geography, psychology, or mathematics, with not more than nine credits in any one field.

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 302 Finan Institutions & Credit	3
Bus 401 Investments	3
Bus 403 Insurance	3
Bus 436 Bus & Econ Fluctuations	3
Econ 409 Public Finance	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.

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 411 Organization Theory	3
Bus 413 Human Relations in Business	3
Bus 414 Management Policy	3
Bus 432 Quant Methods in Bus & Econ	3
Three of the following courses	9
Bus 233 Introduction to Computers	
Bus 312 Industrial Management	
Bus 412 Personnel Management	
Bus 439 Systems Anal & Simulation	
Bus 441 Labor Relations	

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 323 Principles of Advertising	3
Bus 421 Marketing Problems	3
Bus 422 Mktg Research & Analysis	3
Bus 423 Retail Merchandizing Fund	3
Recommended electives:	
Bus 233 Introduction to Computers	3
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 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
Recommended electives:	
Arch 265 Materials & Methods	3
Arch 376 Hist of Modern Arch	2
AgEc 451 Land Resource Econ	3
Geog 470 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 third semester of accounting and Econ 321 and 372), 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; Margaret Walker, 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 he will teach, or in the area in which he 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 services, 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 and the Bachelor of Science in Business Education. See the section headed "Major Curricula" further on in this catalog section 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 business education (includes distributive education and office occupations options), education, elementary education, guidance and counseling, industrial 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 objective (this could be as early as his freshman year and certainly no later than admission to the teacher education program) his 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 his registration cards. Changes in the program require the signature of both advisers. Exceptions to this rule are students major-

ing 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 freshmen 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 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 designated centers. 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 (i.e., Ed 585, SpEd 504 and 505) and in the performance of other school positions (i.e., Guid 529 and 570, and Ed 585).

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, 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 Advanced Secondary School Certificate. Students who complete the master's or professional certificate program 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. He, in turn, works with the registrar to get the necessary supporting credentials and forward 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 students in the college:

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)* shall include composition and literature.

2. *Social Science (9-12 credits)* shall include at least one course in American history or American government. 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)* shall include biological, earth, or physical science courses requiring laboratory work. 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 teach at the elementary-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 UNIFORM 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

*Not required of majors in recreation. 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. or B.S.Bus.Ed.). 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.)

Students electing the office occupations or distributive education options should consult their advisers concerning state requirements for the vocational education certificate.

A. OFFICE OCCUPATIONS OPTION

Students whose primary interest is in teaching secretarial and clerical subjects and wish to qualify for vocational certification should elect this option. 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
BusEd 497 Coordination Techniques	3
Econ 251-252 Principles of Economics	6
Eng 313 Business Writing	3
Geog 112 Economic Geography	3
OAd 103 Typewriting III (may be waived by examination)	2
OAd116 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

B. GENERAL BUSINESS OPTION

This option 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 112 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
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

C. DISTRIBUTIVE EDUCATION OPTION

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

Plus 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

DISTRIBUTIVE EDUCATION

See Business Education.

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	2
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

(Continued on next page)

INDUSTRIAL EDUCATION (Cont)

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

See Business Education.

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 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, Pyramids & Stunts	2
PE 150 General Hygiene	3
PE 228 Square & Social Dance	1
PE 237 Archery & Bowling	1
PE 240 Tennis & Badminton	1
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

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 department 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 Instructor's 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 specialization in an activity area (see below) to complete a sixty-credit major in physical education.

A. SPECIALIZATION IN SPORTS

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 cr for the specialization:

Ed 428 Audio-Visual Aids	3
PE 106 Adv Bandminton & 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. SPECIALIZATION IN DANCE

Art 101 *or* 102 Survey of Art	2
MusH 100 Music Appreciation	3
PE 105 Modern Dance	1
PE 113 Problems in Dance Composition	1-2
PE 220 Rhythms for Children	2
PE 228 Square & Social Dance	1
PE 320 Labanotation	1
PE 325 Dance Production	2

Plus six cr from the following:

Dr 105 Basics of Performance	2

Dr 266 Creative Dramatics	2
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

C. SPECIALIZATION IN AQUATICS

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. SPECIALIZATION IN GYMNASTICS

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 cr for the specialization:

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, Pyramids & Stunts	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
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 Handicap	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.Ed.)

This curriculum is primarily for students interested in careers in leadership, supervision, or management of recreation, parks, or youth-serving agencies.

College Requirements

Required course work includes the general requirements for students preparing to teach at the secondary level, except that PE 495 is substituted for senior practicum. In partial fulfillment of the general college requirements, recreation majors should take the following (or approved equivalents):

Course	Credits
Anthr 120 Intro to Social Anthropology	3
Biol 100 Man & the Environment	4
Biol 203 General Botany	4
Eng 313 Business Writing	3
Geol 101-102 Physical Geology & Lab	4
PolSc 101 American Government	3
Soc 110 Introduction to Sociology	3
Literature elective offered by Department of English	3

Major Requirements

Acctg 131 Principles of Accounting	3
PE 108 Swimming (may be waived by proficiency examination)	0-1
PE 228 Square & Social Dance	1
PE 243 Highly Organized Games	2
PE 252 Elem School Physical Education	2
PE 254 Camp Leadership	2-3
PE 261 Recreational Arts & Crafts	2
PE 264 Recreational Music	1

(Continued on next page)

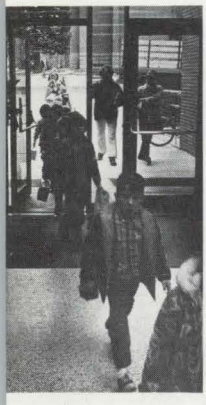
RECREATION (Cont.)

PE 271 Interpretations	3
PE 329 Leadership in Recreation	2
PE 387 *or* 226 Officiating	1-3
PE 486 Program Planning for Rec Centers	3
PE 494 Community Recreation	3
PE 495 Internship in Recreation	9
Physical education electives (indiv sports activities)	2
Drama elective	3
Radio-television elective	3

Plus twenty credits in one of the following fields: industrial education, sports activity, arts and crafts, dance, music, drama, camping, speech, sociology, history, radio-television, or another field approved by the student's adviser.

Recommended Electives

Arch 483 Arch & Rec Planning	2
Ed 428 Audio-Visual Aids	3
For 487 Forest Recreation	3
IEd 140 Woodwork I	3
IEd 250 General Metals	3
IEd 251 Plastics	3
Jour 221 News Writing	2
PE 255 Backpacking & Camping Skills	2
PE 266 Aquatic Instructor's Course	2
PE 288 First Aid	2
Soc 311 Urban Sociology	3
Soc 320 The Family	3
Soc 321 The Community	3



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
Psych 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
Ed 430 Practicum: Elem Sch Tching
Ed 434 Children's Literature
MusT 381 Elem School Music Meth I
PE 252 Elem School Phys Ed
PE 316 Elem School Health Materials

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 451 School Shop Planning & Admin	3
IEd 462 Industrial Ed Curriculum	3
IEd 472 Industrial Ed Methods	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.

VOCATIONAL TEACHER EDUCATION (B.S.Ed.)

Required course work includes the general requirements for students preparing to teach at the secondary level, plus the following courses which are common to the trade and industrial option and the vocational-technical option:

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 Technical 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 teacher 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 History 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 315 General 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

(Continued on next page)

BIOLOGICAL SCIENCES (Cont.)

Plus one of the following courses	4-5
Bot 311-312 Plant Phys & Lab	
Bot 425 Developmental Plant Anatomy	
Zool 315 Cell Physiology	
Zool 323 Compar Vert Embryology	
Zool 324 Compar Vert Anatomy	

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.

A. 21-CREDIT OFFICE OCCUPATIONS TEACHING MINOR

Course	Credits
Bus 313 Office Management	2
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 395 Secretarial Procedures	3

B. 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 are 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 Dance (folk and modern)	2
PE 112 Dance Techniques	1
PE 113 Problems in Dance Composition	2
PE 220 Rhythms for Children	2
PE 228 Square & Social Dance	1
PE 320 Labanotation	1
PE 321 Theory & Tech of Teaching Dance	2
PE 325 Dance Production	2
Two credits selected from the following	2
Dr 105 Basics of Performance	
Dr 266 Creative Dramatics	
PE 105 Dance (advanced folk, ballet, and jazz)	
PE 111 Fundamentals of Movement	
PE 113 Problems in Dance Composition	
PE 499 Directed Study	
Rad-TV 282 Intro to TV Production	
Rad-TV 322 Ed Uses of Radio & TV	
Rad-TV 488 Cinematography for TV	

DRAMA

A. 30-CREDIT DRAMA TEACHING MAJOR

Course	Credits
Dr 102 Stage Makeup	1
Dr 105 Basics of Performance	2
Dr 263 Technical Production	3
Dr 271 Play Analysis	3
Dr 272 Intermediate Acting	3
Dr 362 Costume for the Stage	2

Dr 420 Production Management	2
Dr 471-472 Directing	6
Approved drama electives	8

B. DRAMA TEACHING MINORS

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

Course	Credits
Dr 102 Stage Makeup	1
Dr 105 Basics of Performance	2
Dr 263 Technical Production	3
Dr 271 Play Analysis	3
Dr 272 Intermediate Acting	3
Dr 362 Costume for the Stage	2
Dr 420 Production Management	2
Dr 471 Directing	3
Approved drama elective	1

DRAMA-SPEECH

40-CREDIT COMPOSITE TEACHING MAJOR

Course	Credits
Dr 102 Stage Makeup	1
Dr 105 Basics of Performance	2
Dr 263 Technical Production	3
Dr 272 Intermediate Acting	3
Dr 362 Costume for the Stage	2
Dr 420 Production Management	2
Dr 471-472 Directing	6
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
Approved electives in drama and speech	2

EARTH SCIENCE

40-CREDIT COMPOSITE TEACHING MAJOR

Note: Chem 111, Principles of Chemistry, is a prerequisite for Geol 202. Students who have not had high school chemistry should take Chem 103, Introduction to Chemistry.

Course	Credits
Geog 103 Physical Geography	4
Geog 112 Economic Geography	3
Geog 251 Cartography	3
Geog 254 World Regional Geography	2
Geog 340 United States & Canada	3
Geog 401 Atmospheric Environment	3
Geol 101-102 Physical Geology & Lab	4
Geol 106-107 Historical Geology & Lab	4
Geol 111 Ancient Life	4
Geol 202 Mineralogy & Petrology	4
Geol 401 Geomorphology	3
Plus three credits from the following	3
Geog 437 Dec-Making in Resource Mgmt	
Geog 455 Asia	
Geol 421 Structural Geology	
Geol 431 Field Geology	

ENGLISH

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

A. 30-CREDIT ENGLISH TEACHING MAJOR

Course	Credits
Eng 267-268 *or* 277-278 Survey	6
Eng 435 *or* 436 Shakespeare	3
Eng 438 *or* 455 *or* 456 Rest & 18th Cent	3
Eng 441 American English	3
Eng 452 *or* 453 *or* 454 Seventeenth Cent	3
Eng 464 *or* 465 *or* 466 Nineteenth Cent	3
Eng 471 *or* 472 American Literature	3
Approved English electives	6

B. 20-CREDIT ENGLISH TEACHING MINOR

Course	Credits
Eng 267-268 *or* 277-278 Survey	6
Eng 435 *or* 436 Shakespeare	3
Eng 464 *or* 465 Nineteenth Century	3
Eng 471 *or* 472 American Literature	3
Approved English electives	5

C. 15-CREDIT ENGLISH TEACHING MINOR

Course	Credits
Eng 267-268 *or* 277-278 Survey	6
Eng 464 *or* 465 Nineteenth Century	3
Eng 471 *or* 472 American Literature	3
Approved English elective	3

ENGLISH AREA

A. 30- OR 40-CREDIT COMPOSITE TEACHING MAJOR

Required course work includes approved courses from English, drama, journalism, and speech with at least twenty-four credits in English.

Course	Credits
Eng 267-268 *or* 277-278 Survey	6
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 American English	3
Eng 464 *or* 465 *or* 466 Nineteenth Century	3
Eng 471 *or* 472 American Literature	3
Approved English elective	3
Approved electives from English, drama, journalism, or speech	6-16

B. 20-CREDIT COMPOSITE TEACHING MINOR

This composite teaching minor is limited to students who are majoring in elementary education and may include a course in speech.

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 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 103 Physical Geography	4
Geog 112 Economic Geography	3
Geog 252 Cultural Geography	3
Geog 254 World Regional Geography	2
Geog 340 United States & Canada	3
Geog 343 Idaho & Pacific Northwest	3
Geog 401 Atmospheric Environment	3
Geog 437 Dec-Making in Resource Mgmt	3
Geog 455 Asia	3
Geog 480 Political Geography	3

B. 20-CREDIT GEOGRAPHY TEACHING MINOR

Course	Credits
Geog 103 Physical Geography	4
Geog 112 Economic Geography	3
Geog 252 Cultural Geography	3
Geog 254 World Regional Geography	2
Geog 340 United States & Canada	3
Geog 437 Dec-Making in Resource Mgmt	3
Approved geography elective (Geog 455 recommended)	2

GEOLOGY

A teaching major in geology is not offered.

20-CREDIT GEOLOGY TEACHING MINOR

Note: Chem 111, Principles of Chemistry, is a prerequisite for Geol 202. Students who have not had high school chemistry should take Chem 103, Introduction to Chemistry.

Course	Credits
Geol 101-102 Physical Geology & Lab	4
Geol 106-107 Historical Geology & Lab	4
Geol 111 Ancient Life	4
Geol 202 Mineralogy & Petrology	4
Plus four credits from the following	4
Geol 401 Geomorphology	
Geol 421 Structural Geology	
Geol 431 Field 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 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 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
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

(Continued on next page)

LIBRARY SCIENCE (Cont.)

librarianship credential. Since library science 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 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 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
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	

MILITARY SCIENCE

TEACHING MINORS IN MILITARY SCIENCE

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

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 the catalog).

20-CREDIT MUSIC TEACHING MINOR

Course	Credits
MusA 387 Conducting	2
MusC 121-122 Elements of Music Theory, *or* 141, 241 Musicianship & Music Lit and Theory of Music I	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 I, *or* 385 Choral Music in the Sec School, *or* 386 Instr Music in the Sec School	2
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 Music in the Sec Schools	

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 and Physiology, and Ed 323, Health Education Methods.

The general university requirement in physical education activity courses is waived for majors and minors in their 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 Education
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, Pyramids, & Stunts	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 Gymnastics	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 SCIENCES

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, including 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 9-12 credits from the following	9-12
PolSc 105 Elements of Pol Science	
PolSc 152 Politics & Pollution	
PolSc 153 Politics & Peace	
PolSc 154 Politics & the Economy	
PolSc 275 Amer State Government	
PolSc 276 Amer Local Government	
PolSc 428 Amer Political Thought	

(Continued on next page)

POLITICAL SCIENCE (Cont.)

PolSc 431 Political Parties
PolSc 432 The Legislative Process
PolSc 433 Public Opinion & Prop
PolSc 434 Interest Groups
PolSc 451 Pres & Admin Dec-Making
PolSc 452 Admin Law & Regulation
PolSc 467 Constitutional Law
PolSc 469 The Judicial Process
PolSc 493-494 Sem in Urban Studies

Comparative Government and Politics

At least three credits from the following:
PolSc 285 Systems of Parl Democracy
PolSc 286 Authoritarian Pol Systems
PolSc 446 The Chinese Empire
PolSc 483-484 Developing States
PolSc 485 African Political Systems

International Relations

At least three credits from the following:
PolSc 153 Politics & Peace
PolSc 237 International Politics
PolSc 341 World Politics
PolSc 438 Conduct of Amer For Policy
PolSc 440 Prin of Inter Law & Org
PolSc 443 Contemp Far East Politics

Public Administration and Public Law

At least three credits from the following:
PolSc 451 Pres & Admin Dec-Making
PolSc 452 Admin Law & Regulation
PolSc 454 Admin Org & Behavior
PolSc 467 Constitutional Law
PolSc 469 The Judicial Process

Political Thought

At least three credits from the following:
PolSc 425 Western Pol Thought
PolSc 426 Recent Pol Thought
PolSc 428 American Pol Thought

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 scoiology/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* 455 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 228 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	3
PE 226 Officiating Women's Sports	
PE 387 Intramural & Athl Officiating	
PE 486 Program Planning for Rec Cent	
PE 494 Community Recreation	

Additional Courses for Women

Six credits selected from the following 6
PE 105 Dance
PE 108 Swimming
PE 115 Team Sports Backgrounds
PE 116-117 Indiv Sports Backgrounds
PE 139 Gymnastics

Additional Courses for Men

Six credits selected from the following 6
PE 126 Weight Training & Conditioning

PE 138 Swimming
PE 139 Gymnastics
PE 141 Wrestling
PE 142 Tumbling, Pyramids, & Stunts
PE 244 Life Saving

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 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 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 130 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 130 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 for policies on advanced placement.

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.

(Continued on next page)

SPANISH (Cont.)

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

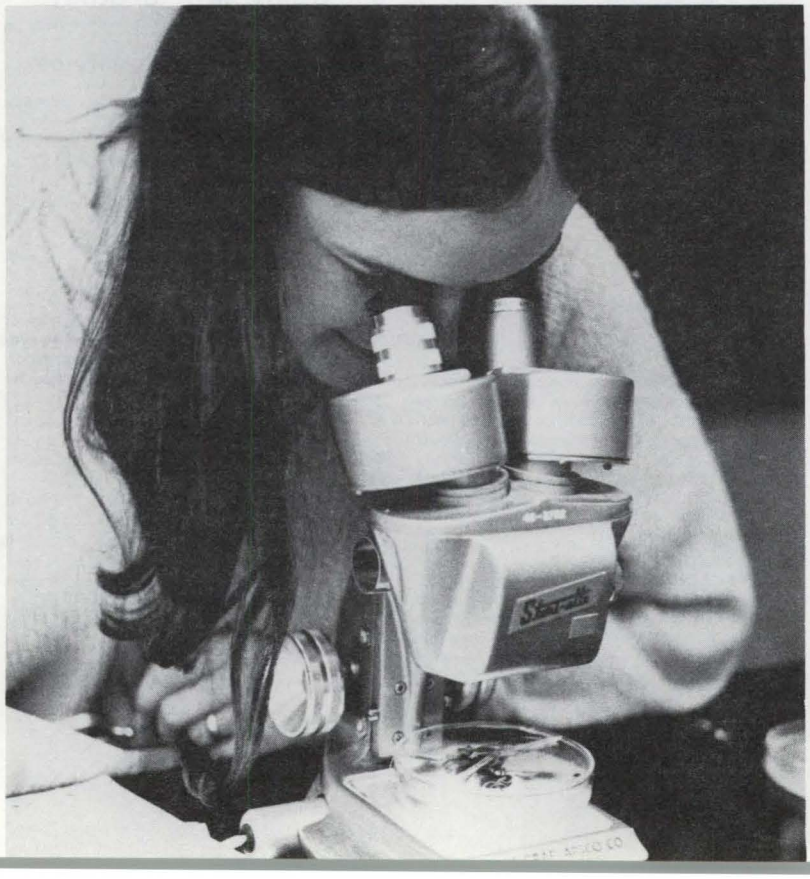
The teaching minor in speech may be fifteen or twenty credits; however, twenty credits is required for certification in speech at the secondary-school level. Select courses from those specified for the speech teaching major.

TECHNICAL EDUCATION

See Industrial Education.

ZOOLOGY

See Biological Sciences.



College of Engineering

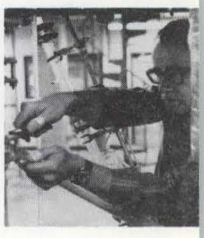
H. Sidwell Smith, Dean (131 Engr. Bldg.); George R. Russell, Assistant Dean and Secretary of the College Faculty; Weldon R. Tovey, Assistant Dean.

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 training is devoted to humanistic-social studies to help him relate his technical training to the world around him and to enhance his 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, willing 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 can progress very far in his 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 contemplate 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

A number of scholarships and awards is available to engineering students and prospective students. See part 2 of this catalog for descriptions and information about applications.

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 fields of practice. Interdepartmental activities are designed to lead the student to an awareness of the inter-relationship 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" (Requirements for Degrees) in part 3 of this catalog.

Courses of study leading to the graduate degree, Master of Science (M.S.), with majors in agricultural, chemical, civil, electrical, mechanical, and nuclear engineering, are offered. 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 outlinted 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 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.

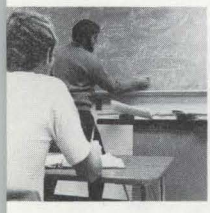
Students may enter the honors program as early as the first semester of the freshman year; normally entry will be at the second semester of the freshman year or during the sophomore year. Students must achieve a 3.00 or better grade-point average each term to remain in the program.

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 faculty 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 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

Course	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
Elective 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.)

Note: If EE 314 is elected, the extra hour will be subtracted from the undesignated elective in the senior year.

First and Second Years

Courses common to all curricula	57
ES 221 Dynamics of Rigid Bodies	2
Life science elective (biol or agric)	4

Third and Fourth Years

AgE 342 Agricultural Engr Analysis	3
AgE 351 Hydrology	3
AgE 352 Fund of Irrigation & Drainage	4
AgE 443 Agric Engr Instrumentation Lab	2
AgE 449 Elem of Structural Engr	3
AgE 461 Environmental Systems	3
AgE 462 Materials Handling & Proc	3
AgE 471 Energy Conversion in Ag Systems	2
AgE 472 Agricultural Machine Design	2
AgE 491-492 Seminar	0
Ag 321 Biometry	3

(Continued on next page)

AGRICULTURAL ENGINEERING (Cont.)

CE 382 Engineering Economy	2
EE 314 Electronics & Cont Sys, *or* 324 Electrical Machinery	3-4
ES 320 Fluid Mechanics	3
ES 321 Thermodynamics & Heat Transfer	3
ES 340 Mechanics of Materials	3
Soils 205 General Soils	3
Humanistic-social science electives	9
Technical electives	6
Undesignated electives	5

CHEMICAL ENGINEERING (B.S.Ch.E.)

First and Second Years

Courses common to all curricula	57
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
Phys 360 Intro to Modern Physics	3
Engineering science elective	3
Mathematics elective	3
Humanistic-social science electives	7
Undesignated elective	3

*Approved technical elective may be substituted for ChE 454.

CIVIL ENGINEERING (B.S.C.E.)

First and Second Years

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 357 Mech Properties of Materials	2
CE 372 Transportation Engineering	4
CE 382 Engineering Economy	2
CE 431 Sanitary Engineering	4
CE 440 Structural Design	3
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
Phys 360 Intro to Modern Physics, *or* Chem 302 Prin of Physical Chemistry, *or* Geol 101 Physical Geology	3
Soc 493 *or* 494 Seminar in Urban Plan	2
Technical electives (at least one mathematics-oriented course)	14
Humanistic-social science electives	7
Undesignated electives	4

ELECTRICAL ENGINEERING (B.S.E.E.)

First and Second Years

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 391-392 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

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 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
Phys 360 Intro to Modern Physics	3
Humanistic-social science electives	6
*Technical electives	13

*At least nine of the thirteen 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 Bldg.); Robert H. Seale, 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 he needs for his 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 type 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 extensive recreational areas. These natural study areas and resources are available for directed effort of the student in preparing himself for his chosen 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 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 him 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 earn his degree 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 un-

able 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 be 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 in which he is particularly interested. 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 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, wildlife, 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 can 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 138 semester credits is required for the degree of Bachelor of Science in Forestry. 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 or 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 programs.

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 courses.

FIRST AND SECOND YEAR COURSES COMMON TO ALL CURRICULA

Course	Credits
Biol 201 Introduction to the Life Sciences	4
Biol 203 General Botany	4
Biol 331 General Ecology	3

(Continued on next Page)

Chem 111 Principles of Chemistry 4
Econ 251-252 Principles of Economics 6
Eng 101 English Composition 3
Eng 201 Language & Literature 3
For 101 Forestry Orientation 1
For 250 Introduction to Wildland Management 2
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 36
Bot 241 Systematic Botany 3
CE 218 Elem Surveying & Photogrammetry . . 3
Phys 113 *or* 114 General Physics 3
Communications elective 2
Computer elective 2
Geography *or* geology (physical) 4
Electives 12

Forestry Summer Camp

For 300 Forest Resource Measurements 4
For 301 Wildland Ecology 4

Third and Fourth Years

Eng 317 Tech & Engr Report Writing 3
For 307 Biometry 3
For 314 Fish & Wildlife Population Ecol. 3
For 320 Dendrology 3
For 321 Silvics 2
For 331 Intro to Wood Technology 3
For 351 Elem of Range Management 3
For 424 Silviculture 3
For 434 Forest Engr & Harvesting 3
For 474 Mensuration 3
For 475 Forest Finance 2
For 476 Forest Regulation 3
For 483 Economics of Conservation 3
For 484 Forest Policy & Administration 3
For 494 Models for Resource Decisions 3
Soils 205 General Soils 3
Electives 19

B. BUSINESS OPTION

First and Second Years

Courses common to all curricula 36
Bot 241 Systematic Botany 3
CE 218 Elem Surveying & Photogrammetry . 3
Phys 113 *or* 114 General Physics 3
Communications elective 2
Computer elective 2
Geography *or* geology (physical) 4
Electives 12

Forestry Summer Camp

For 300 Forest Resource Measurements . . . 4
For 301 Wildland Ecology 4

Third and Fourth Years

Acctg 395 Fundamentals of Accounting 4
Bus 231 *or* For 307 Statistics 3-4
Bus 311 Intro to Management Theory 3
Bus 312 Industrial Management 3
Eng 317 Tech & Engr Report Writing 3
For 321 Silvics 2
For 331 Intro to Wood Technology 3
For 424 Silviculture 3
For 434 Forest Engr & Harvesting 3
For 474 Mensuration 3
For 475 Forest Finance 2
For 476 Forest Regulation 3
For 483 Economics of Conservation 3
For 484 Forest Policy & Administration 3
For 494 Models for Resource Decisions 3
Electives 21

C. SCIENCE OPTION

First and Second Years

Courses common to all curricula 36
Biol 202 General Zoology 4
Bot 241 Systematic Botany 3
Chem 112 Inorg Chem & Qual Anal 5
Phys 113 *or* 114 General Physics 3
Communications elective 2
Computer elective 2
Geog *or* Geol (physical) *or* Org Chem 4
Electives 6

Forestry Summer Camp

For 300 Forest Resource Measurements . . . 4
For 301 Wildland Ecology 4

Third and Fourth Years

For 307 Biometry 3
Professional courses 15
Quantitative sciences 7
Natural sciences 17
Electives 23

RANGE RESOURCES (B.S.For.)

First and Second Years

Courses common to all curricula 36
Bot 241 Systematic Botany 3
Chem 275 Carbon Compounds 3
CE 218 Elem Surveying & Photogrammetry . 3
Phys 113 *or* 114 General Physics 3
Communications elective 2
Geography *or* geology (physical) 4
Electives 11

Forestry Summer Camp

For 300 Forest Resource Measurements . . . 4
For 301 Wildland Ecology 4

Third and Fourth Years

Anl 305 Principles of Nutrition 3
Anl 321 *or* 322 Beef *or* Sheep Science 3
AgEc 493 Agric Production Economics 3
Bot 311 Plant Physiology 3
Bot 432 Plant Ecology 3
Eng 317 Tech & Engr Report Writing 3
For 307 Biometry 3
For 314 Fish & Wildlife Population Ecol. 3
For 351 Elem of Range Management 3

For 370 Prin of Forest Management	2
For 452 Range Communities	3
For 453 Range Methods & Techniques	3
For 454 Range Improv & Mgmt Planning	3
For 494 Models for Resource Decisions	3
Soils 205 General Soils	3
Soils 454 Soil Devel & Classification	3
Electives	18

WILDLIFE-FISHERY RESOURCES (B.S.For.)

First and Second Years

Courses common to all curricula	36
Biol 202 General Zoology	4
Chem 275 Carbon Compounds	3
Phys 113-114 General Physics	6
Sp 131 Fundamentals of Speech	2
Geography *or* geology (physical)	4
Electives	14

Third and Fourth Years

Biol 351 General Genetics	3
Biol 442 Biological Evolution	3
For 307 Biometry	3
For 314 Fish & Wildlife Population Ecol	3
For 351 Elem of Range Mgmt, *or* 370 Prin of Forest Mgmt	2
For 411 Ichthyology, *or* Zool 484 Invertebrate Zool	3
For ID413 Fish Ecology	2
For 415 Limnology	3
For 442 Fish & Wildlife Management	3
For 448 Wildlife Ecology	2
For 483 Economics of Conservation	3
For 495 Fish & Wildlife Seminar	1
For 497 Land Management 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

Courses common to all curricula	36
Bot 241 Systematic Botany	3
Chem 275 Carbon Compounds	3
CE 218 Elem Surveying & Photogrammetry	3
Phys 113-114 General Physics	6
Communications elective	2
Computer elective	2
Electives	14

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
For 307 Biometry	3
For 321 Silvics	2
For 331 Intro to Wood Technology	3
For 370 Prin of Forest Management	2
For 434 Forest Engr & Harvesting	3
For 436 Biological Properties of Wood	3
For 437 Physical Properties of Wood	3
For 438 Chemical Properties of Wood	3
For 464 Forest Pathology	2
For 474 Mensuration	3
For 483 Economics of Conservation	3
For 494 Models for Resource Decisions	3
For 496 Forest Products Seminar	1
Electives	22

B. SCIENCE-ENGINEERING OPTION

First and Second Years

Courses common to all curricula	36
Chem 114 General Chemistry	4
Chem 277, 278 Organic Chem I & Lab	4
Math 190 Anal Geom & Calc II	4
Phys 220-221 Engr Physics I-II	6
Communications elective	2
Computer elective	2
Electives	11

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
For 307 Biometry	3
For 321 Silvics	2
For 331 Intro to Wood Technology	3
For 370 Prin of Forest Management	2
For 434 Forest Engr & Harvesting	3
For 436 Biological Properties of Wood	3
For 437 Physical Properties of Wood	3
For 438 Chemical Properties of Wood	3
For 464 Forest Pathology	2
For 474 Mensuration	3
For 483 Economics of Conservation	3
For 494 Models for Resource Decisions	3
For 496 Forest Products Seminar	1
Electives	24

College of Law

Albert R. Menard, Dean (126 Admin. 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 are emphasized, as are ethical problems. The study of law, while essential to those who intend to practice, also serves as a valuable asset to the young man or woman who desires to pursue a position of leadership in government or business.

Methods of instruction are adapted to development in each student of his 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 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. The student preparing to enter law school should avoid courses which are not demanding and take those which will develop his powers of analytical thought. Intensive work will enable him to acquire the intellectual discipline and experience necessary for success in law school. The student should aspire to a

critical appreciation of values and of political, economic, and social institutions; he should stress understanding, not just knowledge, in his 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. Exceptions will be made and in rare instances admission extended to carefully selected students who demonstrate unusual capacity for legal study on the basis of their college record and LSAT score *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 material 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.

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.

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 approximately six months before 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 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 to him, he 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. Action should be initiated at least six months before the opening of the 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 2.30 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. 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 semester credits of law must be completed in residence at the University of Idaho.

Non-Matriculated Students

In rare instances persons who cannot qualify as candidates for the degree of Juris Doctor may be admitted as non-matriculated students on petition to the Committee of Admissions of the College of Law. The applicant must show that he is unable to pursue such studies as will qualify him for admission as a regular student, and that he possesses such educational training and practical experience as will enable him to pursue a limited number of selected law courses constituting less than a complete program. Application for permission to enter as a non-matriculated student should be made in advance of the regular registration period. It must be distinctly understood that such non-matriculated students are not candidates for a degree in law and will not be qualified to take bar examinations as a result of studies while a non-matriculated student.

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 or Bachelor of Science in Business and the degree of Juris Doctor in a total of six years under certain circumstances. The student registers for his 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, he can take no law courses. In the spring semester of the third year, he must apply for admission to the College of Law. Only those students whose outstanding college grade record and Law School Admission Test score 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 fourth year. After two more years of law 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 which he has undertaken in his first two semesters of enrollment in the College of Law, he 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 his 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, he 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 a pass-fail basis.

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 Inc, 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. 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.

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 Jurisdiction	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
640 Family Law and Community Property	3
641 Wills, Estates, and Trusts	3
642 Natural Resources	3
643 Problems in Natural Resources	2
650 Evidence	4
652 Remedies and Restitution	3
656 Appellate Court	1-2

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 Jurisdiction	3
610 Government Regulation of Business	3
611 Municipal Corporations	2
612 Legislation	2
622 Corporate Securities	3
625 Security	2
626 Creditor's and Debtor's Rights	3
627 Business Planning	3
631 Taxation II	2
632 Estate Planning	4
640 Family Law and Community Property	3
642 Natural Resources	3
643 Problems in Natural Resources	2
644 Land Use Planning	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
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 to the 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, as defined by the faculty, are to provide a liberal and professional education in the arts and sciences, 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, Drama/Speech, English, Foreign Languages, History/Philosophy, Home Economics, Journalism, Mathematics, Physics, Political Science, Psychology, Radio/Television, and Sociology/Anthropology. The School of Music also functions as a department of the college. Cooperating departments from other divisions include the departments of Bacteriology, 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, drama, English, French, German, history, home economics, interior design, mathematics, music, philosophy, physical sciences, physics, political science, social sciences, sociology, Spanish, and zoology. The degree of Doctor of Philosophy is available in botany, chemistry, history, mathematics, physics, political science, pyschology, 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 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.

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 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 a teaching career should apply for admission to the teacher education program upon the completion of the first semester of the sophomore year. Admission to the program is a prerequisite to taking upper-division courses in teacher education. The College of Education is responsible for the screening of these applications; further information and forms are available from that college.

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 objective (this could be as early as his freshman year and certainly no later than admission to the teacher education program), his 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 his registration cards. Changes in the program require the signatures 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.

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 his curriculum), including at least thirty-six credits in courses numbered 300 and above, the all-university requirements in English composition and physical education (see regulation "J" in part 3), and the college and departmental requirements for the particular 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) 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 drama or speech as literature; and (2) courses which deal with the history or appreciation of art, architecture, drama, music, or speech.

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 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 drama or speech as literature, plus one course which deals with the history or appreciation of art, architecture, drama, music, or speech.

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. A student 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, a student seeking the B.A. degree must take courses in fulfillment of the foreign-language requirement as early as possible. If he cannot do this during his first semester, he must immediately take a course that can be used in partial fulfillment of his 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)	9
Anthr 120 Intro to Social Anthr	
Econ 435 Amer Economic Development	
Geog 340 United States & Canada	
Phil 425 American Philosophy	
PolSc 428 Amer Political Thought	
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
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 252 Cultural Geography	
Geog 340 United States & Canada	
Geog 470 Urban Geography	
Geog 480 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.)

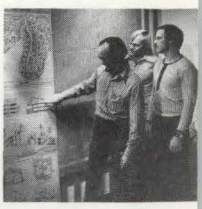
General requirements for the B.A. degree, plus:

Course	Credits
Anthr 110 Intro to Phys Anthr & Arch	3
Anthr 120 Intro to Social Anthr	3
Anthr 402 History of Anthr Theory	3
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	15
Econ 490 Comp Economic Systems	
Eng 442 Intro to Linguistics	
Geog 112 Economic Geography	
Hist 465 Social & Cul Hist of Europe	
Hist 466 Social & Cul Hist of Europe	
Museo 310 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 The Family	
Soc 321 The Community	
Soc 420 Social Stratification	
Soc 421 Population & Human Ecology	

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 255-256 Architectural Design I	6
Arch 257-258 Landscape Arch I	6
Arch 263 Programs & Systems I	2
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	3
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)	4-5
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	
Phys 113-114 General Physics	6
Physical education activities	2
Electives to total 160 credits for the degree (at least two 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 333-334 Water Color II	4
Art 351-352 Printmaking	4
Art 423-424 Graphic Design III	6
Art 497 Proseminar	4
Bus 323 Principles of Advertising	3

(Continued on next page)

ART (cont.)

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 341 *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.

BFA 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 seven additional credits in approved art electives and, 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	4
Bact 400 Seminar	2
Bact 409 Immunology & Serology	4
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 General Physics	8
Electives (upper-division), which may include any of the following strongly recommended courses	10
Bact 402 Food & Appld Microbiology	
Bact 414 Clinical Lab Methods	
Bact 425 Soil Microbiology	
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	4
Bact 400 Seminar	2
Bact 409 Immunology & Serology	4
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 Analysis	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 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. 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 315 General Physiology	4
Zool 323 Com Embry, *or* 324 Anatomy	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 Quantitiative 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	5
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)

(Continued on next page)

CHEMISTRY: TECHNICAL LITERATURE (cont.)

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
Dr 467 The Theatre	3
Eng 442 Intro to Linguistics	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 Philosophy	3
Sp 421 Intro to Rhetorical Theory	3

Note: FL 441-442, Intermediate Greek, is a recommended elective.

DRAMA (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:

Core Courses	Credits
Dr 102 Stage Makeup	1
Dr 105 Basics of Performance	2
Dr 190 Theatre Practice I	4
Dr 263 Technical Production	3
Dr 264 Stage Lighting	3
Dr 271 Play Analysis	3
Dr 272 Intermediate Acting	3
Dr 362 Costume for the Stage	2
Dr 407-408 Styles of Acting	3-6
Dr 420 Production Management	2
Dr 467-468 The Theatre	6
Dr 471-472 Directing	6

Plus completion of either of the options below:

A. ACTING-DIRECTING OPTION

Course	Credits
Dr 106 Basics of Performance	2
Dr 305 Stage Movement	3
Dr 306 Advanced Acting	3
Courses in related fields	20

B. TECHNICAL THEATRE OPTION

Course	Credits
Dr 108 Intro to Media	2
Dr 320 Advanced Stage Lighting	2
Dr 364 Scene Design & Tech Problems	3
Courses in related fields	20

DRAMA (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 drama (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* 130 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.

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 422, 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 103 Physical Geography	4
Geog 112 Economic Geography	3
Geog 251 Cartography	3
Geog 252 Cultural Geography	3
Geog 254 World Regional Geography	2
Geog 495 Proseminar	1
Geol 101, 102 Physical Geology & Lab	4
Geography electives (upper-division)	18
Courses in related fields approved by the head of 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 Hist 101-102 History of Civ Hist 111-112 Intro to U.S. History Hist 271-272 History of England	12
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 Hist 101-102 History of Civ Hist 111-112 Intro to U.S. History Hist 271-272 History of England	12
Upper-division history courses	20
Related fields	20
Plus any combination of the following 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.	12

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

A. GENERAL OPTION

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	2
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 409 Trends & Perspectives in Home Ec	1
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
Foreign language or humanities	7-9

B. JOURNALISM OPTION

Courses listed under the general option above, plus:

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

Courses listed under the general option above, plus:

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	2
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 409 Trends & Perspectives in Home Ec	1
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 468 Contemporary Education	3
HEc 352 Methods in Teaching Home Ec	3
HEc 455 Problems in Teaching Homemaking & Adult Education	3
HEc 457 Student Teaching	9
Psych 421 Education Psych, *or* 206 Developmental Psych	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
Advanced psychology or sociology	3

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	2
HEc 272 Food Management	2
HEc 346 Principles of Home Management	2
HEc 409 Trends & Perspectives in Home Ec	1
HEc 470 Problems in Nutrition	3
HEc 471 Dietetics	4
HEc 472 Food Chemistry & Analysis	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, 278 Carbon Compounds & Lab	4
Chem 480, 483 Elem of Biochemistry & Lab	4
Econ 251 Principles of Economics	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
Psych 421 Educational Psychology	3

Recommended but not required:

HEc 124 Clothing	3
HEc 347 *or* 349 Home Management	3

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
AgBiC 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 409 Trends & Perspectives in Home Ec	1
HEc 413 Textile Design	2
HEc 423 Advanced Textiles	3
HEc 448 Consumer Education	3
Psych 100 Intro to Psychology	3
Soc 110 Intro to Sociology	3

(Continued on next page)

HOME EC.: CLOTHING TEXTILES AND DESIGN (cont.)

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 & Furniture	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	2-3
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	2
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 409 Trend & Perspectives in Home Ec	1
HEc 434 Nursery School Participation	2-4
HEc 435 Hist & Phil of Child Development	2
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) approved electives in sociology-social work, or (D) additional major in the College of Education.

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 Development	2
HEc 436 Current 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. Approved electives in sociology-social work.

D. 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 section, provided it has been 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 Programs. The general requirements for either the B.A. or B.S. degree apply. (A student may apply for admission to this curriculum at any time; however, a program under this major should normally be presented during the sophomore year).

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	2
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	3
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 498 Proseminar	3
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) 32

Recommended art electives:
- Art 223-224 Lettering & Layout 4
- Art 233-234 Water Color I 4
- Art 241-242 Sculpture I 4
- Art 351-352 Printmaking 4

JOURNALISM (B.A.)

General 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, drama, economics, English, geography, history, philosophy, political science, psychology, sociology, or speech	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 & Analysis	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, drama, economics, English, geography, history, philosophy, political science, psychology, sociology, or speech	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 Contemporary Affairs	2
Jour 445 Media Internship	1-5
Jour 492 Journalism & 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, drama, economics, English, geography, history, philosophy, political science, psychology, sociology, or speech	15

JOURNALISM (B.S.)

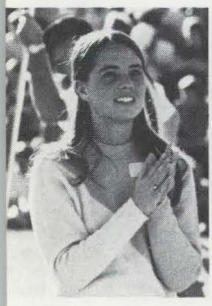
General requirements for the B.S. degree, plus the course requirements under one of the options for the B.A. degree in journalism (see above), and the completion of at least twenty credits in a specialized subject-matter area (or a logical combination of related courses) which will constitute a minor. 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, drama, economics, English, geography, history, philosophy, political science, psychology, or sociology. 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.

(Continued on next page)

JOURNALISM (cont.)

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, or sociology. 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.



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	2
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	2
Arch 357-358 Landscape Architecture II	6
Arch 363 Programs & Systems II	3
Arch 375 History of Renaissance Arch	2
Arch 376 History of Modern Arch	2
Arch 392 Plant Mat & Planting Design	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
For 487 Forest Recreation	3
Geog 252 Cultural Geography	3
Geog 532 Recreational Geography	3
Geol 101, 102 Physical Geology & Lab	4
Geol 401 Geomorphology	3
Math 111-112 Fundamentals of Math (or higher mathematics)	8
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
Econ 477 Econ of Developing Countries	3
FL 384 Hispanic Culture & Institutions (Latin American)	3
FL 387-388 Survey of Span-Am Lit	6
FL 487-488 Contemporary Span-Am Lit	6
Geog 445 South America	3
Hist 435 Colonial Latin America	3
Hist 438 Mex Since Indep, Cent Am & Carib	3
Hist 439 Nat Latin Am: South Am Rep	3
Hist 440 Inter-American Relations	3
PolSc 483 Developing States	3

Recommended electives:

For a more rounded view of Latin America, its past and its present reality, the student is advised to take Hist 101-102, History of Civilization, in his freshman year, and to elect six of the following courses:

Anthr 320 Peoples of the World	3
Anthr 330 World Prehistory	3
Eng 111-112 Lit of Western Civ	6
FL 386 Survey of Spanish Lit	3
Geog 254 World Regional Geography	3
Geog 480 Political Geography	3
Hist 465-466 Soc & Cult Hist of Europe	6
Phil 411 Phil of the Social Sciences	3
PolSc 341 World Politics	3
PolSc 426 Recent Political Thought	3
Soc 312 Sociology of Organization	3

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 four years (during the fourth year securing the approval also of the College of Law and supplying that college with a duplicate study list) and in the College of Law for the final two 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
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 305 Digital Computers	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	6
Ag 507 Experimental Design	
Math 370 Numerical Analysis	
Math 440 Linear Algebra	
Math 472 Advanced Calculus	
Math 499 Directed Study	
Approved electives in fields where statistics is applied (not to be in applied statistics courses)	6

B. COMPUTER-PROGRAMMING OPTION

Course	Credits
Math 310 Ordinary Diff Equations	3
Math 370 Numerical Analysis	3
Math 440 Linear Algebra	3
At least three courses selected from the following	9
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 immediately 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 is registered for his 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

(Continued on next page)

PHYSICS (cont.)

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
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, 432, 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 General Physics	6
Phys 115-116 General Physics Lab	2
Social science electives	6
Physical education activities	2
Foreign language	8
Electives	3

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 General Physics, *or* 221, 222 Engr Physics II, III	6-8
Zool 323 Comp Vertebrate Embryology	4
Zool 324 Comp Vertebrate Anatomy	4
Foreign language	14-16
Physical education activities	2
Social science electives	6
Electives to complete 96 credits for the first three years	11-18

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* PISc 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

	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

	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* 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

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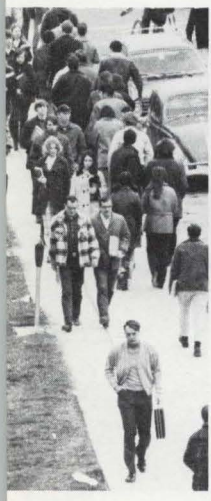
PSYCHOLOGY (cont.)

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 305 Compar Psych, *or* 441 Physiological Psych, *or* 455 Psych of Motivation	3
Psych 311 Abnormal Psych, *or* 320 Social Psych, *or* 461 Psych of Personality	3
Psych 317 Stat for Behaviorial Sciences	3
Psych 490 Psych of Learning	3
Psych 498 History & Systems of Psych	3
Mathematics (minimum)	4



RADIO-TELEVISION (B.A. or B.S.)

General 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 drama	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 chairman of Radio-Television.

SOCIOLOGY (B.A. or B.S.)

Recommended preparation includes at least six 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 130 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	

SOCIOLOGY: SOCIAL WORK (B.A. or B.S.)

General requirements for either the B.A. or B.S. degree and the requirements for the major in sociology (see above), plus:

Course	Credits
Bact 254 Public Health & Hygiene	3
Psych 301 The Exceptional Individual *or* 311 Abnormal Psychology	3
Psych 461 Psych of Personality	3
Soc 240 Intro to Social Welfare	3
Soc 241 Organization of Social Services	3
Soc 320 The Family	3
Soc 330 Sociology of Youth, *or* 331 Criminology	3
Soc 410 Intro to Social Research	3
Soc 440 Methods of Social Work	3
Soc 441 Field Experience	3

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.)

General 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
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 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.

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
Zool 315 General Physiology	4
Zool 323 Comp Vertebrate Embryology	4

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 scholarships, 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 Accreditation 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 facilties 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, 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 plans an annual series of concerts and recitals by 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. All concerts are open to the public without charge. Special events such as opera and certain visiting groups charge a small admission fee.

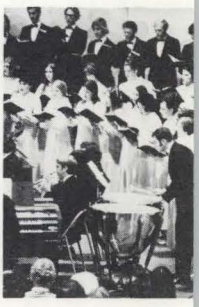
Financial Aids

Information about scholarships and financial aids for music students can be

obtained from the director of student financial aids.

Curricula

The School of Music offers curricula leading to the degrees Bachelor of Music, Bachelor of Arts, Master of Arts, Master of Music, and Master of Arts in Teaching Music.



The Bachelor of Music degree is offered with majors in vocal or instrumental applied music, 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 and composition. The B.A. emphasizes a broad liberal education and is neither professionally oriented nor the normal route to certification as a public school music teacher.

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

Organized Music. Regular participation is required each academic session in one of the large choral or instrumental groups.

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 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 must have passed the requirements of his 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
Physical education activities	2
Humanities (L & S humanities requirement, plus courses from art, architecture, dance, drama, or literature)	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
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

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 course 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
Organized music—elect from MusA 103, 104, 105, 106, 303, 304, 305, or 306 (registration is required each academic session in residence)	8
MusA 101 Individual Instruction	12
MusA 387 Conducting	2
MusC 133 Theory Keyboard Laboratory	1
MusC 141 Musicianship & Music Literature	4
MusC 142, 241, 242 Theory of Music I, II, III	11
MusC 323 Tonal Counterpoint	2
MusC 325 Composition	2
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

MUSIC: APPLIED INSTRUMENTAL (B.Mus.)

Note: To complete the music electives below, keyboard majors must take MusH 431 and MusT 433; other instrumentalists should elect music literature or pedagogy courses appropriate to their major field.

Basic requirements for the B.Mus. degree, plus:

Course	Credits
MusA 101 Indiv Instr (secondary field)	4
MusA 265 and/or 365 Chamber Ensemble (instrumental)	4
MusA 301 Indiv Instr (instrumental)	12
MusA 388 Conducting	2
MusA 490 Senior Recital	0
MusC 324 Modal Counterpoint	2
MusC 326 Composition	2
MusC 327 Instrumentation	2
MusC 427 Orchestration	2
MusH Special period course to be selected from MusH 410 through 418	2
Courses acceptable toward the L & S general requirements for the B.A., not including courses in music, English composition, or physical education	26
Music electives	4
Electives to total 128 cr for the degree	--

MUSIC: APPLIED VOCAL (B.Mus.)

Basic requirements for the B.Mus. degree, plus:

Course	Credits
MusA 101 Indiv Instr (secondary field)	4
MusA 301 Indiv Instr (voice)	12
MusA 388 Conducting	2
MusA 490 Senior Recital	0
MusC 324 Modal Counterpoint	2
MusC 326 Composition	2
MusC 328 Choral Arranging	2
MusH Special period course to be selected from MusH 410 through 418	2
MusH 435 Solo Vocal Literature	2
MusT 437 Vocal Pedagogy	2
Musical ensembles (1-3 cr in MusA 280/480, and 1-3 cr in MusA 265, 266, 365, 366 vocal or collegium)	4
Foreign language (two years of one foreign language, or one year each of two foreign languages)	16
Courses acceptable toward the L & S general requirements for the B.A., not including courses in music, English composition, or physical education	10
Electives to total 128 cr for the degree	--

MUSIC: COMPOSITION (B.Mus.)

Note: Composition majors may substitute four credits in music electives for four of the basic eight credits required in organized music courses.

Basic requirements for the B.Mus. degree, plus:

Course	Credits
MusA 101 Indiv Instr (secondary field)	4
MusA 301 Indiv Instr (major field)	2
MusA 388 Conducting	2
MusA 490 Senior Recital	0
MusC 324 Modal Counterpoint	2
MusC 326 Composition	2
MusC 327 Instrumentation	2
MusC 420, 421 Advanced Tonal & Modal Counterpoint	4
MusC 423-424 Advanced Composition	4
MusC 427 Orchestration	2
MusT 251 String Instrument Techniques	1
MusT 252 Reed Instrument Techniques	1
MusT 253 Brass Instrument Techniques	1
MusT 254 Flute & Percussion Techniques	1
Courses acceptable toward the L & S general requirements for the B.A. not including courses in music, English composition, or physical education	26
Electives to total 128 cr for the degree	--

MUSIC EDUCATION: INSTRUMENTAL (B.Mus.)

Basic requirements for the B.Mus. degree, plus:

Course	Credits
MusA 101/301 Indiv Instr (7-9 cr in secondary field and 2-4 cr at the upper division level in major instrument)	11

(Continued on next page)

MUSIC ED.: INSTRUMENTAL (cont.)

MusC 327 Instrumentation	2
MusH Special period course to be selected from MusH 410 through 418	2
MusT 251 String Instrument Technique	1
MusT 252 Reed Instrument Technique	1
MusT 253 Brass Instrument Technique	1
MusT 254 Flute & Percussion Techniques	1
MusT 381 Elem School Music Methods I	2
MusT 383 Music in the Sec Schools	3
MusT 386 Instr Music in the Sec School	2
Ed 314 Strategies for Teaching	2
Ed 432 Practicum: Music Teaching	9
Ed 445 Proseminar in Teaching	1
Ed 468 Contemporary Education	3
Psych 100 Intro to Psychology	3
Psych 206 *or* 421 *or* Ed 415 Dev *or* Ed Psych	3
Additional English (including literature)	6
Social science (including Am hist or govt)	6
Science and/or math (biological, physical, or earth science only)	8
Electives to total 128 cr for the degree	--

MUSIC EDUCATION: VOCAL (B.Mus.)

Basic requirements for the B.Mus. degree, plus:

Course	Credits
MusA 101/301 Indiv Instr (7-9 cr in secondary field and 2-4 cr at the upper-division level in piano, organ, or voice)	11
MusA 280 and/or 480 Opera Workshop	1
MusC 328 Choral Arranging	2
MusH Special period course to be selected from MusH 410 through 418	2
MusT 381, 382 Elem School Mus Meth I, II	3
MusT 383 Music in the Sec Schools	3
MusT 385 Choral Music in the Sec School	2
Ed 314 Strategies for Teaching	2
Ed 432 Practicum: Music Teaching	9
Ed 445 Proseminar in Teaching	1
Ed 468 Contemporary Education	3
Psych 100 Intro to Psychology	3
Psych 206 *or* 421 *or* Ed 415 Dev *or* Ed Psych	3
Additional English (including literature)	6
Social science (including Am hist or govt)	6
Science and/or math (biological, physical or earth science only	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 101/301 Indiv Instr (7-9 cr in secondary field and 2-4 cr at the upper-division level in the major field; at least one cr must be in private voice or voice class)	11
MusC 327 Instrumentation, *or* MusC 328 Choral Arranging	2
MusH Special period course to be selected from MusH 410 through 418	2
MusT 251 String Instrument Techniques	1
MusT 252 Reed Instrument Techniques	1
MusT 253 Brass Instrument Techniques	1
MusT 254 Flute & Percussion Techniques	1
MusT 381, 382 Elem School Mus Meth I, II	3
MusT 383 Music in the Sec Schools	3
MusT 385 Choral Mus in the Sec School	2
MusT 386 Instr Mus in the Sec School	2
Ed 314 Strategies for Teaching	2
Ed 432 Practicum: Music Teaching	9
Ed 445 Proseminar in Teaching	1
Ed 468 Contemporary Education	3
Psych 100 Intro to Psychology	3
Psych 206 *or* 421 *or* Ed 415 Dev *or* Ed Psych	3
Additional English (including literature)	6
Social science (including Am hist or govt)	6
Science and/or math (biological, physical, or earth science only)	8

Total: 130 cr for the degree

SECONDARY APPLIED MUSIC DISTRIBUTION FOR THE MUSIC EDUCATION CURRICULA

		Credits
A.	**Music Education: Vocal**	
	If the major instrument is:	
	1. Voice	14-16
	4-7 cr in keyboard instruments*	
	0-5 cr in elective applied music	
	2. Piano, organ, or harpsichord	14-16
	4-8 cr in voice**	
	0-5 cr in elective applied music	
B.	**Music Education: Instrumental**	
	If the major instrument is:	
	1. Violin, viola, cello, or string bass	14-16
	2 cr in a woodwind instrument	
	2 cr in a brass instrument	
	2 cr in a secondary string instrument	
	1-3 cr in elective applied music*	
	2. Flute, oboe, clarinet, saxophone, *** or bassoon	14-16
	2 cr in a secondary woodwind instrument	
	2 cr in a brass instrument	
	2 cr in a string instrument	
	1-3 cr in elective applied music*	
	3. French horn, trumpet, trombone, euphonium, **** or tuba	14-16
	2 cr in a woodwind instrument	
	2 cr in a secondary brass instrument	
	2 cr in a string instrument	
	1-3 cr in elective applied music*	
	4. Piano, organ, or harpsichord	14-16
	2 cr in a woodwind instrument	
	2 cr in a brass instrument	
	2 cr in a string instrument	
	1-3 cr in elective applied music*	
C.	**Music Education: Vocal-Instrumental**	
	If the major instrument is:	
	1. Violin, viola, cello, or string bass	14-15
	3 cr in voice**	

2 cr in a woodwind instrument
2 cr in a brass instrument
1 cr in a secondary string instrument
0-1 cr in elective applied music*

2. Flute, oboe, clarinet, saxophone, *** or bassoon 14-15
3 cr in voice**
1 cr in a secondary woodwind instrument
2 cr in a brass instrument
2 cr in a string instrument
0-1 cr in elective applied music

3. French horn trumpet trombone euphonium, **** or tuba . . . 14-15
3 cr in voice**
2 cr in a woodwind instrument
1 cr in a secondary brass instrument
2 cr in a string instrument
0-1 cr in elective applied music**

4. Voice 14-15
2 cr in a woodwind instrument
2 cr in a brass instrument
2 cr in a string instrument
1-3 cr in elective applied music*

5. Piano, organ, or harpsichord . . . 14-15
3 cr in voice**
2 cr in a woodwind instrument
2 cr in a brass instrument
2 cr in a string instrument

*May include MusA 101, Piano, or 145-146, Piano Class, as required for piano proficiency.

**May include one semester of MusA 147-148, Voice Class.

***Saxophone majors may take up to eight credits in another woodwind as part of the major instrument requirement. In this event, another woodwind instrument must be selected for secondary work.

****Euphonium majors may take up to eight credits in trombone as part of the major instrument requirement. In this event, another brass instrument must be selected for secondary work.

College of Mines

Rolland R. Reid, Dean (206 Mines Bldg.); Joseph Newton, Assistant Dean; Donald F. Clifton, Secretary of the College Faculty.

THE UNIVERSITY OF IDAHO, situated in one of the foremost mining regions of the world, appropriately maintains courses in mineral industries technology and in the earth sciences. To enable this work to be carried on effectively, a College of Mines was created in 1917 as an administrative unit of the university, and its scope was indicated as follows: "Within this College will be included the work in mining proper, in metallurgy, and geology; and it shall include the exploitation of the non-metallic minerals (except road-making materials) as well as that of the precious and useful metals."

Accordingly, the College of Mines offers curricula leading to the baccalaureate degree in mining engineering, metallurgical engineering, geological engineering, geology, and geography. The Graduate School offers advanced work leading to the degree of Master of Science in these areas and also in hydrology. The degrees of Master of Arts in Teaching Geography, Master of Arts in Teaching Earth Science, and Master of Natural Science with a major in earth science are also offered. Doctoral study leading to the degree of Doctor of Philosophy is offered in geology and in mining engineering-metallurgy. Consult the catalog of the Graduate School for the special requirements for the professional degrees of Engineer of Mines, Metallurgical Engineer, and Geological Engineer.

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-

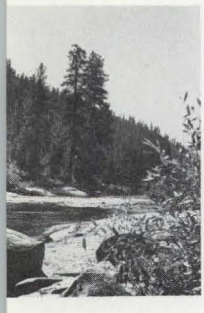
strain studies of rock structures. Mine surveying instruments, ventilation apparatus, and other mining engineering tools are available. Illustrative material includes maps, drawings, films, and slide collections illustrating mining methods and practices. The greatest assets for laboratory or graduate 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 section, 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 staff 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, and darkroom techniques.

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, Grants-in-Aid, and Loan Funds

Students having a high academic standing in high school or while in college should refer to the "Financial Aids" section in part 2 of this catalog. The Idaho Mining Association Scholarships and the Idaho Mining Memorial Scholarships are open exclusively to freshmen entering the College of Mines. Fifty out-of-state tuition scholarships are available for entering freshmen and transfer undergraduate students. The Hecla-Bunker Hill, A. E. Larson (Sunshine Mining Co.), and ASARCO (American Smelting and Refining Co.) scholarships are available to College of Mines students. The College of Mines also administers the J. R. Simplot grant-in-aid program to needy students. The Staley scholarship is also available to mining engineering students. Two special loan funds (the Laney fund and the J. J. Day fund) are restricted to College of Mines students. For graduate students there are several institutional assistantships and the A. H. Featherstone graduate scholarship.

Inquiries should be directed to the chairman, Scholarship and Awards Committee, College of Mines.

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. 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
Anthr 110 Intro to Phys Anthr & Arch. *or* 120 Intro to Social Anthr	3
Econ 251-252 Principles of Economics	6
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Eng 317 Tech & Engr Report Writing	3
Geog 103 Physical Geography	4
Geog 112 Economic Geography	3
Geog 251 Cartography	3
Geog 252 Cultural Geography	3
Geog 254 World Regional Geography	2
Geog 401 Atmospheric Environments	3
Geog 424 Interm Economic Geography	3
Geog 437 Dec-Making in Resource Mgmt	3
Geog 470 Urban Geography	3
Geog 480 Political Geography	3
Geog 495 Proseminar	1
Geol 101, 102 Physical Geology & Lab	4
Geol 401 Geomorphology	3
Math 111-112 Fund of Math. *or* 140, 141 Coll Alg & Anal Trig	5-8
Phys 101 Fund of Phys Sc. *or* 113 Gen Phys	3-4

(Continued on next page)

GEOGRAPHY (cont.)

Psych 317, *or* Ag 321, *or* Bus 231 Statistics, *or* one year of college-level study of a foreign language	3-8
Biology, botany, chemistry, or zoology	8
Geography electives	6
Physical education activities	2
Approved electives	31-34

GEOGRAPHY (B.A., 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 Chem	4
Chem 112 Inorganic Chem & Qual Anal	5
Eng 101 English Composition	3
Eng 201 Language & Literature	3
Geog 251 Cartography	3
Geol 101, 102 Physical Geology & Lab	4
Geol 106, 107 Historical Geology & Lab	4
Geol 111 Ancient Life	4
Geol 202 Mineralogy & Petrology	4
Geol 401 Geomorphology	3
Geol 413 Sedimentology	2
Geol 414 Stratigraphy	2
Geol 421 Structural Geology	3
Geol 431 Field Geol & Report Writing	6
Geol 497 Proseminar	1
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-division courses in biological sciences with perm of adviser)	8-9
Physical education activities	2
Geology electives (upper-division)	9
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 Chem	4
Chem 112 Inorganic Chem & Qual Anal *or* 114 General Chemistry	4-5
CE 112 Elementary Surveying	2
Econ 251-252 Principles of Economics	6
EE 200 Systems & Circuits	3
ES 211 Intro to Mechanics	4
ES 221 Dynamics of Rigid Bodies	2
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
Geol 101, 102 Physical Geology & Lab	4
Geol 106, 107 Historical Geology & Lab	4
Geol 202 Mineralogy & Petrology	4
Geol 413 Sedimentology	2
Geol 421 Structural Geology	3
Geol 431 Field Geol & Report Writing	6
Geol 441 Engineering Geology	3
Geol 497 Proseminar	1
Math 140, 141 Coll Alg & Anal Trig	5
Math 180, 190, 200 Anal Geom & Calc	11
Math 310 Ordinary Diff Equations	3
Phys 221, 222 Engr Physics II, III	6
Humanities and social sciences	12
Physical education activities	2
Electives	5-8

The following courses are recommended electives for those students wishing to specialize in the areas indicated.

Mineral Exploration

Geol 458 Mineral Deposits	4
Geol 460 Exploration Geology, *or* 485 Geochemical Exploration	3
Min 401 Rock Mechanics	3

Construction

CE 460 Soil Mechanics	3
Geol 445 Geological Engr Design	3
Min 401 Rock Mechanics	3

Hydrogeology

AgE 351 Hydrology	2
CE 460 Soil Mechanics	3
Geol 445 Geological Engr Design	3
Geol 447 Ground Water	2

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 131 Digital Computer Programming	2
Engr 120-121 Engr Analysis & Design	4
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	2
Met 203 Metallography	1
Met 305 Elements of Crystallography	2
Met 308 Intro to Metallurgic Thermo	2
Met 403 Intro Extractive Metallurgy	3
Met 410 Metallurgical Lab	2
Met 412 Mechanical Metallurgy	2
Met 413 Physical Metallurgy	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 equivalent	3
Electives, including at least sixteen credits in approved humanities and social science	24-25

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 Chem	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 131 Digital Computer Programming	2
Engr 120-121 Engr Analysis & Design	4
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 421 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	2
Min 101, 202 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 441 Engr Geology; Geol 458 Mineral Deposits; Geol 485 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

Graduate School

Ronald W. Stark, Dean (111 Morrill Hall); Edgar H. Grahn, Associate Dean; Bruce Higgins, Assistant Coordinator of Research.

THE GRADUATE SCHOOL was formally organized in 1925 but the University of Idaho has offered advanced degrees for 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 seventy-eight 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.

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 available only to graduate students. 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, or business. It is also possible for a student holding a master's degree to complete residence course requirements and examinations on-campus for the Ph.D. 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 family and child development.

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.

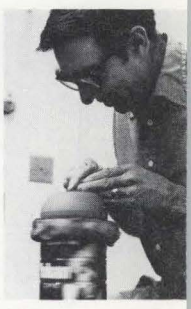
Admission in advance of registration permits certain courses to be designated for graduate credit. Capable students can thus begin graduate work at an earlier date than would otherwise be possible. Qualified seniors will normally be in their last semester when applying for partial enrollment. In some 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 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 at 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. Research and thesis credits 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 by *in-absentia* registration (no more than three of the eight credits may be taken *in-absentia*).

All credits submitted to meet the requirements for a master's degree must have been earned within six consecutive years prior to the commencement at which the degree is awarded.

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 requirements 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 com-

petence and for specialized study. The student is admitted to the Graduate School in a category designated as "fifth year." 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 and Mining

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. Preliminary inquiry should be directed to the department concerned giving a detailed statement of professional activity since graduating, a list of references, and the proposed thesis subject. The department will review and recommend a course of action. Upon invitation to proceed with degree requirements, the student prepares the thesis which is usually based on a professional project. This degree carries the same diploma and thesis binding fees and the same deadlines as for master's degrees. Preliminary negotiations and authorization should be completed in the summer or early fall to afford ample time for the preparation and review of the required thesis for award of the degree in May. A listing of professional degrees is given in part 1.

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.

Summer Sessions and Continuing Education

Paul F. Kaus, Director of Summer Sessions and Special Programs (103 Adult Ed. Bldg.); James L. Black, North Idaho Regional Director of Continuing Education, State Office of Higher Education.

THIS OFFICE OF THE UNIVERSITY is responsible for directing summer sessions, coordinating for the university the programs administered by the Division of Continuing Education of the state Office of Higher Education, and operating a number of continuing and adult education programs.

Summer Sessions

The summer program consists of a basic eight-week session and a three-week pre-session. Both undergraduate and graduate courses are offered, many of them accelerated into one-, two-, or three-week concentrated sessions, thus allowing students to complete a course in less than the full eight weeks. A variety of special features is available, including the summer music festival, summer theater, classic films, as well as programs for high school students in the areas of journalism, music, and computer programming.

Academic regulations included in this catalog are applicable during the summer session and are also described in detail in the summer bulletin. Individuals interested in enrolling are invited to write to the Office of Summer Sessions and Continuing Education for a copy of the bulletin which is published each February.

Coordination of Office of Higher Education Programs

The Division of Continuing Education of the Office of Higher Education is a state-wide agency with headquarters in Boise which is responsible for field service administration of most off-campus adult and continuing education programs throughout the state of Idaho. The division has regional directors located at Moscow, Boise, and Pocatello. Programs administered by the division include University of Idaho programs and those offered via other public higher education institutions in Idaho. Included are extension and correspondence study programs, adult education centers, and the Boise Cooperative Graduate Center. Academically, the latter program is supervised at the University of Idaho by the Graduate School while the others are supervised by the appropriate regional directors of continuing education of the state Office of Higher Education.

Extension Courses. Persons interested in enrolling in extension courses should contact the regional director of the state-wide division at Moscow, Boise, or Pocatello. 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.

The purpose of the extension course program is to enable adults throughout the state to strengthen their professional qualifications and continue their general education. Most higher education institutions restrict the amount of extension credit that is applicable toward degrees. Since the acceptability of this type credit varies among institutions, and within institutions for specific degree programs, individuals intending to apply extension credit toward a degree should check with the institution or department. For University of Idaho general restrictions on the acceptability of extension credit, see general regulation "J-5" in part 3.

In programs where it is proposed that the University of Idaho grant college credits, both the instructor and the course must be approved by the University of Idaho prior to the offering. Before the university can accept credit registrations, the student must provide application and registration information and meet the requirements for admission to the University of Idaho. The entrance requirements for credit extension courses are the same as for on-campus study (see admissions section in part 2 of this catalog). In some courses, non-high

school graduates over twenty-one years of age may be allowed to enroll on a non-credit basis.

Students are not permitted to carry extension work while enrolled in residence at the University of Idaho. This rule may be waived by written approval of the student's academic dean. Many other institutions of higher education have similar regulations and individuals are advised to check with their resident institution before enrolling.

Correspondence Study. The University of Idaho grants credit for approved correspondence study programs administered by the Division of Continuing Education of the Office of Higher Education. Each course represents an amount of work equivalent to that done by students in similar courses on the campus. Students who expect to apply the credit toward a degree must satisfy all entrance requirements. The amount of correspondence credit applicable toward a degree is limited (see general regulation "J-5" in part 3). There are also restrictions on the acceptability of correspondence study work for satisfying the requirements for a teaching credential in Idaho.

A correspondence study bulletin describing the specific courses available and the procedures for enrolling and completing the course is available from any regional director of the Division of Continuing Education of the Office of Higher Education or by writing the Office of Summer Sessions and Continuing Education, University of Idaho, Moscow, Id. 83843. Both college and high school courses are offered, as well as some non-credit courses.

Most institutions of higher education, including the University of Idaho, do not allow students enrolled in residence to carry correspondence courses during their period of resident registration. At the University of Idaho, this rule may be waived by written permission of the student's academic dean.

Coeur d'Alene Adult Education Center. Subject to annual approval, the University of Idaho grants resident credit for a summer program offered at the Coeur d'Alene Adult Education Center. The selection of courses, administration of funds, and arrangements for facilities are handled by the state-wide division.

The center offers resident credit. Each instructor and course must receive prior approval of the University of Idaho. Students enrolling for credit must meet requirements for admission to the University of Idaho.

Students may work toward University of Idaho degrees at adult education centers by taking University of Idaho courses offered at these centers, and the grades earned in such courses are computed in the student's grade-point average. To the extent that appropriate courses are available, an individual may complete all of the requirements for the baccalaureate degree at a center, except sixteen of the last forty credits required. After a candidate is within forty credits of completing the total number of credits required for his degree, he 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.

University Continuing and Adult Education Programs

A restricted number of continuing and adult education programs continue to be administered directly by the University of Idaho's Office of Summer Sessions and Continuing Education, rather than through the state-wide division. For information on these programs, write directly to the University of Idaho.

Civil Defense University Extension Program. The University of Idaho, under contract with the U.S. Office of Civil Defense, cooperates with the Idaho Department of Disaster Relief and Civil Defense in providing non-credit professional improvement courses in civil defense throughout the state. Several different courses of thirty-two-hours duration each are offered, as well as conferences and simulated exercises. The programs are designed primarily for city, county, and state officials to acquaint them with emergency planning and operations under emergency conditions, whether the emergency be nuclear war, natural disaster, or man-made disaster.

The program is coordinated from the campus with a resident instructor in southern Idaho. The annual schedule of courses is available from the Office of Summer Sessions and Continuing Education, University of Idaho, or from local civil defense directors.

NRTS Education Program. The undergraduate portion of the educational program at the National Reactor Testing Station at Idaho Falls is supervised by the Office of Summer Sessions and Continuing Education. 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.

The program offers resident credit and 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 an undergraduate degree at the NRTS Education Center with the exception that the last sixteen semester credits must be earned on the Moscow campus. It should be noted since the courses offered at NRTS are generally restricted to those related to the employment of individuals, it is likely that students will find it necessary to complete a number of general education requirements through programs other than those available at NRTS.

The graduate portion of the program is administered by the Graduate School. Further information may be obtained by writing to the resident director, NRTS Education Program, P.O. Box 1845, Idaho Falls, Id. 83401.

NRTS Certificate Program. Students enrolled in the NRTS Educational Program (see above) who complete the specified course requirements 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 includes from twenty-four to thirty-three

semester credits of course work which has been approved by the faculty of the appropriate subject matter department at the university and by the University Curriculum Committee.

This certificate program should not be confused with a degree program. Rather, 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.

Credits earned while enrolled in a certificate objective may also be applied toward a degree if a 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. This non-credit program offers units leading to fundamental or advanced certificates. The program is designed for licensed salesmen and brokers or those seeking such licensing, but 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 concentrated 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 Office of Continuing Education on the University of Idaho campus.

Instructional Conferences. The Office of Continuing Education, in cooperation with academic departments, each year sponsors a large number of short-term, non-credit programs. Many of these programs depend on user fees for financial support, but public funding may be possible for specific types of programs. This type of instructional program offers very concentrated continuing education in a specific subject field and is often concluded within a three- or four-day period. Such instructional conferences may be arranged for occupational or professional groups as well as those desiring to broaden their knowledge in a general interest field. Subject-matter expertise is provided by members of the faculty or by visiting specialists.

Individual instructional conferences are arranged as the need arises. Announcements of specific programs are made available by direct mailing to those most likely to be interested and by newspaper and other news announcements. Individuals interested in proposing specific instructional programs are invited to contact the Office of Continuing Education on the University of Idaho campus.

Reserve Officers' Training Corps

Vice President Robert W. Coonrod, Coordinator (105 Admin. Bldg.); Col. Paul M. Fletcher, Head, Department of Military Science (103 Memorial Gymnasium); Lt. Col. John A. Magee, Head, Department of Aerospace Studies (106-B Adult Ed. Bldg.); Capt. Jack R. Voorhees, Head, Department of Naval Science (1 Navy Bldg.).

RESERVE OFFICERS' TRAINING is offered at the University of Idaho by the departments of Aerospace Studies (Air Force ROTC), Military Science (Army ROTC), and Naval Science (Naval ROTC).

The purpose of ROTC 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 ROTC study programs leads to a commission in the armed forces.

General Information

The three ROTC departments offer, on a selective basis, four-year and two-year ROTC 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 ROTC 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 three-, two-, and one-year scholarships with similar financial benefits. The Navy offers four-year and two-year scholarships. Non-scholarship students receive $100.00 per month during their final two years of ROTC instruction only. Uniforms and textbooks for all ROTC 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 ROTC 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 ROTC office.

Air Force ROTC

The Air Force ROTC 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). 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 ROTC 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 January 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 and the composition and role of 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 unit is normally taken between the second and third semesters of the professional officer course. Students applying for the two-year program must participate in a six-week field training course during the summer prior to entering the two-year program. Participants in field training courses are paid half the basic pay of a second lieutenant. Travel to and from the base is paid, and food, lodging, medical care, and uniforms are furnished at no cost.

Army ROTC

The Army ROTC program consists of the basic and advanced courses, and can be completed in two, three, or four years. The basic course, normally taken during the freshman and sophomore years, introduces the student to basic military subjects. The advanced course is devoted to a two-year study of the more complex phases of military leadership training. It is open to students who have completed the basic course or basic summer camp and who have demonstrated a positive potential for becoming commissioned officers. A six-week summer training camp is held between the first and second year of the advanced course (normally at the end of the junior year), for which students receive approximately $400. The four-year program can be compressed with approval of the head of the Department of Military Science.

Basic Summer Camp. A student with at least two years of successful college work may apply for a six-week basic ROTC camp in lieu of taking the basic ROTC course. Applicants are accepted during the first half of the second semester of each school year.

Naval ROTC

The Naval ROTC 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 and law. 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 uniforms and naval science textbooks at no cost and begin receiving monthly subsistance 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 program 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.

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).

Uniform Course Entries

The following courses in the 100-499 series have been authorized by the regents (January, 1971) in all subject areas and may be offered on a credit-arranged basis or listed in the time schedule for a specific number of credits: 200 Seminar, 299 Directed Study, 400 Seminar, and 499 Directed Study.

Reserved numbers for courses offered on a credit-arranged basis or listed in the time schedule for a specific number of credits at the graduate level are: 500 Master's Research and Thesis, 501 Seminar, 502 Directed Study, 600 Doctoral Research and Dissertation, 601 Seminar, 602 Directed Study, and 603 Independent Study. Course 500 is authorized in all fields offering the master's degree; 501 and 502 are authorized for fields offering graduate study; 600, 601, 602, and 603 are authorized in all fields granting the doctorate.

Letter Designations with Numbers

Certain course numbers also include letters preceding the arabic numbers, 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 graduate 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 graduate students.

X — offered by extension only.

Subtitled Courses

An "s" in parentheses between the number and title of a course indi-

cates 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.

Old Numbers

Course numbers which have been changed in this catalog have the old number shown in parentheses immediately after the credit designation and just ahead of the course description.

Other Abbreviations

Acctg — accounting
Ag — agriculture
AgBiC — agricultural biochemistry
AgEc — agricultural economics
AgEd — agricultural education
AgE — agricultural engineering
AgMech — agricultural mechanization
Alt/yrs — offered alternate years (the academic year to be offered is usually shown)
Anl — animal industries
Anthr — anthropology
Arch — architecture
AS — aerospace studies
Bact — bacteriology
Biol — biology
Bot — botany
Bus — business
BusEd — business education
ChE — chemical engineering
Chem — chemistry
CE — civil engineering
Comm — communications
Coreq — corequisite
Cr — credit
Dem — demonstration
Disc — discussions
Dr — drama
Econ — economics
Ed — education
EE — electrical engineering

Engr — general engineering
Equiv — equivalent
ES — engineering sciences
Eng — English
Ent — entomology
FS — food science
FL — foreign languages
For — forestry
Genet — genetics
Geog — geography
Geol — geology
Grad — graduate
Guid — guidance and counseling
Hist — history
HEc — home economics
Hr — hour
Hydro — hydrology
IEd — industrial education
InfSc — information science
Inter — interdisciplinary studies
Jour — journalism
Jr — junior
Lab — laboratory
Lec — lecture
LibSc — library science
Math — mathematics
Max — maximum
ME — mechanical engineering
Met — metallurgy
Min — mining engineering
MinMt — mining engineering-metallurgy
MS — military science
Museo — museology
MusA — applied performance studies in music
MusC — music theory and composition
MusH — music history and literature
MusT — music teaching
MusX — music, miscellaneous
MusZ — music summer camp
NE — nuclear engineering
NS — naval science
OAd — office administration
Phil — philosophy
Photo — photography
PE — physical education
Perm — permission of instructor
Perm of dept — permission of the department or subject-field administrative officer
Phys — physics
PlSc — plant sciences
PolSc — political science
Prereq — prerequisite
Psych — psychology
RadTV — radio-television
Rec — recitation
RelSt — religious studies
SocSc — social science
Soc — sociology
Soph — sophomore
Sp — speech
SpEd — special education
VS — veterinary science
VocEd — vocational teacher education
Wk — week
Yr — year
Zool — zoology

Accounting

Robert W. Clark, Dept. Chairman (209-A Admin. Bldg.). Professor Clark; Associate Professors Reynolds, Stewart; 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 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.

Aerospace Studies

J. A. Magee, Jr., Dept. Head (106-B Adult Ed. Bldg.). Professor Magee; Assistant Professors Davis, Winchester.

AS **101 Nature of Military Power in the United States** (1 cr). Defense establishment; the USAF. Two hrs per wk; one 1-day field trip.

AS **102 Strategic Offensive and Defensive Forces** (1 cr). Forces composition; use and effect of nuclear weapons; mission, weapons systems, and command/control of SAC; composition and role of defensive forces. Two hrs per wk; one 1-day field trip.

AS **200** (s) **Seminar** (cr arr). Prereq: perm.

AS **201 General Purpose and Aerospace Support Forces** (1 cr). Unified commands; role of TAC in limited war and counter-insurgency actions; contributions of USAF commands whose primary role is aerospace support. Two hrs per wk; one 1-day field trip.

AS **202 Trends of World Military Power** (1 cr). Conflict between democracy and communism; alliance and alignments; contemporary military thought. Two hrs per wk; one 1-day field trip.

AS **299** (s) **Directed Study** (cr arr). Prereq: perm.

AS **301 Growth and Development of Aerospace Power** (3 cr). Nature of war; airpower development in the U.S.; mission and organization of the Department of Defense; USAF concepts, doctrine, employment. Four hrs per wk; one 2-day field trip.

AS **302 Astronautics and Space Operations** (3 cr). Aerospace power; programs, vehicles, systems, problems in space exploration. Four hrs per wk; one 1-day field trip.

AS **400** (s) **Seminar** (cr arr). Prereq: perm.

AS **401 Air Force Leadership** (3 cr). Military professionalism; responsibilities; theory of leadership; discipline; human relations, military justice. Four hrs per wk; one 2-day field trip.

AS **402 Air Force Management** (3 cr). Personnel policies; channels of communication; principles and functions of management; command-staff organization. Four hrs per wk.

AS **465 Air Force Flight Instruction Program** (0 cr). Open to cadets who qualify to become Air Force pilots. Ground school, plus 36½ hrs of flying time (20 dual, 16½ 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). Also offered 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). Also offered as For 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). Also offered 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 **507 Experimental Design** (3 cr). Also offered 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.

Agricultural Biochemistry

Alvin C. Wiese, Head, Dept. of Agricultural Biochemistry and Soils (112 Ag. Sci. Bldg.). Professors LeTourneau, Wiese; Associate Professor Muneta.

AgBiC **205 General Agricultural 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.

AgBiC **401 Undergraduate Research** (1-2 cr, max 4). Individual study. Prereq: sr standing and perm.

AgBiC **422 Food Chemistry and Analysis** (3 cr). Alt/yrs 72-73. Also offered as FS 422 and HEc 472. Two lec and one 3-hr lab per wk. (Lab A is for home economics and food and nutrition majors—problems in cookery; lab B is for food science and other majors.) Prereq: Chem 253, 275, or equiv.

AgBiC **431 Chemistry and Physiology of Vitamins** (3 cr). Alt/yrs 73-74. Includes their relation to human and animal nutrition. Prereq: course in biochemistry.

AgBiC **461 Plant Biochemistry** (3 cr). Alt/yrs 73-74. Composition and metabolism of higher plants. Prereq: course in biochemistry.

AgBiC **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.

AgBiC **490 Proseminar** (1 cr, max 2). Prereq: jr standing and perm.

AgBiC **500 Master's Research and Thesis** (cr arr).

AgBiC **501** (s) **Seminar** (cr arr). Prereq: perm.

AgBiC **502** (s) **Directed Study** (cr arr). Prereq: perm.

AgBiC **505 Advanced Laboratory Techniques** (4 cr). Also offered as Soils 505. Chromatography, spectrophotometry, manometric and other special techniques. Two lec and two 3-hr labs per wk. Prereq: Chem 253 and perm.

AgBiC **531 Enzymes and Intermediary Metabolism** (3 cr). Alt/yrs 72-73. Chemistry of enzymes and intermediary metabolism of carbohydrates, lipids, and proteins. Prereq: Chem 481 or equiv.

AgBiC **532 Enzymology Laboratory** (1 cr).

Alt/yrs 72-73. One 3-hr lab per wk. Prereq or coreq: 531.

AgBiC **581 Carbohydrates and Lipid Chemistry** (3 cr). Alt/yrs 72-73. See Chem 581.

AgBiC **582 Amino Acids and Protein Chemistry** (3 cr). Alt/yrs 73-74. See Chem 582.

AgBiC **600 Doctoral Research and Dissertation** (cr arr).

AgBiC **601** (s) **Seminar** (cr arr). Prereq: perm.

AgBiC **602** (s) **Directed Study** (cr arr). Prereq: perm.

AgBiC **603** (s) **Independent Study** (cr arr). Prereq: perm.

Agricultural Economics

Richard W. Schermerhorn, Dept. Head (109 Ag. Sci. Bldg.). Professors Folz, Lindeborg, Marousek, Schermerhorn; Associate Professors Long, Michalson, Withers; Assistant Professors Araji, Godfrey, Hamilton; Extension Economists Early, Sargent.

AgEc **101 Agriculture and Its Social and Economic 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.

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 World Agriculture** (3 cr). The agricultural economy and its problems in various countries of the world; food production, consumption, and distribution problems.

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). Also offered as Econ 507. Theoretical background of 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 noncompetitive 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). Also offered as Econ 524. Macrodynamic 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 Introduction to Econometrics** (3 cr). Also offered 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 **600 Doctoral Research and Dissertation** (cr arr). For students concentrating in agricultural 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 Cvancara, Haynes; Assistant Professor Shane.

AgEd **200** (s) **Seminar** (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). Also offered 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 **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 or payment of the late registration fee. 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.

Agricultural Engineering

Gilbert L. Corey, Dept. Chairman (326 Buchanan Engineering Lab.). Professors Bloomsburg, Corey, Fitzsimmons, Martin; Associate Professors Dixon, Modén, Williams; Assistant Professors Busch, Molnau.

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 **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 **443 Agricultural Engineering Instrumentation Laboratory** (2 cr). Equipment and techniques; lab techniques and data analysis. One lec and one 3-hr lab per wk. Prereq: sr standing.

AgE **449 Elements of Structural Engineering** (3 cr). Design of steel and timber members and connections, reinforced concrete beams, slabs, columns, walls, footings; intro to prestressed concrete. 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 sub-surface 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). Environmental systems for animal production, crop storage, and plant growth; properties of biological materials. Prereq: ES 321.

AgE **462 Materials Handling and Processing** (3 cr). Engineering elements of agricultural materials handling and processing; heat transfer; drying, cooling, and conditioning of materials; design of systems for handling. 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 **472 Agricultural Machine Design** (2-3 cr). Machines and basic agricultural operations; force and functional analysis; machine and system efficiency; economic considerations. Two lec, or two lec and one 3-hr lab per wk. Prereq: ES 340.

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 **555 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 multi-flow 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

Gilbert L. Corey, Chairman, Dept. of Agricultural Engineering (326 Buchanan Engineering 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 stationary engines and farm tractors. Two lec, or two lec and one 2-hr lab per wk.

AgMech **312 Electric Power Application** (2-3 cr). For heat, light and power, circuits and wiring; selection of motors and controls; use of electricity for lighting, refrigeration, and ventilation. Two lec, or 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

Auttis M. Mullins, Dept. Head (215 Ag. Sci. Bldg.). Professors Bell, Christian, Dahmen, Mullins, Petersen, Ross; Associate Professors Frederiksen, Hodgson, Sauter; Associate Professor and Extension Specialist Hemstrom; Assistant Professors Bull, Jacobs, Sasser, 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** (1 cr). Methods of identification, registration, preparation for exhibition and marketing. One 3-hr lab per wk.

Anl **203 Live Animal Selection and Carcass Evaluation** (3 cr). Evaluation and selection of breeding and marketing animals; visual and objective appraisal. Three 1-day and four ½ day field trips or equiv time. One lec and two 3-hr labs per wk.

Anl **205 Animal and Avian Nutrition** (3 cr). Not open for credit to majors in animal industry agricultural science. Nutrients, their metabolism, requirements, and application in ration formulation for animals and birds.

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 **263 Meat Industry** (3 cr). Survey course of the livestock and meat industry; slaughtering, processing, and merchandising of meat and meat products. One 1-day field trip. Two lec and one 3-hr lab per wk.

Anl **299** (s) **Directed Study** (cr arr). Prereq: perm.

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. Four 1-day and four ½-day field trips in addition to contests or equiv time. One lec and two 3-hr labs per wk. Prereq: 203.

Anl **305 Principles of Nutrition** (3 cr). Proteins, carbohydrates, fats, minerals and vitamins, physiology of digestion, absorption and metabolism of nutrients and the relationships of enzymes and hormones in these phenomena; lab feeding experiments. Prereq: AgBiC 205 or equiv.

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 **308 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 72-73. Breeding, feeding, management, and marketing of commercial and purebred sheep; wool studies. Two lec and one 2-hr lab per wk.

Anl **323 Dairy Cattle Management** (3 cr). Alt/yrs 72-73. Operation of modern large dairy farms. Two lec and one 2-hr lab per wk.

Anl **324 Horse Production** (3 cr). Alt/yrs 73-74. Physiology, anatomy, and function of the horse as related to nutrition, breeding, and conformation; practical horse management. One ½-day field trip. Two lec and one 2-hr lab per wk. Prereq: jr standing.

Anl **326 Swine Science** (3 cr). Alt/yrs 73-74. 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 72-73. 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 **331 Meat Selection** (2 cr). Alt/yrs 72-73. Also offered as FS 331. Primarily for home economics and food science students. Factors affecting the quality and palatability of meat; selection, storage, preparation, and serving of meat and meat products. One lec and one 2-hr lab per wk.

Anl **334 Meat Technology** (3 cr). Alt/yrs 72-73. Also offered 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 331.

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.

Anl **421 Population Genetics** (3 cr). Also offered 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). Also offered 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 **433 Poultry Products Technology** (3 cr). Alt/yrs 72-73. 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). Also offered 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 **454 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).

Anl **457 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.

Anl **500 Master's Research and Thesis** (cr arr).

Anl **501** (s) **Seminar** (cr arr). Prereq: perm.

Anl **502** (s) **Directed Study** (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 **513 Microbiology and Physiology of Ruminant Nutrition** (3 cr). Physiology and microbial aspects of ruminant digestion and their influence on the metabolism of extra-ruminal 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 monogastric animals and birds; development of nutritive requirements and nutritive interrelationships. Prereq: perm.

Anl **522 Statistical Genetics** (3 cr). Also offered 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 **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 **572 Meat Science** (3 cr). Biochemical, histological, microbiological, and physiological properties of meat; their application to live animal and meat research. One lec and two 3-hr labs per wk.

Anthropology

Roderick Sprague, Head, Dept. of Sociology/Anthropology (4 Faculty Office Bldg.). Associate 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 **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). Simpler societies of Eurasia, Africa, Americas, Australia, and Islands of the Pacific.

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). Also offered as Soc 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.

Anthr **421 Belief Systems of Simpler Societies** (3 cr). Theories, methods, and findings of comparative anthropological study; emphasis on religion.

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). 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 **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 **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 Archaeological 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) (WS481). WSU 554. Prereq: perm.

Architecture

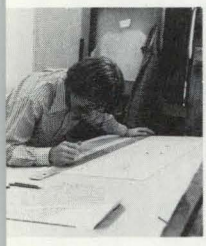
Paul L. Blanton, Head, Dept. of Art and Architecture (102 Art and Arch. North). Professors Bartell, Sloan; Associate Professors Ashland (Landscape Architecture), Blanton, Dotts, Snyder (Landscape Architecture); Assistant Professors Berg, Bevans, Converse, Hollett, McCroskey, Smith, Tinder, Walker.

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** (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 in 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 Professional Problems** (3 cr, max 6). Jury evaluation of project required.

Arch **562 Concepts in Contemporary Habitation** (3 cr). The house in history establishing precedents for the current patterns of housing with a critical analysis to determine their suitability to the requirements of today's society.

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 **150** (s) **Workshop** (cr arr). Normally offered in painting, water color, sculpture, drawing, ceramics, design, printmaking, and jewelry. Prereq: perm.

Art **200** (s) **Seminar** (cr arr). 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 (also offered 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 **423-424 Graphic Design III** (2 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 **450** (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 **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) **Professional Problems** (3-5 cr, max 10).

Art **504** (s) **Studio Problems** (3-5 cr, max 10).

Bacteriology

Campbell M. Gilmour, Dept. Head (14 Life Sci. Bldg.). Professors Anderson, Gilmour; Associate Professors Beck, Teresa; Assistant Professor 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.

Bact **304 Pathogenic Bacteria** (4 cr). Disease-producing organisms; cultural, biochemical, and morphological characteristics which serve as a means of identification. Two lec and two 3-hr labs per wk. Prereq: Bact 250.

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: Bact 250.

Bact **409 Immunology and Serology** (4 cr). Theory of immunity; animal experiments in the production of immune sera, use of vaccines, preparation and testing of vaccines, sera, toxins, and anti-toxins. Two lec and two 3-hr labs per wk. Prereq: Bact 250 and 304.

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: Bact 250, 304, Chem 254.

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: Bact 414.

Bact **425 Soil Microbiology** (3 cr). Also offered as Soils 425. Activities of microscopic forms of plant and animal life within the soil, relationship between microbial activities, soil fertility, and crop production. One lec and two 3-hr labs per wk. Prereq: Bact 250.

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 72-73. 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: Bact 250.

Bact **505 Microbial Fermentations** (2-4 cr). Alt/yrs 73-74. Industrial and non-industrial fermantations; biochemical mechanisms and methods of fermentation analysis. Two lec, or two lec with labs per wk. Prereq: Bact 250, Chem 372, or perm.

Bact **507 Bacterial Taxonomy** (2 cr). Taxonomic groups of bacteria; philosophies of classification. Prereq: Bact 250, 304.

Bact **509 Virology** (2-4 cr). Emphasis on pathogenesis and host-virus relationship. Prereq: perm.

Bact **512 Microbial Genetics** (2-4 cr). Also offered as Genet 512. Genetics of microorganisms; reproduction, variation, and heredity. Prereq: elem course in genetics is recommended.

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.

Biology

Doyle E. Anderegg, Head, Dept. of Biological Sciences (115 Life Sci. Bldg.). Professor Anderegg; Associate Professors Forbes, Johnson, Larrison, McMullen, Tylutki; Assistant Professors Naskali, Rabe, 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). Also offered 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). Also offered as Genet 314 and PlSc 314. Genetic mechanisms in animals, plants, and microorganisms; forms important in biological research. Also offered by correspondence study. Prereq: 201.

Biol **352 General Genetics Laboratory** (1 cr). Also offered 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). Evolution of organisms; character variability, adaptation, natural selection, population systems, ecologic control, speciation, evolutionary rates; development of mammals, including man. Also offered by correspondence study. Prereq: 351.

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 Directed Study** (cr arr). Prereq: perm.

Biol **501** (s) **Seminar** (cr arr). Prereq: perm.

Biol **502** (s) **Directed Study** (cr arr). Prereq: perm.

Biol **504 Colloquium** (1 cr, max 2).

Biol **555 Physiological and Molecular Genetics** (2-3 cr). Also offered as Genet 537. Prereq: 351 or Genet 314 or PlSc 314.

Botany

Doyle E. Anderegg, Head, Dept. of Biological Sciences (115 Life Sci. Bldg.); Professors Baker, Roberts; Associate Professors Aller, McMullen, Tylutki; Assistant Professor 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. Also offered 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 **504 Colloquium** (1 cr, max 2).

Bot **512 Plant Growth Substances** (3 cr). Alt/yrs 72-73. 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 72-73. 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; mechanics 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 **558 Genetics of Fungi** (3 cr). Alt/yrs 72-73. Also offered 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

Russell L. Chrysler, Dept. Chairman (218 Admin. Bldg.). Professors Carter, Chrysler, Dobler; Associate Professors Del Mar, Golis, Moore, Seelye, Sheldon; Assistant Professors Hallaq, Hulbert, Lillis, Merk.

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 **231 Statistics** (4 cr). Also offered as InfSc 231. Intro to probability theory, distribution theory, hypothesis testing, and statistical inference. Three lec and one 2-hr lab per wk. Prereq: Math 111 or 140-141.

Bus **233 Introduction to Computers** (3 cr). Also offered as InfSc 233. Elements of programming; computer operation.

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, and personnel policies. One 1-day field trip. Prereq: 231.

Bus **313 Office Management** (2 cr). Application of generally-accepted principles to administrative services.

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 **333 Electronic Computers in Business and Economics** (3 cr). Also offered as InfSc 333. Impact of computers on decision making; FORTRAN IV, COBOL, PL1; information science; information systems and data processing. Prereq: 233.

Bus **334 Statistics for Business Decisions** (3 cr). Also offered as InfSc 334. Decision making under conditions of uncertainty; utility and probability theory. Prereq: 231.

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. 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 Merchandizing 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 **432 Quantitative Methods in Business and Economics** (3 cr). Also offered as Econ 432 and InfSc 432. Quantitative methods employed in solving business and economic problems. Prereq: 231, Econ 252, or perm.

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 **436 Business and Economic Fluctuations** (3 cr). Also offered as Econ 436. Application of recent theoretical, statistical, and institutional developments to business forecasting. Prereq: 231, Econ 372.

Bus **438 Advanced Statistics** (3 cr). Also offered as InfSc 438. Correlation analysis; time correlation and business forecasting; analysis of variance; statistical analysis of business cycles. Prereq: 231.

Bus **439 Systems Analysis and Simulation** (3 cr). Also offered as InfSc 439. Analysis of the various types of systems within a business firm; creation and testing of systems utilizing the technique of computer simulation. Prereq: 233.

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).

Bus **442 Government Regulation of Business** (3 cr). Also offered as Econ 442. Relations between government and business; types of government control. Prereq: Econ 252 or perm.

Bus **444 International Commercial Policy** (3 cr). Also offered as Econ 444. Principles of international trade, tariff, foreign exchange, market development, dumping, foreign policies, trade agreements, and merchandising. Prereq: Econ 251.

Bus **450 The Computer and Information Science** (3 cr). Also offered as InfSc 450. Applications course. FORTRAN IV programming; solution of business and statistical problems using computer programming. Prereq: perm.

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, economics, 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 **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 **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). Also offered as InfSc 532. Statistical decision theory and operations research techniques. Prereq: 231 or perm.

Bus **533 Automation Systems** (1 cr). Also offered 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, queing, 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 Administration and Contemporary Issues** (3 cr). See Inter 580.

Bus **R597-R598 Statistical Methods in Business Applications** (3 cr). Development and application of mathematical statistics to business procedures. 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 **299** (s) **Directed Study** (cr arr). Prereq: perm.

BusEd **400** (s) **Seminar** (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). Methods and materials. Prereq: perm.

BusEd **496 Directed Work Experience** (2 cr). 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). Also offered 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 pro-

grams in distributive education. Prereq: perm.

BusEd **524 Issues in Distributive Education** (3 cr). Philosophies, objectives, trends, and organization patterns of distributive education in secondary schools. Prereq:perm.

Chemical Engineering

Robert R. Furgason, Dept. Chairman (308 Buchanan Engr. Lab.). Professors Edwards, Furgason, Hoffman, Jackson; Associate Professor Scheldorf; Assistant Professors Blair, Thomson; Instructor Hager; Associate Engineer McConnachie.

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 **371 Process Engineering** (2-3 cr). Not open for credit to majors. Applications of chemical engineering principles to industrial processing; unit operations of interest to such industries as wood utilization, food processing, dairying, and fermentation. Prereq: perm.

ChE **393 Chemical Engineering Projects** (1-3 cr, max 9). Problems of a research or exploratory nature. Prereq: perm of dept.

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, crystalization, filtration, sedimentation, and fluidization. Coordinated lec-lab periods. Prereq or coreq for 430: ES 320; prereq or coreq for 430-431: Math 310.

ChE **443 Instrumentation Laboratory** (1 cr). Analytical techniques and instrumentation equipment. One 3-hr lab per wk. Prereq: perm.

ChE **453-454 Chemical Process Analysis and Design** (3 cr). Estimation of equipment and total investment costs, annual costs and profits, and ths indices of attractiveness, optimization, design of equipment, and entire processes including economic considerations, selection of alternate equipment, and processing schemes; design in the presence of uncertainty; case studies on selected processes. One 1-wk field trip. Prereq: Econ 251, sr standing.

ChE **490 Introduction to Chemical Engineering Principles** (3 cr). For chemists, engineers, and other non-chemical engineers. Material and energy balances and unit operations used in chemically-related industries. Prereq: perm.

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). Also offered 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). Equilibrium 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). Also offered 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 Diffusional Operations I-II** (2-3 cr). Diffusion and mass transfer in the operation of absorption, extraction, distillation, and drying; 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 ıemical 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 agricultural 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 under-developed nations; guidelines for the non-scientist 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 eight cr in 112 and 114 combined. Three lec, one rec, and one 3-hr lab per wk. Prereq: 103 or 111.

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 structure 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-hr 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 processes 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.

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). Also offered 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, non-aqueous 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.

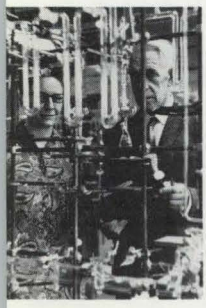
Chem **475 Qualitative Organic Analysis** (3 cr). Homologous reactions and the separation and identification of various types of organic compounds. One lec and two 3-hr labs per wk. Prereq: 372 or perm.

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). Prereq: perm of dept.

Chem **493 Molecular Structure and Quantum Chemistry** (3 cr). Applications of quantum theory to chemical bonding, molecular spectroscopy, and molecular structure. Prereq: 306 or perm.

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 **505 Chemical Thermodynamics** (3 cr). Partial molar quantities and systems of variable composition, applications 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 **506 Chemical Kinetics** (3 cr). Theory and application of chemical kinetics to systems reacting in the gaseous phase and in liquid solution. Prereq: 306.

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 **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 to polymers and their solutions; kinetics of polymerization. Prereq: 306.

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). Alt/yr 73-74. 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 Analytical Chemistry** (3 cr). Fundamental principles of classical 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, interstitial, non-stoichiometric compounds; chemical bonding; inorganic reaction mechanisms. Prereq: perm.

Chem **WS568 Advanced Topics in Biochem-**

istry (1-9 cr, max 9). Selected topics from the current literature. Prereq: perm.

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). Also offered as AgBiC 581. Carbohydrates, lipids, and related compounds. Prereq: 482.

Chem **582 Amino Acid and Protein Chemistry** (3 cr). Also offered as AgBiC 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, Lottman, Russell, Schuster, Smith, Wallace, Warnick; Associate Professors Haber, Hathaway, Junk, Peebles, Sack, Watts; Assistant Professor Brockway.

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 251.

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; stereoplotters; 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 principles 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; seismic loads. Three lec and one 3-hr lab per wk. Prereq: ES 340.

CE **357 Mechanical Properties of Materials** (2 cr). Characteristics and measurement of stress-strain strength properties of structural materials. One 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 **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 **440 Structural Design** (3 cr). Continuation of ES 340 and CE 342; intro to design concepts. Two lec and one 3-hr lab per wk. Prereq: 342.

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 or coreq: 440.

CE **444 Steel and Timber Design** (3 cr). Members and joints; use of latest AISC and NLMA specifications; one-third on timber structures. Two lec and one 3-hr lab per wk. Prereq: 440.

CE **445 Structural Analysis and Plastic Design** (3 cr). Secondary stresses, non-prismatic frame members, composite structures; one-half on plastic theory and design using latest AISC recommendations. Two lec and one 3-hr lab per wk. Prereq or coreq: 444.

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 Operations** (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 Mangement 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 **531 Unit Operations of Sanitary Engineering** (3 cr). Analysis and design of physical and chemical operations of water and waste treatment; flow models, sedimentation, flocculation, filtration, and water conditioning. Prereq: perm.

CE **532 Unit Processes of Sanitary Engineering** (3 cr). 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 **534 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 Industrial Hygiene and Air Sanitation** (3 cr). WSU 544. Industrial poisons, occupational hazards and diseases, fatigue, ventilation, illumination; causes and control of atmospheric pollution. Two lec and one 3-hr lab per wk. Prereq: 431.

CE **WS539 Environmental Health Engineering Science** (4 cr). WSU 584. Role of microorganisms including bacteria, algae, fungi, and protozoa in water and waste treatment processes. Three lec and one 3-hr lab per wk. Prereq: perm.

CE **541-542 Design of Structures I-II** (3 cr). CE 541: arches, prestressed concrete, and thin shell design. CE 542: plate girders, floor systems with concentrated loads, and composite construction. 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). Also offered as ME 548. Mathematical analysis of strain and stress including vectors, tensors, and coordinate transformations; equations of elasticity; stress problems involving extension, torsion, and flexture; theories of failure. Prereq: perm.

CE **ID556 Physical Properties of Concretes** (3 cr). Structure theories of aggregate and binder mixtures; application to portland cement and asphalt concretes. Two lec and one 3-hr lab per wk. Prereq: 357 or perm.

CE **557 Strength Properties of Non-Elastic Materials** (3 cr). Effects of load duration time, temperature, stress, and strain on design moduli and fracture properties of structural materials; quantitative methods and applications. 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 562: 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 **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

Bert C. Cross, Chairman, Dept. of Journalism (104 Journ. Bldg.); Associate 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 **299** (s) **Directed Study** (cr arr). Prereq: perm.

Comm **400** (s) **Seminar** (cr arr). Prereq: perm.

Comm **499** (s) **Directed Study** (cr arr). Prereq: perm.

Drama

Edmund M. Chavez, Head, Dept. of Drama/Speech (U-Hut 104). Associate Professor Chavez; Assistant Professors Croskey, Sears.

ADVANCED PLACEMENT: Courses in this

subject field which are vertical in content are: 105-106-272-305-306-407-408.

Dr **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.

Dr **102 Stage Makeup** (1 cr). Principles and practices; practical lab experience. Limited to twenty students. Prereq: perm.

Dr **105-106 Basics of Performance** (2 cr). Work on improvisation; presentation of play scenes. Dr 105: acting techniques in relaxation, observation, imagination, and sense memory. Dr 106: emphasis on stage speech, breathing, projection, resonance, pitch, and articulation; international phonetic alphabet. Prereq: perm.

Dr **108 Introduction to Media** (2 cr). For majors and students concurrently enrolled in other drama courses. Intro to drawing, design, graphics, painting, and other media designed specifically for the drama student; preparation for design and technical classes, promotional graphics, and related areas.

Dr **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.

Dr **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.

Dr **190 Theatre Practice I** (1 cr, max 4). Open to non-majors. Practical experience in all aspects of theatre practice.

Dr **200** (s) **Seminar** (cr arr). Prereq: perm.

Dr **263 Technical Production** (3 cr). Drafting methods, set construction, props, sound, painting, and use of tools.

Dr **264 Stage Lighting** (3 cr). Equipment, methods of distributing light, color theory, basic electricity, reflection and absorption, and special effects.

Dr **265 Children's Theatre** (3 cr). Selection, preparation, and presentation of theatre for children; story telling; recreational and special occasion programs.

Dr **266 Creative Dramatics** (2 cr). Selection, preparation, and presentation of creative dramatics; practical application through working with children on the elementary-school level.

Dr **271 Play Analysis** (3 cr). Critical intro to drama; tragic and comic genres; analysis of contemporary theatre systems; emphasis on modern movements in theatre.

Dr **272 Intermediate Acting** (3 cr). Interpretation of roles; methods in characterization; techniques for developing a character. Prereq: perm.

Dr **299** (s) **Directed Study** (cr arr). Prereq: perm.

Dr **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.

Dr **306 Advanced Acting** (3 cr). Intense textural and characterization study of a specified play; theory and practice in the major stage dialects. Prereq: perm.

Dr **320 Advanced Stage Lighting** (2 cr). Poetic and realistic functions of stage lighting; design of lighting for several plays. Prereq: 264.

Dr **330 Drama-Television Production II** (1 cr, max 4). Continuation of 130. Prereq: perm of dept.

Dr **362 Costume for the Stage** (2 cr). Costume design and construction for theatrical productions; development of period costumes and production problems.

Dr **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.

Dr **390 Theatre Practice II** (1 cr, max 4). Open to non-majors. Continuation of 190. Set construction, costumes, lights, and properties.

Dr **395 Summer Theatre II** (2 cr, max 8). Continuation of 125. Max ten cr in 125 and 395 combined. Prereq: perm of dept.

Dr **400** (s) **Seminar** (cr arr). Prereq: perm.

Dr **407-408 Styles of Acting** (3 cr). Alt/yrs. Dr 407: cultural backgrounds, manners, and customs in classic acting styles from the Greeks through Shakespeare. Dr 408: Restoration theatre through 20th century styles. Prereq: perm.

Dr **420 Production Management** (2 cr). Publicity and promotion, business management, box office organization, house management, bids, contracts, and budget problems in theatre organization.

Dr **467-468 The Theatre** (3 cr). Survey of European and American theatres, dramatists, and actors.

Dr **471-472 Directing** (3 cr). Organization and techniques involved in directing. Dr 471: preparation of a play from casting to performance. Dr 472: emphasis on staging and interpreting the play; work in composition, picturi-

zation, movement, and rhythm. Prereq: perm of dept.

Dr **499** (s) **Directed Study** (cr arr). Prereq: perm.

Dr **500 Master's Research and Thesis** (cr arr).

Dr **501** (s) **Seminar** (cr arr). Prereq: perm.

Dr **502** (s) **Directed Study** (cr arr). Prereq: perm.

Dr **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 drama and perm of dept.

Dr **ID510 Costume Design and Rendering Techniques** (2 cr). Emphasis on developing rendering techniques applicable to costume design. Prereq: 362.

Dr **ID515 Advanced Stage Costuming** (2 cr). Design responsibility for a major production. Prereq: perm of dept.

Dr **520 Advanced Directing** (3 cr). Genres of tragedy, comedy, drama, and melodrama; directorial problems in staging arena and musical productions.

Dr **ID522 Directing the Period Play** (3 cr). Interpreting and staging the period play in major dramatic periods; social and cultural view of each period.

Dr **524 The Modern Theatre** (3 cr). History of movements, personalities, and representative plays from the Duke of Saxe-Meiningen to the theatre of cruelty.

Dr **530 Scene Design II** (3 cr). Survey of historical periods and architectural styles and their practical application to design problems. Prereq: 263, 364.

Dr **ID535 Advanced Scene Design** (3 cr). Design responsibility for a major production. Prereq: perm of dept.

Dr **ID560 Seminar in Dramatic Criticism** (3 cr). Analysis of past and present day criticism of the drama; writing of dramatic practical work in such criticism.

Dr **WS567 The Forms of Drama: Tragedy** (3 cr). WSU Sp 567. Development of tragedy from its origins to the present.

Dr **WS568 Seminar in Theatre** (3 cr, max arr). WSU Sp 568. Research in a specific area of theatre.

Dr **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.

Economics

Max E. Fletcher, Dept. Chairman (339 Admin. Bldg.). Professors Fletcher, Nybroten; Associate Professor Lynch; Assistant Professors Campbell, Cooper, Di Noto, Ghazanfar, Reynolds.

Econ **170 Contemporary Economics** (3 cr). Economic issues and the economic principles involved. One semester survey course for the non-major. 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. Also offered by correspondence study. Prereq: 251 for 252.

Econ **272 Foundations of Economic Analysis** (3 cr). Not open to students who have taken Econ 251-252 or equiv. Concepts underlying micro- and macroeconomic analysis. Prereq: Math 180 or perm.

Econ **321 Intermediate Microeconomic Analysis** (3 cr). Theory of the individual firm, industry, market, price determination, and allocation of productive resources. Honors section covering additional selected topics offered fall semester. Prereq: 252 or perm.

Econ **372 Intermediate Macroeconomic Analysis** (3 cr). Theory of the economy as a whole; national income accounting as a tool of analysis; national output and income, employment, price levels, and growth. Honors section covering additional selected topics offered spring semester. Prereq: 252 or perm for regular sections; 321 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). Theory; includes some emphasis on banking practices.

Also offered by correspondence study. Prereq: 252.

Econ **409 Public Finance** (3 cr). Government expenditures and taxation; structure and economic effects of the American tax system; federal taxes; analysis of the tools of fiscal policy and public debts. Prereq: 252.

Econ **410 State and Local Government Finance** (3 cr). Criteria for and determinants of expenditures; equity, adequacy, and economic impact of taxes; economics of metropolitanism and intergovernmental relations. Prereq: 252.

Econ **430 Regional Economics** (3 cr). Methods of economic analysis appropriate to regional problems; application to the Pacific Northwest. Prereq: 252 or 272.

Econ **432 Quantitative Methods in Business and Economics** (3 cr). See Bus 432.

Econ **433 Introduction to Econometrics** (3 cr). Use of quantitative techniques to analyze and test economic theories. Prereq: 432 and 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 or perm.

Econ **436 Business and Economic Fluctuations** (3 cr). See Bus 436.

Econ **441 Labor Economics** (3 cr). Application of economic theory to the labor market; labor market institutions; theory of collective bargaining; current problems. Prereq: 252.

Econ **442 Government Regulation of Business** (3 cr). See Bus 442.

Econ **474 International Economics** (3 cr). History and theory of international trade and finance; commercial policies of nations; current world economic problems. Prereq: 321.

Econ **477 Economics of Developing Countries** (3 cr). Also offered as AgEc 477. Problems; characteristics of underdevelopment; role of innovation and investment; threat of population growth; barriers to growth; international programs for development; macroeconomic theories explaining the development process. Prereq: 252 or perm.

Econ **490 Comparative Economic Systems** (3 cr). Origin, development, and attributes of major contemporary economic systems. Prereq: 252 or perm.

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). Also offered as AgEc 521. Analysis of the economics of enterprise.

Econ **522 Advanced Aggregate Economics** (3 cr). Also offered as AgEc 522. Current economic theory in national income, employment, price stability, and economic growth in developed economies.

Econ **523 Advanced Monetary Theory** (3 cr). Also offered as AgEc 523. Emphasis on the value of money.

Econ **524 Theory of Economic Development** (3 cr). See AgEc 524.

Econ **525 Introduction to Econometrics** (3 cr). See AgEc 525.

Econ **526 Business Conditions Analysis** (3 cr). Social accounting and macroeconomic theory pertaining to economic forecasting and analysis.

Education

Thomas O. Bell, Dept. Head (404-B Educ. Bldg.). Professors Archambault, Farley, E. Kelly, Kirkland, Maib, Samuelson, Shreve, Snider, Vent; Associate Professors Armstrong, Foster, Kaus, Marten, Miller, Richardson, L. Smith, Woolums, Wriggle; Assistant Professors Amos, Couch, Glenn, Harris, J. Kelly; Instructor Freer. 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 field 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. One lec and three 1-hr labs per wk.

Ed **X273 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). 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. Also offered by correspondence study.

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** (2 cr). See MusT 381.

Ed **400** (s) **Seminar** (cr arr). Prereq: perm.

Ed **401** (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. Also offered by correspondence study.

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 lec or two lec and 3 hrs of micro-teaching lab per wk; one 1/2-day and one 1-day field trip.

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: 413, 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 Grography** (3 cr). 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 **X473 International Education Scene** (1-9 cr, max 9). See X273.

Ed **498 Instructional Television Institute** (6 cr). Preparation, utilization, and evaluation of telecourses.

Ed **499** (s) **Directed Study** (cr arr). 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). Problems 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 teachers 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. Prereq: qualified for a standard elem certificate.

Ed **523 Creative Arts and Creative Teaching** (3 cr). Creativity in children; art, music, sociodrama-creative writing. Prereq: qualified for a standard elem certificate.

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 **534 Elementary School Mathematics Practicum** (9 cr). The student serves as a full-time teacher of mathematics in a public school for nine wks; teaches four classes each day and serves as consultant to other teachers. Prereq: min of 1 yr teaching in elem school and 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 **585** (s) **Internship** (3-9 cr, max 9). Normally offered in public school teaching, college teaching, and school administration. The public school teaching internship is limited to M.A.T. candidates; the college teaching internship may be taken for a max of three cr by doctoral students and consists of supervised teaching of undergraduate college courses. Graded on the basis of P or F. Prereq: perm of dept.

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 Administration of Public 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 Maintenance** (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, sociological, and cultural points of view; their application to school administration.

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 **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, Rigas, Thomas; Assistant Professors Maki, Olson, Stefanakos, Stevens; Instructor Fronek.

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 computers; concepts of programming; number systems, basic logical circuits, arithmetic and memory elements, input-output 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 circuits; 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). Also offered as InfSc 440. Concepts of Boolean algebra, logic components; combinational and sequential circuit analysis and synthesis; number systems. Prereq: jr standing.

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 **ID503 Network Synthesis** (3-4 cr). Active and passive electrical networks; passive one-port and two-port networks; practical limitations on performance and realizations; intro to multiport synthesis. Prereq: 401 or 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 **537 Plasma Dynamics** (3 cr). Conduction in gases, statistical methods in describing motion of charged particles in electromagnetic fields, application to microwave propagation, fusion, and magnetohydrodynamics. Prereq: 531 or perm.

EE **540 Computation Structures and Machine Organization** (3 cr). Also offered 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). Also offered 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 **543 Computer Programming Systems and Information Structures** (3 cr). Also offered as InfSc 543. System software; programming systems; machine language programming; input-output programming; assemblers, searching and sorting; list structures. Prereq: perm.

EE **546 System Simulation** (3 cr). Also offered as InfSc 546. Digital and hybrid simulation; logical problem divisions; digital simulation of continous systems; queueing theory; theory of models; and design of simulation programs. Prereq: perm.

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). Optimum receiver principles; channel contraints, 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). Also offered 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). Also offered as InfSc 565. Discrete and continous-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 concepts, 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: phenomena 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 520.

EE **WS585 Advanced Topics in Information Processing** (3 cr, max 6). WSU CptS 520.

EE **586 Solid-State Electronics II** (3 cr). Transistors, tunnel diodes, and other junction devices; metal-semiconductor devices; field-effect transistors; 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 tranformations; 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-Reghi effects; piezoresistance and piezogalvanomagnetic effects. 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 Professor Nelson; Instructor 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 Geog 251.

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 permission. Basic concepts for beginning engineering students. Engineering method of problem solving and the design process. Engr 120 is graded on the basis of P or F.

Engr **131 Digital Computer Programming** (1-2 cr). Also offered 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 **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 Engineering in a Technological Society** (3 cr). Not open to engineering majors. 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 **490 Technology and Human Value** (2-3 cr). See Inter 490.

Engineering Science

George L. Bloomsburg, Chairman (224 Engr. Bldg.). Professor Bloomsburg; Associate Professors Haber, Scheldorf, Sun; Assistant Professor Doyle.

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). Also offered 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). Also offered 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 **420 Fluid Mechanics II** (3 cr). Analysis of fluids in motion; basic laws for systems and control volumes; Navier Stokes equations; boundary layer theory; compressible flow. Prereq: 320.

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 **540 Continuum Mechanics** (3 cr). Stress and deformation of continua using tensor analysis; relationship between stress, strain, and strain rate 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 Boone, Kirtley, Storm, Tung; Associate Professors Heningham, Malek, Meldrum; Assistant Professors Barber, Davis, Dozier, Foriyes, Gilbertson, Hannaford, Knight, Leyden, McFarland, Murphy, Sipahigil, Stratton, Tanner, Wallins; Instructors Bie, Eden, Elwood, McKie, Michel, O'Callaghan, Otness, Pugmire, Riley, Slette, 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) (102). 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. 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). 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 **395 Interpreting Literature** (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 **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). Alt/yrs. 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). Alt/yrs. Liturgical beginnings 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). Alt/yrs. 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 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). Transformational theory and techniques; phrase structures; cyclic rules, semantic interpretation, and conjoining and embedding from semantic deep structures.

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). Alt/yrs.

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, 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. Also offered by correspondence study.

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. Prereq: 291 or 292, and perm.

Eng **495 Literary Criticism** (3 cr). History of literary criticism from Plato to the present; critical practice representing various schools and techniques; practice in applying critical methods to selected poems, fiction, and drama.

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 **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.

Entomology

Arthur R. Gittins, Dept. Head (101 Ent. Bldg.). Professors Barr, Bishop, Gittins, Schenk, Stark; Associate Professors Brusven, Smith; Assistant Professor O'Keeffe; Assistant Re-

search Professors Carpenter, Scott, 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). Importance of insects associated with agriculture; 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 **ID372 Aquatic Entomology** (3 cr). Alt/yrs 72-73. Identification and biology of insects associated with aquatic and subaquatic environments. One lec and two 2-hr labs per wk; two 1-day field trips. Prereq: perm.

Ent **400** (s) **Seminar** (cr arr). Prereq: perm.

Ent **438 Pesticides in the Environment** (2 cr). Also offered as PISc 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 72-73. 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 72-73. Mechanisms of plant resistance; factors affecting expression or permanence of resistance; analysis of insect-plant associations. Prereq: general entomology and organic chemistry or plant physiology.

Ent **WS448 Medical Entomology** (3 cr). Insects and related arthropods in relation to human health; means of control. Prereq: adv standing in entomology.

Ent **467 Forest Entomology** (3 cr). Also offered as For 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 **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). Assembly and use of entomological literature.

Ent **521 Principles of Insect Control** (3 cr). Alt/yrs 72-73. Principles, theory, and methodology of regulating populations of detrimental insects.

Ent **538 Pesticide Toxicology** (3 cr). Also offered as PISc 538. Modes of action of pesticide chemicals; effects on living organisms. Prereq: perm.

Ent **541 Insect Ecology** (3 cr). Alt/yrs 72-73. Factors affecting the distribution, abundance, and behavior of insects; population dynamics. Prereq: 211 and course in general ecology, or perm.

Ent **544 Systematic Entomology** (3 cr). History and principles of insect classification; taxonomic procedure and rules of nomenclature.

Ent **WS551 Insect Biochemistry** (3 cr). Alt/yrs 72-73. Examination of the current knowledge of insect chemistry. Prereq: course in biochemistry.

Ent **561 Insect Behavior** (2 cr). Alt/yrs 72-73. Biology and behavior of insects.

Ent **569 Advanced Forest Entomology** (3 cr). Alt/yrs 73-74. Also offered as For 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 **582 Insect Physiology** (4 cr). Alt/yrs 73-74. Interrelations of structure and metabolic functions of insect organ systems. Two lec and two 3-hr labs per wk. Prereq: 484 and course in organic chemistry.

Ent **600 Doctoral Research and Dissertation** (cr arr).

Ent **601** (s) **Seminar** (cr arr). Prereq: perm.

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; Instructor and Research Associate Huber.

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 72-73. 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 **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 72-73. 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 **331 Meat Selection** (2 cr). See Anl 331.

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 72-73. 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). See AgBiC 422.

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.

Foreign Languages

C. L. Iiams, Dept. Chairman (314 Admin. Bldg.). Professors Iiams (German), Reed (German); Associate Professors Aaron (Spanish), Rowe (Classics), Sita (Spanish and Italian), Sullivan (German); Assistant Professors Fiske (French), Gonzalez (Spanish), Jensen (Spanish), Koubourlis (Russian), Stevenson (French); Instructors Bessette (Classics), Cohee (French), Norton (Spanish), Reece (German), Rose (French), Vogt (German), Wu (French).

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, 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 ıer-division language courses, except thc in Greek, is the appropriate intermediate ı ɹrse 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 **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 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; knowledge of Russian is not required.

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 **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.

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).

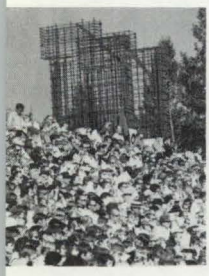
FL **305-306 Survey of French Literature** (3 cr). Middle Ages to the present.

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 cr). 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 **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 is 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

John H. Ehrenreich, Dean of the College of Forestry, Wildlife and Range Sciences (201 Forestry Bldg.). Professors Chapman, Ehrenreich, Erickson, Howe, Hungerford, Loewenstein, MacPhee, Partridge, Schenk, Seale, Sharp, Stark, Tisdale, Wang, Wohletz; Associate Professors Adams, Belt, Bjornn, Hironaka, Hornocker, Johnson, Knight, Pitkin; Assistant Professors Aulerich, Bizeau, Falter, Godfrey, Gordon, Hofstrand, Sowles; Instructor Jones; Extension Forester Burlison.

For **101 Forestry Orientation** (1 cr). Intro to forestry and related wildland management professions; orientation to the university and college.

For **200** (s) **Seminar** (cr arr). Prereq: perm.

For **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.

For **216 Tree Identification** (2 cr). Open to non-forestry students only. Identification, distribution, and economic use of important trees of western U.S.; emphasis on trees of Idaho. One lec and one 2-hr lab per wk.

For **250 Introduction to Wildland Management** (2 cr). Methods of inquiry into and logical exposition of topics in forestry and related wildland disciplines.

For **299** (s) **Directed Study** (cr arr). Prereq: perm.

For **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.

For **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: systematic botany and general ecology.

For **303 Forest Resources Conservation** (2 cr). Ecosystem approach to resource manage-

ment 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.

For **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.

For **307 Biometry** (3 cr). See Ag 321.

For **314 Fish and Wildlife Population Ecology** (3 cr). Characteristics of fish and wildlife populations and their environment. Prereq: general ecology or perm.

For **320 Dendrology** (3 cr). Identification, classification, distribution, and associations of the important tree species of 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.

For **321 Silvics** (2 cr). Ecological basis for the management of vegetation, especially forests. Prereq: 301 and general chemistry.

For **327 Elementary Forest Tree Improvement** (1 cr). Also offered as Genet 307. Basic genetic principles and practices of forest tree improvement. Two 1/2-day field trips. Prereq: general botany.

For **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.

For **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.

For **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.

For **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.

For **400** (s) **Seminar** (cr arr). Prereq: perm.

For **WS406 Radiation Ecology** (2 cr). Alt/yrs 72-73. WSU BioSc 440. Fate and effect of radio nuclides in the natural environment.

For **408 Forest Soils** (2 cr). Also offered 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.

For **411 Ichthyology** (3 cr). See Zool 481.

For **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.

For **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.

For **ID414 Fish Ecology Laboratory** (1 cr). One 2-hr lab per wk. Prereq: general zoology and perm.

For **415 Limnology** (3 cr). Also offered 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.

For **417 Fish Culture** (2 cr). Alt/yrs 72-73. 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.

For **418 Fishery Management Techniques** (2 cr). Methods and techniques employed in fishery management. Prereq: 307 and ecology.

For **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: 321.

For **424 Silviculture** (3 cr). Silvicultural cutting systems, cultural operations, and the silvicultural characteristics of important commercial species. Two lec and one 3-hr lab per wk; one or two 1-day field trips. Prereq: 321.

For **425 Regional Silviculture** (2 cr). Forest regions of the U.S. and the practical methods for successful handling of the important forest types in each region. Prereq: 424.

For **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.

For **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.

For **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.

For **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. Prereq: organic chemistry.

For **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 procedures. Two lec and one lab per wk; two 1-day field trips. Prereq: 314.

For **448 Wildlife Ecology** (2 cr). Environmental relations of wildlife species and individuals in altered and in natural habitats. Prereq: 314.

For **449 Wildlife Ecology Laboratory** (1 cr). One 3-hr lab per wk; three days of field trips. Prereq or coreq: 448.

For **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.

For **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.

For **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.

For **462 Watershed Management** (3 cr). The hydrologic cycle as it is influenced by climate, vegetation, and land use; forest and range management practices placed in the context of water resource management at local and regional levels; management practices which influence quality, quantity and regimen of yield from non-agricultural lands. Lab occasionally substituted for lec. Two days of field trips. Prereq: general soils, sr standing in the college or perm.

For **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.

For **465 Biometerology** (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.

For **467 Forest Entomology** (3 cr). See Ent 467.

For **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.

For **475 Forest Finance** (2 cr). Financial aspects of management of American forests; appraisal of land, growing stock, stumpage, and damages; application of simple and compound interest, capitalization, and discount formulae in forest business.

For **476 Forest Regulation** (3 cr). Regulation of American forests for continuous timber production. One 2-day field trip. Prereq: 424, 474.

For **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.

For **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.

For **487 Forest Recreation** (3 cr). Objectives and problems in the integration of recreation into multiple-use land management. Three days of field trips.

For **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.

For **494 Models for Resource Decisions** (3 cr). Also offered as InfSc 494. Use of mathematical models of resource systems to explore managerial strategy; problem analysis; systems concepts and optimization of resource allocation. Prereq: sr standing in the college or perm.

For **495 Fish and Wildlife Seminar** (1 cr, max 2). Discussions integrating biological, social, political, economic, and philosophic aspects of fish and wildlife problems. Prereq: sr standing in the college.

For **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.

For **497 Land Management Seminar** (1 cr, max 2). Assigned studies in wildland management. Prereq: sr standing in the college.

For **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, GPA 2.5, and perm.

For **500 Master's Research and Thesis** (cr arr).

For **501** (s) **Seminar** (cr arr). Major philosophical, management, and research problems of wildlands; presentation of individual studies on assigned topics. Prereq: perm.

For **502** (s) **Directed Study** (cr arr). Normally offered in forestry, range, wildlife, fishery, wood, and watershed sciences. Prereq: perm.

For **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.

For **WS507 Statistical Ecology** (3 cr). Alt/yrs 73-74. WSU BioSc 530. Collection and interpretation of ecological data according to biometrical procedures.

For **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.

For **514 Fish Population Dynamics** (2 cr). Alt/yrs 72-73. 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.

For **521 Advanced Forest Soils** (3 cr). Also offered 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.

For **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.

For **525 Advanced Silviculture** (2 cr). Silvicultural systems and intermediate cuttings. Two days of field trips. Prereq: 424, 425.

For **527 Forest Genetics** (3 cr). Also offered as Genet 527. Appliation of principles of genetics to the improvement of trees and silvicultural practices. Two lec and one lab per wk. Prereq: 424 and general genetics.

For **528 Forest Tree Improvement** (3 cr). Also offered as Genet 528. Practical problems and techniques related to genetic improvement of forest trees. Two days of field trips. Prereq: 424 and general genetics.

For **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.

For **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.

For **541 Advanced Population Biology** (2 cr). Alt/yrs 72-73. Readings and discussions of current theories of population control, their biological basis, and application to wildlife populations. Prereq: 442, 544.

For **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.

For **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.

For **545 Game Range Ecology** (2 cr). Alt/yrs 73-74. Reading and discussion on autecology of forage plants important to game animals and synecology of game ranges. Prereq: 442, perm, background in plant and animal ecology.

For **546 Upland Game Ecology** (2 cr). Alt/yrs 72-73. Ecology and management of wildlife species using forest and rangeland habitats; current management problems and procedures. Three days of field trips. Prereq: perm.

For **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.

For **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.

For **553 Range Forage Productivity and Management** (3 cr). Alt/yrs 72-73. 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.

For **555 Range Literature** (3 cr). Alt/yrs 72-73. Survey and analysis of the literature in range management and closely related fields.

For **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 problems in forest pathology and their relations to forest practices. Prereq: 464.

For **566 Activities of Tree-Inhabiting Organisms** (2 cr). Alt/yrs 72-73. 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.

For **569 Advanced Forest Entomology** (3 cr). See Ent 569.

For **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.

For **575 Advanced Forest Management** (2 cr). Aspects of forest regulation; recent developments in applied forest management and important contributions in forest management.

For **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.

For **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.

For **589 Water Resources Seminar** (1 cr). See Inter 589.

For **600 Doctoral Research and Dissertation** (cr arr).

For **601** (s) **Seminar** (cr arr). Prereq: perm.

For **602** (s) **Directed Study** (cr arr). Prereq: perm.

For **603** (s) **Independent Study** (cr arr). Prereq: perm.

Genetics

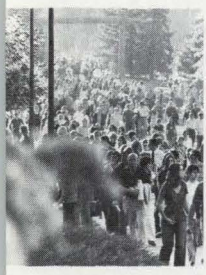
Doyle E. Anderegg, Coordinator (115 Life Sci. Bldg.). Professors Christian, Wang; Associate Professors Forbes, Slinkard, Tylutki; Assistant Professor Lingg.

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 For 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 558.

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 For 527.

Genet **528 Forest Tree Improvement** (3 cr). See For 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 **103 Physical Geography** (4 cr). Earth sciences; weather, climate, landforms, water resources, ocean and ocean basins, native plants and animals, and soils; data and map analysis. Three lec and one 2-hr lab per wk.

Geog **112 Economic Geography** (3 cr). 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 **251 Cartography** (3 cr). Visual presentation, map projections, lettering and sketching techniques, layout, compilation and design problems, three-dimensional models, map and photo interpretation. One lec and two 3-hr labs per wk.

Geog **252 Cultural Geography** (3 cr). 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 **254 World Regional Geography** (2 cr). Countries, regions, and peoples of the world; interrelationships between man and his physical and cultural environments.

Geog **299** (s) **Directed Study** (cr arr). Prereq: perm.

Geog **340 United States and Canada** (3 cr). Alt/yrs. Regional and systematic geography of the United States and Canada with emphasis on contemporary problems. Two 1-day field trips.

Geog **343 Idaho and the Pacific Northwest** (3 cr). Alt/yrs. Regional and systematic geography of the Pacific Northwest with emphasis on Idaho and on contemporary problems. One 2-day field trip.

Geog **400** (s) **Seminar** (cr arr). Prereq: perm.

Geog **401 Atmospheric Environment** (3 cr). Alt/yrs. 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: 103 or Geol 101-102, or perm.

Geog **416 Europe** (3 cr). Regional and systematic geography of Europe, exclusive of the Soviet Union, with emphasis on contemporary problems.

Geog **424 Intermediate Economic Geography** (3 cr). Alt/yrs. Theory and models for the location and interrelations among transportation, trade, manufacturing, agriculture, and other economic activities.

Geog **437 Decision-Making in Resource Management** (3 cr). 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 **444 Mexico and Middle America** (3 cr). Regional and systematic geography of Middle America and Mexico with emphasis on contemporary problems.

Geog **445 South America** (3 cr). Regional and

systematic geography of South America with emphasis on contemporary problems.

Geog **452 Advanced Cartography and Remote Sensing** (2 cr). 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 **455 Asia** (3 cr). Alt/yrs. Regional and systematic geography of Asia with emphasis on contemporary affairs.

Geog **470 Urban Geography** (3 cr). Alt/yrs. 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 **480 Political Geography** (3 cr). 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 **493-494 Seminar in Urban Studies** (2 cr). See Inter 493-494.

Geog **495 Proseminar** (1 cr, max 2). Prereq: sr standing.

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 **506 Location Theory** (3 cr). Alt/yrs. 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 **507 Field Geography** (3 cr). Alt/yrs. Acquisition in the field of data for geographic research through cartographic, photographic, and interview techniques; field problem.

Geog **521 Applied Climatology** (3 cr). Alt/yrs. Climatic classifications, microclimatic investigations, instrumentation; impact of climate on agriculture, vegetation, and economic activities.

Geog **532 Recreational Geography** (3 cr). Alt/yrs. Dynamics of recreational uses of land and water; measurement and planning; interaction of local and regional approaches; economic impact studies.

Geog **ID595 Geometrics** (3 cr). Alt/yrs. Quantitative techniques and their application to spatial and geologic problems. Two lec and one 2-hr lab per wk. Prereq: perm.

Geog **596 Applied Geometrics** (2 cr). Formulation of specific research project that culminates in a quantitative research document. One lec and one 2-hr lab per wk. Prereq: ID595 or perm.

Geology

George A. Williams, Dept. Head (211 Mines Bldg.). Professors Bond, Hall, Reid, Smiley, G. Williams, R. Williams; Associate Professors Jones, Powell, Savage, Siems; Assistant Professors Allman, 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. Concurrent enrollment in 107 recommended. One 1-day field trip.

Geol **107 Historical Geology Laboratory** (1 cr). Laboratory study relevant to 106. Coreq: 106.

Geol **111 Ancient Life** (4 cr). Life in the different geologic periods; evolutionary development of organisms; lab study of fossils. Three lec and one 2-hr lab per wk.

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 **202 Mineralogy and Petrology** (4 cr). Identification and composition, physical and chemical conditions controlling origin, occurrence and association of minerals and rocks. Two lec and two 2-hr labs per wk; two 1-day

and one 2-day field trips. Prereq:101, 102, and Chem 103 or 111.

Geol **299** (s) **Directed Study** (cr arr). Prereq: perm.

Geol **400** (s) **Seminar** (cr arr). Prereq: perm.

Geol **401 Geomorphology** (3 cr). 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 **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 **N409 Earth Science** (3 cr). Effects of geologic processes on earth's crust; rock and fossil record of earth's history, weather, climate, and the origin of land forms; relations of water resources, soils, oceans, and native plants and animals. Four lec and 3 hrs of lab per wk; two 1-day field trips.

Geol **412 Invertebrate Paleontology** (3 cr). 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, or 107, or perm.

Geol **413 Sedimentology** (2 cr). Environments and processes responsible for separation of clastic and non-clastic sedimentary rock materials; roles of transportation, deposition, including siltation, and lithification. One lec and one 3-hr lab per wk; one 1-day field trip. Prereq: 202.

Geol **414 Stratigraphy** (2 cr). Description, classification, distribution, and correlation of layered rocks; significance of stratigraphic analysis and geologic history. One lec and one 3-hr lab per wk; one 1-day field trip. Prereq: 413.

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 **421 Structural Geology** (1-3 cr). Deformed rocks; mechanics of failure, recognition, description, classification, and genesis of folded and fractured rocks. Two lec and one 3-hr lab per wk; one 2-day field trip. Prereq: 101, 102.

Geol **427 Earth Science** (4 cr). 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 103, or equiv.

Geol **431 Field Geology and Report Writing** (6 cr). 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: 421 or perm.

Geol **441 Engineering Geology** (3 cr). 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 **445 Geological Engineering Design** (3 cr). Application of engineering and geological principles to analysis and design in the construction industries. One 1-day field trip. Prereq: 441.

Geol **447 Ground Water** (2 cr). Ground water geology; intro to ground water hydrology. Two 1/2-day field trips. Prereq: 101, 102, or perm; coreq: 1 cr in 499.

Geol **453 Advanced Paleontology** (3 cr). Fossil assemblages of different ages and environments; sequence of floras and faunas through time. One 1-day field trip. Prereq: 106, 107, or 111, or perm.

Geol **458 Mineral Deposits** (4 cr). 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: 202, 421.

Geol **460 Exploration Geology** (3 cr). Design of geologic surveys and mineral exploration programs; integration and evaluation of geologic, geochemical, and geophysical exploration techniques. Prereq or coreq: 458.

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: 202, Chem 112.

Geol **497 Proseminar** (1 cr). Evolution of geologic thought; geology as a science and profession. Prereq: sr standing.

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 **512 Methods in Paleontology and Biostratigraphy** (3 cr). Alt/yrs 73-74. Methods of collection, preparation, illustration of paleontologic data; principles of systematic paleontology; statistical-graphic presentation of biostratographic 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 **545 Advanced Igneous Petrology** (3 cr). Alt/yrs 72-73. Classification and genesis of igneous rocks; emphasis on plutonic bodies. Two lec and one 2-hr lab per wk. Prereq: 563.

Geol **ID548 Paleoecology** (3 cr). 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 **551 Stratigraphic Paleobotany** (3 cr). Alt/yrs 72-73. 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 **553 Sedimentary Petrology and Petrography** (3 cr). Alt/yrs 72-73. 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 **560 Theory of Mineral Exploration** (3 cr). Alt/yrs 73-74. History and development of thought; statistical methods; application of geologic studies in search for mineral deposits.

Geol **561 Advanced Mineral Deposits I** (3 cr). Alt/yrs 72-73. Ore mineralogy and sulfide phase equilibria; microscopic studies of natural and synthetic sulfide minerals.

Geol **562 Advanced Mineral Deposits II** (3 cr). Alt/yrs 72-73. Modern concepts on the origin and geochemistry of metallic mineral deposits.

Geol **563 Optical Mineralogy and Petrography** (3 cr). Optical crystallography; identification of minerals by optical means; classification of rocks. Three 2-hr lec-labs per wk; one 3-day field trip. Prereq: 202.

Geol **564 Volcanic Geology** (3 cr). 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: 563.

Geol **ID565 Metamorphism** (3 cr). Alt/yrs 73-74. Metamorphic minerals, rocks, processes, and facies; poly-metamorphic rocks; recent developments in structural geometry. Two lec and one 3-hr lab per wk. Prereq: 563.

Geol **570 Tectonics** (3 cr). Alt/yrs 72-73. Form, pattern, and evolution of large-scale units of the earth's crust.

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 **580 Advanced Geochemical Exploration** (3 cr). 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 **581 Instrumental Techniques in Geochemistry** (3 cr). 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 **585 Electron Microprobe** (3 cr). 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: 563 or 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. Three 2-hr labs per wk. Prereq: 401, 420, or perm.

Geol **592 Advanced Photogeology** (3 cr). 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. Three 2-hr labs per wk. Prereq: ID590 or 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.). Associate Professor Kjos; Assistant Professors Bergstrom, T. Hipple (Chairman); Cooperating Faculty: Bain (Assistant Registrar), Hill (Dean of Women), J. Hipple (Counselor), Kees (Director, Counseling Center), Morris (Counselor), Prescott (Counselor).

Guid **200** (s) **Seminar** (cr arr). Prereq: perm.

Guid **299** (s) **Directed Study** (cr arr). Prereq: perm.

Guid **322 Vocational Guidance** (3 cr) (Psych 322). Also offered 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) (Ed 401). Professional issues. Prereq: perm.

Guid **420 Principles and Practices in Guidance** (3 cr) (Psych 420). 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) (Psych 460). 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) (Ed 503). Professional issues. Prereq: perm.

Guid **520 Group Standardized Tests** (3 cr) (Psych 520). 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) (Psych 523). 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). (Psych 525). Development of basic counseling techniques; case studies, role playing, and tape and video recordings.

Guid **527 Psychometric Assessments** (3 cr) (Psych 527). Developmental assessment procedures used by counselors in various settings. Prereq: 520, 525.

Guid **529 Practicum in Counseling** (3 cr) (Psych 529). Development of skill in individual counseling. Prereq: 525 and perm.

Guid **560 Theories of Vocational Choice** (3 cr) (Psych 560). Psychological, sociological, and economic foundation of vocational choice and adjustment. Prereq: 460 and perm.

Guid **561 Organization and Administration of Guidance Services** (3 cr) (Psych 561). 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) (Psych 564). Principles and techniques of counseling groups; didactic and lab learning experience. Prereq: 529 or perm.

Guid **565 Theories of Counseling** (3 cr) (Psych 565). Consideration and evaluation of contemporary theories. Prereq: 525 and perm.

Guid **567 Advanced Practicum** (3 cr) (Psych 567). Individual and group counseling procedures; field experience in a variety of settings; minimum of thirty hours of supervised counseling experience. Prereq: 529, 564, and perm.

Guid **570** (s) **Internship** (2-9 cr, max 12) (Psych 570). 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, Harris, Proctor; Assistant Professors Baldridge, Hackmann.

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 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). 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). Revolutionary decade, 1789-1799; Napoleon and Europe; Restoration in France; July Monarchy and Second Republic.

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 central 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: Renaissance and 18th century Enlightenment. Hist 466: cultural and intellectual trends in the 19th and 20th centuries.

Hist **467-468 History of Russia** (3 cr). Hist 467: Imperial Russia from Peter the Great through the Revolution of 1905. Hist 468: Russia in WW I; Revolution of 1917; Soviet regime.

Hist **469 Modern France** (3 cr). French nation from the beginning of the Second Empire to the present.

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 **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 **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; philosophy of history; bibliography. Hist 591: American historians. Hist 592: European and British historians.

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, Acting Dept. Head (108A Mary Hall Niccolls Home Ec. Bldg.). Professors Aller, Bellinger; Associate Professor Newcomb; Assistant Professors Forbes, Kessel, Kiehn, Medsker, Myers, Old, Potter; Instructors Jonas, Miller.

HEc **109 Introduction to Home Economics** (0 cr). Orientation to home economics as a career; the founders, professional contributors, and literature.

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 **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, overnutrition, food fads, food additives, and nutrition for athletes.

HEc **271 Foods** (2 cr). Basic cookery and meal planning. One 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 prm. (2 cr). Open to non-majors by perm. Analysis of resources 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 Eco-**

nomics (3 cr). Techniques and materials for secondary schools; lesson plan development for homemaking classes. Field trip included. Prereq: developmental or educational 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 **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 development 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 72-73. 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 72-73. 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, socioeconomic 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 72-73. 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 Food Chemistry and Analysis** (3 cr). See AgBiC 422. (Lab sec A for home economics majors.)

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, overnutrition, 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 **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 **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 **557 Internship** (6-9 cr, max 9). Supervised internship in educational institutions, government and social agencies, hospitals, or industry; geared to the educational and vocational goals of students.

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.

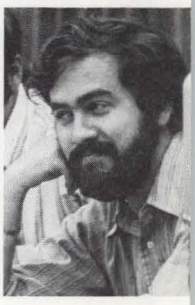
HEc **601** (s) **Seminar** (cr arr). Prereq: perm.

HEc **602** (s) **Directed Study** (cr arr). Prereq: perm.

HEc **603** (s) **Independent Study** (cr arr). Prereq: perm.

HEc **604 Interstate 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 Professors Allman, 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 447, 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 447 or perm.

Hydro **567 Hydrometerology** (3 cr). Exchange of water between the atmosphere and the lithosphere or hydrosphere; factors influencing areal and temporal distribution, evapotranspiration, 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: Geol 563 or perm.

Hydro **569 Application of Hydrogeological Concepts** (3 cr). Application of hydraulic and chemical characteristics of well and aquifer systems to practical field problems.

Industrial Education

William R. Biggam, Chairman (Room C,

Industrial Ed. Bldg.). Professor Biggam; Assistant Professors Amos (Metals), R. Smith (Electronics, Plastics).

IEd **130 Basic Electricity** (4 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 **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 **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 **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 Business Office. One lec-dem and one 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 72-73. Framing, rafter layout, materials, and job estimating. Prereq: 170 or perm.

IEd **290 Industrial Arts Crafts** (2 cr). Alt/yrs 72-73. 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 72-73. 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 Business 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 **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 Business Office. One lec and one 3-hr lab per wk. Prereq: perm.

IEd **365 Industrial Supervision** (2 cr). Alt/yrs 72-73. 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 **401** (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 Teachers**

(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 72-73. 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). Alt/yrs 73-74. Also offered 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 **450 Industrial Safety** (3 cr). Also offered 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). Also offered 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). Also offered as VocEd 462. Principles of occupational analysis and course construction; subject content; state curriculum patterns; special education programs; trends and new concepts.

IEd **472 Industrial Education Methods** (3 cr). Also offered 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 **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.

Information Science

Dale O. Everson, Coordinator (10 Ag. Sci. Bldg.). Professors Crowley, Edwards, Everson, E. Kelly, Montgomery, Rathbone; Associate Professors Crandall, Haber, Lynch, Rigas, Sheldon, Sun, Turner; Assistant Professors Aulerich, Maki, Nelson, Olson, Potratz, W. Thompson, Wang; Instructor Shaw.

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 **305 Digital Computers** (3 cr). See Math 305.

InfSc **333 Electronic Computers in Business and Economics** (3 cr). See Bus 333.

InfSc **370 Numerical Analysis** (3 cr). See Math 370.

InfSc **402 Applied Numerical Methods** (3 cr). See ES 402.

InfSc **439 Systems Analysis and Simulation** (3 cr). See Bus 439.

InfSc **440 Digital Systems Engineering** (3 cr). See EE 440.

InfSc **450 The Computer and Information Science** (3 cr). See Bus 450.

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 **543 Computer Programming Systems and Information Structures** (3 cr). See EE 543.

InfSc **546 Simulation Techniques** (3 cr). See EE 546.

InfSc **554-555 Information Theory I-II** (3 cr). See EE 554-555.

APPLIED STATISTICS

InfSc **231 Statistics** (4 cr). See Bus 231.

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 **334 Statistics for Business Decisions** (3 cr). See Bus 334.

InfSc **401 Engineering Statistics** (3 cr). See EE 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 **432 Quantitative Methods in Business and Economics** (3 cr). See Bus 432.

InfSc **438 Advanced Statistics** (3 cr). See Bus 438.

InfSc **451-452 Probability Theory and Mathematical Statistics** (3 cr). See Math 451-452.

InfSc **494 Models for Resource Decisions** (3 cr). See For 494.

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). Also offered 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 **399** (s) **Independent Study** (cr arr). See 299.

Inter **400** (s) **Seminar** (cr arr). See 200.

Inter **490 Technology and Human Values** (2-3 cr). Also offered as Engr 490 and 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). Also offered 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, sociocultural and psychological factors, neighbor-

hoods, 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). Also offered 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). Also offered as AgE, For, 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 division.

Journalism

Bert C. Cross, Dept. Chairman (104 Journ. Bldg.). Associate Professor Cross; Assistant Professors Stanton, Van Leuven; Instructor Harrison.

ADVANCED PLACEMENT: Courses in this subject field which are vertical in content are: 221-222.

Jour **200** (s) **Seminar** (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 Industrial Journalism** (3 cr). Writing, editing, layout, and other operations of the business press; layout and publication of periodicals and brochures. Two lec and one lab per wk.

Jour **400** (s) **Seminar** (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** (1-5 cr, max 9). 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, Davis, Harrington.

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 Jurisdiction** (3 cr).

Law **610 Government Regulation of Business** (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 Security** (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 **640 Family Law and Community Property** (3 cr).

Law **641 Wills, Estates and Trusts** (3 cr).

Law **642 Natural Resources** (3 cr).

Law **643 Seminar, Selected Problems in Natural Resources** (2 cr).

Law **644 Seminar, Land Use Planning** (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).

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, Cobb, Dierker, Walker; Assistant Professors Barbut, Christenson, Goetschel, Neuhaus, Potratz, Royalty, Voxman, Wang. 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 hrs 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, differentiation, integration, applications, differentiation and integration of transcendental functions. 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). Also offered as InfSc 205. Characteristics of digital computers from programmer's viewpoint; programming principles; introduction to programming in Fortran and PL/1.

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 Digital Computers** (3 cr). Also offered as InfSc 305. Advanced programming techniques, data management and retrieval, and operating systems. 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). Also offered as InfSc 320. Samples 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). Also offered 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 **N408 Directed Reading** (1-6 cr, max 6). Max 3 cr may be completed in absentia.

Math **N409 Topology** (3 cr). Construction of topologies, closure, dense sets, compactness, and connectedness.

Math **411 Elementary Topology** (3 cr). Alt/yrs 72-73. 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). Also offered 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, and 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). Partial differential equations and boundary value problems, Green's functions, perturbation techniques, and calculus of variations. Prereq: 481.

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, axion of choice, partially ordered sets, and Zorn's lemma. Prereq: 200.

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 72-73. 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 72-73. 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 72-73. 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 72-73. Linear functionals on the space of continuous functions, linear transformations, Hilbert and Banach spaces, and spectral theory. 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; iterative 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 **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, Place, Silha; Assistant Professors Avery, Jacobsen, Penton, Scofield; Instructor Ayers.

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: Phys 221.

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 **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 3-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** (3 cr). Advanced applications of concepts and theory associated with dislocation theory; strengthening and softening mechanisms in ferrous materials; non-metallic materials; component failures as applied to mechanical engineering systems. Prereq: 261.

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 3-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 **422 Statistical Thermodynamics** (3 cr). 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; introduction to kinetic theory of a perfect gas. Prereq: ES 321.

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 independent 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 **432 Energy Conversion Systems** (3 cr). Principles of energy conversion and irreversible thermodynamics; internal combustion engines, nuclear and fossil fuel power production systems; design theory and analysis of thermo-electric, thermoionic, photovoltaic, and magnetohydrodynamic conversion systems; fuel cells; selected other modes of direct energy conversion. 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 3-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 3-hr lab per wk. Prereq: ES 320, 321.

ME **451 Aerospace Propulsion** (3 cr). Thermodynamic, fluid flow, heat transfer, and aerodynamic problems in jet propulsion systems. Prereq: ES 321.

ME **467 Fuels and Lubricants** (2 cr). Correlation between properties of fuels and lubricants and their performance in an engine or machine, and the significance of the standard tests conducted on these materials. One lec and one 3-hr lab per wk. Prereq: perm.

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 3-hr lab per wk. Prereq: ES 221, 340, 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 3-hr lab per wk. Prereq: ES 340.

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 **505 Dynamics** (3 cr). Kinematical analysis, dynamic specification of a solid body, basic principles of dynamics; dynamics of rectangular, angular, and plane motion; dynamics in three dimensions; beams. Prereq: ES C220, 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 **510 Hydrodynamics** (3 cr). Incompressible flow treated from idealized or inviscid viewpoint; use of complex functions to solve fluid fields. Prereq: ES 320-321 or perm.

ME **512 Gas Dynamics** (3 cr). Basic concepts of compressible flow; principles of unidimensional flow, shock wave phenomena, and flow in variable and constant area ducts. Prereq: 322, ES 320.

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 **527 Advanced Fluid Mechanics** (3 cr). Fundamentals and applications of fluid flow, irrotational inviscid flow, two-dimensional subsonic, transonic, and supersonic flow; unsteady flow, show waves, and compressible boundary layers; advanced topics. Prereq: ES 320 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 **563 Theory of Lubrication** (3 cr). Properties and laws of lubricants; contact modes and friction; characteristics and design of journal, thrust, and gas-lubricated bearings; lubrication practice. Prereq: 425, ES 320 or perm.

Metallurgy

J. R. Hoskins, Head, Dept. of Mining Engineering and Metallury (217 Mines Bldg.). Professors Clifton, Newton; Assistant 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 **200** (s) **Seminar** (cr arr). Prereq: perm.

Met **201 Elements of Materials Science** (2 cr). Principles relating properties and behavior of metals, ceramics, polymers, and composites to their structures and environments. Prereq: Chem 103 or 111 or 114.

Met **203 Metallography** (1 cr). Lab preparation of metal specimens for microscopic examination; hardness testing. One 3-hr lab per wk. Prereq: 201.

Met **305 Elements of Crystallography** (2 cr). Includes an intro to crystal chemistry and physics. Prereq: Chem 103 or 111 or 114, Phys 221.

Met **308 Introduction to Metallurgical Thermodynamics** (2 cr). Aspects of thermodynamics most used in metallurgy; applications to problems. Prereq: Chem 305, ES 321.

Met **400** (s) **Seminar** (cr arr). 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** (2 cr). Alt/yrs 72-73. Mechanical forming and testing of metals. One 1-day field trip. Prereq: 203, ES 340.

Met **413 Physical Metallurgy** (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: 203, 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 **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 **431 Proseminar** (1 cr, max 2). Review of current literature. One 3-day field trip. Prereq: sr standing or perm.

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 72-73. 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 72-73. 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 72-73. 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 72-73. 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 **R535 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.

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

Paul M. Fletcher, Dept. Head (101 Memorial Gym.). Professor Fletcher; Assistant Profes-

sors Jinks, Mirus, Muth, Nuccitelli, Ratchye, Reilly.

MS **101-102 Fundamentals of Military Leadership and Management** (1 cr). Orientation to ROTC, 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 ROTC 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 Metallury (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 72-73. 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 environment 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 **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).

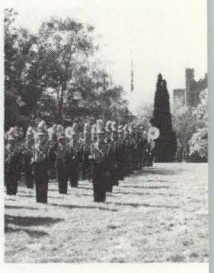
Min **501** (s) **Seminar** (cr arr). Prereq: perm.

Min **502** (s) **Directed Study** (cr arr). Prereq: perm.

Min **503 Mine Stress Analysis** (3 cr). Alt/yrs 72-73. 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 72-73. 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 72-73. 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 72-73. 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 72-73. 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 72-73. Underground exploration for mining engineers; application of geologi-

cal, 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 72-73. 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 72-73. 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.

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 (4 Faculty Office Bldg.). Associate Professor Burcaw (Director, University Museum).

Museo **200** (s) **Seminar** (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 **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 Bilyeu, R. Hahn, Jones, Probasco, Skinner, Spevacek; Instructors Barnes, DuPree, 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 **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-division standing in individual 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 **401** (s) **Individual Instruction** (1-3 cr, max arr). Primarily for graduate students not concentrating in performance studies. See MusA 101 for description and areas. Prereq: perm of dept.

MusA **464** (s) **Workshop** (cr arr). Prereq: perm.

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). 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 **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. Prereq: perm of dept.

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** (3 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 **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 analysis 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 **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 **464** (s) **Workshop** (cr arr). Prereq: 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 **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.

MUSIC 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. Two lec per wk. Prereq: perm of dept; coreq: MusC 142.

MusH **200** (s) **Seminar** (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). Primarily for minors and students majoring in fields other than music. 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 **343-344 History of Music IV-V** (2 cr). Primarily for and may be limited to majors. History and aesthetics of the late 19th and 20th centuries. Three lec per wk. Prereq: MusH 243-244.

MusH **400** (s) **Seminar** (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 **464** (s) **Workshop** (cr arr). 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 **513-514 Seminar in Music History** (1-4 cr, max 8). Prereq: perm.

MUSIC TEACHING

MusT **200** (s) **Seminar** (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 I** (2 cr). Curriculum, organization, and instructional materials for teaching general classroom music. Prereq: MusC 120 or demonstration of basic music skills.

MusT **382 Elementary School Music Methods II** (1 cr). Methods and techniques for teaching general classroom music. One lec and one lab per wk. Prereq: MusT 381.

MusT **383 Music in the Secondary Schools** (3 cr). Principles, practices, curriculum, and organization of the secondary 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 **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 **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 **464** (s) **Workshop** (cr arr). Prereq: perm.

MusT **466 Marching Band Techniques** (1 cr). Techniques of drilling; materials for field and street maneuvers; 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 **470 School Orchestra Problems** (2 cr). Emphasis on assisting school band directors establish orchestra programs.

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 **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.

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 **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 **464** (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 **511 Introduction to Musical Scholarship** (2 cr). Orientation to graduate study; bibliography and research procedures.

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).

Naval Science

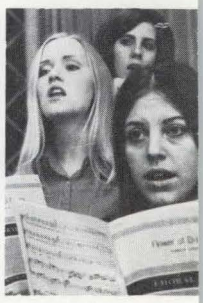
Jack R. Voorhees, Dept. Head (Navy Bldg.). Professor Voorhees; Associate Professor Elliott; Assistant Professors Birchmier, Dowling, Haskell, Wetherell, Yanaros.

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 302: theory, principles, procedures of terrestrial and celestrial 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 sutuations 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 72-73. 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, Furgason, Rathbone, Stewart; Associate Professor Dixon; Assistant Professor Avery.

RELATED FIELDS: For other courses offered in the nuclear field, see Chem 416, Chem 513, Phys 465, and Phys WS565.

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 **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 **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 566 or perm.

Office Administration

Robert M. Kessel, Dept. Chairman (230 Admin. Bldg.). Professor Kessel; Assistant 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 **271-272 Shorthand III-IV** (3 cr). OAd 271: speed development. OAd 272: transcription skill to occupational competency levels. Prereq: perm.

OAd **299** (s) **Directed Study** (cr arr). Prereq: perm.

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 **499** (s) **Directed Study** (cr arr). Prereq: perm.

Philosophy

Francis Seaman, Chairman (305-C Admin. Bldg.). Professor Seaman; Assistant Professors Holmes, Roberts.

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 **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 Contemporary Philosophy** (3 cr). Movements of the 20th century.

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 **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.

Photography

Peter A. Haggart, Acting Head, Dept. of Radio/Television (5 Radio-TV Center). Associate Professor Bell (Chairman).

Photo **281-282 Introduction to Photography** (3 cr). Techniques, development, and present-day uses of photography.

Photo **285 Photography Workshop** (2 cr). Better use of the camera, composition, and photographic processing.

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 (Intramurals), Peterson, Porter (Research), Young; Assistant Professors Hall, Lathen, MacFarlane, Marten (Health Education), Thompson (Service Program), Walker (Dance), Wolf; Instructors Gorton, Parker.

ACTIVITY COURSES

Note: PE 105, 106, 107, 108, and 135 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. 2 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. 2 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. 2 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. 2 hrs per wk. Graded on the basis of P or F.

PE **135 Restricted Physical Education** (1 cr, max arr). Replaces 105-108 when the university physician certifies that the student needs specific activities. 2 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 2 labs per wk.

PE **112 Dance Techniques** (1 cr). Modern dance, composition, and rhythmic analysis. 2 hrs per wk.

PE **113 Problems in Dance Composition** (1 cr, max 4). Various styles, choreography, movement quality, music, costuming, and staging. 2 hrs per wk. Prereq: 105 or perm.

PE **115 Team Sports Backgrounds** (2 cr). Field sports, softball, volleyball, and basketball. 4 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. 4 hrs per wk.

PE **126 Weight Training and Conditioning** (1 cr). 2 lec-labs per wk.

PE **138 Swimming** (1 cr). Advanced swimming and diving. 2 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). 2 lec-labs per wk.

PE **142 Tumbling, Pyramids, and Stunts** (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 (gymnastic, swimming, track and field).

PE **228 Square and Social Dance** (1 cr). Social, round, and square dance. 2 hrs per wk.

PE **237 Archery and Bowling** (1 cr). 2 hrs per wk. Prereq: perm.

PE **240 Tennis and Badminton** (1 cr). 2 hrs per wk. Prereq: perm.

PE **243 Highly Organized Games** (2 cr). Techniques and skills of games of high organization and lead up activities. One lec and 2 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 **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 2 hrs lab per wk.

PE **252 Elementary School Physical Education** (2 cr). Organization and teaching methods. 3 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 **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. 3 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 3 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 72-73. Intro to methods of notating movement; history of notation; fundamentals of labanotation; drafting a score; reconstruction of movement score notated in labanotation; teaching methods. 2 hrs lab per wk.

PE **321 Theory and Techniques of Teaching Dance** (2 cr). Teaching modern dance, dance composition, and folk dance. 3 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 72-73. Organization and production of dance concerts; publicity; set design; costumes; lighting; make-up; accompaniment; house and stage management. One lec and 2 hrs lab per wk.

PE **326 Drill Team** (1 cr). Techniques, organization, and training of drill team.

PE **329 Leadership in Recreation** (2 cr). Organization, planning, and conduct of school and community, social, recreation, and extracurricular 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 **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** (1-3 cr, max 3). 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 **544 Program Development** (3 cr). Physiological, sociological, and psychological growth characteristics of the student; principles, problems, and procedures.

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.

Physics

Michael E. Browne, Dept. Chairman (13 Phys. Sci. Bldg.). Professors Browne, Johnston, Nakamura, 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: 322, 360.

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 222, Math 200.

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 areas of magnetism, electricity, and light. Six hrs lec and four hrs lab per wk.

Phys **411-412 Physical Instrumentation I-II** (3 cr; 2 cr). Methods and instruments used in experimental physics; electronic techniques; design problems in electronic measurement of physical quantities encountered in research. Two lec (one lec second semester) 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. Prereq or coreq: 321 or perm.

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. Prereq: 322 or perm.

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). Also offered 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 equations, 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 **600 Doctoral Research and Dissertation** (cr arr).

Phys **601** (s) **Seminar** (cr arr). Prereq: perm.

Phys **602** (s) **Directed Study** (cr arr). Prereq: perm.

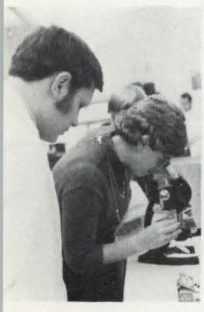
Phys **603** (s) **Independent Study** (cr arr). Prereq: perm.

Physiology

Professors Christian, L. W. Roberts, Wiese; Associate Professors J. Bailey, S. Beck, Ferguson, G. Porter, H. W. Smith; Assistant Professors Boe, Bull, Mead, Meyer, O'Keeffe, Rees, Ridley, Sasser.

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 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

Bot **311 Plant Physiology** (3 cr).

Bot **413 Mineral Nutrition** (3 cr).

Bot **512 Plant Growth Substances** (3 cr).

AgBiC **461 Plant Biochemistry** (3 cr).

AgBiC **462 Plant Biochemistry Laboratory** (1 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, Dept. Head (28 Ag. Sci. Bldg.). Professors Calpouzos, Erickson, Fenwick, Finley, Guthrie, Helton, Seely, Watson; Associate Professors Slinkard; Assistant Professors Boe, Murray, Ridley.

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 **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 **202 Plant Propagation** (3 cr). Propagation of plants of economic importance; physiology of sexual and asexual reproduction. Two lec and one 2-hr lab per wk. Prereq: Biol 203 or perm.

PlSc **303 Plant Pathology** (4 cr). Plant diseases due to bacteria, fungi, viruses, and nematodes; causes, symptoms, effects, dissemination, and control. Two lec and two 2-hr labs per wk. Prereq: Biol 203.

PlSc **305 Biology of Field Crops** (3 cr). Alt/yrs 72-73. Classification, identification, and adaptation of field crops; factors influencing yield, composition, quality, and utilization. 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 **312 Agriclimatology** (3 cr). Relationship of organisms to their environment; significance of environment to agricultural production. Prereq: Biol 203 or perm.

PlSc **314 General Genetics** (3 cr). Also offered as Biol 351 and Genet 314. See Biol 351 for description.

PlSc **317 Woody Plant Materials** (2 cr). Ornamental woody plants for landscape use. Two 2-hr labs per wk; one 1-day field trip.

PlSc **338 Weed Control** (3 cr). Biological, chemical, and cultural control of weeds. Two lec and one 2-hr lab per wk.

PlSc **400** (s) **Seminar** (cr arr). 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 4). Prereq: perm.

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. Also offered 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 72-73. 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 **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). Also offered 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 72-73. Also offered 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 538.

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

Robert E. Hosack, Dept. Chairman (207 Ad. 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). The 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). Systems of parliamentary democracy; responsible ministry, executive-legislative dynamics, recent political development. Also offered by correspondence study.

PolSc **286 Authoritarian Political Systems** (3 cr). Autocratic systems such as the USSR and Communist China, origins, role of party, functions of government, and status of the individual.

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 Propaganda** (3 cr). Survey of political behavior as revealed by attitude and opinion research and as an analysis of the techniques and functions of political propaganda.

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, roll-call 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 **483-484 Developing States** (3 cr). Comparative analysis of political institutions and processes in selected countries in the developing areas of the world.

PolSc **485 African Political Systems** (3 cr). 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 **528 Seminar in the Theory of Democracy** (3 cr). Intensive analysis of the liberal-democratic theoretical model, critical examination of relevant political literature.

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 **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 **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. Chairman (210 Educ. Bldg.). Professors Crandall, Montgomery; Associate Professor Ching; Assistant Professors Bergquist, Emery, Gilligan, 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 Psych** (3 cr). Psych 205: conception to preadolescence; genetics, anatomy, physiology, biological changes during development, learning, socialization, cognition, and personality. Psych 206: adolescence to maturity; psycho-social 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). Also offered 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). Also offered 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 Psychology 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.

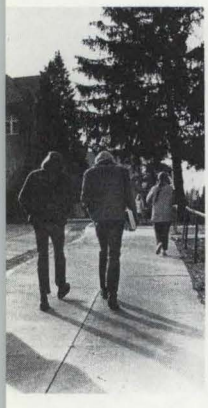
Psych **508 Theory and Research in Motivation** (3 cr). Critical analysis of classical and contemporary literature.

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 **570** (s) **Internship** (2-9 cr, max 12). Prereq: perm of dept.

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, 540, 551, and perm of dept.

Psych **600 Doctoral Research and Dissertation** (cr arr).

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, Chairman and Acting Head (5 Radio-TV Center). Professor Law; Associate Professor Haggert; Assistant Professor Byrd; Instructors Ayer, Bondurant.

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 **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, terminology, 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 **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 (Campus Christian Center). 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; Associate Professor Sprague.

SocSc **101 Man in a Nuclear Age** (2 cr). See Inter 101.

SocSc **103 Introduction to Black Culture** (2 cr). Black contributions, particularly to American society; emphasis on the concept of iden-

tity 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 **299** (s) **Directed Sudy** (cr arr). Prereq: perm of coord.

SocSc **385 Study Tour Abroad** (1-9 cr, max 9). See 185 for basic description. Prereq: jr standing or perm.

SocSc **400** (s) **Seminar** (cr arr). Prereq: perm of coord.

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.

Sociology

Roderick Sprague, Head, Dept. of Sociology/Anthropology (4 Faculty Office Bldg.). Associate Professor Chapin (*Social Work*); Assistant Professors Carlson, Johnson, Wenner.

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 **130 Social Problems** (3 cr). Concepts relating technological and institutional changes to current social problems. Also offered by correspondence study.

Soc **200** (s) **Seminar** (cr arr). Prereq: perm.

Soc **220 Marriage** (3 cr). Preparation for marriage, mate selection, courtship, sexual, economic, and personal marital adjustment, marital problems, child birth, and child rearing.

Soc **240 Introduction to Social Welfare** (3 cr). Analysis of the forces which led to the development of current social welfare fields. Prereq: 110 or 130.

Soc **241 Organization of Social Services** (3 cr). Contemporary public social welfare policy and programs.

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.

Sec **320 The Family** (3 cr). Historical and economic background; the family today from a cross-cultural perspective; conditions affecting the family 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 **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 **420 Social Stratification** (3 cr). Comparative study of differential status patterns, including origins, forms, functions, and trends.

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** (3 cr). Social, psychological, and biological problems relating to the role of older people. Twenty hrs of field work.

Soc **440 Methods of Social Work** (3 cr). Methods, principles, values, occupational roles in social work practice and interviewing. Prereq: 240.

Soc **441-442 Field Experience** (3-4 cr, max 8). Seminar, supervised study, observation, and experience in selected social agencies. One day weekly or 6-wk block placements. Prereq or coreq: 440.

Soc **493-494 Seminar in Urban Studies** (2 cr). See Inter 493-494.

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.

Soils

Alvin C. Wiese, Head, Dept. of Agricultural Biochemistry and Soils (112 Ag. Sci. Bldg.). Professor Lewis; Associate Professors Fosberg, Gardner, 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 72-73. 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 For 408.

Soils **412 Soil Chemistry** (4 cr). Alt/yrs 72-73. 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 72-73. Structure, chemical, and physical properties of clay minerals found in soils. Prereq: Chem 112 or 114.

Soils **425 Soil 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 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 AgBiC 505.

Soils **507 Advanced Forest Soils** (3 cr). See For 521.

Soils **ID511 Soil Organic Matter** (2 cr). Alt/yrs 72-73. 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 72-73. 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 **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 **401** (s) **Workshop** (cr arr). Prereq: perm of dept.

SpEd **450 Children with Behavioral Disorders** (3 cr). Contrasting normal and deviant personality development; classical and contemporary 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 **504** (s) **Practicum** (cr arr). Prereq: perm.

SpEd **505** (s) **Internship** (3-9 cr, max 9). Supervised field experience in an appropriate public or private agency. Graded on the basis of P or F.

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 **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

Edmund M. Chavez, Head, Dept. of Drama/Speech (U-Hut 104). Professor Whitehead (*Chairman, Speech*). 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 meanings of literature.

Sp **200** (s) **Seminar** (cr arr). Prereq: perm.

Sp **209 Argumentation** (3 cr). Analysis, reasoning, types of evidence, organization, and refutation in debate.

Sp **232 Informative Speech** (3 cr). Practice in preparation and delivery of speeches to inform, persuade, entertain, and various types of speeches; emphasis on speech to inform. 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 **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 **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). Alt/yrs. Selected American speakers from the colonial period to the present; theories of rhetorical criticism.

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.

Veterinary Science

Floyd W. Frank, Dept. Head (101 Vet. Sci. Bldg.). Professors Ardrey, Frank; Associate Professor Bailey; Assistant Professor Stauber.

VS **200** (s) **Seminar** (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 **452 Diseases and Care of Laboratory Animals** (4 cr). Vertebrate animal species commonly employed as laboratory animals; diseases, sanitation, environmental control, and general care. Three lec and one 2-hr lab per wk.

VS **462 Meat Inspection and Veterinary Hygiene** (3 cr). 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 **473 Non-infectious Diseases** (4 cr). Of domestic and game animals. Three lec and one 2-hr lab per wk.

VS **474 Animal Diseases—Infectious** (4 cr). Causes, transmission, susceptibility, symptoms, diagnosis, prevention, and control of major infectious disease and parasites of domestic animals. Three lec and one 2-hr lab per wk. Prereq: 371, Bact 250.

VS **498 Internship: Veterinary Medical Technology** (cr arr, max 33). Diagnostic and research methods used in veterinary laboratories; work to be pursued in designated and approved laboratories. Twelve months of training. Enrollment may be limited by the dept. Prereq: perm of dept.

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 **512 Principles of Comparative Pathology** (4 cr). Alt/yrs 72-73. 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 **514 Advanced Study of Animal Diseases** (1-3 cr, max 6). Alt/yrs 73-74. Intensive study (lecture and laboratory) of a single or related group of animal diseases.

VS **516 Methods of Animal Experimentation** (4 cr). 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.

Vocational Teacher Education

Robert E. Sprecher, Dept. Chairman (207-C Educ. Bldg.). Professors Kessel ***(Business Education),*** **Kindschy** ***(Agricultural Education);*** **Associate Professors Cvancara** ***(Agricultural Education),*** **Kjos** ***(Counselor Education);*** **Assistant Professors Hipple** ***(Counselor Education);*** **Kiehn** ***(Home Economics Education),*** **Sprecher** ***(Trade-Technical Education).***

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 of 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 **401** (s) **Workshop** (cr arr). 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 **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 Organization of Vocational Education** (2 cr). Federal, state, and local organization of the support and conduct of vocational programs.

VocEd **518 Practicum** (3-6 cr, max 6). Application of theories and techniques; supervised field experiences in selected settings. Graded on the basis of P or F.

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 **590** (s) **Internship** (1-8 cr, max 8). Supervised experience in teacher education, administration, supervision, or ancillary services in vocational education. Graded on the basis of P or F. Prereq: perm of dept.

Zoology

Doyle E. Anderegg, Head, Dept. of Biological Sciences (115 Life Sci. Bldg.). Professor Schell; Associate Professors Ferguson, Forbes, Larrison; Assistant Professors Mead, Rabe, Wallace.

Zool **119 Human Anatomy and Physiology** (5 cr). Three lec and two 2-hr rec-labs per wk.

Zool **315 Cell Physiology** (4 cr). Fundamental activities of cells. Three lec and one 3-hr lab per wk. Prereq: organic chemistry, Biol 202.

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 **366 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) (412). 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 **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 For 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) (584). Introduction to the natural behavior of wild animals, emphasizing the descriptive aspect. Two lec per wk; three 1-day field trips. Prereq: upper-div natural history course.

Zool **481 Ichthyology** (3 cr). Also offered as For 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 protozoa. 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 **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: 315 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). 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.

Cooperative Extension Service

James E. Kraus, Director (111 Ag. Sc. Bldg.); James L. Graves, Associate Director.

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

James E. Kraus, Director (111 Ag. Sc. Bldg.); Ronald D. Ensign, Associate Director.

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 (125 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 Forestry 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 COLLEGE FACULTY 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 station staff conducts research on a wide variety of problems in the areas of forest management, wood technology, range management, wildlife, and fisheries. Typical projects include studies of the effects of disease and insects on Douglas-fir, ponderosa pine, and other valuable tree species, as well as problems of survival in seeded and planted stands. Improvement of ponderosa pine through breeding and selection is another major project in forest management. Investigation of the quality of inland Douglas-fir and the influence of its physical properties on wood strength are under way. Methods for maximizing the production of reseeded ranges are being studied, along with ecological investigations of native sagebrush-grass and mountain shrub rangelands, and studies of undesirable range plants. Wildlife projects include studies of the habits and productivity of elk and white-tailed deer, the ecology of predators such as the cougar and bobcat, and studies of rare or endangered species including the sandhill crane and golden eagle. Fisheries research includes evaluation of methods for increasing stocks of native cutthroat, and the ecology of young chinook salmon and steelhead. The effects of water quality in the Snake River on steelhead migration and the evaluation of toxins for controlling undesirable fish species are also being investigated.

Funds for the station are provided by the university, by several state departments, and by grants from federal and other outside sources. Currently about fifty-four 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; R. D. Gordon, Assistant Resource Biologist.

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 imple-

mentation 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

Board of Directors, University of Idaho Research Foundation, Inc.; R. W. Coonrod (Chairman), H. Sidwell Smith (Vice Chairman), Ronald W. Stark (Secretary-Treasurer), John H. Ehrenreich, Ronald D. Ensign, Ernest W. Hartung, R. Bruce Higgins, Donald F. Kline, Albert R. Menard.

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 University of Idaho Research Foundation, Inc., is a separate legal entity which implements the provisions of the university patent policy. Its purpose is to protect the interests of the inventor, the public, and the university, and to handle inventions growing out of university research programs.

Bureau of Business and Economic Research

Norman C. Olson, Director (211-A Admin. Bldg.); Norman Nybroten, Associate Director

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 determining 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.); Edward L. Kelly, Associate Director.

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.).

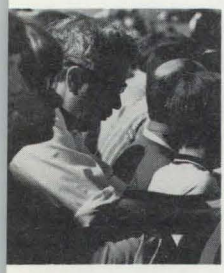
THE IDAHO BUREAU OF MINES AND GEOLOGY functions primarily as a research and service organization in fields pertaining to the mineral industry of the state. Cooperative relations are maintained with federal agencies working in this area, particularly the U.S. Bureau of Mines and the U.S. Geological Survey.

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; Michael P. Nagan, Assistant to the 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 twenty-nine major research studies: fourteen on city government, four on county government, three on the state legislature, three 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 1967 the bureau has sponsored short courses and workshops for city mayors and councilmen, county commissioners and clerks, city fiscal officers, legislative budget staff, local law enforcement administrators, and tax assessors and appraisers. The bureau is currently planning a series of workshops for secondary teachers of Idaho state and local government, and has developed a high school text and 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 Commission, 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.

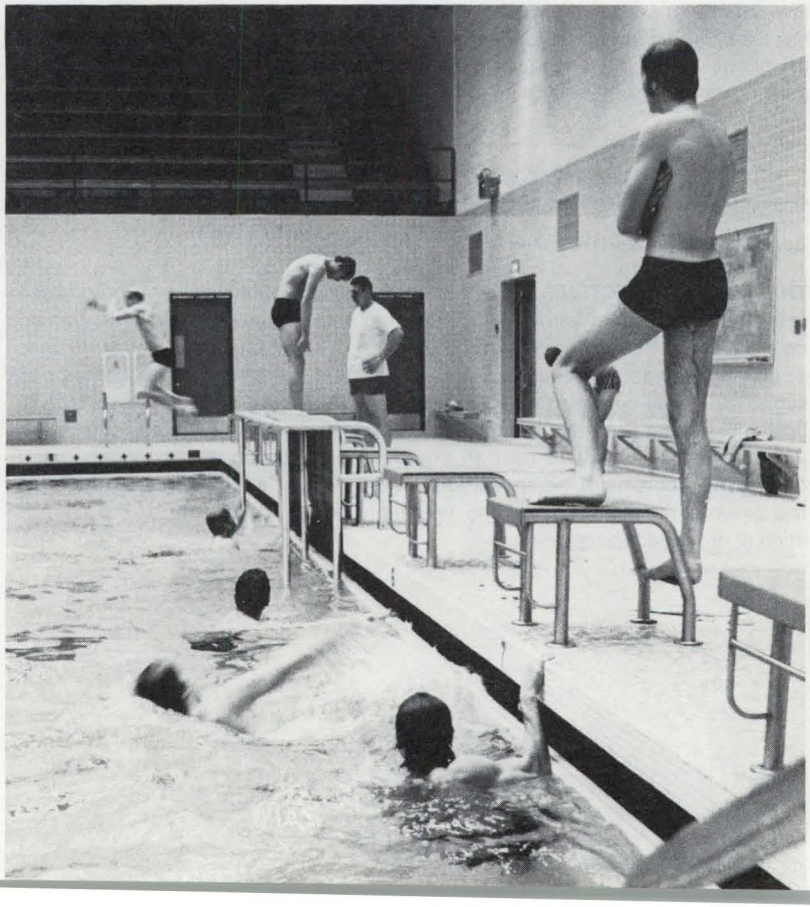
Computer Services

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 key-punch 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; William R. Parish, Chairman of the Faculty Council (1970-72); 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.), professional librarians (those who have a designated equivalent rank), 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 of the College of Agriculture, the Affiliate Faculty, and emeriti. Members of these non-voting constituencies are included in this list in recognition of their many contributions to the university and to the state of Idaho.

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 present academic rank.

All appointments shown are as of October 1, 1971.

M. Audrey Aaron, 1971, Associate Professor of Foreign Languages (Spanish); A.B., 1934, Mount St. Scholastica; A.M., 1950, Ph.D., 1952, Johns Hopkins.

Ali D. Abbasi, 1957 (1962), Assistant Professor of Engineering Science and Mechanical Engineering; B.S.Ch.E., 1957, Iowa; M.S.Ch.E., 1963, Idaho.

David L. Adams, 1971, Associate Professor of Forestry (Management); B.S., 1959, Oklahoma State; M.F., 1961, Idaho; Ph.D., 1969, Colorado State.

***Robert C. Alldaffer,** 1955 (1971), Associate Extension Professor and Caribou County Extension Agricultural Agent, Soda Springs; B.S.Ag., 1950, Idaho.

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 of Botany (Ecology); B.S., 1931, Bethany; M.S., 1932, Kansas State; Ph.D., 1949, Oregon State.

Florence D. Aller, 1962 (1971), Professor of Home Economics (Home Management-Family Life); Acting Department Head, 1971-; A.B., 1930, Bethany-Peniel; M.S., 1947, Oregon State; Ed.D., 1962, Idaho.

David W. Allman, 1970, Assistant Professor of Hydrogeology; Geologist; B.S.Geol., 1964, Hamilton (Ontario); M.S.Geol., 1967, Illinois.

Harold C. Amos, 1954 (1957), Assistant 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; 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.

***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, Assistant Professor of Agricultural Economics (Production Economics); Assistant Agricultural Economist; B.S., 1962, M.Sc., 1964, Nebraska; Ph.D., 1968, Missouri.

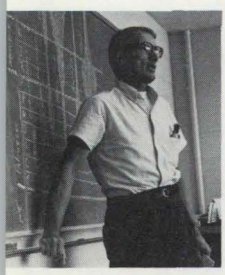
Eldon D. Archambault, 1971, Professor of Education; B.A., 1945, Northern Iowa; M.A., 1948, Ph.D., 1967, Iowa.

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 I. 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 (1969), Head, Catalog Department, University Library (equivalent rank: Associate Professor); A.B., 1935, A.B.-L.S., 1936, Michigan.

***Jorg A. L. Augustin,** 1968, Associate Research Professor of Agricultural Biochemistry, Aberdeen; Diplomierter Ingenieur Agronom, Eidgenoessische Technische Hochschule, 1955, Zurich; M.S., 1957, Illinois; Ph.D., 1964, Michigan State.

Dean E. Aulerich, 1970, Assistant Professor of Forestry (Operations); B.S.F.E., 1960, Oregon State; M.B.A., 1964, Arizona State.

Jasper R. Avery, 1959 (1962), Assistant Professor of Mechanical Engineering; B.S.M.E., 1957, Idaho.

Larry L. Ayer, 1968, Instructor in Radio/Television; Engineering Technician; Program Director, KUID-FM; B.A., 1963, Idaho.

Arnold L. Ayers, Jr., 1971, Instructor in Mechanical Engineering; B.S.M.E., 1963, B.S.-E.E., 1964, Idaho.

James W. Bailey, 1953, Associate Professor of Veterinary Science; Associate Veterinarian; Associate Extension Professor and Extension Veterinarian, Moscow; B.Ed., 1935, Western Illinois; D.V.M., 1943, Texas A & M.

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, Assistant 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 of Botany; Chairman, Botany; B.S., 1935, M.S., 1942, Ph.D., 1949, Oregon State.

Donald C. Baldridge, 1969, Assistant Professor of History (Latin American History); B.A., 1960, 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, Instructor in 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; B.S.M.E., 1947, Idaho; M.M.E., 1949, Yale; 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 (equivalent rank: Professor); B.A., 1949, St. Thomas; B.S.L.S., 1950, M.A., 1955, Minnesota.

Sidney M. Beck, 1951 (1962), Associate Professor of Bacteriology; Associate Bacteriologist; A.B., 1941, M.A., 1948, Brigham Young; Ph.D., 1951, Pennsylvania State.

*** Joseph M. Beeston,** 1961, Affiliate Professor of Metallurgy, NRTS, Idaho Falls; B.S., 1949, Ph.D., 1953, Utah.

Harold I. Bell, 1969, Assistant Professor of Military Science; B.A., 1965, Stanford.

George M. Bell, 1949 (1955), Professor of Law; B.S., 1935, Utah State; J.D., 1940, George Washington.

Roy A. Bell, 1950 (1961), Associate Professor of Photography; B.A., 1938, M.A., 1954, Idaho.

T. Donald Bell, 1957, Professor of Animal Science; Animal Scientist; 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.

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; A.B., 1962, Occidental; M.A., 1964, Ph.D., 1970, Oregon.

Edward A. Bergstrom, 1967, Assistant Professor of Guidance and Counseling; A.A., 1958, Clark; B.S., 1961, M.Ed., 1966, Ed.D., 1971, Washington State.

*** Herbert A. Berman,** 1952 (1957), Professor Emeritus of Law; A.B., 1924, J.D., 1927, Harvard. Emeritus since 1967.

Katrina V. Berman, 1971, Visiting Assistant Professor of Economics; B.A., 1941, Bennington; M.A., 1963, Columbia; Ph.D., 1968, Washington 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 (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, 1969-; 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.

*** Roland C. Bevan,** 1946, Associate Professor Emeritus of Agricultural Economics; B.S., 1923, M.S., 1937, Minnesota; Ph.D., 1959, Illinois. Emeritus since 1967.

Ronald D. Bevans, 1970, Assistant 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., 1966, 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., 1957, Washington State.

Elwood G. Bizeau, 1967, Assistant 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, Associate 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 of Continuing Education, State Office of Higher Education; B.A., 1949, M.S., 1953, Idaho; Ed.D., 1969, Washington State.

Robert E. Black, 1954 (1971), Associate Extension Professor and District Extension Agent Supervisor, Moscow; B.S.A., 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 (1967), Associate Professor of Architecture; Head, Department of Art/Architecture, 1971-; B.S., 1957, Idaho; M.Arch., 1963, California (Berkeley).

George 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, Assistant 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, Assistant Professor of Horticulture; Assistant Horticulturist; B.S., 1962, Ph.D., 1966, Utah State.

* **Darrell G. Bolz,** 1971, Extension Instructor 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 of English (Linguistics); B.A., 1938, East Texas State; M.A., 1947, Oklahoma; Ph.D., 1951, Florida.

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.

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.

* **F. J. (Packey) Boyle,** 1955, Instructor Emeritus in Physical Education; D.O., 1930, Astill. Emeritus since 1968.

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.

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, Affiliate Professor of Forest Mensuration, U.S. Forest Service, Moscow; B.S., 1961, Washington State.

* **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 (1947), Professor Emeritus of Law; B.A., 1919, Haverford; LL.B., 1923, Harvard; LL.M., 1932, Montpelier; 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.

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 Clothing Specialist, Moscow; B.S., 1966, M.S., 1970, North Dakota State.

Richard C. Bull, 1967, Assistant Professor of Animal Science; Assistant 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.

Ellis G. Burcaw, 1966 (1970), Associate Professor of Museology; Director, University Museum, 1966-; 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.

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 Horticulture, 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 Pathology; Head, Department of Plant 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).

Colin Campbell, 1962 (1969), Catalog Librarian (equivalent rank: 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., 1971, Ph.D., 1971, California (Berkeley).

* **Elizabeth M. Campbell,** 1969 (1971), Extension Instructor and Clearwater County Extension Home Economist, Orofino; B.S.H.Ec., 1969, Idaho.

Howard E. Campbell, 1963, Professor of Mathematics; Department Chairman, 1963-; B.S., 1946, M.S., 1947, Ph.D., 1949, Wisconsin.

John E. Carlson, 1970, Assistant Professor of Sociology; B.S., 1964, M.A., 1969, Washington State.

Laurence 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.

* **Eugene 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.

* **Louise A. Carter,** 1923, Dean of Women Emerita (Dean of Women, 1944-1958); B.A., Washington; M.A., 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, Kim-

berly; 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, 1962 (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 (1966), Associate Professor of Drama; Head, Department of Drama/Speech, 1968-; B.A., 1949, Southwest Texas State; M.F.A., 1951, Texas.

Melvin L. Cheesman, 1971, Assistant Professor of Education; B.A., 1948, Dartmouth; M.Ed., 1950, Oregon; M.A., 1963, Washington; Ph.D., 1965, Idaho.

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A. Woodard Ching, 1971, Associate Professor of Psychology; B.A., 1944, South Dakota State; Ph.D., 1958, Minnesota.

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Charles O. Christenson, 1964, Assistant 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-; B.B.A., 1932, M.A., 1937, Minnesota; Ph.D., 1953, Northwestern.

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* **James B. Colson,** 1960, Affiliate Professor of Electrical Engineering, NRTS, Idaho Falls; B.S., 1957, Utah; M.S., 1959, New York.

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James H. Cooley, 1957 (1968), Professor of Chemistry; B.A., 1952, M.S., 1954, Middlebury; Ph.D., 1958, Minnesota.

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.

John M. Cooper, 1969, Assistant Professor of Economics; B.A., 1965, Sacramento State.

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George T. Croskey, 1971, Assistant Professor of Drama; A.B., 1940, Park; M.F.A., 1953, Kansas City Art Institute and School of Design; M.A., 1962, Missouri (Kansas City).

Bert C. Cross, 1962, Associate Professor of Journalism; Department Chairman, 1962-; B.A., 1947, Washington; M.S., 1951, Oregon.

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Harry E. Davey, Jr., 1950-52, 1961, Dean of Men, 1968-; B.S., 1939, U.S. Naval Academy; M.Ed., 1964, Idaho.

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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.

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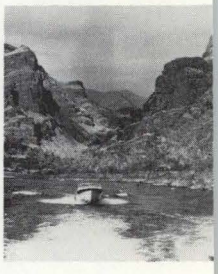

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John H. Ehrenreich, 1971, Professor of Forestry (Ecology); Dean, College of Forestry, Wildlife and Range Sciences, 1971-; Director, Forest, Wildlife and Range Experiment Station; B.S., 1951, M.S., 1954, Colorado State; Ph.D., 1956, Iowa State.

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Albert W. Erickson, 1970, Professor of Wildlife Management and Zoology; Director, Wil-

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Lambert C. Erickson, 1945 (1964), Professor of Agronomy; Agronomist; B.S., 1940, Minnesota; M.S., 1943, Wyoming; Ph.D., 1962, Minnesota.

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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, Assistant 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.

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Harry S. Fenwick, 1956 (1971), Professor of Plant Pathology; Plant Pathologist; Extension Professor and Extension Plant Pathologist, Moscow; B.S., 1949, M.S., 1953, Montana State; Ph.D., 1956, Oregon State.

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Delbert W. Fitzsimmons, 1959 (1971), Professor of Agricultural Engineering; Acting Department Chairman (1970-1972); Agricultural Engineer; B.S.Ag.E., 1959, M.S.Ag.E., 1962, Idaho; Ph.D., 1970, Washington State; P.E.

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Max E. Fletcher, 1958 (1965), Professor of Economics; Department Chairman, 1968-; B.A., 1946, Washington; M.A., 1949, Idaho; Ph.D., 1957, Washington.

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Carolyn A. Folz, 1945 (1969), Law Librarian (equivalent rank: Assistant Professor); A.B., 1929, Evansville; B.S.L.S., 1933, Illinois; M.A., 1939, Idaho.

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Rose L. Forbes, 1965, Assistant Professor of Home Economics (Foods); B.S., 1962, M.S., 1964, Pennsylvania State.

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John F. Gilligan, 1971, Assistant Professor of Psychology; A.B., 1961, Stonehill; S.T.B., 1963, Angers (France); M.A., 1967, Fairfield; Ph.D., 1971, Idaho.

Campbell M. Gilmour, 1970, Professor of Bac-

teriology; Department Head, 1970-; Bacteriologist; B.S.A., 1941, M.S.A., 1945, British Columbia; Ph.D., 1949, Wisconsin.

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Earl E. Gray, 1962 (1966), Associate Professor of Electrical Engineering; B.S.E.E., 1955, M.E.E., 1960, Colorado State.

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William S. Greever, 1949 (1958), Professor of History (American History); Department Head, 1956-; A.B., 1938, Pomona; A.M., 1940, Ph.D., 1949, Harvard.

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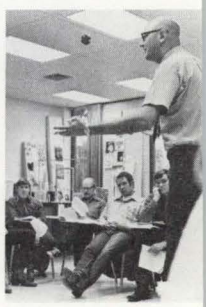

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Carlton L. Iiams, 1961 (1971), Professor of Foreign Languages (German); Department Chairman, 1965-; A.B., 1950, M.A., 1952, Ph.D., 1956, California (Berkeley).

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Edward T. Knecht, 1969, Director of Athletics; B.A., 1950, Toledo; M.S., 1957, Michigan.

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Index

A

Abbreviations and symbols: key to, 148

Absence: from final examinations, 53; general regulations covering, 59; *see also* Leave of absence

Absentia courses: credit limitations in, 139; fees for, 30

Academic calendar, 6-7

Academic unit(s), high school: defined, 24; required for admission, 23

Accelerated courses: registration in, 48

Accident insurance: general provision for, 37

Accounting: courses in, 150; degrees offered in, 15; undergraduate curriculum in, 70

Accreditation, 13

Adding courses, 48-49

Administration: officers of, 8

Admission: after disqualification, 58; general regulations and procedures covering, 21; of lower-division students to upper-division courses, 47; of non-high school graduates, 24; of undergraduates to graduate courses, 47, 138; to adult education centers, 142; to classes, 46; to College of Education, 72; to College of Engineering, 92; to College of Forestry, 98; to College of Law, 104; to College of Letters and Science, 110; to extension courses, 141; to Graduate School, 138; to teacher education, 74; to workshops, 48

Adult education centers: admission to, 142; credit limitations in, 142

Advanced standing: admission to College of Law with, 105; admission with, 25; fees covering, 30; in course sequences, 54

Advertising: undergraduate curriculum in, 121

Aerospace studies: courses in, 151; *see also* Reserve Officers' Training Corps

Affiliate Faculty, 259

Agribusiness: undergraduate curriculum in, 64

Agricultural biochemistry: courses in, 152; degrees offered in, 15, 18; undergraduate curriculum in, 66

Agricultural economics: courses in, 153; degrees offered in, 15, 18; undergraduate curricula in, 65

Agricultural education: courses in, 154; degrees offered in, 15, 18; undergraduate curriculum in, 65

Agricultural engineering: courses in, 155; degrees offered in, 15, 18; undergraduate curriculum in, 95

Agricultural Experiment Station, 251

Agricultural mechanization: courses in, 156; degrees offered in, 15; undergraduate curriculum in, 64

Agricultural science: degrees offered in, 15; undergraduate curriculum in, 65

Agriculture, College of: admission to, 23; degrees and curricula offered in, 15-20, 63; general courses in, 152

Air Force ROTC: *see* Aerospace studies

Algebra: high school units required in, 23

Alumni Association, 39

American studies: degrees offered in, 15; undergraduate curriculum in, 112

Animal industries: courses in, 156; degrees offered in, 16, 18; undergraduate curricula in, 64, 66

Anthropology: courses in, 158; degrees offered in, 16, 18; teaching minor in, 81; undergraduate curriculum in, 113

Application for degrees: general regulations covering, 56

Architecture: courses in, 159; degrees offered in, 16, 18; undergraduate curriculum in, 113

Army ROTC: *see* Military science

Art: courses in, 161; degrees offered in, 16, 18; teaching major and minor in, 81; undergraduate curriculum in, 113-114

Arts and law: combined curricula in, 122

Attendance regulations, 59

Auditors: fees for, 30; regulations covering, 47

B

Bacteriology: courses in, 162; degrees offered in, 16, 18; undergraduate curricula in, 114

Biochemistry: *see* Agricultural biochemistry

Biological sciences: teaching major and minor in, 81; *see also* Biology, Botany, Zoology

Biology: courses in, 163; degrees offered in, 16, 18; high school units required in, 23; undergraduate curriculum in, 115

Board of Regents, 9

Books and supplies: estimate cost of, 28

Botany: courses in, 164; degrees offered in, 16, 18, undergraduate curriculum in, 115

Bureaus: Business and Economic Research, 254; Educational Research and Service, 255; Mines and Geology, 256; Public Affairs Research, 256

Business: courses in, 166; degrees offered in, 16, 18; general undergraduate curriculum in, 71; *see also* Agribusiness

Business and applied science: undergraduate curriculum in, 70

Business and Economic Research: Bureau of 254

Business and Economics, College of: admission to, 23; degrees and curricula, 68

Business education: courses in, 168; degrees offered in, 16, 18; teaching minor in, 82; undergraduate curriculum in, 76

Business and law: combined curriculum in, 70

C

Calendar: academic, 6-7

Career planning, 39

Catalog issue: time limit for graduation under, 56

Certification for teaching: recommendation for, 75; through College of Education, 75; through College of Letters and Science, 110

Challenge (credit by examination): fees covering, 30; procedures for, 50

Change(s): in regulations, 48; University's right to make, 60

Chemical engineering: courses in, 169; degrees offered in, 16, 18; undergraduate curriculum in, 96

Chemistry: courses in, 170; degrees offered in, 16, 18; teaching major and minor in, 82; undergraduate curricula in, 115-116

Child development: degrees offered in, 16, 18; undergraduate curricula in, 120

Civil engineering: courses in, 173; degrees offered in, 16, 18; undergraduate curriculum in, 96

Class rating for undergraduates: credits required for, 59

Classes: absence from, 59; admission to, 46; withdrawal from, 48-49, 53

Classical studies: degrees offered in, 16; undergraduate curriculum in, 116

Clothing, textiles, and design: degrees offered in, 16; undergraduate curriculum in, 119

Coaching: teaching minor in, 82

Communications: courses in, 175

Computer Services, 258

Continuing Education: Division of, 141

Cooperative: Extension Service, 284; graduate program, 138; residence halls, 32

Correspondence study: admission to, 142; credit limitations in, 56; restrictions on, 47

Costs: *see* Expenses

Counseling services, 36

Course numbering system, 148

Credit(s): definition of, 49; for standing in the various classes, 59; limitations, 56; requirements for status as full-time student, 59; transfer of, 25

Cum laude: requirements for the awarding of, 57

Curriculum requirements: fulfillment of, 56

D

Dance: teaching minor in, 82

Deficiencies: admission with, 25

Degree applications, 56

Degree requirements: catalog applicable for, 56; for baccalaureate degrees, 55

Degrees granted, 14

Dental studies: degrees offered in, 16; undergraduate pre-dental curriculum, 124

Diploma fee, 30

Disenrollment: *see* Withdrawal

Disqualification: scholastic, 58

Distributive education: undergraduate curricular option in, 77

Dormitories: *see* Housing

Drama: courses in, 175; degrees offered in, 16, 18; teaching major and minor in, 82-83; undergraduate curricula in, 116

Dropping courses, 48-49

E

Earth science: degree offered in, 18; teaching major in, 83

Economics: courses in, 177; degrees offered in, 16, 19; undergraduate curricula in, 71, 117; *see also* Agricultural economics

Education: courses in, 178; degrees offered in, 16, 19; undergraduate curricula in, 76

Education, College of: admission to, 23, 73; degrees and curricula in, 76

Education, State Board of, 9

Educational Research and Service, Bureau of, 255

Elective unit: high school, defined, 24

Electrical engineering: courses in, 182; degrees offered in, 16, 19; undergraduate curriculum in, 96

Elementary education: degrees offered in, 16, 19; undergraduate curriculum in, 77

Eligibility to reregister, 58

Engineering: degrees offered in, 16, 19; general

courses in, 185; professional degrees offered in, 140

Engineering, College of: admission to, 23, 92; degrees and undergraduate curricula in, 92

Engineering Experiment Station, 252

Engineering science: courses in, 185

English: all-university requirements in, 55; courses in, 186; degrees offered in, 16, 19; proficiency for foreign students, 26; teaching major and minor in, 83; undergraduate curriculum in, 117; units required for admission, 23

Entomology: courses in, 188; degrees offered in, 16, 19; undergraduate curriculum in, 66

Examination(s): absence from final, 53; admission by, 24; for credit by examination, 50; for entering freshmen, 21; special final, 54

Excuses: for absences, 59

Expenses, 27

Extension courses: admission to, 141; credit limitations in, 56; grade points in, 52; removal of incompletes in, 52; restrictions on, 47

F

Faculty members, 259

Family housing, 33

Fees, 27

Fifth-year program in teaching education, 139

Final examinations: *see* Examinations

Finance: degrees offered in, 16; undergraduate curriculum in, 71

Fishery resources: degrees offered in, 16, 19; undergraduate curriculum in, 102

Food and nutrition, degrees offered in, 16; undergraduate curriculum in, 102

Food science: courses in, 190; degrees offered in, 16, 19; undergraduate curricula in, 64, 67

Foreign languages: courses in, 191; degrees offered in, 17, 20; *see also* French, German, Greek, Italian, Latin, Russian, and Spanish

Foreign students: admission of, 26

Forest entomology: degrees offered in, 19

Forest pathology: degrees offered in, 19

Forest products, wood utilization: degrees offered in, 18, 20; undergraduate curriculum in, 102

Forest resources: degrees offered in, 17; undergraduate curriculum in, 101

Forest, Wildlife and Range Experiment Station, 253

Forestry: courses in, 193

Forestry sciences: degrees offered in, 19

Forestry, Wildlife and Range Sciences, College of: admission to, 23, 98; degrees and curricula, 100

Fraternities, 33

French: courses in, 191; degrees offered in, 17, 19; teaching major and minor in, 84; undergraduate curriculum in, 117

Full-time student: credit requirements for, 59

G

General business: degrees offered in, 16; undergraduate curriculum in, 71

General regulations and procedures, 46

General requirements for baccalaureate degrees, 54

General studies program, 61

Genetics: courses in, 197

Geography: courses in, 198; degrees offered in, 17, 19; teaching major and minor in, 84; undergraduate curricula in, 117, 135

Geological engineering: degrees offered in, 17, 19; undergraduate curriculum in, 136

Geology: courses in, 199; degrees offered in, 17, 19; Idaho Bureau of Mines and, 289; teaching minor in, 84; undergraduate curricula in, 136

Geometry: high school units required in, 23

German: courses in, 192; degrees offered in, 17, 19; teaching major and minor in, 84; undergraduate curriculum in, 118

Grades: disqualification because of, 57; explanation of, 50; reporting of, 52

Graduate School: admission to, 137; degrees offered by, 18

Graduation requirements: general, 54

Greek: courses in, 192

Guidance and counseling: courses in, 202; degrees offered in, 19

H

Health and accident insurance, 37

Health education: teaching minor in, 84

High school courses: repeat of, 50

High school unit: defined, 24

History: courses in, 203; degrees offered in, 17, 19; teaching major and minor in, 85; undergraduate curricula in, 118

Home economics: courses in, 205; degrees offered in, 17, 19; undergraduate curricula in, 118

Honors, 57

Housing: costs of, 27, 33; requirements, 32

Hydrology: courses in, 207; degrees offered in, 19; *see also* Agricultural engineering courses

I

Idaho Bureau of Mines and Geology, 256

Incompletes: explanation of and removal of, 52

Industrial education: courses in, 207; degrees offered in, 17, 19; teaching minor in, 85; undergraduate curriculum in, 77

Information science: courses in, 209

Insurance: *see* Health and accident insurance

Interdisciplinary studies: courses in, 210; degrees offered in, 17; undergraduate curriculum in, 120

Interior design: degrees offered in, 17, 19; undergraduate curriculum in, 120

International students: *see* Foreign students

Italian: courses in, 192

J-K

Journalism: courses in, 211; degrees offered in, 17; teaching minor in, 85; undergraduate curricula in, 121

Junior colleges: admission from, 26

Junior standing: credits required for, 59

L

Landscape architecture: degrees offered in, 17; undergraduate curriculum in, 122; *see also* Architecture

Languages: *see* Foreign languages

Late registration fee, 30

Latin: courses in, 192; degrees offered in, 17; teaching major and minor in, 85; undergraduate curriculum in, 122

Law: courses in, 212; curriculum in, 108; degrees offered in, 17, 19

Law, College of: admission to, 104; curriculum in, 108

Leave of absence, 59

Letters and Science, College of: admission to, 23, 110; degrees and curricula in, 112

Library, 13

Library science: courses in, 212; teaching minor in, 85

Living accommodations: *see* Housing

Load limitations: *see* Credit limitations

M

Major(s): offered by the University, 15

Management: degrees offered in, 17; undergraduate curriculum in, 71

Marketing: degrees offered in, 17; undergraduate curricula in, 71

Married students: housing for, 33

Mathematics: courses in, 213; degrees offered in, 17, 19; high school units required in, 23; teaching major and minor in, 86; undergraduate curriculum in, 122-123

Matriculation, 46

Mechanical engineering: courses in, 216; 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 curricular option, 114

Men: housing requirements, 32

Metallurgical engineering: degrees offered, 17, 19; undergraduate curriculum in, 136; *see also* Metallurgy

Metallurgy: courses in, 218

Midsemester grades: report of, 52

Military science: courses in, 219; teaching minor in, 86; *see also* Reserve Officers' Training Corps

Mines, College of: admission to, 23; degrees and curricula in, 135

Mines and Geology, Idaho Bureau of, 256

Mining: professional degrees in, 140

Mining engineering: courses in, 220; degrees offered in, 17, 19; undergraduate curriculum in, 137

Mining Research Bureau, 256

Museology: courses in, 222

Museum, 14

Music: courses in, 222; degrees offered in, 17, 19; special fees in, 30; teaching minor in, 86; undergraduate curricula in, 129

N

National Reactor Testing Station (Idaho Falls): graduate program in, 138; undergraduate program in, 143

Natural science: high school units required in, 23

Naval science: courses in, 227; degrees offered in, 17; undergraduate curriculum in, 123; *see also* Reserve Officers' Training Corps

News: radio-television news option, 121

Non-high school graduates: admission of, 24

Non-matriculated status: admission to, 26

Non-resident instruction: maximum credit in, 47

Nonresidents: admission of, 24

Nuclear engineering: courses in, 228; degrees offered in, 19

Nursing studies (pre-nursing studies): programs in, 125

O

Office administration: courses in, 228; degrees offered in, 17; undergraduate curriculum in, 71

Office occupations: option under business education, 76

Officers: administrative, 8

P-Q

Painting: undergraduate curricula in, 114

Partial enrollment: in Graduate School, 138

Pass-fail option, 48

Permits to register, 46

Philosophy: courses in, 229; degrees offered in, 17, 19; undergraduate curriculum in, 123

Photography: courses in, 229

Physical education: all-university requirements in, 56; courses in, 230; degrees offered in, 17, 19; teaching minor in, 86; undergraduate curricula in, 78, 79

Physical sciences: teaching major in, 87

Physical therapy (pre-physical therapy): degrees offered in, 17; undergraduate curriculum in, 125

Physics: courses in, 232; degrees offered in, 17, 20; high school units required in, 23; teaching major and minor in, 87; undergraduate curricula in, 123-124

Physiology: courses in, 236

Placement services, 39

Plant sciences: courses in, 237; degrees offered in, 17, 20; undergraduate curricula in, 67

Political science: courses in, 238; degrees offered in, 17, 20; teaching major and minor in, 87-88; undergraduate curriculum in, 124

Pre-dental studies: *see* Dental studies

Pre-law: *see* Law

Pre-medical studies: *see* Medical studies

Pre-nursing: *see* Nursing studies

Pre-veterinary medicine: *see* Veterinary Science

Prerequisite courses: review of, 50

Probation: scholastic, 57

Professional certificates: in education, 140

Professional degrees: 140

Psychology: courses in, 240; degrees offered in, 18, 20; undergraduate curriculum in, 125

Public Affairs Research, Bureau of, 256

R

Radiological science: degrees offered in, 20

Radio-television: courses in, 242; degrees offered in, 18; undergraduate curricula in, 126

Range resources: degrees offered in, 18, 20; undergraduate curriculum in, 101

Readmission: after disqualification, 58

Real estate: undergraduate curriculum in, 71

Recreation: degrees offered in, 18; teaching minor in, 88; undergraduate curriculum in, 79; *see also* Forestry courses

Refund of fees, 31

Regents: Board of, 9

Registration: changes in, 48; fees, 28; general regulations and procedures for, 46

Regulations: general academic, 46

Religious studies: courses in, 243

Repeat of courses, 52

Repeated absences: report of, 59

Requirements: University's right to change, 60

Research Council and Research Foundation, 254

Reserve Officers' Training Corps, 145

Residence requirements for baccalaureate degree, 55

Resident status: defined, 29

Russian: courses in, 193; teaching major and minor in, 89

S

Scholarships: general information about, 37

Scholastic probation, 57

Science: teaching major and minor in, 89

Sculpture: undergraduate curricular options in, 114

Secondary education: degrees offered in, 18, 20; undergraduate curriculum in, 80

Second baccalaureate degree: requirements for, 57

Secretarial studies: *see* Office administration

Senior standing: credits required for, 59

Services: student advisory, 36

Social science: courses in, 243; degrees offered in, 20; high school units required in, 23; teaching major and minor in, 89

Social work: degrees offered in, 18; undergraduate curriculum in, 126

Sociology: courses in, 244; degrees offered in, 18, 20; teaching minor in, 89; undergraduate curriculum in, 126

Soils: courses in, 245; degrees offered in, 18, 20; undergraduate curricula in, 65, 67

Sophomore standing: credits required for, 59

Sororities, 33

Spanish: courses in, 193; degrees offered in, 18, 20; teaching major and minor in, 89; undergraduate curriculum in, 126

Special education: courses in, 246; degrees offered in, 18, 20; teaching minor in, 90; undergraduate curriculum in, 80

Speech: courses in, 247; degrees offered in, 18, 20; teaching major and minor in, 90; undergraduate curricula in, 126-127

Statement of Student Rights, 40

Student advisory services, 36

Student counseling, 34

Student fees, 27

Student housing, 32

Summa cum laude: requirements for the awarding of, 57

Summer sessions, 141

Supplies and books: estimated cost of, 28

T

Teacher certification: recommendation for, 75

Teacher education: admission to, 74; continuance in, 74

Technical education: degrees offered in, 18, 20; undergraduate curriculum in, 80

Television: courses in, 242; curriculum in, 126

Time limit: for graduation under a particular catalog, 56

Transcripts: fee for, 31; required for admission, 21, 24

Transfer credit, 25

Transfer students: admission to University of, 25; catalog applicable to, 56

Trigonometry: high school units required in, 23

Tuition: non-resident, 29

U-V

Unit: high school, definition of, 24

Veterinary science: courses in, 248; degrees offered in, 18, 20; undergraduate curriculum in, 67

Vocational teacher education: courses in, 248; degrees offered in, 18, 20; undergraduate curriculum in, 80

Vocational units: number permitted for admission, 23

W

Warnings, scholastic: procedures for, 57-58

Washington State University: cooperative graduateater Resources Research Institute, 253

Washington State University: cooperative graduate program with, 138

Water Resources Research Institute, 253

Watershed science: degrees offered in, 20

Wildlife management: degrees offered in, 18, 20; undergraduate curriculum in, 102

Withdrawal: from classes, 48-49; procedures and regulations covering, 53; refund of fees, 31

Women: housing requirements, 32

Wood utilization technology: degrees offered in, 18, 20; undergraduate curricula in, 102

X-Y-Z

Zoology: courses in, 249; degrees offered in, 18, 20; undergraduate curriculum in, 127

New Courses

SINCE THE foregoing pages of this catalog went to press, the following new courses have been approved:

AGRICULTURAL ENGINEERING

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.

ENGINEERING (GENERAL)

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 session. Prereq: perm.

ENGLISH

Eng **375 The Bible as Literature** (3 cr). Literary qualities of the Bible.

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 to literature at the secondary-school level; designed to aid in the integration of literature and composition.

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.

GEOGRAPHY

Geog **320 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 **525 Experimental Conservation Workshop** (4 cr). A field trip oriented approach to conflict resolution concerning state and regional conservation questions.

INDUSTRIAL EDUCATION

IEd **R212 Elements of Quality Assurance** (3 cr). Continuation of R211.

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 **R240 Electronics and Control Systems** (3 cr). Complex frequency domain; application of electronic devices and systems; intro to control theory.

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 **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.

NATIVE AMERICAN AFFAIRS

NatAm **200** (s) **Seminar** (cr arr). Prereq: perm.

NatAm **299** (s) **Directed Study** (cr arr). Prereq: perm.

NatAm **400** (s) **Seminar** (cr arr). Prereq: perm.

NatAm **499** (s) **Directed Study** (cr arr). Prereq: perm.

NUCLEAR ENGINEERING

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 **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.