

UNIVERSITY OF WASHINGTON BULLETIN 1967 - 1969

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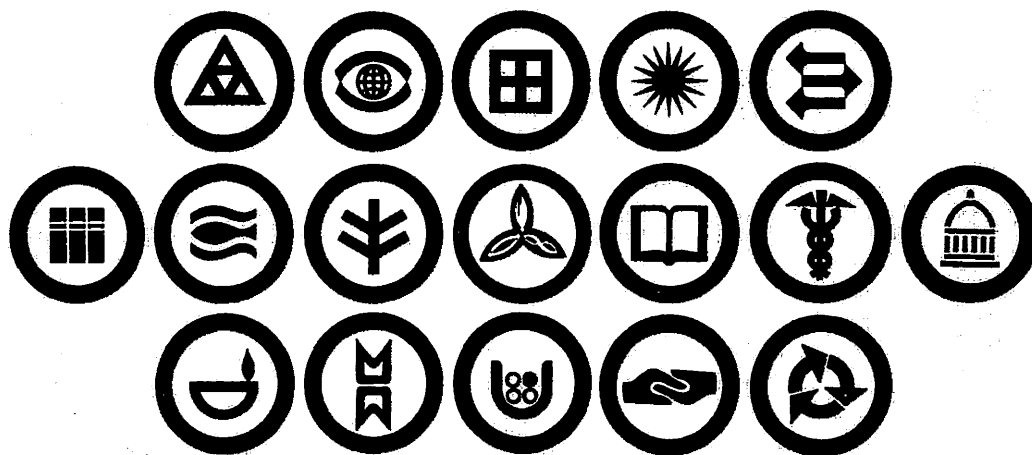
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# UNIVERSITY OF WASHINGTON



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# ACADEMIC CALENDAR 1967-68

## *SPRING QUARTER, 1967*

Application deadline	March 1
Advance registration	January 30-February 17
Returning and new student registration	March 20-23
Classes begin	March 27
Memorial Day holiday	May 30
Final examinations	June 5-9
Commencement	June 10

## *SUMMER QUARTER, 1967*

Application deadline for new students	May 15
Application deadline for former students	June 1
Registration	May 29-June 2, June 7-15
First term classes begin	June 19
Independence Day holiday	July 4
First term final examinations	July 19
Second term classes begin	July 20
Second term final examinations	August 18

## *AUTUMN QUARTER, 1967*

Application deadline for new students	July 15
Application deadline for returning students	August 15
Advance registration	May 8-26
Returning and new student registration	August 28-September 21
Classes begin	September 25
State Admission Day holiday	November 11
Thanksgiving recess	November 22-27
Final examinations	December 7-14

## *WINTER QUARTER, 1968*

Application deadline	December 1
Advance registration	October 30-November 17
Returning and new student registration	December 21-28
Classes begin	January 2
Washington's Birthday holiday	February 22
Final examinations	March 11-15

Dates in this calendar are subject to change without notice.

Dates appearing in admission and registration instructions take precedence over those in this Catalog.



1968-69

*SPRING QUARTER, 1968*

Application deadline	March 1
Advance registration	January 29-February 16
Returning and new student registration	March 18-21
Classes begin	March 25
Memorial Day holiday	May 30
Final examinations	June 3-7
Commencement	June 8

*SUMMER QUARTER, 1968*

Application deadline for new students	May 15
Application deadline for former students	June 1
Registration	May 27-31, June 4-13
First term classes begin	June 17
Independence Day holiday	July 4
First term final examinations	July 17
Second term classes begin	July 18
Second term final examinations	August 16

*AUTUMN QUARTER, 1968*

Application deadline for new students	July 15
Application deadline for returning students	August 15
Advance registration	May 6-24
Returning and new student registration	September 3-26
Classes begin	September 30
State Admission Day holiday	November 11
Thanksgiving recess	November 27-December 2
Final examinations	December 12-19


*WINTER QUARTER, 1969*

Application deadline	December 1
Advance registration	November 4-22
Returning and new student registration	December 27-January 2
Classes begin	January 6
Washington's Birthday holiday	February 22
Final examinations	March 17-21

Dates in this calendar are subject to change without notice.

Dates appearing in admission and registration instructions take precedence over those in this Catalog.



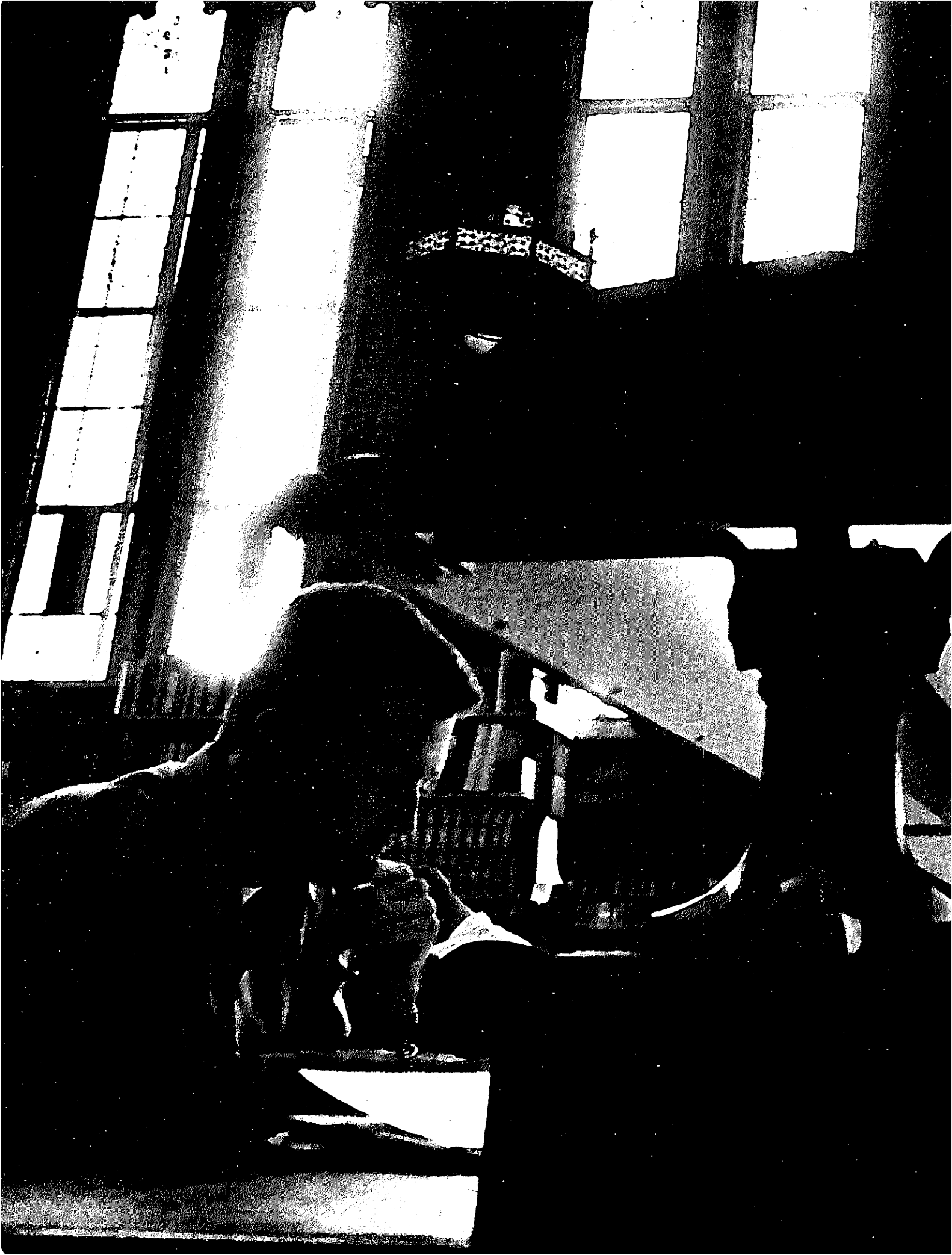


*It is the primary task of a great university  
to attract and to cultivate the intellectual powers of  
students who will be competent to engage successfully  
in the strenuous race for ideas which marks especially  
our time and upon which order, freedom,  
human welfare, and peace depend.*

*The capacity to work with ideas, to use abstractions,  
to find a degree of order in chaos, to reason  
around corners and over difficulties, must be found,  
stimulated, and above all, disciplined.*

Charles E. Odegaard  
President







## GENERAL INFORMATION

The University of Washington was founded in 1861 on a ten-acre knoll in what is now downtown Seattle, and was moved in 1895 to its present 660-acre site on the shores of Lake Washington. Now offering instruction in more than two hundred academic disciplines, the "University of a Thousand Years" has entered its second century of service.

The University of Washington's enrollment for Autumn Quarter 1966 is expected to be 27,100.

Enrollment for Autumn Quarter 1965 was 25,152. Of this number, 19,585 were undergraduates; the remainder were in professional and graduate programs. More than three-fourths of the undergraduates enter as freshmen from Washington high schools or as transfer students from Washington community colleges or other colleges and universities in the state. These students come from every county in Washington and represent the smallest as well as the largest communities. The remaining students enter from high schools, colleges, and universities from every state and territory of the United States and from foreign countries. During the year 1965, 1,188 noncitizens from more than ninety countries have enrolled, ranking the University fourteenth in the nation in size of foreign student population. The largest groups at the University are the Freshman

Class, with an Autumn 1965 enrollment of 6,987, and the professional schools and Graduate School, which together enroll 5,567 students.

The majority of students who enter the University as freshmen are from the top one-third to one-fifth of their high school graduating class. The grade-point average for the Freshman Class entering in Autumn Quarter 1965 was 3.18.

Women comprised 36.6 per cent of the student population in Autumn Quarter 1965. Married students numbered 2,817 in the undergraduate program and 2,607 in graduate study.

### **The Faculty**

The faculty of the University includes the president, vice presidents, provost, vice provost, deans, professors, associate professors, assistant professors, instructors, research associates, and lecturers.

The University attracts faculty members from colleges and universities throughout the world. A survey for the years 1957-62 shows that 27 per cent of new faculty members, ranking as assistant professors or above, came from the eastern seaboard of the United

States; 24 per cent came from the Midwest; 19 per cent, from California; 6 per cent, from the state of Washington; 18 per cent, from other areas of the United States; and 6 per cent, from foreign universities. In 1965, the full-time academic staff of the University numbered approximately seventeen hundred.

### **Accreditation**

The University of Washington is accredited by the Northwest Association of Secondary and Higher Schools and is a member of the Association of American Universities. Individual schools and colleges are members of the various accrediting associations in their respective fields.

## **COLLEGES AND SCHOOLS**

At the undergraduate level, the freshman or transfer student enrolls in the college offering his chosen major. Premajor and preprofessional programs are offered within the College of Arts and Sciences.

Undergraduate students wishing to enter the Schools of Medicine and Dentistry usually enroll in the College of Arts and Sciences. The School of Law requires that applicants for admission present a baccalaureate degree from an approved college or university, except that applicants presenting three years of satisfactory undergraduate credit may be admitted if they meet other admission standards and present exceptional additional qualifications by virtue of background or experience. In addition, students may be admitted to the School of Law after satisfactorily completing three years of undergraduate work in a combined-degree program prior to September, 1964. Degree programs in biomathematics, drama arts, geophysics, librarianship, physiological psychology, public affairs, radiological sciences, and social work are available only to graduate students.

Some colleges provide honors programs which are designed to encourage the development and achievement of the undergraduate student of superior ability. At the graduate level, programs consistent with the highest national academic and professional standards are offered. Whether the student is specializing or wishes only a limited amount of work in a particular field of study, most colleges, schools, and departments offer both graduate and undergraduate courses that will enrich his program.

## **PROGRAMS OF STUDY**

The wide variety of programs of study offered not only prepares students for the professions and occupations, but also prepares them to contribute as informed citizens to the culture and progress of a changing world. The colleges and schools and the principal fields of study at the University of Washington are listed herein.

### **College of Architecture and Urban Planning**

Architecture  
Landscape Architecture  
Urban Planning  
Building Technology and Administration

### **College of Arts and Sciences**

Anthropology  
Art  
Astronomy  
Atmospheric Sciences  
Biology  
Botany  
Chemistry  
Classics  
Communications  
Comparative Literature  
Dental Hygiene, Preprofessional Program  
Dentistry, Preprofessional Program  
Drama  
Economics  
English  
Far Eastern and Russian (social sciences)  
Far Eastern and Slavic Languages and Literature  
General Studies  
Genetics  
Geography  
Geology  
Germanic Languages and Literature  
History  
Home Economics  
Law, Preprofessional Program  
Linguistics  
Mathematics  
Medical Technology, Preprofessional Program  
Medicine, Preprofessional Program  
Microbiology  
Music  
Oceanography  
Occupational Therapy, Preprofessional Program  
Philosophy  
Physical and Health Education  
Physical Therapy, Preprofessional Program





Physics  
Political Science  
Preventive Medicine  
Psychology  
Romance Languages and Literature  
Scandinavian Languages and Literature  
Social Work, Preprofessional Program  
Sociology  
Speech  
Zoology

**School of Business Administration**

Accounting  
Business and Its Environment  
Business Statistics and Operations Research  
Finance  
General Business  
International Business  
Marketing  
Personnel and Industrial Relations  
Production  
Real Estate  
Risk and Insurance  
Transportation

**School of Dentistry**

Basic Sciences  
Clinical Dental Sciences  
Dental Hygiene

**College of Education**

**College of Engineering**

General Engineering  
Aeronautics and Astronautics  
Ceramic Engineering  
Chemical Engineering  
Civil Engineering  
Electrical Engineering  
Industrial Engineering  
Mechanical Engineering  
Metallurgical Engineering  
Mineral Engineering  
Mining Engineering  
Nuclear Engineering

**College of Fisheries**

Fishery Biology  
Food Science

**College of Forestry**

Forest Sciences  
Forestry Management  
Logging Engineering  
Pulp and Paper Technology  
Wood and Fiber Sciences  
Wood Technology

**Continuing Education**

**Graduate School of Public Affairs**

**School of Law**

**School of Librarianship**

**School of Medicine**

Basic Health Sciences  
Clinical Medical Sciences  
Medical Technology  
Physical Therapy  
Occupational Therapy  
Biomedical History

**School of Nursing**

**College of Pharmacy**

**ROTC (Army, Navy, Air Force)**

**School of Social Work**

**Graduate School**

Advanced Degree subject matter fields in the Graduate School include the following:

\*Aeronautics and Astronautics  
\*Anthropology  
Architecture  
Art  
\*Atmospheric Sciences  
\*Biochemistry  
\*Biological Structure  
\*Biomathematics  
\*Botany  
\*Business Administration  
\*Ceramic Engineering  
\*Chemical Engineering  
\*Chemistry  
\*Civil Engineering  
\*Classics

Communications  
 \*Comparative Literature  
 Dentistry  
 Drama  
 \*Drama Arts  
 \*Economics  
 \*Education  
 \*Electrical Engineering  
 \*English  
 \*Far Eastern and Slavic Languages  
 \*Fisheries  
 \*Forestry  
 \*Genetics  
 \*Geography  
 \*Geology  
 \*Geophysics  
 \*Germanic Languages and Literature  
 \*History  
 Home Economics  
 Librarianship  
 \*Linguistics  
 \*Mathematics  
 \*Mechanical Engineering  
 \*Metallurgical Engineering  
 \*Microbiology  
 Mineral Engineering  
 \*Music  
 \*Nuclear Engineering  
 Nursing  
 \*Oceanography  
 \*Pathology  
 \*Pharmacology  
 \*Pharmacy  
 \*Philosophy  
 Physical and Health Education  
 Physical Medicine and Rehabilitation  
 \*Physics  
 \*Physiology and Biophysics  
 \*Physiology Psychology  
 \*Political Science  
 Preventive Medicine  
 \*Psychology  
 Public Affairs  
 Radiological Sciences  
 \*Romance Languages and Literature  
 Scandinavian Languages and Literature  
 Social Work  
 \*Sociology  
 \*Speech  
 Surgery  
 Urban Planning  
 \*Zoology

\*Asterisk indicates doctoral program.

## DEGREES

The University of Washington grants the following degrees upon satisfactory completion of appropriate programs of study in the departments, schools, and colleges:

### Undergraduate Degrees

Bachelor of Architecture . . . . . B.Arch.  
 Bachelor of Arts . . . . . B.A.  
 Bachelor of Arts in Business Administration . . . . . B.A.BA  
 Bachelor of Arts in Urban Planning . . . . . B.A.Urb.Plan.  
 Bachelor of Fine Arts . . . . . B.F.A.  
 Bachelor of Landscape Architecture . . . . . B.L.Arch.  
 Bachelor of Laws . . . . . LL.B.  
 Bachelor of Music . . . . . B.Mus.  
 Bachelor of Science . . . . . B.S.  
 Bachelor of Science in Aeronautics  
 and Astronautics . . . . . B.S.A.&A  
 Bachelor of Science in Building Technology and  
 Administration . . . . . B.S.BT&A  
 Bachelor of Science in Ceramic Engineering . . . . . B.S.Cer.E.  
 Bachelor of Science in Chemical Engineering . . . . . B.S.Ch.E.  
 Bachelor of Science in Civil Engineering . . . . . B.S.C.E.  
 Bachelor of Science in Electrical Engineering . . . . . B.S.E.E.  
 Bachelor of Science in Fisheries . . . . . B.S.Fish.  
 Bachelor of Science in Forestry . . . . . B.S.For.  
 Bachelor of Science in Industrial Engineering . . . . . B.S.I.E.  
 Bachelor of Science in Mechanical  
 Engineering . . . . . B.S.M.E.  
 Bachelor of Science in Medical  
 Technology . . . . . B.S.Med.Tech.  
 Bachelor of Science in Metallurgical  
 Engineering . . . . . B.S.Met.E.  
 Bachelor of Science in Mining Engineering . . . . . B.S.Min.E.  
 Bachelor of Science in Nursing . . . . . B.S.Nurs.  
 Bachelor of Science in Occupational  
 Therapy . . . . . B.S.Occ.Therapy  
 Bachelor of Science in Pharmacy . . . . . B.S.Pharm.  
 Bachelor of Science in Physical  
 Therapy . . . . . B.S.Phys.Therapy

### Graduate Degrees

Master of Arts . . . . . M.A.  
 Master of Arts for Teachers . . . . . M.A.T.  
 Master of Arts in Communications . . . . . M.A.Com.  
 Master of Arts in Home Economics . . . . . M.A.H.Ec.  
 Master of Arts in Music . . . . . M.A.Music  
 Master of Science . . . . . M.S.  
 Master of Science in Aeronautics and  
 Astronautics . . . . . M.S.A.&A.



Master of Science in Ceramic Engineering	M.S.Cer.E.
Master of Science in Ceramics	M.S.Cer.
Master of Science in Chemical Engineering	M.S.Ch.E.
Master of Science in Civil Engineering	M.S.C.E.
Master of Science in Dentistry	M.S.Den.
Master of Science in Electrical Engineering	M.S.E.E.
Master of Science in Engineering	M.S.E.
Master of Science in Forestry	M.S.F.
Master of Science in Home Economics	M.S.H.Ec.
Master of Science in Mathematical Statistics	M.S.Math.Stat.
Master of Science in Mechanical Engineering	M.S.M.E.
Master of Science in Metallurgical Engineering	M.S.Met.E.
Master of Science in Metallurgy	M.S.Met.
Master of Science in Mining Engineering	M.S.Min.E.
Master of Science in Physical Education	M.S.Phys.Ed.
Master of Science in Preventive Medicine	M.S.Prev.Med.
Master of Science in Radiological Sciences	M.S.Rad.Sci.
Master of Aeronautics and Astronautics	M.A.&A.
Master of Architecture	M.Arch.
Master of Business Administration	M.B.A.
Master of Education	M.Ed.
Master of Electrical Engineering	M.E.E.
Master of Fine Arts	M.F.A.
Master of Forestry	M.F.
Master of Law Librarianship	M.Law Libr.
Master of Librarianship	M.Libr.
Master of Nursing	M.N.
Master of Public Administration	M.P.A.
Master of Social Work	M.S.W.
Master of Urban Planning	M.UrbanPlan.
Doctor of Business Administration	D.B.A.
Doctor of Education	Ed.D.
Doctor of Musical Arts	D.Mus.Arts
Doctor of Philosophy	Ph.D.

### Medical and Dental Degrees

Doctor of Dental Surgery	D.D.S.
Doctor of Medicine	M.D.

Undergraduate programs and degree requirements are described in the *Undergraduate Education* section. Graduate degree requirements are explained in the section on *Graduate Study*. For detailed information about the programs of study and requirements in the colleges, schools, and departments, see the sections describing each.

### Sessions

University instruction is offered during three quarters of approximately 11 weeks each during the Autumn, Winter, and Spring Quarters, and for nine weeks during the Summer Quarter. The Autumn Quarter begins in September and ends before the Christmas holidays; the Winter Quarter continues from early January until the third week in March; and the Spring Quarter extends from late March until the middle of June.

### Summer Quarter

The opportunities for study during Summer Quarter are comparable to those of the regular school year, except that the number of courses offered is not as large. A wide selection of courses in most major fields is available to graduate and undergraduate students pursuing degree programs on a year-around basis, as well as to teachers and other summer-only students seeking to broaden, intensify, or refresh their subject matter competence. Freshman students entering from high school are encouraged to begin their college work in the summer; and through the University Office of High School Relations, enrollment in summer courses may be arranged under certain circumstances for specially qualified students who have not yet completed high school.

Admission requirements for Summer Quarter are the same as for any other quarter, and credits earned by students with regular matriculated standing are evaluated as residence credits. The Summer Quarter fees closely parallel those of a regular quarter; there is no additional fee for nonresidents during the summer.

For further information concerning the summer program, write for the *Summer Quarter Bulletin*, or address inquiries to the Summer Quarter Office, 303 Lewis Hall, University of Washington, Seattle 98105.

### Continuing Education

For information concerning correspondence study, evening classes, and other programs in Continuing Education, see the *Continuing Education* section.

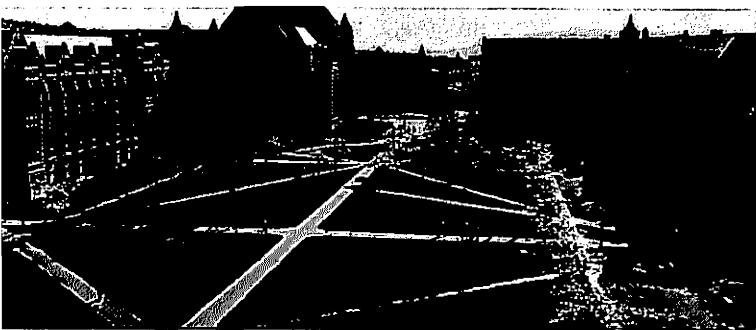
## THE CAMPUS

The University of Washington's campus—660 acres of trees, landscape, and buildings—is located on the shores of Lake Washington and has long been considered one of the most attractive in the nation. Many



different species of trees, shrubs, and flowers add beauty to the campus. There are more than fifty-five permanent buildings, including a modern, fully equipped 320-bed teaching hospital which forms a portion of the Health Sciences complex located at the southern end of the campus.

The major buildings in which the academic activities are centered form the central portion of the campus; student housing facilities are distributed around the periphery. The extensive athletic plant, playing fields, and recreational areas are situated on the campus as are the botanical and drug-plant gardens and a 267-acre arboretum which contains thousands of varieties of trees, plants, and shrubs from all over the world.



### **University Libraries**

The University libraries span the campus in a coordinated system of general and select collections of books and other study resources assembled to meet the needs of the University community. Collections, housed in a large main library building and in eighteen branch libraries closely related to certain departments of instruction, afford effective use of library resources once the student has undertaken to familiarize himself with the system in general and those units of particular interest to him.

Experience gained in the use of other or smaller libraries elsewhere will be helpful, but must be broadened if the user would accomplish effective utilization of the library system's 1,450,000 books, its 22,000 serials and periodicals, its many maps, newspapers and microforms, as well as its countless state, federal, and foreign government publications.

Most books in the Suzzallo Library (as in the branch libraries) are in open shelf collections to which students have direct and easy access. There are few

formal reading rooms; study areas are located conveniently within the book collections throughout the building. Librarians assigned to each collection or service unit assist students in the location and use of the materials.

An Undergraduate Library—a select collection of 80,000 books, periodicals, and reference works—is maintained in the Suzzallo Library by a special staff who seek to provide for undergraduate students' needs in all academic fields. The Reserve Book Collection is located here, together with copies of required and collateral reading lists, and card catalogs for both the select and reserve collections.

The Suzzallo Library and its supporting branches afford well-developed collections in all traditional areas of inquiry and instruction; in other specialized areas, the collections are continuously expanded and strengthened to support the needs of researchers and the work of candidates for advanced degrees. More than 75,000 volumes were added in 1965.

The University of Washington Libraries constitute one of the largest academic book collections in the United States and participate in many regional and national bibliographic enterprises. The Pacific Northwest Bibliographic Center, owned and supported by forty libraries in the Pacific Northwest, maintains in the Suzzallo Library a union catalog with 3,750,000 author entries as an aid to interlibrary lending and to facilitate the location of uncommon books that may be required by faculty, researchers, and advanced students in the region, the nation, and abroad.

### **Museum**

The Thomas Burke Memorial Washington State Museum, located at the northwest corner of the campus, houses creative displays of the natural history of the Pacific Northwest, Oceania, and the Far East.

### **University Theatres**

Three University theatres, the Showboat, the Penthouse, and the University Playhouse, are maintained and operated by the School of Drama on the University of Washington campus. Presentations during a given academic year range from the classics to musical comedy. The University's School of Drama was a pioneer in the theatre-in-the-round productions in which the Penthouse Theatre specializes.



### Henry Art Gallery

The Henry Art Gallery offers a program of rotating exhibitions of recent work in painting, sculpture, print-making, photography, and the craft media, in addition to film programs and other special events. The spacious gallery offers favorable conditions for showing significant art exhibitions from various parts of this country. The Henry Gallery also contains a small, distinguished, permanent collection of art works.

### The Center for Asian Arts

The Center for Asian Arts, with administrative offices in 346 Mackenzie Hall, coordinates the research and teaching facilities of all schools and departments of the College of Arts and Sciences which are concerned with some aspect of Asian art, and joins these facilities with similar resources in the College of Architecture and Urban Planning. The Center gives performances, arranges exhibits, and encourages work in the creation of actual works of art.

## STUDENT HOUSING

Extensive residence programs have been developed to encourage students to participate more fully in the academic community. All unmarried students are encouraged to live in University-recognized living facilities, particularly during their freshman year. Although not required to live on campus, single women under the age of twenty-one must file with the Dean of Women their parents' written approval of any off-campus housing arrangements.

### Residence Halls

Residence hall accommodations for men and women at the University of Washington are available in a variety of types, including three coeducational buildings. All are located within walking distance to campus classrooms and laboratory buildings. Except for McMahon, the halls operate with active student government organizations in "houses" of from 50 to 120 students each. Preference in assignment to McMahon Hall is given to students of at least Junior Class standing and age twenty or older. Rofcre House, in Lander Hall, is occupied predominantly by graduate and professional students.

Most rooms are planned for double occupancy, and are furnished with twin beds and individual desks and wardrobes. Attractive dining areas, study rooms, kitchenettes, and laundry rooms have been included for student comfort and convenience. Ample study and recreation areas, including lounges and game areas, are provided in all halls.

For information about special language programs conducted in the residence halls, please refer to the material under the heading of Living-Language Groups.

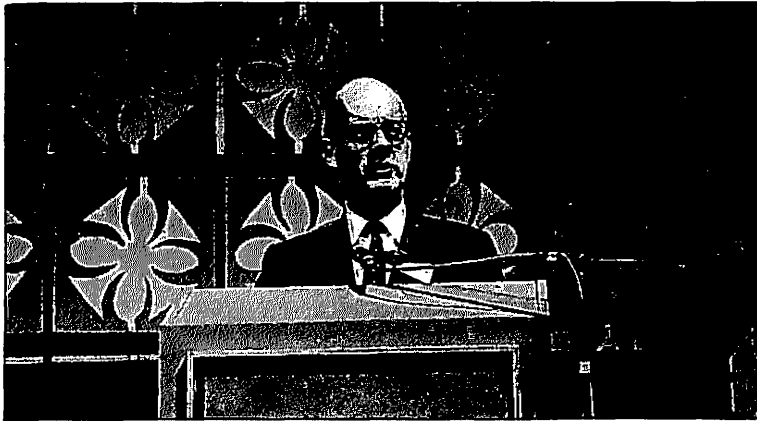
Contact the Office of Student Residences, 4039 15th N.E., Seattle, Washington 98105, for reservations or further information.

### University Housing for Married Students

The University maintains an apartment building adjacent to the campus—the Commodore-Duchess—for married students without children or for single students over the age of twenty-one. Preference for housing in these apartments is given to graduate students with part-time teaching or research responsibilities. Second preference is given to other graduate, medical, dental, and law students.

A limited number of University-owned apartments for married students also are available in Union Bay Village and Sand Point Homes. In assignment of these facilities, preference is given first to graduate students holding subfaculty appointments, and, second, to other graduate and professional students with children.

For information concerning housing for married students, contact the Office of Student Residences, 4039 15th N.E., Seattle, Washington 98105. Please indicate that you desire information for married students. This office also maintains listings of housing facilities available off campus.



### **Privately Operated Accommodations**

Listings of off-campus rental properties such as rooming and boarding houses, housekeeping rooms, apartments, and houses are maintained in the Office of Student Residences, 4039 15th N.E., Seattle, Washington 98105, for the convenience of single and married students. The University does not inspect these accommodations and, therefore, students and parents must accept full responsibility for making a selection. Because these listings change so frequently, they cannot be mailed out and must be consulted in person.

### **Fraternities and Sororities**

Twenty sororities and 31 fraternities are recognized at the University of Washington. All maintain chapter houses near the campus. Each house has complete living facilities and provides experiences in group planning and living. These groups conduct educational, social, recreational, and cultural activities and place particular emphasis on study programs for entering students.

Fraternities and sororities are granted a broad degree of self-government. However, the University makes available, through the offices of the Dean of Men and Dean of Women, staff members to advise house leaders on all phases of chapter life and operation. Activities of the fraternities and sororities are coordinated and governed by the student Interfraternity Council and Panhellenic Association, respectively. In addition to the above-mentioned duties, both of these student organizations coordinate and supervise the rush programs for their member fraternities and sororities.

For additional information write to: University of Washington, Panhellenic Association, 233 Student Union Building, Seattle, Washington 98105, or University of Washington, Interfraternity Council, 318 Student Union Building, Seattle, Washington 98105.

### **Men's Cooperative**

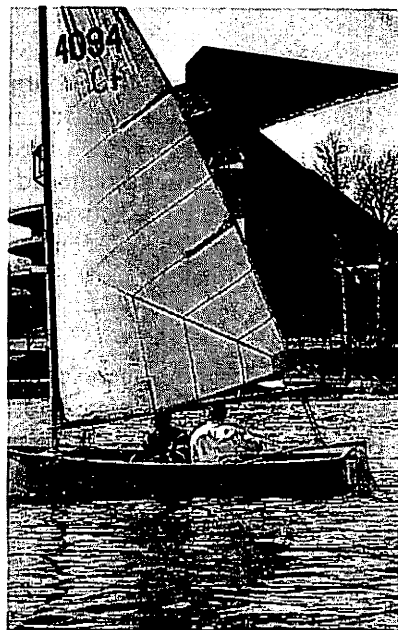
Allerlei House, a men's cooperative, provides economical living facilities for a small number of men students who share work and expenses. This residence, located one block from campus, operates as a recognized University organization.

### **Religious Living Units**

Wesley House (Methodist), Newman Club (Catholic), University Christian Union Women's House and University Christian Union Men's House (Protestant), and Baptist Student Center also provide housing for students at the University of Washington. Their primary purpose is to offer an environment consistent with religious ideals and to encourage maximum scholastic achievement.

### **Living-Language Groups**

Russian House is a living group for both men and women interested in learning the Russian language. Since Russian is spoken at all times among residents, the student should have some familiarity with the language before applying for admission to the House program. For further information write to Russian House Faculty Adviser, Department of Far Eastern and Slavic Languages and Literature, University of Washington, Seattle, Washington 98105.



Living-Language Programs in French, German, Spanish, and Swedish are conducted in several coeducational residence halls by students in cooperation with language departments. Members are grouped according to language interests, and they have most meals together. For further information, please write to the Department concerned.

## CAMPUS ACTIVITIES

### Lecture-Concert Series

Each year the University presents more than fifty programs featuring some 15 to 20 special events and concerts, which include dramatic presentations, dance groups, concerts, and approximately 35 to 40 lectures. Also included are ballets, foreign films, world travel films, and opera.

### Recreational Facilities

The University provides the student with opportunities for a well-rounded college experience, which includes participation in social, recreational, and athletic activities. The Student Union Building (the HUB) is a cultural, social, recreational, and service center for all students. Activities are planned and coordinated by student committees with the assistance of trained staff advisers. Regular dining facilities are provided by the Husky Den, the Cafeteria, the Husky Hollow, the Evergreen Dining Room, and special dining rooms also

available as private banquet rooms. Among the HUB's many facilities are the information center, ticket office, auditorium, lost-and-found service, post office, lounges, bowling alleys, billiard rooms, table tennis rooms, ballroom, bookstore, offices of student government, and several meeting rooms.

Intercollegiate athletic facilities at the University are expanding to keep pace with the growing intercollegiate program. Two major renovations will be ready for the 1967 season. The baseball team will play on the new Graves Field just east of the Golf Driving Range. A clubhouse, complete with shower and equipment facilities, will be located adjacent to the field. Eighteen new tennis courts will round out the improvements in the intercollegiate athletics complex.

Conibear Crew House, located on the shore of Lake Washington just north of Edmundson Pavilion, is one of the most modern college shellhouses in the country. It also provides living accommodations for 75 men. The Clarence S. "Hec" Edmundson Pavilion, seating 11,500 persons, is used for basketball, handball, wrestling, volleyball, gymnastics, and other sports, and in addition houses a large swimming pool for men and a practice gym.

Hutchinson Hall, the center for women's physical education activities and instruction, is equipped for basketball, badminton, tennis, swimming, dancing, fencing, and has adjacent tennis courts and playing fields.

A golf driving range with twenty automatic tees is available for student, faculty, and staff use. Waterfront facilities support sailing and canoeing programs. An Intramural Activities Building and a new marine recreational facility are planned.

Since the University is located in a major recreational area, off-campus and public facilities for swimming, sailing, skiing, riding, camping, and fishing are plentiful. Mountain climbing also ranks high among Northwest sports.

## **Athletics**

### **Intercollegiate Athletics**

The Intercollegiate Athletics program offers a 15-sport program for male students, in which nearly six-hundred men participate annually in baseball, basketball, crew, cross country, football, golf, gymnastics, riflery, skiing, soccer, swimming, tennis, track, volleyball, and wrestling. Top-flight competition in the several sports is scheduled with conference schools in the Athletic Association of Western Universities, as well as with other schools in and outside the state. The well-rounded program emphasizes both scholarship and aggressive competition in sports.

### **Men's Intramural Activities**

During the last academic year there were more than 14,300 participations in men's intramural sports. These included flag football, volleyball, swimming, table tennis, bowling, wrestling, gymnastics, basketball, badminton, handball, weight lifting, skiing, billiards, softball, water polo, tennis, track, golf, crew, and horse shoes.

A number of sports oriented clubs are recognized by the University. Some are clubs for men students only, others are co-recreational in nature. Several carry on competition with other colleges. The following groups are active at the present time: Fencing Club, Gymnastics Club, Husky Swim Club, Ice Hockey Club, Mountain Climbing Club, Rugby Club, Yacht Club, Weight Lifting Club, Winter Sports Club, and Wrestling Club.

### **Women's Recreation Program**

The Women's Recreation Council provides the University coed with a well-rounded program of recreational activities, which includes intramural events, interest clubs, and extramural events.

Through its intramural tournaments the Recreation Council provides an active program of competition among the living groups on campus. During the past year 4,200 coeds participated in intramural activities which included basketball, bowling, softball, swim marathon, volleyball, badminton, dance, fencing, archery, and field hockey.

In the extramural phase of the program, the Recreation Council sends representatives to the golf courses, ski slopes, hockey fields, bowling lanes, dance and gymnastics floors, tennis, badminton, and basketball courts for competition and experience in meeting with other West Coast schools.

Through intramural events, interest clubs, and extramural events, the Women's Recreation Council is attempting to provide an area of interest for every woman student. Relaxation, enjoyment, excitement, and exercise for everyone can be found somewhere within this program.

## **Drama**

About a dozen productions are scheduled regularly each year by the University's School of Drama. There are also a number of master's thesis presentations which range from early Greek theatre to contemporary drama. Tryouts for all University dramatic productions are open to the entire student body. In addition, the Readers Theatre of the Department of Speech sponsors a series of interpretative readings, both from ancient and contemporary sources in poetry, prose, and dramatic form.

## **Music**

In addition to the fine music available to students through the lecture-concert series, both undergraduates and graduates from all academic fields are invited to participate in a variety of musical groups.

Vocal and instrumental performing groups include: University Symphony Orchestra, University Sinfonietta, Concert Band, Wind Sinfonietta, Marching Band, University Singers, University Chorale, Madrigal Singers, Opera Workshop, Opera Theatre, Festival Opera, and Collegium Musicum.



### Forensics

The University forensics program includes extracurricular debate, discussion, oratory, extemporaneous speaking, and oral interpretation of literature, and is open to all undergraduates who demonstrate high academic achievement. Special achievement in forensics is recognized by membership in Delta Sigma Rho, national honorary society.

During a typical season, students represent the University in three hundred or more debates and a great variety of individual speaking events. In addition, some students are selected to represent the University in public discussions and debates before local civic, service, and community groups. Freshmen are especially urged to participate, and each year's schedule includes four or more tournaments for beginners in college forensics. Outstanding freshmen also represent the University in varsity activities.

### Religious Activities

There are many student religious centers in the University District which encourage students to participate in programs of religious worship, and to meet other students through planned social and educational activities.

### Student Government

The Associated Students of the University of Washington (ASUW) is the central student organization on campus. Each full-time student is a member and, through his elected representatives on the Board of Control, shares in the responsibility for the welfare of students, student benefits, and support and aid to campus organizations and activities. Other large student organizations include the Associated Women Students (AWS), the Associated Men Students (AMS), and the organized student governments of the living groups.

### Student Organizations

Students are encouraged to become active in at least one of the nearly three hundred student organizations on campus, which include honoraries, professional and social organizations, cooperative houses and residence clubs, service and coordinating clubs, activity groups, church and fraternal organizations, and geographical groups.

### Student Publications

Student publications at the University of Washington include the *Daily*, the *Tyee* yearbook, and the *Tyee* quarterly magazine. The *Daily* is published Tuesday through Friday mornings and is distributed on campus without charge. Any student with an interest in journalism is eligible to serve on the *Daily* staff. The *Tyee* yearbook and magazine are prepared by students who have volunteered their services. Top editorial and managerial positions on ASUW publications carry nominal salary allowances.

A number of other publications, such as *Assay*, a journal of creative writing, are prepared by various student groups.

### Campus Events

During the academic year, many events are scheduled for student participation. They include the School of Forestry's annual Garb Day, Homecoming Week End for both students and alumni, the International Banquet for foreign students and their friends, the Dance Drama of the Physical Education Department, Parents' Week End, Governor's Day, the Christmas Concert, ASUW Christmas Party, Scholarship Banquet, Election Banquets, Fine Arts Festival, Husky Winter Sports Club Carnival, and Commencement in June.

Other ASUW sponsored activities include the College Bowl, charter flights to Europe, dances, People-to-People international student events, art exhibits, film series, and the booking of nationally known speakers and popular musical artists.

*University Prevue*, held during the first week of Autumn Quarter for entering freshmen, includes a University reception, tours of Henry Suzzallo Library, Frosh Night at the HUB to introduce students to programs sponsored by various organizations and committees, a transfer-student program, AMS and AWS assemblies. The Husky Guide program is a student-to-student orientation plan in which older students help to introduce incoming students to the University.

*Activities on Parade*, held in the HUB ballroom early in the Autumn Quarter, highlights the many opportunities offered through participation in the activities of the ASUW committees and recognized student organizations.

## Foreign Students

Nearly twelve hundred foreign students from more than ninety countries now attend the University of Washington. Day to day contact with these students provides American students with the opportunity to hear fresh points of view expressed and to learn more about the ways in which other people live. Such contacts are valuable and take place in classes in all subjects, even though they are obviously especially valuable in fields of study such as political science, languages and literature, and geography. The free exchange of ideas and opinions, both in class and elsewhere when students meet informally, is an important benefit of attending a large university with a sizeable foreign student population. Foreign students also significantly enrich the cultural environment at the University through their contributions in the fields of art, music, and drama.

The fourteen foreign student organizations recognized by the University provide a variety of programs designed to acquaint American students with the practices, customs, and traditions of other countries. The Foundation for International Understanding Through Students, a private community organization, has offices on campus and provides numerous activities for the mutual benefit of foreign and American students. The ASUW's People-to-People program furthers international understanding through such projects as Student Ambassadors Abroad, and a weekly coffee hour which offers a casual atmosphere in which all students may become better acquainted.



## STUDENT SERVICES

### Academic Advising

Faculty members are available for personal discussions with students outside the classroom. However, since most professors at the University are engaged in a variety of teaching, research, and public service activities which occupy much of their time, students must

take the initiative in establishing advisory relationships. The University encourages students to cultivate such relationships for a better appreciation of the aims and purposes of higher education.

Academic advisers are available to assist students with registration, curriculum development, academic standards, and degree requirements. Advisers are usually located in a central advisory office within each college; however, the larger colleges often delegate certain advisory responsibilities to the individual departments. Students may consult these advisers about official curriculum approval, contemplated changes in major or college, or, more generally, about any educational concerns.

The goals of advising are consistent with those of teaching. The relationship between student and adviser is intended to foster the development of a student's intellectual growth and his ability to make intelligent, critical judgments. Therefore, the student is expected to accept the primary responsibility in making his own informed decisions on all aspects of his University career where he has discretion.

The extent to which students should use advisory services becomes a matter of individual need. All students, of course, are required to have periodic reviews of their academic programs with advisers, but beyond this the use of such services depends upon individual interest and concern about one's educational development. Students will find that advisory services, both formal and informal, are available.

### Office of the Dean of Students

The Office of the Dean of Students is concerned with the general welfare of students in their extracurricular life and activities and provides various nonacademic services to assist students. It welcomes correspondence and conferences with both parents and students. This office works closely with the advisers of the colleges and schools, the Counseling Center, and other agencies to provide assistance with personal, social, and adjustment problems that may influence a student's academic performance.

Students are invited to contact the Dean of Students Office for information about fraternities, sororities, special programs of living groups, student organizations, and special services for handicapped students.



### **International Services Office**

Students from other countries may contact the Office of International Services for information or counsel about immigration regulations, housing, social relationships, personal problems, minimum course requirements, employment opportunities, finances, and applications for scholarship aid (no scholarships are available for Summer Quarter). The Office also provides assistance in immigration matters to noncitizen faculty and staff and information for American students who are interested in study abroad.

The Foundation for International Understanding Through Students, a private community organization associated with this office, arranges many activities for foreign students and for Americans interested in foreign students.

### **Study Abroad**

The University of Washington, in cooperation with other Northwest institutions, sponsors spring and summer language study programs in Europe and a spring and summer program for undergraduates in the liberal arts, also in Europe.

The University also participates in the Intercollegiate Center for Classical Studies in Rome, which offers a program of undergraduate courses during the academic year. Admission to the program is restricted to juniors and seniors studying the classical languages.

Academic credit may also be awarded for satisfactory participation in many other overseas study programs.

Since study experience in another country can make a valuable contribution to the education of the serious student, the University maintains a counselor in the International Services Office to assist students interested in these programs, or in independent study abroad.

### **Counseling Center**

The Counseling Center in Lewis Hall Annex offers vocational and educational counseling to students who need special assistance. The staff of the Center, which includes vocational counselors and psychologists, works closely with other service agencies and the academic advisory personnel of the several colleges of the University. The services of the Center are available to any registered student who desires educational counseling about such matters as making an appropriate vocational

choice or determining a proper major area of study. The Center's staff is especially skilled in the area of psychological test interpretation and can arrange, when necessary, additional tests of special interest or aptitude.

### **Bureau of Testing**

In addition to providing a variety of educational and psychological testing services for departments, the Bureau of Testing, with offices in Lewis Hall Annex, sponsors a number of testing programs of interest to prospective University entrants and to University students approaching graduation.

The Bureau provides for University participation in the Washington Pre-College Testing Program, administering and processing the battery of grade-prediction tests. Entrance placement testing in English, mathematics, and the foreign languages is also arranged by the Bureau staff. For the graduating University student, the Bureau offers a number of tests required either for admission to graduate, law, medical, and other professional schools or for the information of governmental and private prospective employers.

### **Health Services**

The University operates the Hall Health Center located on the east side of campus, across from the Student Union Building as a medical care facility for students.

The clinics are open from 8 to 5 Monday through Friday throughout the calendar year, and offer general medical care and specialist consultation of several types. A 35-bed hospital unit operates from about September 15 through June 15; night emergency service is also available during the regular school year.

There is no charge for professional services obtained through the Student Health Service. However, students must pay for outpatient prescriptions. Major surgery and the occasional illness of exceptional severity will require treatment elsewhere, and the student should protect himself against the expenses of these by supplementary medical insurance. A low-cost group medical-surgical-hospital policy designed to meet these specific needs may be purchased at time of registration.

### **University Placement Services**

The University maintains an extensive program of placement services, both to assist students who desire



part-time or temporary work while attending school, and also to help those who are seeking career employment at the completion of their University education. The central office of the University Placement Services is located at 210 Guggenheim Hall. All general inquiries concerning the placement program of the University should be directed to this office. Students and graduates who wish to make use of the services are encouraged to visit the offices as listed below.

*Office of Student Employment* (Lewis Annex) lists many types of part-time, temporary, and summer work available, both on and off campus, to University students and their spouses. A student may make application only in person after he has established residence in Seattle, and after he has been accepted as a student by the University.

*Office of Engineering and Science Placement* (210 Guggenheim) provides opportunities for graduating seniors, graduate students, and alumni in engineering, natural sciences, and other technological fields to talk with representatives of business, industry, and government who visit the campus to interview candidates for employment. Employer information files are maintained for student use, as well as information on job hunting and interview procedures. Both local and nation-wide listings of specific career openings are also available throughout the year.

*Office of Business and Arts Placement* (135 Mackenzie) provides opportunities for graduating seniors, graduate students, and alumni in business, social sciences, liberal arts, and other nontechnical majors to talk with representatives of national and local companies during their college recruiting tours. Company brochures and general career information pamphlets are on display in the office. Listings of specific career openings are also available, together with information on job hunting and interview procedures.

*Office of School and College Placement* (120 Miller) is maintained to assist qualified students and graduates in obtaining employment in the educational field. Calls are received for college instructors, administrators, supervisors, and teachers in elementary and secondary schools. Students who wish to use this service should have recommendations collected before leaving the University, while their work and personal qualities are clear in the minds of their instructors. These records then will be available when needed. The minimum

requirement for placement registration is one full quarter in residence.

### **Financial Aid**

Students who find themselves faced with serious financial problems in attending the University are invited to inquire about the undergraduate scholarship program, Economic Opportunity Grants for undergraduates, employment under the College Work-Study Program, and loan assistance through various programs, including federal and University long-term loans and University short-term emergency loans.

Information concerning scholarship and grant aid for undergraduates and loan assistance for both undergraduate and graduate students is available from the Office of Student Financial Aid, University of Washington, 3939 University Way, Seattle, Washington 98105.

For graduate students there are scholarships, fellowships, loans, teaching assistantships, research assistantships, and other part-time employment. Graduate students will find further information concerning financial aid in the *Graduate Study* section of this Catalog.

### **University Book Store**

The University Book Store, in operation since 1900, is located at 4326 University Way N.E. The Text Book Department stocks required and recommended texts for all University courses plus technical and reference books and study aids. The Book Shop offers a wide selection in fiction, nonfiction, poetry, and 10,000 titles in paperback books for inexpensive supplementary reading. The Student Supplies Department carries art, science, engineering, and architecture materials as well as general supplies. There are also camera, typewriter, pen, sports, gift, and music shops.

An administrative-faculty-student board of trustees determines policies of the Book Store. Savings in operations are returned to students and staff through a Patronage Refund. ASUW membership makes students eligible to participate, and faculty and staff may make application for refund to the Book Store. For the convenience of students and staff a parking lot is available on 15th Avenue N.E. at the rear of the store.

Students will find a convenient supply of miscellaneous pick-up items and paperback books at the HUB branch store which also stocks textbooks for evening classes.



### Selective Service

The Registrar of the University is responsible for maintaining liaison with the Selective Service System. General information regarding Selective Service and student deferments may be obtained at 106 Administration Building.

### Parking

Self-operating parking areas on the periphery of the campus are available to day students at a nominal cost. Physically handicapped students may apply to the Safety Division for assignment to available parking spaces in the central campus area.

Students enrolled in Evening Classes may apply at the time of registration for quarterly permits to park in the central campus area.

## FEES AND EXPENSES

See *Rules and Regulations* section on fees for specific information regarding payment of fees, other fees charged by the University, and refund policies.

### Resident Students

A resident is one who has been domiciled in Washington for at least a year immediately prior to registration. Examples of Autumn, Winter, or Spring Quarter fees are listed below.

Full-Time Students (undergraduate and graduate) except Medical and Dental students <sup>1</sup> . . . . .	\$115.00
Part-Time Students (max. 6 credits exclusive of ROTC) <sup>2</sup> . . . . .	\$81.00
Ex-Service Personnel of World Wars I and II (Chapter 46, Laws of 1945)	
Full-Time . . . . .	\$80.00
Part-Time (max. 6 credits) <sup>3</sup> . . . . .	\$46.00
On-Leave Students (for graduate students only) <sup>4</sup>	\$5.00
Auditors . . . . .	\$39.00

### Nonresident Students

Prospective students are classified as nonresidents when their credentials come from schools outside Washington. If they believe they are residents, they may petition the Residence Classification Office, 205A Ad-

ministration Building, for a change of classification. Examples of Autumn, Winter, or Spring Quarter fees are listed below. (There is no nonresident fee for Summer Quarter.)

Full-Time Students (undergraduate and graduate) except Medical and Dental students <sup>1</sup> . . . . .	\$275.00
Part-Time Students (max. 6 credits exclusive of ROTC) <sup>2</sup> . . . . .	\$211.00
Ex-Service Personnel of World Wars I and II (Chapter 46, Laws of 1945)	
Full-Time . . . . .	\$222.50
Part-Time (max. 6 credits) <sup>3</sup> . . . . .	\$158.50
On-Leave Students (for graduate students only) <sup>4</sup>	\$5.00
Auditors . . . . .	\$39.00

*Note:* All fees, extra service charges, and rentals are payable in United States dollars at the time of registration. The University reserves the right to change any of its fees and charges without notice.

Fee schedules for resident and nonresident students apply to the academic year (Autumn, Winter, and Spring Quarters). Summer fees are listed in the *Summer Quarter Bulletin*.

### Payment Schedule

Students living in University of Washington housing facilities must pay fees and board and room charges *in advance* (1) at the start of each quarter or (2) on a monthly basis.

### Resident Status for Tuition Purposes

A *resident student* is one who has been domiciled in the state for a period of one year prior to the beginning of the quarter for which he registers. If the student is a minor, his domicile is normally determined by that of his parents, who must fulfill the requirement of the one year of Washington domicile. For factors important in determining the legal domicile of the student see *Appendix B*.

A prospective student is *tentatively* classified as a *non-resident* when credentials are presented from an institution of learning not located in the state of Washington. A student is likewise *tentatively* classified as a *non-*

<sup>1</sup> Students working toward advanced degrees in dentistry and surgery pay the regular tuition for the Schools of Dentistry and Medicine, and miscellaneous fees.

<sup>2</sup> Load hour equivalents of noncredit courses must be counted in the 6 credits.

<sup>3</sup> See *Veterans Information* section to determine eligibility.

<sup>4</sup> See *Graduate Study* section for an explanation of fee.



*resident* if he has attended a school located in Washington but has subsequently resided in another state. If the student believes himself eligible for resident status, he should file an application for resident classification with the University of Washington Residence Classification Office, 205A Administration Building, Seattle, Washington 98105. This should be done at least thirty days in advance of his registration

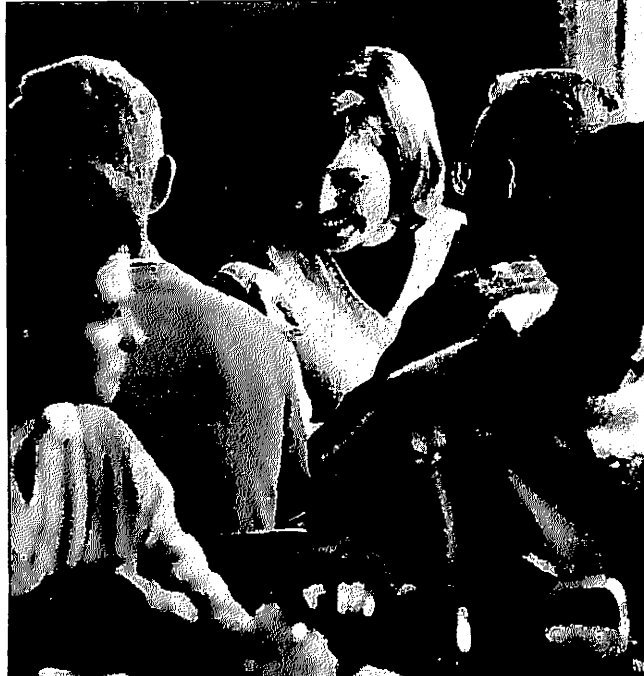
appointment in order to allow sufficient time for the determination of his proper residential status prior to the date when fees must be paid. Forms for such application are available in the Residence Classification Office.

The foregoing are the general rules followed in determining residential status for tuition purposes in accordance with the laws of the state of Washington. The facts and circumstances involved in each case must be set forth in full on the application for resident classification.

For further information, see *Rules and Regulations* section.

### **Estimated Expenses**

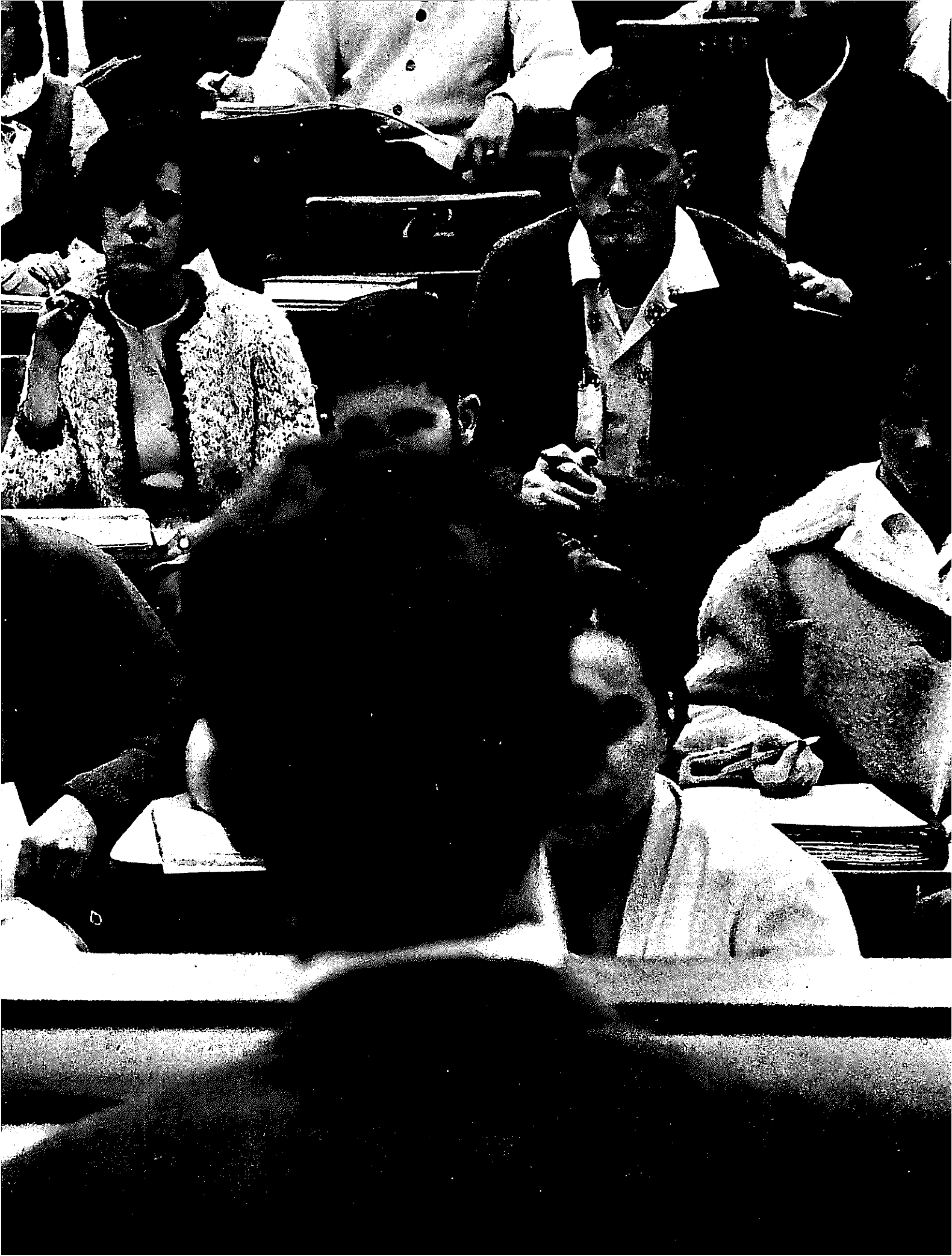
Special fees and deposits are not included in these estimates. The actual costs of books and materials are dependent on the student's major, and it should be understood that actual personal expenses will vary according to individual needs and tastes. It is recommended that each student make careful estimates of his additional expenses, such as transportation, clothing, etc.



**Estimate of Living Expenses for Academic Year**  
**FULL-TIME RESIDENT STUDENT**

Expenses	Men's, Women's, and Coeducational Residence Halls	Living at Home	In Fraternity or Sorority	
			Living at Home	Living in House
Tuition, Fees	\$345.00	\$345.00	\$345.00	\$345.00
Athletic Admission Ticket (optional)	6.50	6.50	6.50	6.50
Health and Accident Insurance (optional)	25.00	25.00	25.00	25.00
Books and Supplies	100.00	100.00	100.00	100.00
Room and Meals (average)	810.00	***	370.00	810.00
Personal Expenses*	400.00	400.00	400.00	400.00
<b>TOTAL</b>	<b>\$1,686.50</b>	<b>\$876.50</b>	<b>\$1,246.50</b>	<b>\$1,686.50</b>

\*It should be recognized that personal expenses for such items as clothing, laundry, recreation and transportation may vary widely as do the interests and needs of individual students. The parents of students living at home sometimes assume responsibility for many of these expenses in addition to room and board.





## UNDERGRADUATE EDUCATION

The University of Washington admits an undergraduate when, in the judgment of the Board of Admissions, he is able to pursue a degree program "with a reasonable probability of success."

Whether or not he chooses an academic major when he enters, the student is required to enroll in one of the University's colleges or schools. If he elects to choose a major from among the more than a hundred courses of study available, he enrolls in the particular school or college offering the program. If, on the other hand, he prefers to sample from the rich variety of disciplines offered, or wishes to undertake a preprofessional curriculum, he enters the premajor program in the College of Arts and Sciences.

Certain courses are required by all University colleges, although they vary in kind and number from one college to another, but the student can also explore his own interests and abilities through electives. In special cases, courses may be substituted for those specified in a program.

Honors programs, allowing opportunities for study in depth, are available to qualified students through special tests. Other examinations define proficiency in mathematics, language, and other areas, and de-

termine advanced credit and the student's assignment to the appropriate class.

For a complete list of programs of study, degrees offered, and the organization of the instructional departments, schools, and colleges, see the *General Information* section of this Catalog.

### ADMISSION TO THE UNIVERSITY

Eligibility for admission is determined by the Board of Admissions according to policies established by the University Faculty. The criterion is evidence of the applicant's apparent ability, as decided by the University, to progress satisfactorily in a degree program. Primary consideration is given to his scholastic standing. The adequacy of an applicant's preparation is always an important factor, but so also are aptitude as measured by test scores, recommendations, and, of course, indications of strong motivation. The University considers all available evidence of a candidate's promise, and endeavors to give students the best possible counseling through its admission decisions.

The criteria described below represent *minimums* and not the averages of students entering the University. Satisfaction of these minimum standards assures consideration. It does not necessarily guarantee acceptance.

Should there be more applicants than the University can accommodate, preference must be given to those with the greater probability of success, according to the date on which complete credentials are filed in the Office of Admissions.

### **Admission of Freshmen (Residents of Washington)**

Minimum high school preparation for admission to all undergraduate colleges of the University should include graduation from an accredited high school with a diploma representing completion of a college preparatory program of at least 32 credits to include the following units:\*

- |   |                  |
|---|------------------|
| (a) English                                 | at least 3 units |
| (b) One foreign language (for all colleges) | at least 2 units |
| (c) College preparatory mathematics         | at least 2 units |
| (d) One laboratory science                  | at least 1 unit  |
| (e) Social science                          | at least 2 units |
| (f) Electives from the above subjects       | at least 2 units |

Additional electives may be chosen from any subjects acceptable for high school graduation. The student is advised to select additional electives carefully, not only courses to reflect his academic and vocational interests, but also to increase his cultural awareness, such as courses of substantial content in the creative and performing arts. The University gives the same careful attention to the total elective pattern as it does to the student's other qualifications.

In addition to the above requirements, the student applying directly from a Washington State high school is expected to present a grade-point average of at least 2.50 (C+) in high school courses.

The talented student is urged to take advantage of the accelerated, honors, and advanced placement courses when offered by his high school. These special opportunities not only provide superior academic preparation for University work, but also help identify students most likely to profit from University-level honors courses. In addition, proficiency in English, mathematics, and foreign language can often satisfy, either wholly or in part, the requirements in some University degree programs. The well-prepared high school stu-

dent who scores high on placement examinations will need only a minimum of college work to complete such requirements.

Since incomplete preparation can delay progress toward a college degree, the student is advised to complete all *standard* courses offered by his high school, particularly if he is sure of his specific educational objectives.

### **Admission of Transfer Students (Residents of Washington)**

A student who has fulfilled the criteria listed below may be assured of consideration. Should the University be unable to accommodate all who meet these minimum standards, preference will be given to those with the better scholastic records and the more advanced class standings.

1. Completion of the specified high school-college preparatory program or equivalent introductory college courses.
2. Satisfactory progress, as indicated below, in a program of study which parallels a University degree curriculum and includes basic lower-division courses required for graduation:
  - a. A high school grade-point average of at least 2.50 and a grade-point average of at least 2.00 in any college-level work completed, or
  - b. A college grade-point average of at least 2.50 in no less than 45 transferable quarter credits of college-level work, or
  - c. A college grade-point average of at least 2.00 in no less than 75 transferable quarter credits of college-level work.

For additional information concerning the transfer of credits, see the section of this Catalog on *Rules and Regulations*.

### **Admission of Nonresidents of Washington**

The University recognizes the academic and educational benefits derived from a cosmopolitan student body and accepts highly qualified nonresidents who are able to meet significantly higher scholastic standards. As a state institution, preference must be given to residents of Washington and to sons and daughters of Washington alumni, who are accepted according to resident stand-



ards, although they are required to pay the regular nonresident fees.

Admissibility of nonresident applicants for admission with undergraduate standing are considered largely in terms of the following criteria:

**Nonresident Applicants for Admission With Freshman Standing**

(a) The adequacy of the college preparatory program completed by the applicant in high school.

(b) Scholastic achievement and rank in the high school graduating class.

(c) Scores on the Scholastic Aptitude Test of the College Entrance Examination Board. These scores are *required* of all out-of-state students and high school seniors are advised to take the test in December.

(d) Scores on the College Entrance Examination Board achievement tests are very desirable.

(e) Counselors' letters of recommendation and other supplementary information which may be helpful in evaluating the applicant's promise as a University student.

**Nonresident Applicants for Admission With Advanced Standing**

(a) The adequacy of the applicant's total educational background, both in college and high school, as preparation for University study.

(b) Scores on the Scholastic Aptitude and Achievement Tests of the College Entrance Examination Board are very desirable.

(c) Other supplementary information.

For definition of resident and nonresident status, see *Appendix B*.

**Admission of Unclassified-5 Students**

Students holding baccalaureate degrees may be admitted to one of the undergraduate colleges in an Unclassified-5 status to pursue the following objectives:

1. To qualify for a second bachelor's degree
2. To qualify for a teaching certificate
3. To take additional undergraduate courses for some other purpose approved by the University

Former students of the University who have not attended since receiving their baccalaureate degrees, as well as new students must make application and be accepted by one of the undergraduate colleges. In selecting students for this classification, careful consideration is given to their scholastic records, during the junior and senior years of undergraduate study, as an indication of probable success in achieving educational objectives. Ordinarily, residents of Washington are expected to present grade-point averages of at least 2.50, and out-of-state applicants averages of at least 3.00 in the junior and senior years of their baccalaureate degree program. Final acceptance is contingent on acceptance by the department concerned.

Such students are not in the Graduate School and ordinarily may not register for courses numbered 500 and above. Courses completed while in the Unclassified-5 status may not be applied later to an advanced degree in the Graduate School.

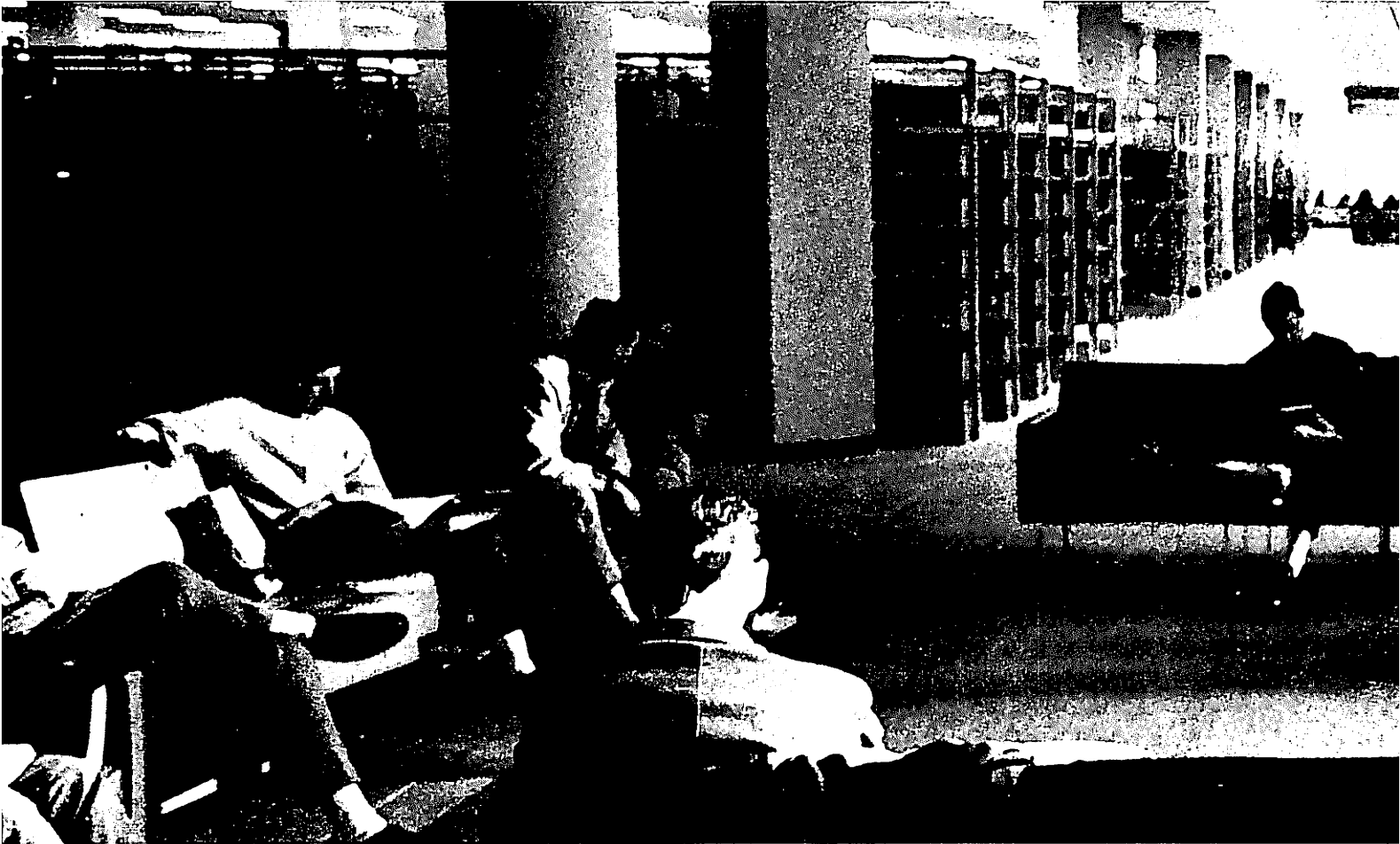
**Admission of Foreign Students and Students Educated Abroad**

The University of Washington believes that its greatest contribution to international education can be made in fields of advanced study. Since its facilities for such studies in some fields are limited, the University must select those applicants who are, on the evidence of previous academic records, best prepared to benefit from available facilities. Preference is given, therefore, to the mature student who has received a first degree, or is well advanced in such a degree program, at a university in his own country. In addition, the foreign applicant must show that he has made fully satisfactory arrangements for financing all his expenses at the University for at least one year, and he must also demonstrate proficiency in the English language. The most acceptable evidence of English proficiency is a satisfactory score on the Test of English as a Foreign Language. This test is administered at centers throughout the world by the Educational Testing Service and arrangements for taking it may be made by writing to the Educational Testing Service, Princeton, New Jersey 08540.

Foreign students are admitted for the school year beginning in mid-September and an application should be initiated the previous year in order that complete credentials may be filed before the February 1 deadline which assures their consideration for the following Autumn Quarter.

\* A unit is defined as one year, or two semesters.





#### **Admission of Veterans and Children of Deceased or Totally Disabled Veterans**

Information on the admission procedure for these applicants is contained in the *Rules and Regulations* section of this Catalog.

#### **Auditors**

In special cases, it is possible for a person twenty-one years or older to be admitted to the University with auditor status. Such auditors pay special fees and cannot enroll in any courses for credit.

In addition, with the consent of the dean and the instructor concerned, a mature person may enroll in the lecture section of any course as an auditor, provided space is available, though he cannot participate in class discussion or laboratory work. An auditor may be officially disenrolled by the instructor of the course if his attendance is not satisfactory.

To receive credit for an audited course, the student must enroll in the class in a subsequent quarter.

#### **Nonmatriculated Standing**

A nonmatriculated student is one whose educational goals are limited and who has been permitted, by the

Board of Admissions, to enroll for credit in day or evening classes to the extent facilities are available. Such students are not engaged in a program of studies which leads to a University of Washington degree or teaching credential. Permission to enroll with nonmatriculated standing implies no commitment on the part of the University, regarding later admission to a degree program.

If a student is later admitted as a matriculated undergraduate, the scholastic standing achieved and appropriate credits earned in the nonmatriculated status may apply toward the requirement for the baccalaureate degree. However, at least 45 credits must be earned in a matriculated status in order to meet graduation requirements.

For further information, refer to the *Summer Quarter* or *Evening Classes Bulletin*.

#### **Admission by the Board of Admissions**

If, for some reason, the prospective student has not fulfilled all of the admission criteria, the Board of Admissions will consider his application on the basis of additional evidence. When, in the judgment of the Board of Admissions, he has a reasonable chance of



success in the University, he may be admitted by special action of the Board with the understanding that he will comply with any conditions specified at the time of his acceptance.

## **ADMISSION PROCEDURE**

### **Application**

A request for an Application for Admission form and all correspondence regarding admission to any College or School of the University should be addressed to the Office of Admissions, University of Washington, Seattle, Washington 98105. The application form should be completed and the high school and/or college transcripts requested according to instructions on the form.

Applicants for Autumn Quarter admission are advised to file an application form and preliminary transcripts showing their scholastic records through the preceding December or January. Tentative decisions can be made frequently on preliminary records with final acceptance contingent on satisfactory completion of work in progress. In any case, complete credentials must be filed prior to the following dates in order to be assured of consideration for admission in the quarter

for which application is being made: July 15 for Autumn Quarter, December 1 for Winter Quarter, March 1 for Spring Quarter, May 15 for Summer Quarter.

The foregoing application deadlines do not apply to foreign students since students from foreign countries are admitted for the school year beginning in mid-September. An Application for Admission form should be requested about one year in advance in order that complete credentials may be filed with the Office of Admissions by February 1 to assure their consideration for admission the following Autumn.

### **Preferential Admission of High School Seniors**

High school seniors applying for admission as freshmen, Autumn Quarter, may be accepted on superior records through their junior year. Final acceptance is, of course, contingent on the satisfactory completion of the college-preparatory program specified and graduation from high school. Washington high school students should make application according to instructions given by their counselors.

### **Notification of Admission Status**

Applicants are notified officially of their admission status after complete credentials have been reviewed,

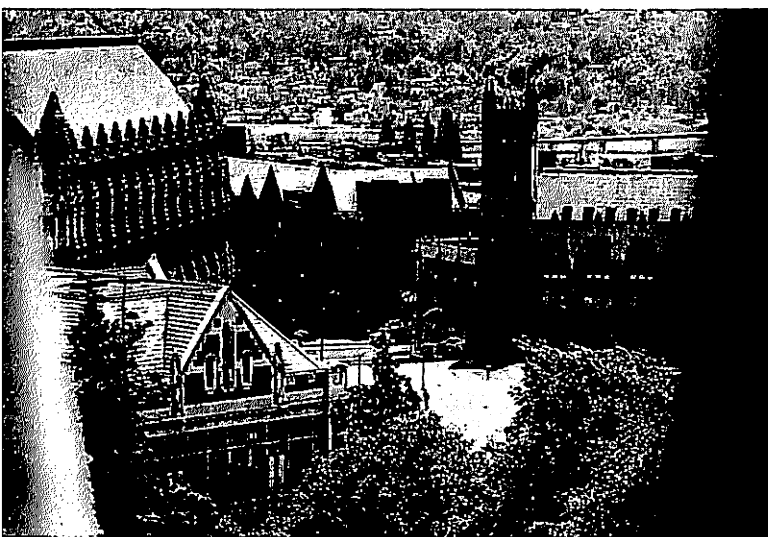
and students accepted will also receive instructions regarding registration and the payment of fees. The University assumes no responsibility for students who do not apply the information or observe the instructions given in the leaflet or for applicants who come to the campus before they have been officially notified of their admission.

The Notice of Admission is valid only for the quarter indicated and the qualifications of students whose enrollment is delayed are subject to re-evaluation for acceptance a subsequent quarter.

### **Retention of Records**

The credentials of applicants who do not register for the quarter to which they have been admitted are normally retained in the Office of Admissions for a period of one year from the date of application. At the end of this time, credentials on file are discarded unless the applicant has notified the Office of his continued interest in attending the University or of his enrollment in the Evening Classes or Correspondence Study programs.

Credentials submitted to the Office of Admissions become the property of the University and may not be returned to the student or duplicated for any purpose.



### **Campus Visitation**

The University encourages prospective students to visit the campus either singly or in groups. Arrangements should be made through the Office of High School Relations at least one week prior to the date of

the visit. Students who wish to visit the University and view its facilities on their own may request a copy of the "Campus Tour Guide."

Visits may include one or all of the following: tours of the campus and specialized facilities; conferences with pre-college counselors and departmental representatives; and visits to classes. Requests to visit classes should include specific information on the areas or classes desired. Students wishing to meet with departmental representatives should prepare themselves by having specific questions in mind.

Requests should be addressed to: University of Washington, Office of High School Relations, Seattle 98105.

### **Housing Reservations**

Admission to the University does not assure assignment to living quarters and, therefore, housing arrangements must be made separately. Application for University residence halls may be made prior to acceptance for admission but not before April 15. Early application is encouraged. Application for housing for married students may also be submitted prior to admission but no earlier than nine months prior to actual enrollment.

### **Student Medical Examination**

All new students are required to submit a medical history and medical examination report, according to instructions appearing on the form, prior to registration. Forms for submitting the report are mailed to the applicant when the Notice of Admission is issued.

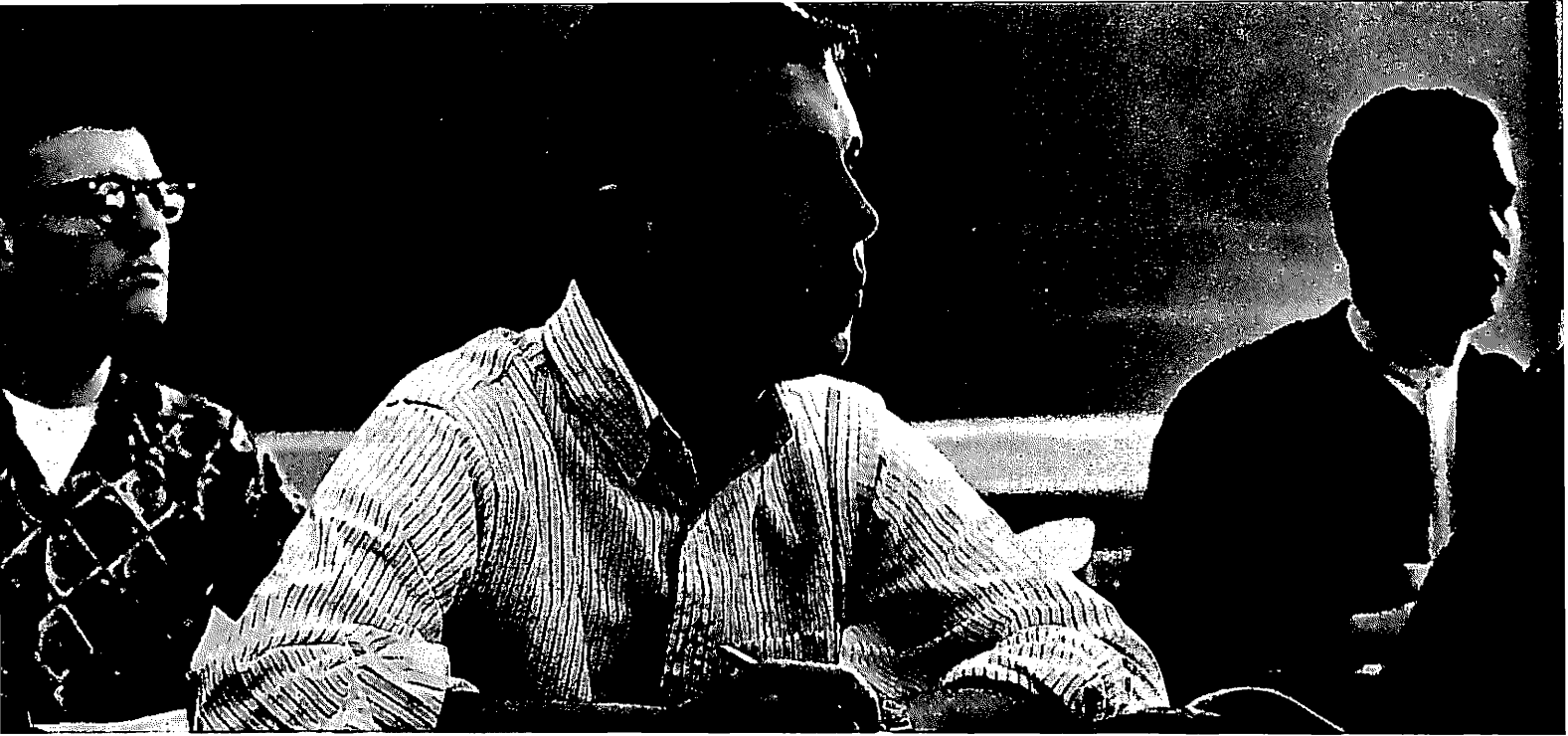
## **PRE-ENROLLMENT EXAMINATIONS AND TESTS**

### **Examinations**

#### **Washington Pre-College Testing Program**

The Washington Pre-College Test, required of all entering freshmen, is used by high school and college counselors for guidance and counseling and in assigning students to appropriate sections in English, mathematics, etc.

All high school seniors in the state of Washington are urged to take this examination when it is offered, and the student should bring a copy of the results with him when he comes on campus for his first conference with



his counselor or adviser. The out-of-state freshman is required to complete the test during registration.

The test is also required of transfer students who have not completed courses equivalent to English 101 (English Composition), or Humanistic-Social Studies 265 (Techniques of Communication), and Mathematics 101 (Intermediate Algebra), or Philosophy 120 (Introduction to Logic).

Special and foreign students, blind applicants, and auditors are exempted. Sample tests are not available.

#### **College Entrance Examination Board Scores**

Scores on the Scholastic Aptitude Test of the CEEB are required of nonresident students who seek admission to the University as freshmen.

#### **Mathematics Placement Tests**

The student's mastery of intermediate algebra and plane geometry is evaluated by a section of the Washington Pre-College Test which determines his placement in appropriate University mathematics classes. A satisfactory score on this section permits him to enroll in Mathematics 104 (Plane Trigonometry) or Mathematics 105 (College Algebra).

The student who fails to qualify but is interested in taking more advanced mathematics courses can enroll in Mathematics 101 and, after successful completion of this course, take 104 or 105. The student who has completed the third semester of high school algebra will not receive credit for Mathematics 101.

The Mathematics Achievement section of the Washington Pre-College Test covers two and one-half years of high school algebra and geometry (three semesters of algebra, two semesters of geometry). Additional placement tests, given by the Bureau of Testing for the Department of Mathematics, determine the appropriate University course for the student who has had trigonometry, four semesters of algebra, mathematical analysis, or similar subjects in high school. *The student is advised to review before taking these examinations.*

#### **Freshman English Placement Test**

The Washington Pre-College Test also evaluates the student's preparation for Freshman English Composition, and he is initially placed in Freshman English (English 101 or 101H) according to his test scores. The student who does not reveal an adequate preparation is required to take (at his expense) a remedial course which carries no college credit (English XN50) before beginning the freshman courses.

#### **Foreign Language Placement Examination**

In qualifying for a degree from the College of Arts and Sciences, the student is required to complete foreign language study equivalent to the second year of college work, and most students in the College will be expected to study a foreign language during their freshman year. A required language examination offered prior to registration evaluates the student's reading and listening comprehension in his chosen foreign language, and determines his placement in language courses appropriate to his pre-University preparation and his field of special interest.

On the basis of this examination, the student who has had extensive pre-University foreign language preparation may be referred to the appropriate academic department to complete a Foreign Language Proficiency Examination. The student who passes the Proficiency Examination may be excused from further language study if he so wishes.

#### **Engineering Graphics Test**

The engineering student is required to complete this aptitude test and, if he qualifies, may elect to take the honors graphics sequence, General Engineering 104 and 105.

#### **Credit Examinations**

To receive credit by examination in courses offered by the University, the regularly enrolled student is required to pass examinations on his independent study, work done by private study, or in class work for which no credit has been granted by an institution of either secondary or collegiate grade.

For rules governing the granting of credit examinations, consult the section of this Catalog which deals with *Rules and Regulations*.

#### **Health Examinations**

Prior to registration, the student entering regular University classes for the first time (disregarding previous attendance in Evening Classes or Summer Quarter), or returning after an absence of more than one calendar year, is required to submit a physician's report of a physical examination and a health history, and take a chest X ray.

The Health History and Physical Examination form, sent by the Office of Admissions to new students, and to returning former students by the Registrar, must be completed by the student and his physician and returned to the University before the specified deadline, since registration cannot be completed without medical clearance.

Chest X rays are given free of charge at the Hall Health Center during or before the student's registration date or on that day; but, this requirement must be met before clearance for registration will be given.

Foreign students (except Canadians) will be taken to Hall Health Center for the required physical examination when they arrive on campus.

#### **Physical Education**

All students must enroll in, and satisfactorily complete a physical education activity course each quarter for three quarters. Physical education courses do not count toward the all-University graduation requirement of 180 credits.

(a) Unless otherwise exempted, all first-quarter freshmen must enroll in one physical education activity each quarter for the first three quarters of residence.



(b) In fulfilling the foregoing requirement, all students must pass a swimming test or satisfactorily complete one quarter of swimming. No activity course may be repeated for credit.

(c) Any student for whom limited physical activity is recommended by his physician, or who has a marked physical handicap, should consult with the Student Health Service (Hall Health Center) for exemption or assignment to special courses with modified activity.

(d) Students enrolled in the activity courses are required (1) to furnish suitable clothing for the activity;

(2) to pay the physical education fees for lockers, as well as towels (see section on *Fees and Charges*); and

(3) to furnish all, or some, of the equipment in certain courses.

(See "Physical Education Requirements" under the *Rules and Regulations* section.)



## HONORS

High scholastic achievement is encouraged and recognized in many ways at the University of Washington, and a major effort is made to place the student at an academic level in keeping with his ability and preparation.

Honors programs are available to academically talented students in the College of Arts and Sciences, the School of Business Administration, and the College of Engineering. (See appropriate sections for details.)

### Advanced Placement and Credit

Advanced placement and/or credit in English, mathematics, foreign languages, and other subjects is granted to the superior student, at the discretion of the University department concerned, on the basis of scores earned in College Entrance Examination Boards, Advanced Placement Examinations, and the placement test administered to entering students. The student who has special competence in some academic area can also apply to the appropriate department for an examination to qualify for advanced placement or credit.

### Special Honors Sections

Some colleges provide special courses and special sections of other courses for the unusually talented. Though primarily intended for those enrolled in formal honors programs, some such sections are open to other qualified students. For example, students who place high on qualifying tests may enroll in honors sections of English composition and mathematics.

### Quarterly Scholarship Lists

These lists include the names of regular undergraduate students who have attained a grade-point average, non-cumulative, of 3.50 in the final grades for at least 12 registered credits, exclusive of lower-division physical education activity and lower-division ROTC courses. They are published in the University *Daily* newspaper and in many Washington State newspapers about four weeks after the end of each quarter.

### Yearly Undergraduate Honors List

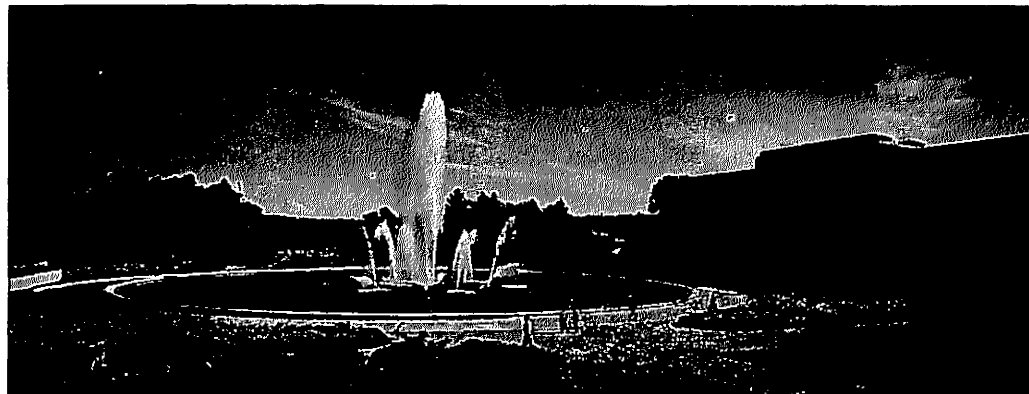
Names of all undergraduates who have achieved a cumulative grade-point average of 3.50 or better for at least 36 credits of resident instruction in three quarters or 46 credits of resident instruction in four quarters at the University of Washington during the preceding academic year, exclusive of lower-division physical education activity and lower-division ROTC courses, are included on this list.

### Certificates of High Scholarship

The University of Washington awards certificates of high scholarship to sophomores, juniors, and seniors who show excellence in scholarship during their freshman, sophomore, and junior years, respectively. These are presented each spring at the AMS-AWS Scholarship Banquet.

### Sophomore Medal

Annually, the junior having the highest scholastic standing for the first two years of his program receives this medal from the President at the Scholarship Banquet.



### Junior Medal

This award is presented annually by the President at the AMS-AWS Banquet to the senior having the highest scholastic standing for the first three years of his University program.

### Baccalaureate and College Honors

Baccalaureate honors (*summa cum laude*, *magna cum laude*, *cum laude*) are awarded to recipients of a first bachelor's degree (Bachelor of Laws is excepted), and are based on the student's entire scholastic record.

Students successfully completing the College of Arts and Sciences Honors Program or the College of Engineering Honors Program are awarded a bachelor's degree "With College Honors" in the major field. Arts and Sciences students completing the honors curriculum in a single department are graduated "With Distinction" in the major field.

Graduation honors appear in the *Commencement Program*, are inscribed on the student's diploma, and recorded on his record.

### President's Medal

Conferred at Commencement, the President's Medal recognizes the graduating senior who has the most distinguished academic record.

## ENROLLMENT

If the entering student is relatively sure of his objectives, and has perhaps taken advantage of high school career days or received specialized vocational counseling, he enrolls in the college which teaches the curriculum in which he intends to major.

If he wishes to pursue a preprofessional program (dental hygiene, dentistry, law, medical technology, medicine, occupational therapy, or physical therapy), he enrolls in the College of Arts and Sciences. Here the premajor program is designed to provide a coherent, broad, academic program. The student can remain in this status for two years, during which time he can satisfy certain graduation requirements and, through the judicious choice of electives, explore possible majors.

The student who is undecided about his career and has not chosen a major will find the following special facilities available for his use:



He can make use of the Counseling Center, which provides career counseling in the areas of vocational and educational choice. This service is free of charge to any registered University of Washington student. In addition, the University Placement Office maintains a library of career information, and staff counselors are available to provide first-hand information concerning hiring trends in business and industry.

Survey courses, for both majors and nonmajors in various academic departments, can acquaint the student with a particular subject or area.

### Graduate Enrollment

University of Washington students who are within 6 credits of completing their undergraduate work and who otherwise meet the requirements for admission to the Graduate School may register the quarter just prior to admission to the Graduate School for as many as 6 credits in graduate courses in addition to their 6 credits of undergraduate work. This registration and these arrangements must receive prior approval by the Graduate School.

### Change of College or Major

As the student matures and gains experience, he may shift his goal accordingly. Recognizing this, the University imposes no conditions upon a student who wishes to transfer from one college or major to another, provided he meets the qualifications of the major or college he wishes to enter.





The student who wishes to transfer from one college to another must obtain approval from the deans of the two colleges concerned. Forms for change of college can be obtained at the College Advisory Office of the college the student is leaving.

To change majors within a college, the student should consult his academic adviser or the central advising office of his college.

Anyone considering a change of major or college is urged to discuss the matter thoroughly with his academic adviser and other knowledgeable persons.

of physical education activity courses and ROTC. If he carries 15 credits for each of the twelve quarters and passes them, he will have the minimum 180 credits necessary for graduation. In practice, students carry more or less than the usual number of credits, depending on personal circumstances and chosen programs.

Minimum and maximum credit loads for a given quarter are established by University regulations. However, these rules are subject to waiver by the dean of the college in certain individual cases. In general, no undergraduate can be registered for fewer than 12 credits, nor more than 16 credits or the number called for in



## Refresher and Review Program

The University maintains a summer refresher and review program in English, mathematics, and foreign languages (German, French, and Spanish) for entering students. These are intensive, ungraded courses of four-week duration for those whose skills in one of these areas either have diminished or who have experienced difficulties in secondary school. Classes are limited to 15 students and, except in unusual circumstances, a student may review only in one of the areas. Classes are held during the four weeks before Autumn Quarter.

## ACADEMIC REQUIREMENTS

### Credit Load

A full-time student at the University is expected to carry the normal number of 15 credits per quarter, exclusive

a prescribed curriculum, exclusive of physical education activity courses and lower-division ROTC.

With the exception of students in the Schools of Medicine and Dentistry, no student shall be registered for, or receive credit for, more than 20 credits of work exclusive of physical education activity courses and lower-division ROTC.

In order to be eligible for participation in intercollegiate athletics, the student must carry at least 12 academic credits; to hold office in student governmental bodies, he must carry a minimum of 10 credits each quarter.

### Minimum Grade Points

The student is expected to maintain a reasonable level of academic performance consistent with University standards.



The undergraduate student is expected to maintain a cumulative 2.00 minimum grade-point average. Excepting his first quarter of University work, a student is placed on academic probation if he falls below this standard. All-University scholarship requirements are detailed under "Maintaining Satisfactory Scholarship" in the *Rules and Regulations* section of this Catalog.

It should be noted that some colleges and some degree programs require a higher minimum average for continuing in certain major fields of study. For specific information, refer to individual college and departmental requirements.

The student on probation is advised to seek assistance from the faculty, his adviser, the assistant dean of his college, the Dean of Students, or from staff members of other agencies such as the Counseling Center.

### **Graduation Requirements for a Bachelor's Degree**

Degrees are granted at the close of any quarter when all graduation requirements are met, although formal commencement exercises are held only at the close of Spring Quarter each year. To be recommended for a bachelor's degree, the student must:

- (a) Complete one year of work as a matriculated student in residence at the University of Washington, normally the senior year, earning at least 45 credits in courses given here.
- (b) Have earned a minimum of 180 academic credits, exclusive of the credits required to complete physical education activities.
- (c) Meet the graduation requirements of the college in which he is enrolled (see the *College* section for graduation requirements).
- (d) Complete the required 180 academic credits with at least a 2.00 grade-point average. (See in *Rules and Regulations* section on cumulative and graduation grade point.)

The prospective candidate for a second bachelor's degree must earn at least 45 additional credits and meet the current requirements of the college or school concerned at the time of application for the degree.

### **TEACHER CERTIFICATION**

Both the Provisional Certificate and the Standard Certificate may be earned through the University of Washington.

The Washington State Standard Certificate is awarded through the Office of the State Superintendent of Public Instruction upon completion of at least two years of successful teaching and the earning of 45 approved credits beyond the baccalaureate degree as a matriculated student.



### **RESERVE OFFICERS TRAINING PROGRAMS**

The Departments of Military Science, Naval Science, and Aerospace Studies offer ROTC programs under agreements between the University and the United States Army, Navy, and Air Force. Eligible male freshman students may enroll in any one of the ROTC programs. Transfer or currently enrolled students who plan to attend the University at least six more quarters (excluding summer sessions) may apply for enrollment in ROTC. Participation in ROTC is elective.

The Army program consists of a two-year basic and a two-year advanced course. The advanced course is open to selected students and leads to a commission in the Army.

The primary program offered by the Department of Naval Science is a four-year program augmented by a limited two-year Advanced Contract Program. Both lead to a commission in the Navy or Marine Corps.

The Air Force program consists of a two-year General Military Course and a two-year Professional Officer Course, which lead to a commission as a Second Lieutenant in the United States Air Force. Any qualified male student may enroll in the General Military Course. Each qualified entering male freshman may register for Air Force ROTC and will be enrolled in the four-year program. Students to be given financial assistance will be advised accordingly. Transfer students having eleven or more quarters remaining in school may also enroll in



the four-year program. Transfer students with at least two full years remaining in school may apply for the two-year non-grant program. AFROTC counselors are available at all times in the Aerospace Studies Department.

Students given financial assistance and entering the advanced or upper-division ROTC program must agree in writing to complete the program and accept a commission in the service for which they are educated.

The specific courses and requirements for each service are described in the following sections. The courses are taught by regular officers assigned to the University by the Army, Navy, and Air Force.

## Military Science

### Professor of Military Science

Col. Frank O. Fischer  
149 Savery Hall

### Assistant Professors

James M. Eggarichs, Donald R. Hiller, Oren P. Phipps

### Instructors

Dean Brown, Glyn H. Bynum, Willis G. Hiatt

Beginning with the academic year 1965-66, the Army Reserve Officers' Training Corps offers two four-year programs and a two-year program which provides the incoming student with options for the attainment of an Army commission on an elective basis while pursuing his academic studies.

### Four-Year Financial Assistance Program

This program is open to incoming freshman students and leads to a commission in the Regular Army or the Army Reserve. All tuition, laboratory fees, textbooks, and uniform items, plus retainer pay of \$50.00 per month for a maximum of four years, are provided by the U.S. Army. Four years of academic study on campus are required, as well as a six-week summer camp training period between the junior and senior years for which the cadet receives \$180 plus travel pay of 6 cents per mile to and from the camp location. Academic studies include courses in military tactics, leadership, methods of instruction, staff procedures, logistics, and military law. The student must sign a contract (with consent of parents if under twenty-one years of age) wherein he agrees to complete the program, enlist in the Army Reserve, accept a commission if offered, and serve on active duty for four years after

commissioning. Applications for this program should be made while the student is still in high school. Selection of students will be made on a nation-wide competitive basis after approval by the Professor of Military Science.

### Four-Year Contract Program

Open to incoming freshman students, this contract program leads to a commission in either the Regular Army or the Army Reserve. All military textbooks and uniform items, plus retainer pay during junior and senior years of \$40.00 per month for a maximum of 20 months, are provided by the U.S. Army. The course of instruction, the academic studies, and summer camp training are exactly the same as those conducted under the financial assistance program except that the program is divided into Basic (first and second year) and Advanced (third and fourth year) Courses. Upon selection by the Professor of Military Science, the student must sign a contract (with consent of parents if under twenty-one) wherein he agrees to complete the advanced course, enlist in the Army Reserve, accept a commission if offered, and serve on active duty for a period of two years after commissioning. Selection of students for this program will be made at the local level by the Professor of Military Science.

### Two-Year Contract Program

This program is open to students presently enrolled at the University or to students who are transferring here from a community college or another university where ROTC was not available. Completion of this program leads to a commission in either the Regular Army or the Army Reserve. All military textbooks and uniform items, plus retainer pay of \$40 per month for a maximum of 20 months, are provided by the Army. The course of instruction requires two years of academic study on campus, a six-week basic summer camp between the sophomore and junior years, and a six-week advanced summer camp training period between the junior and senior years. Students receive \$117 for the basic camp and \$180 for the advanced camp training, plus travel pay of 6 cents per mile to and from the camp's location. Academic subjects covered in the two-year program are the same as those covered in the advanced course of the four-year program described above. It should be noted that the only difference between the four-year and two-year contract programs is that a six-week summer camp is substituted for the two-year Basic Course described under the four-year program. The level of selection as well as obligations and advantages to the student are the same in both programs.

Flight training is available to interested cadets after completion of the first year of the advanced course. Successful completion of this training may lead to a private pilot's license and assignment as an Army aviator.

Students in the basic program are provided uniforms which are turned in at the completion of the basic course. Students in the advanced program are provided new uniforms which become their personal property when commissioned. Uniforms are worn at all Leadership Laboratory classes and when otherwise specified. At the time of registration each student must make a \$25.00 deposit, which is refunded when the uniform and textbooks are returned undamaged.

Inquiries about enrollment or other information should be addressed to the University of Washington, Professor of Military Science, 149 Savery Hall, Seattle, Washington 98105.

### **Naval Science**

#### **Professor of Naval Science**

Capt. Richard B. McNees, USN  
309 Clark Hall

#### **Associate Professor**

Cdr. Harold W. Johnston, USN  
303 Clark Hall

#### **Assistant Professors**

Lawrence A. Brennan, Ralph S. Chapman, Austin P. Dunn, Joseph S. Good

#### **Instructors**

Robert L. Baisden, Jr., M. C. Lange, Ernest H. Oliver, Raymond W. Pool, Nelson A. Rowland

The Department of Naval Science offers college students the opportunity to engage in study leading to a commission in the United States Navy or Marine Corps while working toward a baccalaureate degree in an academic field. Three programs are offered.

#### **Naval ROTC Contract Program**

Just prior to the beginning of Autumn Quarter each year, the Professor of Naval Science selects approximately fifty students to enter the four-year Naval ROTC Contract Program.

Contract Naval ROTC students must, with the consent of their parents, agree to complete the four-year course,

to accept a commission in the U.S. Naval Reserve or U.S. Marine Corps Reserve if offered, and to serve on active duty for a period of three years.

Naval ROTC students must have the following general qualifications:

- (1) Be admitted to the University.
- (2) Be male citizens of the United States between the ages of seventeen and twenty-one on June 30 of the year of entrance.
- (3) Meet physical requirements.
- (4) Be unmarried and agree to remain unmarried until commissioned.

#### **Naval ROTC Two-Year Contract Program**

Early in the Spring Quarter each year, male students completing their sophomore year (or third year in an established five-year curriculum) in an accredited college or junior college who are enrolled in or accepted for enrollment in the University of Washington, may apply for the two-year Naval ROTC Contract Program. Contract requirements and other qualifications are generally similar to those required of candidates for the four-year Contract Program except the age limits are eighteen to not more than twenty-two years of age on June 30 of the year of entrance.

Applicants selected for the two-year NROTC Contract Program will be required to attend a six-week Naval Science Institute at a designated NROTC University, not necessarily the University of Washington, during the summer prior to entrance into the Program. The costs incident to attendance at the Institute are defrayed by the Navy. Upon successful completion of the course of instruction at the Institute the students may be enrolled in the junior year of the standard Naval ROTC Contract Program.

Both two- and four-year NROTC Contract students pay their own college expenses but receive subsistence pay of \$40.00 per month during their junior and senior years, including the intervening summer. The Navy furnishes the uniforms and textbooks used in Naval Science courses.

NROTC Contract students may be enrolled in any University curriculum leading to the receipt of a baccalaureate degree.



One summer cruise of approximately six weeks duration, normally scheduled between the junior and senior years, is part of the Naval Science course.

## **Naval ROTC Regular Program (Midshipmen, USNR)**

Each year a limited number of young men are accepted for the four-year Naval ROTC Regular Program, following nation-wide examination and selection by a state selection committee. They are appointed as Midshipmen USNR, and are provided a four-year college education subsidy by the Navy; all tuition, fees, textbooks, uniforms, and \$50.00 per month subsistence pay. Upon graduation, Midshipmen, USNR, are commissioned as regular officers in the United States Navy or Marine Corps.

Application must be made in November for entrance into the program the following autumn. Qualifications are, in general, as listed above for the four-year Naval ROTC Contract Program.

All Naval ROTC students take the same naval science courses during the first two years. Two-year Naval ROTC Contract students complete the same curriculum in an intensified manner during their summer session at the Naval Science Institute. Students who plan to be commissioned in the Marine Corps take Marine Corps subjects as Naval Science during their third and fourth years; those who plan to be commissioned in the Supply Corps of the Navy take Supply Corps subjects during this period.

Further information about the regular Naval ROTC Programs may be obtained by writing the Professor of Naval Science, Clark Hall, University of Washington, or by visiting the NROTC Unit in Clark Hall.

## **Air Force**

### **Professor of Aerospace Studies**

Lt. Col. Charles H. Lewis, USAF  
Physics Annex 3

### **Assistant Professors**

Duane C. Oberg, Gilbert A. Scriven, Jr.

### **Instructors**

Floyd R. Atchison, Frederick W. Hoopes, Darrell R. Parker, Robert K. Rogers, Lindle M. Scott

The Air Force ROTC program is designed to provide for the development of skills and attitudes vital to the

career professional Air Force officer. The graduate qualifies for a commission and enters upon active duty in the United States Air Force.

The four-year Air Force ROTC program consists of a two-year General Military Course, and a two-year Professional Officer Course. Any qualified male student may enroll in the General Military Course. This program consists of one classroom period and one Corps Training hour per week during each of the six quarters. Uniforms and textbooks are furnished. After completing the General Military Course, students may apply for entrance to the Professional Officer Course.

Students selected for enrollment in the Professional Officer Course are enlisted in the Air Force Reserve, receive retainer pay of \$40.00 per month for up to 20 months, are furnished texts and an officer-type uniform, and are required to attend classes three periods and Corps Training one hour each week. Between the junior and senior year, each cadet is required to attend a four-week Field Training Course at an Air Force base, for which he receives pay of \$120.

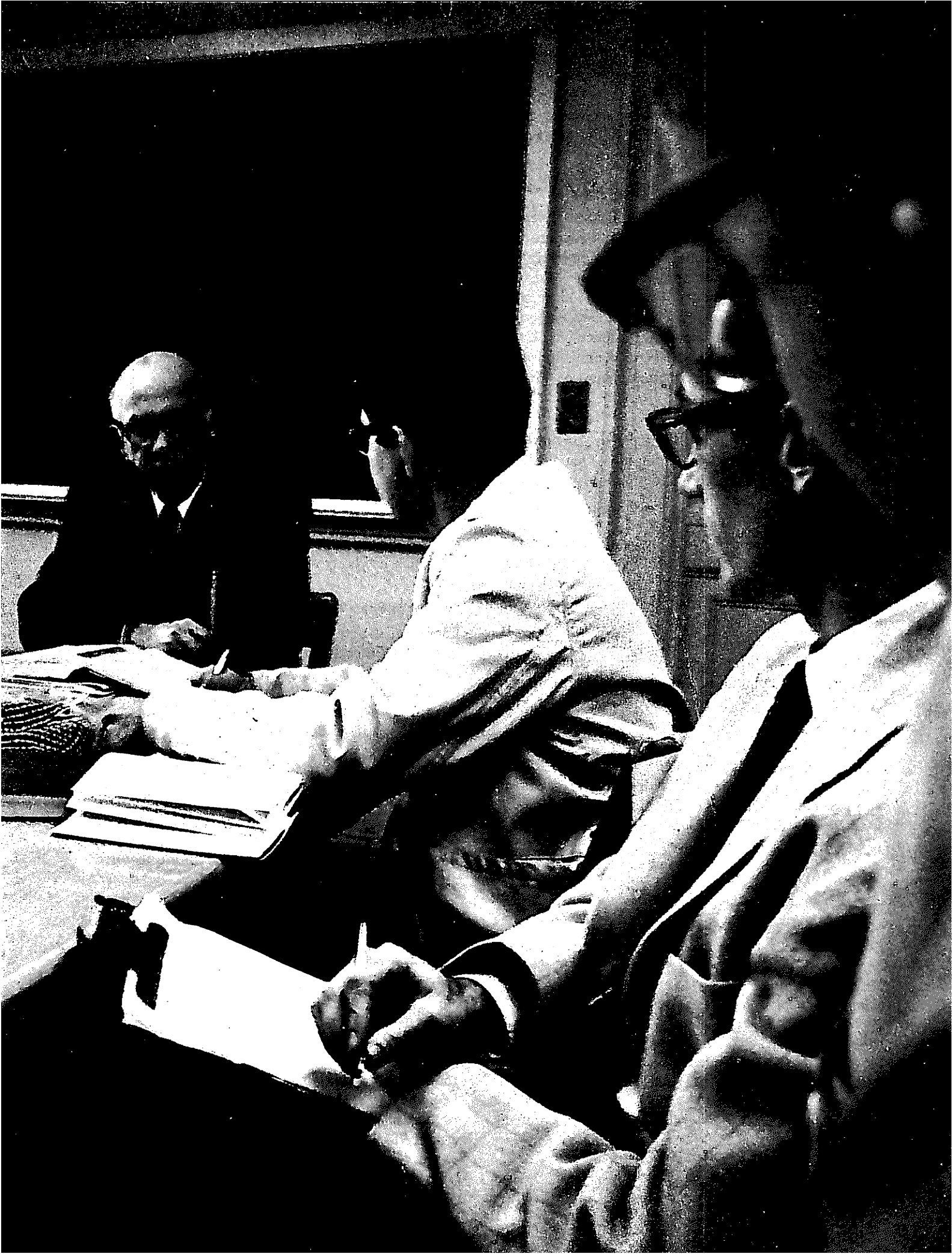
## **Financial Assistance Program**

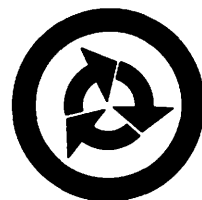
Each year a number of selected students are enrolled in the Air Force Financial Assistance Program. These students are enlisted in the Air Force Reserve and receive tuition, fees, books, uniforms, and a \$50.00 per month retainer for a specified period. Course requirements are as described above.

## **Two-Year Air Force ROTC Program**

To provide for those students who are unable to participate in the four-year Air Force ROTC program, a two-year Professional Officer Course is available on a limited basis. Students in this program are required to attend a six-week Field Training Course at an Air Force base during the summer preceding entry into this program. The student receives \$123 pay for the six-week period. Course requirements, upon return to the campus, are as listed for the Professional Officer Course except that the four-week Field Training Course between the junior and senior year is not required. Uniform, texts, and a retainer of \$40.00 per month are provided.

Inquiries about enrollment or other information should be addressed to the University of Washington, Professor of Aerospace Studies, Physics Annex 3, Seattle, Washington 98105.





# GRADUATE STUDY THE GRADUATE SCHOOL AND RESEARCH

## **Officers of the Graduate School**

Joseph L. McCarthy, Ph.D.  
*Dean of the Graduate School*

Henrietta Wilson, M.A.  
*Assistant to the Dean of the Graduate School*

Edward C. Lingafelter, Ph.D.  
*Associate Dean of the Graduate School*

Robert W. Ritchie, Ph.D.  
*Associate Dean of the Graduate School*

Frank T. Watkins, B.S.  
*Coordinator of Office of University Research*

## **Executive Committee of the Graduate School**

Joseph L. McCarthy, *Chairman*

Thomas G. Rosenmeyer, *Group I*

Alex S. Edelstein, *Group II*

Maurice Rattray, *Group III*

W. Stull Holt, *Group IV*

Frederic Giles, *Group V*

Lennart N. Johanson, *Group VI*

Lowell White, *Group VII*

Elizabeth C. Giblin, *Group VIII*

## **Graduate Faculty Council and Group Operating Committees**

(The combined membership of the eight Group Operating Committees comprises the Graduate Faculty Council—Joseph L. McCarthy, *Chairman*)

### **Group I**

Gerhard Baumgaertel, A. C. Hamilton, Andrew R. Hilen, Jr., Carroll Reed, Thomas G. Rosenmeyer  
(*Chairman*)

### **Group II**

William Bergsma, A. S. Edelstein (*Chairman*), Gregory Falls, Boyer Gonzales, Norman J. Johnston

### Group III

Lauren Donaldson, G. D. Halsey, Boris A. Jacobsohn, Victor Klee, M. Rattray (*Chairman*)

### Group IV

E. A. T. Barth, Arthur Bestor, W. Stull Holt (*Chairman*), M. David Morris, D. W. Treadgold

### Group V

Philip J. Bourque, Frederic T. Giles (*Chairman*), Charles N. Henning, Robert W. Little, J. Rosenzweig

### Group VI

Thomas F. Archbold, Morris E. Childs, S. P. Gessel, L. N. Johanson (*Chairman*), Walter E. Rogers

### Group VII

W. H. Akeson, Earl W. Davie, N. Karle Mottet, R. T. Prehn, Lowell White (*Chairman*)

### Group VIII

Katharine Fox, Elizabeth C. Giblin (*Chairman*), Marguerite Hunt, Patricia J. Keller, L. W. Rising

Graduate Study has been offered at the University of Washington for three-quarters of a century. Over the years it has grown steadily in quality, scope, and size.

## GRADUATE STUDY

The Graduate School, which was formally established in 1911, is administratively responsible for graduate study in whatever division of the University such study is undertaken. This involves supervision of student programs which go beyond formal undergraduate work or the work of the professional schools, into areas of advanced training, education, research, and scholarship.

Programs leading to master's and doctoral degrees are offered in sixty-eight departments or other organizational units within twelve schools and colleges of the University. Graduate instruction and the supervision of the research of graduate students is conducted by a Graduate Faculty of more than nine hundred senior professors. Over forty-six hundred graduate students are now in residence, seeking their master's or doctoral degrees in the Graduate School at the University of Washington. There are, in addition, some three hundred postdoctoral students in residence.

In addition to its primary role in relation to graduate students, graduate faculty, and graduate study programs

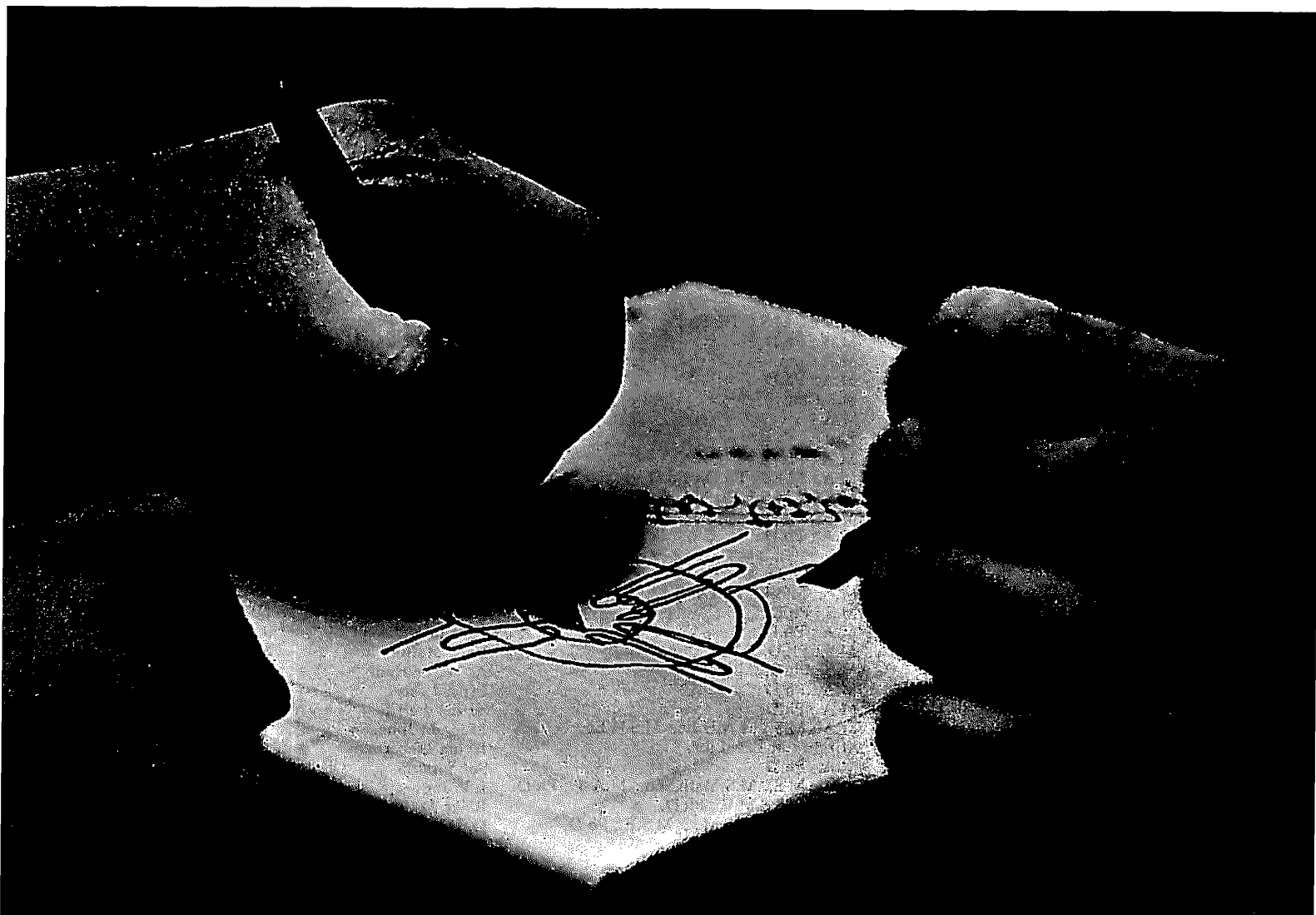
and degrees, the Graduate School is also responsible for the administration of certain academic or research activities and facilities of general significance in all or many fields of knowledge throughout the University. The Graduate School is administered through the Office of the Dean, the Executive Committee of the Graduate School, Group Operating Committees, and the Graduate Faculty Council. The Graduate Faculty Council is composed of representatives elected to eight Group Operating Committees by the members of the graduate faculty, and it and the Executive Committee of the Graduate School serve as the legislative and policy-making bodies of the graduate faculty. The Executive Committee consists of the Dean of the Graduate School and the elected chairman of each of the eight group Operating Committees; it acts as an advisory group to the Dean and as an administrative committee for the Graduate Faculty Council.

The University of Washington Graduate School recognizes major responsibilities in three closely related fields—teaching, research, and public service.

Highly able students who have completed baccalaureate programs are offered the opportunity to further improve their knowledge, understanding, and ability to create and to practice in their chosen fields. Their achievements may be recognized by the award of the degree of Master at the end of one or two years of study, or Doctor at the end of three or more years of study. Students who have completed advanced degree programs usually serve as teachers, research or administrative leaders, or professional practitioners in their respective fields.

In contrast with undergraduate work, graduate study is ordinarily focused quite sharply on some specific field, and the student is expected to develop and demonstrate substantial initiative, mature judgment, and creativeness. Often the graduate student carries on his program in close association with his chosen professor in a tutorial type relationship.

Many diverse programs of graduate study are available. In nearly all of these, two objectives can be distinguished, although their relative importance may differ. In many programs particular emphasis is placed on leading the student to excellence in his ability to teach, and to create new knowledge by research; his achievements are recognized by the award to him of the Master of Arts or the Master of Science degree, or the Doctor of Philosophy degree. In other programs emphasis is



placed on leading the student to excellence in his ability to practice the art of his field or profession; in these cases his achievements are recognized by the award to him of a more specifically designated degree such as Master of Nursing or Master of Science in Electrical Engineering or of Doctor of Education.

A program of graduate study normally includes advanced class work and lectures but is particularly characterized by the independent study and research which the graduate student is expected to conduct. The results of this independent study and research are set forth in a master's thesis or a doctoral dissertation. A master's thesis is a modest contribution to knowledge, or a review or a report on knowledge, or a design, or a composition in the student's field. A doctoral dissertation should set forth a significant contribution to knowledge in the student's field, presented in scholarly form

and demonstrating that he is now competent to conduct reliable, important, and independent research.

The Graduate School is concerned basically with the fundamental and applied research activities conducted throughout the University, and endeavors to assist in the development of arrangements, funds, and facilities needed to encourage and support the research activities of the professors, students, and other scholars and scientists engaged in investigational work. The Graduate School is also concerned with the maintenance and steady improvement in the public service provided by the University to the state, the region, and the nation, and especially including research cooperation with other institutions and with business and industry.

The primary contributions from the University's Graduate School to the community are to be found in the



## Graduate Degree Programs Offered and Names of Graduate Program Advisers

Field	Graduate Degrees	Graduate Program Adviser	Alternate Graduate Program Adviser
Aeronautics and Astronautics	M.S.E.; M.S.A.&A.; M.A.&A.; Ph.D.	E. H. Dill	R. J. H. Bolland
Anthropology	M.A.; Ph.D.	Kenneth E. Read	Isabel S. Caro
Architecture	M.Arch.	Phillip L. Jacobson	Lee Copeland
Art	M.A.; M.F.A.; M.A.T.	Wendell Brazeau	John W. Erickson
Atmospheric Sciences	M.S.; Ph.D.	R. G. Fleagle	James R. Holton
Biochemistry	M.S.; Ph.D.	William J. Rutter	Kenneth A. Walsh
Biological Structure	M.S.; Ph.D.	L. H. Jensen	R. J. Blandau
Biomathematics	M.S.; Ph.D.	Douglas G. Chapman	Edward B. Perrin
Botany	M.S.; Ph.D.	Richard B. Walker	H. W. Blaser
Business Administration	M.A.; M.B.A.; D.B.A.	Richard A. Johnson	Kermit O. Hanson
Ceramic Engineering	M.S.Cer.E.; M.S.Cer.; M.S.E.; Ph.D.	James I. Mueller	J. E. Turnbaugh
Chemical Engineering	M.S.E.; M.S.Ch.E.; Ph.D.	R. W. Moulton	C. A. Sleicher, Jr.
Chemistry	M.S.; Ph.D.	Verner Schomaker	B. Rabinovitch
Civil Engineering	M.S.E.; M.S.C.E.; Ph.D.	S. Sergev	E. M. Horwood
Classics	M.A.; Ph.D.	J. B. McDiarmid	W. C. Grummel
Communications	M.A.Com.	W. E. Ames	Merrill Samuelson
Comparative Literature	M.A.; Ph.D.	Frank W. Jones	
Dentistry	M.S.Den.	Saul Schluger	A. W. Moore
Drama	M.A.	James Crider	
Drama Arts	Ph.D.	Bertram Joseph	
Economics	M.A.; Ph.D.	J. E. Floyd	D. A. Worcester
Education	M.A.; M.Ed.; Ph.D.; Ed.D.	Gordon C. Lee	Frederic T. Giles
Electrical Engineering	M.S.E.; M.S.E.E.; M.E.E.; Ph.D.	W. E. Rogers	A. V. Eastman
English	M.A.; Ph.D.	David C. Fowler	B. Stirling
Far Eastern and Slavic Languages and Literature	M.A.; Ph.D.	H. Swayze	Vincent Shih
Fisheries	M.S.; Ph.D.	Richard Van Cleve	A. C. DeLacy
Forestry	M.F.; M.S.F.; Ph.D.	Stanley P. Gessel	Harvey Erickson
Genetics	M.S.; Ph.D.	H. L. Roman	D. R. Stadler
Geography	M.A.; Ph.D.	Donald Hudson	J. C. Sherman
Geology	M.S.; Ph.D.	V. S. Mallory	S. C. Porter
Geophysics	M.S.; Ph.D.	A. W. Fairhall	Maurice Rattray, Jr.
Germanic Languages and Literature	M.A.; Ph.D.	Ernst Loeb	G. Baumgaertel
History	M.A.; Ph.D.	Arther Ferrill	J. Williams
Home Economics	M.A.; M.S.; M.A.H.Ec.; M.S.H.Ec.	Mary L. Johnson	Florence T. Hall
Librarianship	M.Lib.; M.Law Lib.	Irving Lieberman	L. Dorothy Bevis
Linguistics	M.A.; Ph.D.	Sol Saporta	William Wyatt
Mathematics	M.A.; M.S.; M.S.Math.Stat.; M.A.T.; Ph.D.	J. P. Jans	Jack Segal
Mechanical Engineering	M.S.E.; M.S.M.E.; Ph.D.	Blake D. Mills	Emmett E. Day
Metallurgical Engineering	M.S.Met.E.; M.S.Met.; M.S.E.; Ph.D.	D. H. Polonis	T. F. Archbold
Microbiology	M.S.; Ph.D.	Howard C. Douglas	Eugene W. Nester
Mineral Engineering	M.S.Min.E.; M.S.E.	D. L. Anderson	Drury A. Pifer
Music	M.A.; M.A.Music; Ph.D.; D.Mus.Arts	Demar Irvine	John Verrall
Nuclear Engineering	M.S.E.; Ph.D.	Albert L. Babb	K. L. Garlid
Nursing	M.Nur.; M.A.	Edith Metz	Katherine J. Hoffman
Oceanography	M.S.; Ph.D.	L. K. Coachman	Peter Taylor
Pathology	M.S.; Ph.D.	George M. Martin	David Lagunoff
Pharmacology	M.S.; Ph.D.	J. M. Dille	Akira Horita
Pharmacy	M.S.; Ph.D.	Jack E. Orr	A. C. Huitric
Philosophy	M.A.; Ph.D.	R. Richman	Arthur Smullyan
Physical and Health Education (Men)	M.S.Phy.Ed.; M.S.	G. S. Reeves	J. A. Torney
Physical and Health Education (Women)	M.S.Phy.Ed.; M.S.	Ruth M. Wilson	Marion R. Broer
Physical Medicine and Rehabilitation	M.S.	J. F. Lehmann	W. E. Fordyce
Physics	M.S.; Ph.D.	Lawrence Wilets	David Boulwar
Physiology and Biophysics	M.S.; Ph.D.	Julia G. Skahen	H. D. Patton
Physiology-Psychology	Ph.D.	Mitchell Glickstein	M. H. Smith
Political Science	M.A.; Ph.D.	Dell G. Hitchner	Hugh A. Bone
Preventive Medicine	M.S. Prev. Med.	John P. Fox	J. Thomas Grayston
Psychology	M.S.; Ph.D.	Arthur A. Lumsdaine	George P. Horton
Public Administration	M.P.A.	George Shipman	Brewster C. Denny
Radiological Sciences	M.S.Rad.Sci.	Kenneth Jackson	L. Donaldson
Romance Languages and Literature	M.A.; Ph.D.	A. E. Creore	M. Penuelas
Scandinavian Languages and Literature	M.A.	Walter Johnson	
Social Work	M.Soc.Wk.	J. L. Kelley	C. J. Macdonald
Sociology	M.A.; Ph.D.	E. Barth	Robert Leik
Speech	M.A.; Ph.D.	H. Rahskopf (General)	Laura I. Crowell
		James A. Carrell	
		(Speech Pathology and Audiology)	
Surgery	M.S.	David D. Dillard	Lloyd M. Nyhus
Urban Planning	M.UrbanPlan.	Thomas Norton	M. R. Wolfe
Zoology	M.S.; Ph.D.	Richard A. Cloney	Donald S. Farner



students who have achieved high levels of competence as evidenced by their completion of programs of advanced study, and in the significant research results obtained by these students, their professors, and other scholars and scientists associated with the University.

### The Graduate Programs and Graduate Degree Policies

Graduate programs leading to master's and/or doctorate degrees are offered in sixty-eight departments or other organizational units of the University and the names of these programs, the graduate degrees offered, and the names of the Graduate Program Advisers are given in this Catalog.

#### The Graduate Program Adviser

The graduate student is guided in his initial work at the University by the Graduate Program Adviser in his field. This adviser is a senior member of the faculty who provides or arranges for the provision of responsible advice, guidance, and assistance to students working for advanced degrees in the program or programs offered by the faculty in his department, school, or University unit. He maintains close familiarity with policies and procedures in the Graduate School and provides over-all coordination for the activities within his department. In his absence, these responsibilities are carried by an Alternate Program Adviser.

#### Courses for Graduate Students

Courses numbered 500 and above are intended for and restricted to graduate students. Some courses numbered in the 300's and 400's are open both to graduates and to upper-division undergraduates. Such courses are listed in this Catalog and, when acceptable to the Supervisory Committee and the Graduate Dean, may be part of the graduate program. The Graduate School accepts credit in approved 300-level courses for the minor or supporting fields only; approved 400-level courses are accepted as part of the major.

Undergraduate students of senior standing who wish to register for a 500-level course must obtain permission from both the instructor of the class and the Dean of the Graduate School.

#### Scholarship

To be eligible for a degree in the Graduate School, a student must have an average of B (3.00) in *all* courses numbered 300 and above. Students whose work is not of approved quality may be asked by the Dean of the Graduate School to withdraw. On the Quarterly Grade Report and on each student's permanent transcript, all

courses numbered 100 through 700, with the grades earned, are listed. However, *grade points* are *not* extended for 100- and 200-level courses and such courses are *not* included in quarter or cumulative grade-point averages. *Only* courses numbered 300 and above are included in the total quarter and cumulative credit and grade points, and in the computation of the grade-point average for students in the Graduate School.

#### Language Competence Examinations

Communication by use of languages and in other ways is basically important in scholarly work and research. Thus it is expected that each student admitted to the Graduate School has achieved superior competence in the English language and, for students coming from non-English speaking countries, this competence is specifically tested.

Competence in languages other than English is also expected by the Graduate Faculty in most graduate degree programs. To provide for satisfaction of language competence requirements for advanced degrees, the University uses the Educational Testing Service standardized examination in French, German, and Russian, and these standardized examinations will be given at the University and at other places throughout the United States on October 29, 1966; February 4, 1967; April 15, 1967; August 5, 1967; October 28, 1967; February 3, 1968; April 20, 1968; and August 3, 1968. *Students are urged to acquire and use foreign language competence as undergraduates or as early as possible in their graduate career. The ETS examination may be written and passed by undergraduates who are urged to establish their foreign language competence before entering the Graduate School.*

For languages other than French, German, and Russian, foreign language examinations will be given in Seattle at the University on the day prior to the ETS examinations.

#### Residence

The residence requirement for the master's degree is one year (three full-time quarters). The requirement for the doctor's degree is three years, two of them at the University of Washington. One of the two years must be spent in continuous full-time residence (three out of four consecutive quarters), thus the residence requirement for the doctor's degree cannot be met solely with summer study.

A full quarter of residence is granted for any quarter in which at least 9 credits in graduate course, research, or thesis work are acceptably completed.

Residence credit for students carrying less than 9 credits per quarter is figured on the basis of a total of 12 credits or more for the part-time quarters, *combined* to make a full residence quarter equivalent.

Only courses numbered 400, 500, and 600 can be applied to residence and course credit in the major field for advanced degrees. Courses numbered 300 are not applicable to residence or course credit toward advanced degrees except when applied by permission toward the graduate minor or supporting courses. Courses numbered below 300 are not applicable to residence or course credit for advanced degrees.

#### Continuous Enrollment

A graduate student, from the time of his first enrollment in the Graduate School of the University of Washington, is required to enroll and be registered each quarter, including Summer Quarter, until the completion of all requirements for the graduate degree for which he is working, including the filing of the thesis or dissertation, the passing of the master's or doctor's Final Examination, and the awarding of the degree. A graduate student must be enrolled and registered in day or evening classes as a Full-time Student or as a Part-time Student, or enrolled as an On-leave Student. Registration for extension or correspondence courses at the University does not satisfy the continuous enrollment requirement. Failure to maintain continuous enrollment as a Full-time, a Part-time, or an On-leave Student will be taken by the University to signify the student's resignation from the Graduate School. Should he later wish to resume his studies, he must file an Application for Readmission to the Graduate School in person or by mail by the regularly published deadlines for the quarter and register during the usual registration period. If he has attended any other institution during the period when he was not registered at the University of Washington, official transcripts in duplicate of his work must be submitted. An application for readmission will carry no preference and will be treated in the same manner as an application for initial admission, including the requirement of payment of the \$5.00 application fee.

A student must be registered as a regular Full-time or Part-time Student at the University for the quarter in which the degree is conferred.

If a graduate student is enrolled and registered as a Full-time Student or a Part-time Student, he pays the usual fees and is ordinarily engaged in course and/or research work on the campus as a regular student

supervised by the Graduate Program Adviser or his representative in his field, or by the chairman of his Supervisory Committee.

In unusual cases, a graduate student may need to work *in absentia* at a place distant from the campus and yet actively continue in correspondence or conferences with his professors and proceed with his graduate study and research. In this situation he enrolls and registers as a Full-time Student *in absentia* or a Part-time Student *in absentia* and pays the usual fees for a Full-time Student or a Part-time Student, after previously having had his petition for *in absentia* work approved by his Graduate Program Adviser or his Supervisory Committee Chairman, and by the Dean of the Graduate School. Ordinarily only credits for research may be earned *in absentia*. Periods of *in absentia* registration are not counted toward completion of the requirements for residence by graduate students on the campus of the University.

If a graduate student in good standing plans to be away from the University and out of contact with the University faculty and facilities for a period of time, usually not to exceed four successive quarters, he must enroll and register as an On-leave Student after he has had his petition for On-leave Status approved by his Graduate Program Adviser or his Supervisory Committee Chairman and by the Dean of the Graduate School. This type of enrollment maintains a place for the student as a member of the Graduate School, and permits him to use the University Library and to sit for foreign language competence examinations, but does *not* entitle him to any of the other University privileges of a regularly enrolled Full-time Student or Part-time Student. An On-leave Student petitions for On-leave non-credit status, and he pays a nonrefundable fee of \$5.00 (except for Summer Quarter only) for enrollment as an On-leave Student; this fee covers three successive academic quarters or any single part thereof.

A graduate student who is registered as a Full-time or Part-time Student (day or evening classes) for *Spring Quarter* will be put automatically into On-leave Status for Summer Quarter *only*; and a graduate student who is officially On-leave *for Spring Quarter* will automatically have his On-leave Status extended for Summer Quarter *only*. (The above applies only to a graduate student not registered as a Full-time or Part-time Student (day or evening) for Summer Quarter.) However, a student in either case set forth above must be registered at the University as a Full-time or Part-time Student (day or evening classes) for the following



Autumn Quarter or he must officially petition for On-leave Status for Autumn Quarter. Otherwise he will be considered resigned from the Graduate School.

On-leave Students returning to the University on or before the termination of the period of their leave should register in the usual way as Full-time Students or Part-time Students and by this registration will cancel any remaining leave period. If circumstances require a later leave of absence, the student must petition and proceed again in the same manner as for an initial leave of absence.

## The Master's Degree

### Summary of Requirements

All candidates for the master's degree must meet the following requirements:

1. Under a thesis program, a minimum of 36 credits (27 course credits and ordinarily at least 9 credits of thesis) must be presented. Under a nonthesis program, a minimum of 36 credits of course work is required.
2. At least 18 of the minimum 36 credits for the master's degree must be for work numbered 500 or above. (In a thesis program, 9 of the 18 must be course credits and 9 may be for thesis 700.)
3. A minimum of three full-time quarters of residence credit must be earned. (Part-time quarters may be accumulated to meet this requirement.)
4. A certificate of proficiency in a foreign language is required (unless specifically excepted for a particular degree). The language presented normally should be one related to the student's field of study.
5. A thesis, approved by the Supervisory Committee, must be prepared (unless specifically excepted in a particular program). Students must register for thesis.
6. Any additional requirements imposed by the Graduate Program Adviser in the student's major department or by his Supervisory Committee must be satisfied.

While every master's student is expected to take some work outside his major department, the Graduate Program Adviser in his major department or his Supervisory Committee determines the requirements for supporting courses. The student should consult with his Supervisory Committee in planning requirements for the minor.

7. The graduate student must make application for the master's degree at the Graduate School Office within

the first two weeks of the quarter in which he expects the degree to be conferred, in accordance with "Admission to Candidacy for the Master's Degree" as described below.

8. The graduate student must be registered as a Full-time or Part-time Student at the University for the quarter in which the degree is to be conferred.
9. All work for the master's degree must be completed within six years. This includes applicable work transferred from other institutions.
10. Students must satisfy the requirements for the degree which are in force at the time the degree is to be awarded.

Candidates are urged to attend Commencement exercises.

### Preparation and Advising

Graduate students are expected to be appropriately prepared for the graduate program into which they are admitted and should confer with the Graduate Program Adviser in their field, or with his representative, in planning their program and frequently thereafter during the course of their graduate study.

### Transfer and Extension Credit

A student pursuing a graduate program leading to the master's degree may transmit a written petition to the Dean of the Graduate School requesting permission to transfer up to 9 graduate quarter credits taken while a graduate student in another recognized Graduate School to be applied toward the master's degree here. His petition must be accompanied by a written recommendation from his Graduate Program Adviser.

In the same manner, the student may petition the Dean of the Graduate School for permission to apply up to 6 credits of work taken in Extension Classes, but only if taken at the University of Washington and if taken after the student has been officially admitted to the Graduate School here.

If approved, then 9 credits of transfer work *or* 6 credits of University of Washington extension credit *or a combination* of transfer and extension credits not exceeding 9 credits may be applied to the master's degree. The minimum residence requirement of three quarters at the University of Washington may not be reduced by transfer and/or extension credit.

Neither credit by Correspondence nor by Advanced Credit Examinations is acceptable.

### Examination

As soon as is appropriate, but not later than the time when the student's application for the degree has been approved, the faculty in his major department appoints a Supervisory Committee consisting of not less than three members, including a member from the minor department, if any. The chairman of this committee arranges the time and place of the Final Examination, the results of which must be reported by the Graduate Program Adviser to the Graduate School Office at least two weeks before the date on which the degree is to be conferred. The examination may be oral or written, and all members of the Supervisory Committee must certify its results. If the examination is not satisfactory, the committee may recommend to the Dean of the Graduate School that the student be allowed to take another examination after an interval of further study.

### Thesis

The master's thesis should be evidence of the graduate student's ability to carry out independent investigation and to present the results in clear and systematic form. Two copies of the thesis, normally written in the English language, along with forms signed by the members of the Supervisory Committee from the major department, must be deposited in the Graduate School Office at least two weeks before the end of the quarter in which the degree is to be conferred. The faculty in the department may require the candidate to present an additional copy for its own use. Instructions for the preparation of theses in acceptable form may be obtained at the Graduate School Office.

### Nonthesis Programs

Some departmental faculties have arranged programs for the master's degree which do not require the preparation of a thesis. These programs normally include a more comprehensive plan of course work or more extensive examinations than thesis programs, or they may include some approved research activity in lieu of a thesis.

A student seeking a nonthesis master's degree who has completed all requirements for the degree with the exception of (1) the removal of an Incomplete or (2) the taking of the Master's Final Examination, and who plans no other course registration must register for "Degree Final" for 6 credits and pay the regular Part-time fees the quarter the degree is to be awarded. Credits for Degree Final do not apply to residence or toward satisfaction of the total credit requirements for the particular degree.

### Admission to Candidacy for the Master's Degree

The student must make application for the master's degree at the Graduate School Office *within the first two weeks of the quarter in which he expects the degree to be conferred*. The filing of the application is the responsibility solely of the student. When the application is received, the student's record will be reviewed in the Graduate School Office. The previous work taken by the student, together with his current registration as planned with the approval of the Graduate Program Adviser in his department, must meet the requirement for the degree if the application is to be approved. The applicant will be notified promptly as to whether or not he will have satisfied the general requirements for the degree at the end of the quarter and if approved, the application will be forwarded to the departmental Graduate Program Adviser.

The master's application, reporting the Final Examination results, and signed by his Supervisory Committee certifying that all departmental requirements have been met, must be returned by the Graduate Program Adviser to the Graduate School Office at least two weeks before the end of the quarter of the initial application, if the degree is to be conferred that quarter.

Master's applications are valid for *two consecutive quarters* and if requirements for the degree are not completed during the quarter of the initial application, the student's application may be retained by the Graduate Program Adviser for the quarter *immediately* following (e.g., Autumn to Winter, Winter to Spring, Spring to Summer, Summer to Autumn) and returned to the Graduate School Office two weeks before the end of the second quarter. Thereafter, the application will be void and the student must fill out a *new* application for the degree in the Graduate School Office during the first two weeks of the quarter in which the degree is to be completed.

The student and his departmental Graduate Program Adviser should be thoroughly acquainted with the requirements for the particular degree.

### The Doctor's Degree

The doctor's degree is by nature and tradition the highest certificate of membership in the academic community. As such, it is meant to indicate the presence of superior qualities of mind and intellectual interests and of high attainments in a chosen field. It is not conferred merely as a certificate to a prescribed course of study and research, no matter how long or how



faithfully pursued. All requirements and regulations leading to the doctor's degree are devices whereby the student may demonstrate his present capacities and future promise for scholarly work.

#### Summary of Requirements

In order to qualify for the doctor's degree, the student must meet the following minimum requirements:

1. Complete a program of study and research as planned by the Graduate Program Adviser in his major department or college, and his Supervisory Committee. Half of the total program, including the dissertation, must be credits numbered 500 or above. Every student is expected to take some work outside his major field, and the Supervisory Committee determines the requirements for minors and supporting courses.
2. Present a minimum of three academic years of resident study, two of them at the University of Washington with at least one year in continuous full-time residence. (The continuous year may be satisfied with three out of four consecutive full-time quarters.)
3. Demonstrate a reading knowledge of two foreign languages related to the major field of study. (Language requirements for the Doctor of Business Administration and the Doctor of Education degrees are slightly different.)
4. Pass creditably a General Examination in the major field and, when a part of the program, in the minor field with which it is concerned.
5. Prepare a dissertation which is a significant contribution to knowledge and which clearly indicates training in research. Credit for the dissertation ordinarily should be at least one-third of the total credit.
6. Pass creditably a Final Examination, which is usually devoted to the dissertation and the field with which it is concerned.
7. Complete all work for the doctor's degree within ten years. This includes applicable work from the master's degree and work transferred from other institutions.
8. Register as a regular Full-time or Part-time Student at the University for the quarter in which the degree is to be conferred.
9. Satisfy the requirements which are in force at the time the degree is to be awarded.

Candidates are urged to attend Commencement exercises.

#### Preparation and Advising

Graduate students are expected to be appropriately prepared for the graduate program into which they are admitted.

On initial admission to the Graduate School, a graduate student should confer immediately with the Graduate Program Adviser in his field or with his representative in planning his program. Frequent conferences should be held thereafter during the course of his graduate study.

#### Appointment of Doctoral Supervisory Committee

As soon as is appropriate, but not later than two quarters prior to the time the warrant for the General Examination is presented for approval to the Dean of the Graduate School, the Graduate Program Adviser will request the Dean of the Graduate School to appoint a Supervisory Committee, which will include a Graduate Faculty Representative, to assume general sponsorship of the graduate student. Establishment of a doctoral Supervisory Committee is taken to mean that, in the opinion of the faculty in the graduate student's field, the graduate student's background of study and preparation and achievement is sufficient now to justify his entering into the program of doctoral study and research.

#### Admission to Candidacy for the Doctoral Degree

At the end of two years of graduate study, and after a successful demonstration of proficiency in two foreign languages, the chairman of the Supervisory Committee may present to the Dean of the Graduate School for approval a warrant permitting the student to take the General Examinations for admission to candidacy for the doctoral degree. This means that, in the opinion of the Committee, the student's background of study and preparation is sufficient to justify his undertaking the examinations. The warrant should indicate the time, place, and manner of examination, and must be received at least two weeks prior to the proposed examination date. The warrant is approved by the Dean of the Graduate School only after the prescribed requirements of residence and study have been met. If the examination is oral, a majority of the examining committee must be present during the entire examination.

If the student's performance in his General Examinations is judged by his Supervisory Committee to be

satisfactory, then a warrant certifying the successful completion of his General Examinations is filed in the Graduate School Office by the chairman of his Supervisory Committee.

Thereafter, the student is identified and designated as a Candidate for a doctoral degree and ordinarily devotes his time primarily to the completion of research for his dissertation and to preparation for his Final Examination.

Normally, a student must be registered at least two quarters at the University of Washington after he passes his General Examinations and before a warrant is authorized for the Final Examination.

#### **Dissertation and Final Examination**

The Candidate must present a dissertation demonstrating original and independent investigation and achievement. The dissertation, normally written in the English language, should reflect not only his mastery of research techniques but also his ability to select an important problem for investigation and to deal with it competently. Instructions for the preparation of the dissertation in acceptable form may be obtained from the Graduate School Office.

When the Supervisory Committee believes that the doctoral Candidate is prepared to take his Final Examination, the Dean of the Graduate School is asked to designate a Reading Committee from among the members of the Supervisory Committee. Using forms provided by the Graduate School, the Reading Committee prepares a report briefly summarizing the distinctive achievement of the research, the methods used, and the results. If the report is favorable and is presented at the Graduate School Office two weeks before the Final Examination date, and if the Candidate has met all other requirements, a warrant authorizing the Final Examination is issued by the Dean of the Graduate School.

The Reading Committee report is not binding upon the Supervisory Committee, but is intended to ensure that, except for minor alterations, the dissertation is ready for final presentation. The Dean of the Graduate School returns the Reading Committee report to the Supervisory Committee, together with the warrant for the Final Examination, and upon approval by the Supervisory Committee at the time of the Final Examination, it is bound with the dissertation.

If the Final Examination is satisfactory, the Supervisory Committee signs the Graduate School's warrant and returns it at least two weeks before the end of the quarter in which the degree is to be conferred. If the examination is unsatisfactory, the Supervisory Committee may recommend that the Dean of the Graduate School permit a second examination after a period of further study.

#### **Publication of Doctoral Dissertations**

All doctoral dissertations are published in full on microfilm. Two weeks before the end of the quarter in which the degree is to be conferred, the Candidate must present two copies of his dissertation at the Graduate School Office. Each copy is to be accompanied by a copy of the Reading Committee report and an abstract, not exceeding six hundred words in length, which has been approved by the Supervisory Committee at the time of the Final Examination. A receipt for the \$25.00 publication charge must be shown when the dissertation is presented.

Abstracts are published in full in the publication *Microfilm Abstracts*, and the manuscript copies of the dissertations are kept on file in the University Library. A positive of each microfilmed dissertation is sent to the Library of Congress to be entered in its subject and author file, and the negative is retained by University Microfilms, of Ann Arbor, Michigan, which provides additional microfilm copies on order.

The Candidate signs the necessary publication agreement at the time he presents his dissertation at the Graduate School Office, and if he wishes he may apply for a copyright. Publication in microfilm does not preclude other forms of publication.

#### **Admission to the Graduate School**

##### **Regular Graduate Student Status**

In general, properly qualified students who are graduates of the University of Washington or of other colleges or universities of recognized rank may be admitted to the Graduate School.

The primary criterion for admission to the Graduate School is the applicant's apparent ability, as decided by the University, to progress satisfactorily in a graduate degree program. The applicant's scholastic record is of major importance and, ordinarily, the applicant should have at least a B or 3.00 grade-point average for the courses taken during the junior and senior years



of his undergraduate study. He should also show completion of an undergraduate program appropriate as preparation for graduate study in his chosen field. Consideration will also be given to other evidence which may be available. In some cases, an applicant may give promise of making satisfactory progress in graduate work although his undergraduate grade average may be less than B or 3.00 or his undergraduate preparation may be inadequate; in these cases and other unusual cases an applicant may be admitted to the Graduate School on the favorable written recommendation of the appropriate University of Washington Departmental Chairman or Graduate Program Adviser with approval by the Dean of the Graduate School. The University will be able to grant admission only if sufficient faculty and facilities are available to provide for the applicant's program.

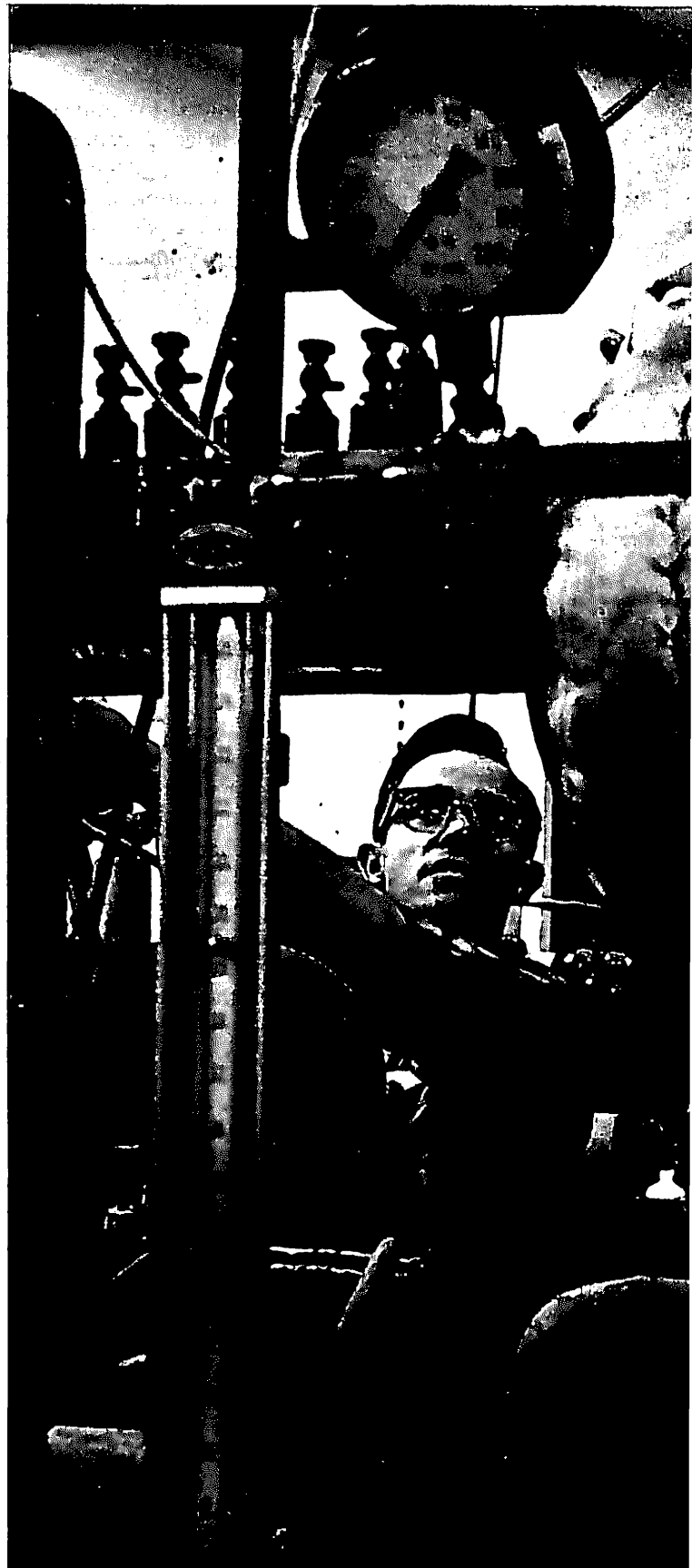
Admission to the Graduate School usually signifies admission into a particular program of graduate study leading to a master's degree or the equivalent, or into post-master's study if the student admitted has already received a master's degree or successfully completed equivalent graduate study. Acceptance of a graduate student into a program of study leading to a doctoral degree is *not* implied by admission to the Graduate School but is usually signified by the appointment of a doctoral Supervisory Committee for a graduate student who has been previously admitted to the Graduate School and has demonstrated the apparent ability, as decided by the University, to progress satisfactorily in a doctoral degree program.

Ordinarily, only students who have been admitted to the Graduate School are permitted to enroll in courses numbered 500 or above and to gain credits applicable to the fulfillment of advanced degree programs.

Admission to the Graduate School provides the opportunity for continuance of graduate study and research only for the period during which the graduate student maintains satisfactory performance and progress toward completion of his graduate degree program, along with a status of physical and mental health approved by the University. The Dean of Graduate School may alter the status of a graduate student.

#### Visiting Graduate Student Status

A student who wishes to enroll for a single summer session or a single quarter in the Graduate School at the University of Washington, and who intends thereafter to return to the graduate school in which he is carrying forward his program of studies for an ad-





vanced degree, may be admitted as a Visiting Graduate Student.

He must have been officially admitted to another recognized graduate school and be in good standing and actively pursuing a graduate program at present or during the past ten years at that institution. He need not submit a full transcript of his credits, but must apply for admission, pay the \$5.00 admission application fee, and ask the dean of his graduate school to certify as to his status on a special form titled "Visiting Graduate Student—Certificate of Status," which may be obtained by writing to the Dean of the Graduate School or the Director of Admissions at the University of Washington, Seattle, Washington 98105.

Admission to the University of Washington as a Visiting Graduate Student *does not guarantee* admission to any particular course of study. A Visiting Graduate Student will be permitted to register only in those courses for which he is judged to be eligible by a faculty adviser or the instructor in the course, and if space is available to accommodate his registration.

For any student admitted on this basis, it is understood that his registration shall terminate at the end of the single quarter or the single summer session for which he is enrolled. If at any later time he wishes to apply for admission to the Graduate School of this University to work toward a degree, he must make formal application and submit complete credentials. If a Visiting Graduate Student is later given formal admission and enters upon work toward a degree at the University of Washington, he may petition the Dean of the Graduate School for allowance of credit for courses taken as a Visiting Graduate Student to apply to the work for such a degree.

#### **Admission Procedures**

Requests for the forms, "Application for Admission to the Graduate School," "Visiting Graduate Student—Certificate of Status," and correspondence regarding admission should be addressed to the University of Washington, Office of Admissions, Seattle, Washington 98105.

Each application for admission to the Graduate School as a Regular Graduate Student or as a Visiting Graduate Student is subject to an application fee of five dollars (\$5.00). Payment must accompany the application (U.S. dollars only). This fee is not refundable and is not credited against any other fees charged by the University.

#### **Regular Graduate Student**

The application for admission form, the required transcripts, and the \$5.00 admission application fee must be filed, according to instructions appearing on the application form, with the Office of Admissions prior to the following dates in order to be assured of consideration for admission to the quarter for which application is being made: July 15 for Autumn Quarter; December 1 for Winter Quarter; March 1 for Spring Quarter; May 15 for Summer Quarter. In some cases, departments have an earlier admission deadline which must be observed. (Please note in this Catalog the section pertaining to the appropriate department.) Former students of the University of Washington who were not in residence the preceding Spring Quarter are given until August 15 to file complete credentials for an Autumn Quarter application.

When the required application forms, official credentials, and the \$5.00 admission application fee have been received, an evaluation will be made and the applicant will be notified of his admission status.

All records become a part of the official file and can be neither returned nor duplicated for any purpose. A student should obtain an additional copy of his official credentials to keep in his possession for advisory purposes. Failure to submit complete credentials will be considered a serious breach of honor and may result in permanent dismissal from the University.

General information and instructions for registration are mailed to new students with the notice of admission. In the event of a discrepancy, these instructions supersede those found in earlier publications. *The University assumes no responsibility for students who do not apply the information or observe the instructions or for applicants who come to the campus before they have been officially notified of their admission.*

*The admissions credentials of applicants who do not register for the quarter to which they had been admitted are normally retained in the Office of Admissions for a period of one year from the date of application. At the end of this period, credentials on file are discarded unless the applicant has notified the Admissions Office of his continued interest in attending the University or of his enrollment in the Evening and Extension Classes program. Should a student wish to renew his application after the one-year lapse, he must submit a new application and new credentials and pay the \$5.00 admission application fee in advance of the dates given above for the quarter desired.*



*University of Washington* students who are within 6 credits of completing their undergraduate work and who otherwise meet the requirements for admission to the Graduate School may register the quarter just prior to admission to the Graduate School for as many as 6 credits in graduate courses in addition to their 6 credits of undergraduate work. This registration and these arrangements must receive prior approval by the Graduate School; however, students concerned will not be reclassified as graduates until the bachelor's degree has been granted and after their official admission to the Graduate School. Only under these circumstances may graduate work taken as an undergraduate be applied toward an advanced degree. Further registration for graduate work is contingent upon completion of the requirements for the bachelor's degree.

#### Foreign Students

Students educated abroad who apply for admission with graduate standing are expected to meet the same general requirements as all other applicants educated in American schools. However, the admission application, official credentials, and the \$5.00 admission application fee must be received in the Office of Admissions at the University of Washington before February 1 to be considered for admission Autumn Quarter. In addition, applicants must demonstrate a satisfactory command of English and must have sufficient funds available in the United States to meet their expenses. The \$5.00 fee which must accompany the admission application is payable in currency of the United States in the form of an International Postal Money Order, a bank draft on a United States Bank, or an American Express Check.

#### Veterans

Veterans and children of deceased or totally disabled veterans must meet the general admission criteria and follow the general procedures outlined for all applicants. Applications for and questions about government aid should be addressed to a Veterans Administration Regional Office. For additional information, see the *Veterans* section in this Catalog.

#### Visiting Graduate Students

The "Application for Admission to the Graduate School" form, the "Visiting Graduate Student—Certificate of Status" form, appropriately completed and signed by the dean of the applicant's "home" graduate school, and the \$5.00 admission application fee must be filed with the Office of Admissions prior to the following dates: September 15 for Autumn Quarter; December 15 for Winter Quarter; March 15 for Spring

Quarter; and for Summer Quarter, the final date, as announced in the *Summer Quarter Bulletin*, for filing applications for admission to the Summer Quarter with nonmatriculated standing.

#### Unclassified -5 Students

A student holding a baccalaureate degree may be admitted to one of the undergraduate colleges in an Unclassified -5 status to pursue one or more of the following objectives: (1) to qualify for a second bachelor's degree; (2) to qualify for a teaching certificate; (3) to take additional undergraduate courses for some other purpose approved by the University.

Former students of the University who have not attended since receiving their baccalaureate degrees, as well as first-time applicants, must apply as *new students* and be accepted by an undergraduate college. Ordinarily, residents of Washington are expected to present grade-point averages of at least 2.50 and out-of-state applicants averages of at least 3.00 in the junior-senior years of their baccalaureate degree programs to receive favorable consideration. Final acceptance is contingent on the adequacy of the departmental faculty and facilities to accommodate additional students in this classification.

Such students are *not* in the Graduate School and ordinarily may not register for courses numbered 500 and above. Courses completed while in unclassified status may not be applied later to an advanced degree in the Graduate School.

#### Second Bachelor's Degree and/or Standard Teaching Certificate

Students who wish to obtain a second bachelor's degree and/or Standard Teaching Certificate register as Unclassified -5 students in the appropriate undergraduate college, not in the Graduate School.

#### Registration in the Graduate School

A regular graduate student is a student who fulfills the following requirements: (1) he has been granted regular admission to the Graduate School; (2) his current program of studies is satisfactory to his Graduate Program Adviser; (3) he has received medical clearance from the Student Health Service; and (4) he has completed all of the required steps for registration, including paying tuition and fees, the filing of class cards, and the depositing of registration materials at Sections.

Graduate students are required to maintain continuous enrollment from the time of their first registration until

completion of the advanced degree. (See section on *Continuous Enrollment*.)

Visiting Graduate Students follow regular registration procedures.

#### Registration Procedure

All students currently attending the University who plan to register for a succeeding quarter (Summer Quarter excepted) must register by *advance registration* and pay fees by the stated deadline. Students are held responsible for knowing and observing registration procedures, dates, and deadlines which appear in this Catalog, in *Notices*, in the *Daily*, and on campus bulletin boards.

New students are given appointments when they are notified of admission, and they receive complete directions for registering at the time of registration.

Students expecting to return to the University after an absence of a quarter or more (excluding Summer Quarter) must register by *in-person registration*. The required registration appointment may be obtained by writing to, calling at, or telephoning the Registrar's Office at the time specified in the Calendar, but in *no case* later than the stated deadline.

#### Advising

After notification of admission and before registration, the student should confer with his departmental Graduate Program Adviser about the program for his current registration, which must be approved by the Graduate Program Adviser before it is presented at Sections. Graduate students registering by *in-person registration* must also secure the signature of the Dean of the Graduate School before presenting his Official Program at Sections. As soon as the student's Supervisory Committee is appointed, he should meet with this committee and work out plans for his entire graduate program. It is primarily to this committee, and especially the chairman of his Supervisory Committee and to the Graduate Program Adviser in his department, that the student must look for individual counsel, guidance, and instruction in the scholarly study and research which characterize graduate work. The programs of students employed in the University or elsewhere will be limited. Students who are employed full time may not register for more than 6 credits.

#### Changes in Registration

After students have registered, they cannot change their schedules except with permission of the appropriate

Graduate Program Adviser or Supervisory Committee Chairman. No student is permitted to make a registration change that involves entering a new course after the first calendar week of the quarter. After that time no student may register without the consent of the Dean of the Graduate School and of the instructor whose class the student wishes to enter.

#### Financial Aids: Assistantships, Associateships, Fellowships, Loans, and Employment

Students applying for fellowships, traineeships, and assistantships or associateships must make certain that complete transcripts and other credentials are on file by February 15 (earlier submission of applications and supporting documents is urged by all and required by some departments). Application forms may be secured by writing to the Graduate Program Adviser of the appropriate department.

#### Assistantships and Associateships

The University provides for the employment of many graduate students as research and teaching assistants, predoctoral associates, predoctoral instructors, and predoctoral lecturers. More than nine hundred such appointments were made during the past year.

Appointments are granted only to graduate students of high intellectual competence and attainment whose educational goals are clearly defined. An appointment is made only when it is reasonably certain that it will help the student toward the attainment of his goal. Succeeding appointments may be made if the student's progress toward the degree is satisfactory. Maintenance of high scholarship will also be a condition of reappointment.

Graduate appointments are granted to graduate students only. An initial appointment may be offered to a student before he has been admitted formally to the Graduate School but such an appointment is contingent upon the student's admission to graduate status prior to the beginning of his tenure under the appointment.

The tabulation appearing below sets forth a three-level appointment structure providing for specific correlation between the student's eligibility for the higher appointment categories and his progress toward an advanced degree. This structure also provides for a range of stipends for students at various levels of merit and



achievement. A graduate student's classification, depending on his stage of progress at the University, is defined in the footnotes following the table.

## GRADUATE STUDENT APPOINTMENTS

Title of Appointment	<i>*Stipend for Half-time Service (20 hours per week)</i>		<i>**Graduate Student Classification for Eligibility</i>
	<i>One Month</i>	<i>Academic Year</i>	
Teaching Assistant	\$307	\$2,763	Premaster or Intermediate or Candidate
Research Assistant	\$292	\$2,628	
Graduate Staff Assistant	\$292	\$2,628	
Predoctoral Teaching Associate I	\$328	\$2,952	Intermediate or Candidate
Predoctoral Research Associate I	\$313	\$2,817	
Predoctoral Staff Associate I	\$313	\$2,817	
Predoctoral Teaching Associate II	\$351	\$3,159	Candidate
Predoctoral Research Associate II	\$334	\$3,006	
Predoctoral Staff Associate II	\$334	\$3,006	

Graduate students appointed to the beginning level of graduate teaching appointments will not be permitted to be in over-all charge of a course but will be given an appropriate degree of responsibility and supervision of laboratory or classroom work so that they may be introduced to teaching activities gradually and effectively. Student appointees may also serve as assistants in research activities for which a faculty member is responsible.

Two special categories for teaching appointments are provided above the predoctoral associate level: Predoctoral Instructor, for the graduate student who has achieved Candidate status and is ready for increased teaching responsibility, and Predoctoral Lecturer, for a mature and competent graduate student who, though he need not be a Candidate, has had exceptional previous teaching or other professional experience. For the 1966-67 academic year these appointments carried a minimum stipend of \$373 per month (half time) and with no designated maximum so that the stipend may be adjusted to a level appropriate to the appointee's experience and his teaching responsibilities.

An additional series of appointments titled Graduate Staff Assistant and Predoctoral Staff Associates I and II, is provided for University service activities which are not appropriately described as teaching or research but which are closely related to the student's field of advanced study. Appointments of specific graduate stu-

dents to these positions may not be made until after the position itself has been specifically approved. Stipends for these appointments for the 1966-67 academic year ranged from \$292 per month to \$334 per month.

Students holding any of the above appointments are required to render 20 hours of service per week to the University. The appointments may be on a nine-month basis and ordinarily cover the period running from September 16 through June 15. A significant number of these appointments may be extended to 11 or 12 months. Graduate student appointments do not provide for paid vacations or sick leave.

Students who accept these University service appointments must confine their employment to such appointments.

During tenure under one of the above appointments, a graduate appointee must register for and carry throughout each quarter a minimum of 9 credits in formal courses or in research, thesis, or dissertation work. These credits must be in courses which are applicable toward an advanced degree.

Students holding any of the above appointments pay resident tuition and fees. They may not also hold foreign student tuition scholarships.

Under highly exceptional circumstances and with the prior approval of the Dean of the Graduate School, the above graduate appointments may be made on an hourly basis. Other hourly appointments for graduate students not employed on any of the above appointments are also available to assist faculty members in teaching and research. Readers are so classified, as are students who give routine assistance in research.

**Fellowships, Traineeships, and Scholarships**

Fellowships carrying stipends ranging from \$300 to \$2,500 are available through the Graduate School or graduate departments to outstanding graduate students

\*These stipends prevailed for 1966-67.

\*\**Premaster*, having been admitted to the Graduate School but not yet having completed the master's degree or the equivalent. *Intermediate*, having completed the master's degree or the equivalent but not yet having been designated as a Candidate. *Candidate*, having completed the General Examination successfully and having been designated as a Candidate for the doctor's degree but not yet having completed the doctor's degree.

in all fields of study leading to advanced degrees. Application should be made by February 15. Information and the application form may be obtained by writing to the Graduate Program Adviser of the appropriate department.

*National Defense Education Act Fellowships* are awarded in a number of areas each year. Applications for Title IV Programs must be received by February 15. Title VI Modern Foreign Language Fellowship applications must be received in early January.

*National Science Foundation Fellowships* are available through the University of Washington under the Program of Summer Fellowships for Graduate Teaching Assistants. The University also participates in the National Science Foundation Graduate Fellowship Program.

*National Science Foundation Traineeships* are also offered through many departments.

Other fellowships and traineeships are available through participation by the University of Washington in the programs of the Woodrow Wilson National Fellowship Foundation, the National Institutes of Health, the National Aeronautics and Space Administration, the Atomic Energy Commission, and other agencies, foundations, and institutes. Special fellowships are awarded under the terms of specific grants and bequests to the University.

*Foreign Student Scholarships* are awarded by the University of Washington each academic year to 100 worthy students from other countries. These scholarships are not available for the Summer Quarter. The awards are made on the basis of the academic record of the student, recommendations from his professors, his need for such assistance, and the availability of such openings in his department at the University. These scholarships cover tuition only and are administered by the Foreign Exchange Scholarship Committee, International Services Office, University of Washington, Seattle, Washington 98105, U.S.A. Application for these scholarships must be made by March 1 for the following academic year.

#### Loans

Federal and University long-term loans are available through the Office of Student Financial Aid. Applications for these should be submitted well before the money is needed. Short-term loans can be made available on short notice to students faced with school-related financial emergencies.

#### Employment

There are many job opportunities on the campus for graduate students. Students may apply directly to the department in which they hope to work or to the Personnel Department.

Single graduate students interested in part-time positions as Resident Advisers in one of the University residence halls may write to the Director of Student Residences for an application and further details.

Working students must be sure to correlate their employment with Graduate School regulations governing study loads (see under *Registration*).

The University offers a number of full-time and part-time employment opportunities in the secretarial, clerical, and technical fields for wives of married students. These positions offer pay comparable to the prevailing salaries in the community and carry fringe benefits such as vacations, sick leave, and opportunities to enroll in University courses. In addition, nonresident students may receive waiver of the nonresident portion of fees if their spouses are full-time employees of the University. Students seeking part-time employment must be on campus before they may secure jobs from one of the University's personnel offices. For information concerning part-time and full-time work, see the *General Information* section.

## UNIVERSITY RESEARCH

Research is of particular concern to the Graduate School since the advanced instruction of graduate students is largely guidance in research and since the continuing effectiveness of professors in instruction of graduate students rests largely upon continuation of the scholarly research activities of these professors. Thus the research policies and practices of the University are to a considerable degree developed through and administered by the Graduate School.

#### Statement on University Research Policy

The University of Washington is committed to a large and varied program of research. In common with all other institutions of higher learning, it recognizes that its mission of service to society in the modern age will not be fulfilled unless its programs of teaching and research at all levels are fully integrated and vigorously executed. It believes that it is only through combined



teaching and research that society maintains effective contact with the frontier of knowledge, adds new knowledge from time to time to that which we already have, and trains new students in the continuation of these processes. Thus, we find in research the common ingredient essential to the advancement of knowledge, the enrichment of teaching, and the rendering of services to the community.

The principle of indivisibility of teaching and research has been clearly enunciated on many occasions and in both scholarly and political documents. As an example of the latter, we have the statement in the report of the President's Science Advisory Committee of 1960<sup>1</sup> to the effect that research and the graduate education of young scientists are intimately related. On page 11 of that report one finds the specific conclusion "Basic research and graduate education, . . . are the very essence of the fundamental purposes of the American University." In a similar vein the recent report of the National Academy of Sciences Committee on Science and Public Policy<sup>2</sup> characterizes the central purpose of American universities by the statement that this purpose is "the advanced education of American youth integrated with the scholarly activities of teachers; in the natural sciences these activities take primarily the form of scientific research."

It is the aim of the University to adhere closely to these principles, thus executing programs of research and teaching in a large variety of fields of learning in the sciences, humanities, social studies, and engineering. Since it is not possible in any one institution to emphasize all of the vast field of learning uniformly, the emphases on the different fields of learning must vary considerably, as is the case also in all other institutions of higher learning. Complete coverage is not a practical, nor would it perhaps be a desirable, objective. On the national scale there is confidence that such coverage is achieved. On the regional scale the University's aim is, and should be, the vigorous development of those areas of learning in which the University has special competence. These areas of special competence are the areas for which it has been most fully prepared by its history of development as a university. It is believed that these are also the areas best suited to its particular geography and the special interests, as well as the needs and potentials of the state of Washington.

*The Office of University Research* has been established in the Graduate School to encourage and to assist in the

further development of the research activities of the University and the community.

#### **Intra-University Scholarly and Research Support**

*The Graduate School Research Fund* provides modest funds available through the University to aid in the support of research activities of the faculty and graduate students. These monies are allocated by the Dean of the Graduate School with the advice of the Graduate School Research Fund Committee, appointed by the Dean, which reviews proposals for research support, formulates regulations concerning personnel and use of funds, and stimulates interest in investigative activities. The Committee is concerned with allocations of the Initiative 171 monies, which help to support research in medicine and biology, and of the other funds of the Graduate School.

*The Agnes H. Anderson Research Fund* for the support of research was formed from the proceeds of a very generous gift donated by two anonymous friends of the University. Accepted by the Board of Regents in 1943, the fund is named in memory of the donor of Alfred H. Anderson Hall and the *Agnes Healy Anderson Forestry Trust Fund*. The selection of research projects and allocation of funds for their support are recommended by the Dean of the Graduate School after consultation with the Graduate School Research Fund Committee.

*The Graduate School Consultants Fund* provides modest funds to assist in bringing distinguished scholars and scientists in the vicinity to the University for a day or for short periods for consultations and seminar discussions to assist members of the faculty and graduate students in carrying forward their research. For information relating to the Consultants Fund, communications may be addressed to the Dean of the Graduate School.

*Gift, Grant, and Contract Research Funds* may provide assistance to University faculty, graduate students, and staff in carrying out significant research and other activities. Research requiring substantial amounts of faculty, graduate student or other staff time, or significant use of University facilities may be undertaken by the University under arrangements specified in a gift, grant, or contract agreement between the research sponsor and

<sup>1</sup> *Scientific Progress, the Universities and the Federal Government*, Statement by the President's Science Advisory Committee, November 15, 1960, U.S. Government Printing Office, Washington, D.C.

<sup>2</sup> *Federal Support of Basic Research in Institutions of Higher Learning*, NAS Study, March, 1964, Printing and Publishing Office, National Academy of Sciences, Washington, D.C.

the University. The sponsor usually pays all of the costs associated with the project, such as salaries, wages, supplies, travel, and special equipment needed for the research. Participation of faculty members in grant or contract research activities is on a voluntary basis, and assignments to such research are usually treated as part of the regular academic load. Graduate students, post-doctoral students, and full-time technical or professional research personnel may aid in carrying out the research program.

Whenever possible, results of sponsored research are published in appropriate technical or professional journals as soon as publication appears warranted.

Patent provisions may be made part of an agreement covering sponsored research work. In such a case, recognition is given to the interests of the sponsor, the research worker or inventor, the University, and the general public whose taxes and gifts support the University.

Grants are often made by foundations, industries, and other agencies for basic research in designated fields without explicit definition of projects or goals. Grants of this kind contribute in an especially important way to the advancement of knowledge through basic research.

#### **Special Lectureships and Professorships**

*The Walker-Ames Fund* was founded in 1931 by Maud Walker Ames and her husband, Edwin Gardner Ames. Its purpose was to enable the University of Washington "to guarantee to the state of Washington the scholarly and educational services of the most distinguished minds available in this and other countries . . ." Since the first Walker-Ames visiting professor was appointed in 1936, well over one hundred notable scholars have come to the University as temporary members of the faculty and have enriched the intellectual life of the University community.

*The John Danz Fund* was established in 1961 by a gift to the University from the late Mr. John Danz and Mrs. John Danz. The funds, in part, are used to bring to the University one or more distinguished scholars "of national and international reputation who have concerned themselves with the impact of science and philosophy on man's perception of the rational universe." The first John Danz Lecturer was Sir Julian Huxley who came to the University from London during Spring Quarter, 1962.

Communications relating to the Walker-Ames Fund and the John Danz Fund should be addressed to: University of Washington, The Dean of the Graduate School, Seattle, Washington 98105.

## **SPECIAL SCHOLARLY FACILITIES**

Some academic or research activities and facilities are of general significance in all or many fields of knowledge throughout the University. In certain cases, special University units have been established and are administered by the Graduate School or other agencies.

### **Bureau of Governmental Research and Services**

#### **Director**

Robert H. Pealy  
3935 University Way N.E.

#### **Associate Director**

Ernest H. Campbell, Ph.D.  
3935 University Way N.E.

The Bureau of Governmental Research and Services was established in 1934 as a research and service arm of the University of Washington to carry out community responsibilities to the State by contributing toward the solution of governmental problems and in helping to advance the science of public administration. The Bureau is administratively a part of the Graduate School of Public Affairs.

The primary purpose of the Bureau is to provide research and advisory services to the governmental agencies of the state and its political subdivisions. The published research of the Bureau appears in the form of reports, information bulletins, and research memoranda. Although the Bureau has specialized in municipal research, its services are available to all levels of state and local government. It functions as a central organization to which inquiries may be directed and provides information concerning governmental problems. In addition, its personnel serves as advisers and consultants to quasi-public agencies and various civic organizations.

Another major function of the Bureau is organizing and sponsoring educational and training conferences, the most important of which is the annual Institute of



Government. The Bureau also engages in a number of supplementary activities, including maintenance of a library reference service and ordinance file, a news and publicity service, and the training and placement of governmental administrators, teachers, and research personnel.

Through the facilities of the Bureau of Governmental Research and Services, graduate students are afforded special opportunities for study and research in problems of state and local government.

### **Center for Graduate Study at Hanford**

#### **Director**

Kermit B. Bengtson, Ph.D.  
Richland, Washington

#### **Faculty Director**

Ralph W. Moulton, Ph.D.  
3 Administration Building

The Center for Graduate Study at Hanford, located at Richland, Washington, is an off-campus facility operated by Oregon State University, Washington State University, and the University of Washington. The facility is available for graduate study and research to students associated with these universities, as well as other colleges and universities in the Pacific Northwest and elsewhere. Course work completed through the Graduate Center and research performed in the Hanford laboratories, upon approval in advance, may be applied toward the fulfillment of the requirements for certain advanced degrees offered by the University of Washington.

Currently, graduate-level and upper-division courses are available in business administration, chemistry, librarianship, mathematics, physics, radiology, and in chemical, electrical, mechanical, metallurgical, and nuclear engineering. Atomic Energy Commission-owned laboratory facilities, operated by Battelle Northwest and other contractors to the AEC, are available for research purposes on an individual arrangement basis and provide an exceptional opportunity to do research work requiring facilities not available at most colleges and universities. A limited amount of financial support is available through the Richland Graduate Fellowship program for students of advanced standing in support of M.S. thesis or doctoral dissertation research to be performed at Hanford.

Most of the students and faculty of the Graduate Center are employees of the Atomic Energy Commission or its prime contractor, although such employment is not a prerequisite for enrollment at the Graduate Center or appointment to the faculty. Classes at the Graduate Center are usually held in the evening or late afternoon. Employment at the Hanford Atomic Products Operation and access to Atomic Energy Commission laboratories are generally available only to citizens of the United States.

All requests for information concerning the activities and the programs of study and research at the Graduate Center, availability of facilities, admission to activities, and for copies of the *Center for Graduate Study at Hanford Bulletin*, containing general information and course offerings, should be addressed to: The Director, Center for Graduate Study, 1001 Goethals Drive, Richland, Washington.

### **Center for Radiological Sciences**

#### **Acting Director**

Joseph L. McCarthy, Ph.D.  
3 Administration Building

#### **Coordinator**

Kenneth Jackson, Ph.D.  
104 Fisheries Building

The Center for Radiological Sciences, located in the Fisheries Building on the University of Washington campus, is an organization and a set of facilities maintained to coordinate teaching, research, and service programs relating to the radiological sciences. During recent years, knowledge relating to radiations of various types has expanded rapidly, and the effects of radiation on materials and biological systems are of much scientific interest as well as practical importance. Since these developments have occurred and are proceeding within several of the conventional fields of science, the Center functions to bring together faculty members, research scientists, and graduate students interested in one or another of the various fields of science relating to radiation. Specialized laboratories and facilities for research in the radiological sciences are available in the Center and close relations are maintained with research scientists in the laboratories of the Hanford Atomic Products Operations at Richland, Washington. For students interested in graduate degrees related to the radiological sciences, a program



leading to the degree of Master of Science in Radiological Science is available, as well as a number of programs leading to the Doctor of Philosophy degree.

Requests for information concerning the activities, facilities, and programs of study and research coordinated through the Center, and for copies of Center literature should be addressed to: University of Washington, The Director, Center for Radiological Sciences, Seattle, Washington 98105.

#### **Friday Harbor Laboratories**

##### **Director**

Robert L. Fernald, Ph.D.  
212 Johnson Hall

##### **Resident Associate Director**

Eugene N. Kozloff, Ph.D.  
Friday Harbor Laboratories  
Friday Harbor, Washington

The Friday Harbor Laboratories, the marine laboratories of the University of Washington, are administered by the Dean of the Graduate School with the aid of a committee of the faculty. The staff of the Laboratories is made up of professors from various departments of the University (Atmospheric Sciences, Botany, Fisheries, Oceanography, and Zoology) and visiting professors from other institutions.

The Friday Harbor Laboratories are located approximately eighty miles north of Seattle near the town of





Friday Harbor on San Juan Island. This island is one of the largest of the 172 which make up the San Juan Archipelago located in the northwest section of the state of Washington between Vancouver Island and the United States mainland.

The islands of the San Juan Archipelago are, in general, rocky and wooded, with precipitous shores. Many are deeply indented by narrow, fjord-like inlets. They have been strongly glaciated, leaving valleys filled with drift and occasional lakes, swamps, sphagnum, and peat bogs. The Laboratories are located on a state game preserve of 484 acres of wooded land with about two miles of shore line, an excellent location for the study of various aspects of marine science and for many types of investigations.

The Laboratories are close to sea waters varying from oceanic to those highly diluted by streams, with depths to 1,000 feet, bottoms varying from mud to rock, and water movements ranging from those of quiet bays and lagoons to those of swift tideways. The waters about the San Juan Archipelago have exceptionally abundant and varied marine flora and fauna. The area is rich in both phytoplankton and zooplankton. Brown, green, blue-green, and red algae are present in quantity.

Representatives of all major and most minor phyla of invertebrates can be collected within a reasonable distance from the Laboratories. Shore collecting and dredging in the many diverse ecological situations provide an abundance of forms for ecological, experimental, morphological, and systematic work.

The laboratory buildings are provided with aquaria and running sea water supplied through either polyethylene or glass pipes and fittings which deliver water free from metallic contamination.

During the spring and summer, the Laboratories offer an opportunity for independent and supervised research, as well as a varied program of instruction primarily for graduate students (exceptional, advanced undergraduates are occasionally admitted). The program of courses usually includes work in algology, fish biology, oceanographic meteorology, oceanography, invertebrate zoology, invertebrate physiology, or embryology. A booklet describing the summer program and the facilities is available.

Throughout the year, the use of the facilities of the Laboratories for research in various areas of marine science is encouraged.

All requests for information concerning the program of study and research, availability of facilities, and admission to the Laboratories should be addressed to: University of Washington, The Director, Friday Harbor Laboratories, Seattle, Washington 98105.

### Office of Scholarly Journals

#### Director

Emily Johnson, B.A.  
Parrington Annex 7

The University maintains an Office of Scholarly Journals in association with the Graduate School. The function of the Office is to provide assistance to members of the University faculty who have editorial responsibilities in relation to the publication of the many scholarly journals now associated with the University of Washington.

Requests for information concerning the activities and facilities of the Office should be addressed to: University of Washington, The Director, Office of Scholarly Journals, Seattle, Washington 98105.

### Computer Center

#### Director of Operations

Carl G. Young, B.S.  
Computer Center

#### Faculty Director

David B. Dekker, Ph.D.  
Computer Center

The Computer Center, established in September, 1956, provides electronic calculating facilities and auxiliary punched-card equipment for use by faculty and research personnel of the University. The facilities of the Computer Center are also available to neighboring institutions.

The facilities include IBM 7094 and 7040 high-speed digital computing machines as a directly coupled system, and a Burroughs B5500 with facilities for remote access.

The Computer Center is administered by an executive committee from the faculty of the University of Washington. There also exists a Pacific Northwest Research

Computer Laboratory Committee consisting of faculty representatives from all interested colleges and universities of the Pacific Northwest.

All requests for information concerning the facilities of the Center should be addressed to: University of Washington, The Director of Operations, Computer Center, Seattle, Washington 98105.

### **Regional Primate Research Center**

#### **Director**

Theodore C. Ruch, Ph.D.  
I407 Health Sciences Building

#### **Assistant Director**

Orville A. Smith, Ph.D.  
I411 Health Sciences Building

The Regional Primate Research Center, a wing of the Health Sciences Building, was established by the National Institutes of Health in 1960. Its activities are University-wide, regional and national, with the University of Washington being the "host" institution.

The purpose of the Center is to conduct biomedical and psychological research on nonhuman primates (monkeys, apes, and prosimians). Their value in bridging the gap between man's problems and research on animals is such that the National Institutes of Health have built and support seven regional primate centers.

The Washington Center emphasizes research on the cardiovascular and central nervous systems, including behavioral studies. Other areas investigated are viral diseases, neuroendocrinology, and lipid metabolism.

The Center develops and uses advanced instrumentation (transducers, telemetry) and high-speed data acquisition systems—one having 48 channels and one involving a small but rapid computer.

The RPRC maintains a worldwide bibliographic and informative service based on analysis of primate research. It also prepares books on primate care and diseases.

The institution employs graduate assistants and supports visiting scientists. For information, write: The Director, Regional Primate Research Center, University of Washington 98105.

### **Mental Retardation and Child Development Center**

#### **Director**

C. R. Strother, Ph.D.  
Developmental Psychology Laboratory

#### **Associate Director**

Lowell E. White, Jr., M.D.  
C304 Health Sciences Building

The Mental Retardation and Child Development Center has been established to provide facilities for teaching and research programs relating to mental retardation and child development. The Center consists of four units: a medical research unit, a behavioral sciences research unit, a diagnostic and clinical research unit, and an experimental education unit. The facilities include biological, medical, and behavioral research laboratories; a large multidisciplinary diagnostic clinic; a short-term residential building equipped to house families during diagnostic evaluation or while participating in family research projects; and an experimental school containing twelve classrooms.

Laboratories and other facilities are staffed by the various participating departments, schools, and colleges of the University. The programs and activities of the Center are coordinated by an Executive Committee, of which the chairman of the State Interagency Committee on Mental Retardation is a member. Research and training programs of the Center are closely related to the programs of the state departments of Public Instruction, Health, Institutions, and Public Assistance.

Requests for information concerning specific research and training programs should be addressed to the appropriate academic department. Requests for information concerning the Center should be addressed to: Director, Mental Retardation and Child Development Center, University of Washington, Seattle, Washington 98105.

### **University of Washington Press**

#### **Director**

Donald R. Ellegood, M.A.  
University of Washington Press Building  
Northeast 41st Street and University Way N.E.

The University of Washington Press (established in 1909) is the book publishing division of the University. Now in its fifty-eighth year, the Press has published



over three hundred scholarly books of both specialized and general interest, and occasionally original works in the arts. It also prints and distributes textbooks and other publications of certain University laboratories and bureaus. The Press manages all details of editing and design of its books. Its publications are manufactured in various plants, including both the University's Printing Department, which is separate and distinct from the Press, and commercial firms. The Press has sales agents and representatives in this country and abroad for the effective distribution of its books, and carries on a continuous program of advertising, publicity, and promotion of its publications.

Editorial control of the imprint of the Press is vested in the Committee on the University Press, of which the

Dean of the Graduate School is Chairman. The Committee formulates policy, reviews manuscripts, authorizes the use of the Press imprint, and promotes the interests of the Press.

The editors of the Press welcome inquiries from prospective authors in the early stages of preparing manuscripts for publication. All inquiries and requests for information should be addressed to: The Director, University of Washington Press, Seattle, Washington 98105.

The University of Washington Press is a member of the Association of American University Presses and the American Book Publishers Council.





# CONTINUING EDUCATION

**Dean**

Lloyd W. Schram

Because learning is a lifelong activity rather than a terminal process, the University of Washington carries on a sustained continuing education program for adults. This program has three primary and interrelated objectives: (1) to encourage the personal development and self-realization of the individual; (2) to assist him in becoming a more effective citizen; and (3) to strengthen the economic, cultural, and political aspects of society through direct communication with the research and scholarship of the University world. Because the University seeks to be responsive to community needs for continuing higher education, it is concerned not only with already established programs, but also with projects of an innovative nature. Hence, it is continuously expanding and changing to accommodate these needs.

There are three divisions that comprise Continuing Education at the University: the Division of Evening and Extension Classes, the Division of Correspondence Study, and the Division of Extension Services. All of the divisions work closely with the various academic departments. Programs include both credit and non-credit classes of direct interest to undergraduates as well as to graduates and other adults.

**Division of Evening and Extension Classes****Director**

Dominic A. LaRusso  
219 Lewis Hall

These programs both supplement and complement the formal day-school program. Courses are arranged in cooperation with the academic departments and are taught by members of the University faculty or by instructors who have the approval of the appropriate department.

**Credit Courses**

A variety of regular University courses are offered for credit by the Division of Evening and Extension Classes, and are open to all regularly admitted students. Enrollment with nonmatriculated standing is available to applicants who are either (a) in good standing, i.e., have at least a 2.00 grade-point average at another accredited university or college, or (b) are high school graduates at least twenty years of age who have never attended a university or college.

Although this program is primarily intended for persons unable to attend during the day, evening classes are also available to day students who wish to supplement their schedule. Regularly admitted day students

desiring to take credit courses offered by Evening Classes may do so by securing their adviser's approval and paying the Evening Classes fees.

Postbaccalaureate students may enroll with nonmatriculated standing or, if qualified, as regularly admitted Unclassified-5 students or as graduate students. Application of credit toward an advanced degree in the Graduate School or to school administrator's credential requires official admission to the Graduate School prior to graduation.

For further information, please consult the *Evening Classes Bulletin*.

#### **Noncredit Courses**

Noncredit courses often survey a particular field of interest from a broader perspective than the more detailed and specialized credit classes. In lecture-discussion programs, several faculty members present a series of viewpoints on a general theme, and participants have an opportunity to discuss issues raised by lecturers. In addition to offerings in liberal arts and public affairs, noncredit courses in reading improvement, language study, and recreational and avocational skills and for engineering review can be of particular value to the interested student.

A bulletin giving information and listing courses may be obtained from the Evening Classes Admissions and Advisory Office in the Student Union Building or from the Evening Classes Administrative Office, 219 Lewis Hall, University of Washington, Seattle, Washington 98105.

#### **Division of Correspondence Study**

##### **Director**

Richard F. Wilkie  
203 Lewis Hall

This program is designed to meet the needs of those individuals who wish to take college-level courses but find it difficult or impossible to attend formal day or evening classes. Anyone over eighteen who is not attending high school or anyone under eighteen who is a high school graduate is eligible. Certain qualified high school students may also be permitted to enroll upon recommendation of their high school counselors or principals and the approval of the University. In many instances, Correspondence Study is useful to the undergraduate who may wish to pursue a part of his course of study by this method.

Since a student may enroll in a course at any time of the year and proceed as rapidly or as slowly as he wishes, Correspondence Study offers the individual an opportunity to educate himself at his convenience. Course are prepared by regular members of the faculty and may be offered as extension credits toward a bachelor's degree or teaching certificate. Certain noncredit courses required for University entrance are available to adults wishing to qualify for admission.

At present there are more than six thousand registrants in Correspondence Study. Over two hundred courses are offered, and the Division is initiating a program to enlarge the curriculum even further.

A bulletin describing courses and enrollment procedures may be obtained from the Director of Correspondence Study, 203 Lewis Hall, University of Washington, Seattle, Washington 98105.

#### **Division of Extension Services**

##### **Director**

J. Reginald Miller  
322 Lewis Hall

This Division encompasses a tremendous variety of educational opportunities, with programs available to undergraduates, graduate and professional students, and the community at large. Many of the activities are conducted on a state-wide basis.

#### **Bureau of Community Development**

Although the Bureau primarily works with citizens of state communities, it also offers many research opportunities which frequently involve both graduate students and faculty in studies with aspects of academic interest. The Bureau serves as a consulting agency for groups who wish to analyze community problems and discover ways in which they can be solved by greater citizen responsibility and participation. As of January, 1966, sixty-nine communities had requested and received assistance from the Bureau.

#### **Lectures and Concerts**

Musical events and lectures are made available to both students and the general public through this office. Noted instrumental groups, operas, foreign language dramatic productions, and both student and faculty presentations are included in the program, which offers many opportunities for enrichment of the student's cultural background.



#### **Liberal Arts Seminars**

A series of residential week-end seminars to stimulate the continuing interest of adults in liberal arts, this program on occasion may also involve the interested graduate student. Assisted by an initial grant from the Ford Foundation, the conferences bring participants and University faculty members together in an informal setting which encourages and promotes a free exchange of ideas. In addition to the adult seminars, a number of seminars for high school students are presented annually.

#### **Office for Peace Corps Program**

This office plans and administers special training programs for Peace Corps trainees who are selected by Peace Corps/Washington, and supervises overseas programs where the University of Washington administers the work of volunteers in the field. During the past four years, the University, through this special office, has trained volunteers for Thailand, Peru, the Dominican Republic, Bolivia, and Nepal.

#### **Radio Broadcast Services and KUOW**

Radio KUOW-FM broadcasts programs of an educational, cultural, or scientific nature and communicates information concerning University affairs to students, alumni, and the general public. The station also supplies students in the School of Communications with actual experience for careers in radio. In addition, there is opportunity for experimental programs designed to test and develop new broadcasting techniques, some-

times in combination with other media. Effective radiated power of 86 kw carries the signal to most of Western Washington on a frequency of 94.9 mcs.

#### **Short Courses and Conferences**

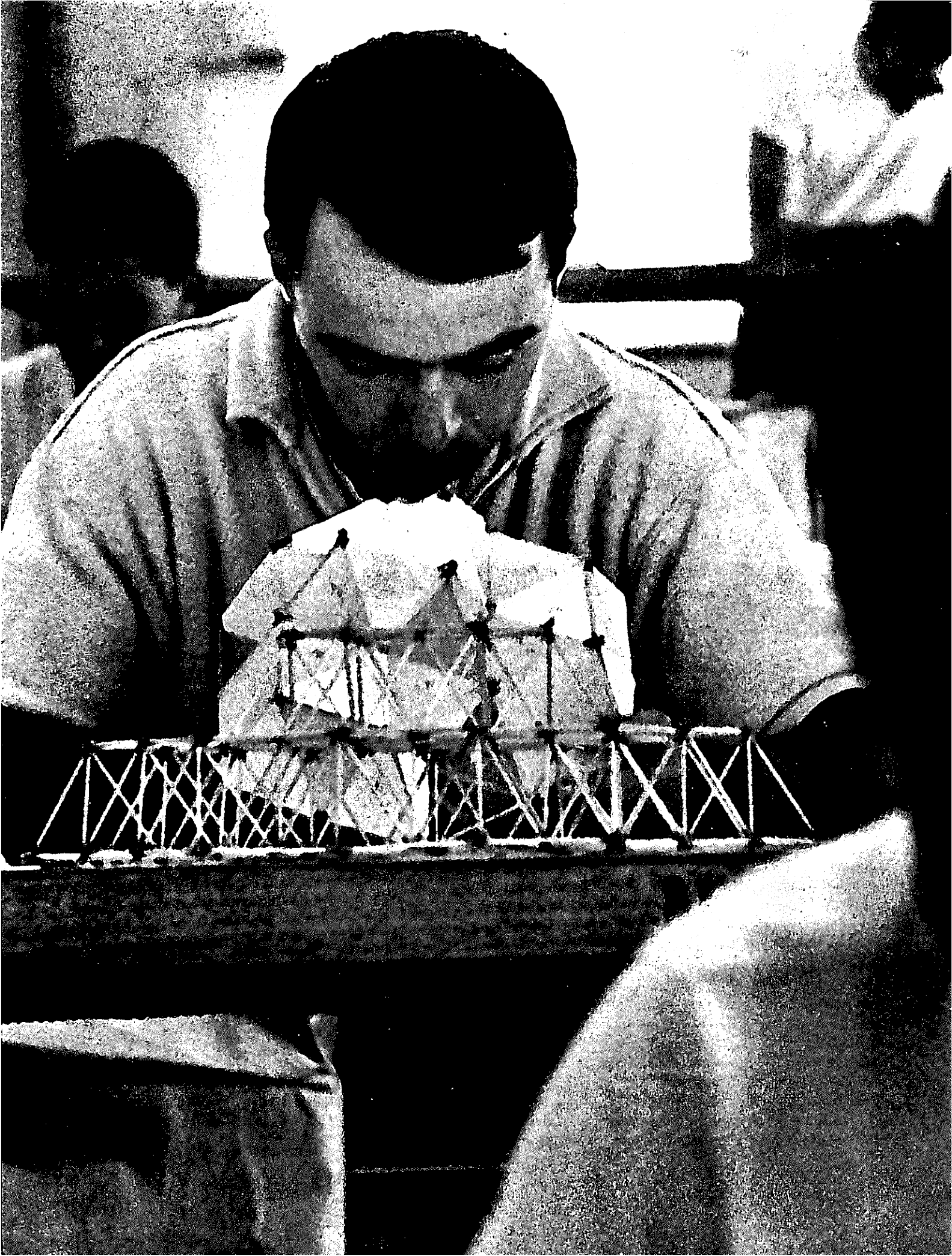
Institutes, conferences, and seminars involving faculty, student, and off-campus groups are arranged through this office, which also works with various occupational and professional societies in the community and state. Short courses in a wide variety of subjects are often of supplemental value to both the graduate and undergraduate student.

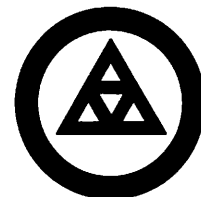
#### **Telecourses**

Telecourses provide an opportunity for everyone with access to a television set to obtain college-level instruction for information and enrichment. Embracing a wide range of topics, a number of televised lecture series are prepared each quarter by members of the University faculty and are presented on the educational station, KCTS-TV, and on commercial stations in Seattle. Kinescope or videotape recordings are also released to stations throughout Washington as well as to stations in other parts of the country. Study guides prepared by the instructor can be purchased.

Information about any of the preceding activities may be obtained from the Director of Extension Services, 322 Lewis Hall, University of Washington, Seattle, Washington 98105.







# ARCHITECTURE AND URBAN PLANNING

## **Dean**

Robert H. Dietz  
206 Architecture

## **Assistant Dean**

Norman J. Johnston  
206 Architecture

## **Professors**

Robert H. Dietz, Arthur L. Grey, Arthur P. Herrman, Alfred Jensen (emeritus), Norman J. Johnston, Charles M. Kelley, Wendell H. Lovett, Victor Steinbrueck, Daniel M. Streissguth, Philip Thiel, Morgan D. Thomas, Charles M. Tiebout, Myer R. Wolfe

## **Associate Professors**

Robert A. Chervenak, Richard Haag, Phillip L. Jacobson, Keith R. Kolb, Omer L. Mithun, Ibsen A. Nelsen, Donald G. Radcliffe, John A. Rohrer, Raymond C. Schneider, Robert E. Small, John R. Sproule, Gerard R. Torrence, William C. Wherrette

## **Assistant Professors**

Robert G. Albrecht, Richard S. Alden, David L. Bonsteel, Lee G. Copeland, Jacob W. Curtis, Grant Hildebrand, Ibrahim M. Jammal, Charles A. Mgebroff, Thomas J. Norton, Donald K. Sakuma, Robert Sasanoff, George P. Shultz, Claus Seligmann, Gary H. Winkel

## **Instructors**

Claudio Arenas, James J. Donnette, Rainer Hasenstab, R. Duane Shinn

## **Lecturers**

Richard L. Eberharter, Gerald F. Fitzmaurice, Marvin J. Flaherty, George R. Hutchinson, Thomas A. Leonidas, Gerald C. Pomeroy, Arnold S. Rosner, Richard M. Stern, Einar M. Syvertsen, Carl L. Timpe, Gerald A. Williams, Gordon B. Varey

## **Visiting Faculty**

Wolfgang F. K. Henning, Kyosi Seike

Man shapes his physical environment toward beauty and order . . . using the land, buildings, and his urban framework to realize his concept of livable growth. His tools are forms and spaces and technology.

The College of Architecture and Urban Planning deals with the physical context in which we live, particularly the city and its surrounding areas. Within the college are four areas of study:

Architecture is concerned with buildings and groups of buildings, comfortable to live with, satisfying to the eye.

Frequently it uses new and unexpected materials, art forms, different structural concepts to achieve simplicity within physical and psychological complexity.

Landscape architecture plans for the human use and enjoyment of the land, combining the disciplines of architecture and art with engineering principles of earthwork, grading and surveying, and with the conservation of natural resources.

Urban planning deals with the metropolitan problem: population, development, regulatory measures, community facilities, transportation, slum clearance . . . the total urban complex and its enormous needs.

Finally, building technology and administration translates ideas into reality. The designer and the developer become effective through the parallel and dynamic functioning of the building industry at all levels.

The location of the University, in the heart of a major urban area, is itself a laboratory for study. The College works closely with both the academic and professional worlds to build the curriculum and faculty best suited to the needs of the student who will be responsible for interpreting environmental needs. The four professional areas of the College are an acknowledgment of the mutual interests of these fields in the creation of an appropriate contemporary environment.

Architecture and Urban Planning became one of the colleges of the University of Washington in July, 1957. Architecture, however, was originally founded as a department in 1914; from 1935 until 1957, it was a school in the College of Arts and Sciences. Urban Planning was initiated in 1941; Landscape Architecture, in 1960; Building Technology and Administration, in 1963.

The architectural program of the College is accredited by the National Architectural Accrediting Board and has been a member of the Association of Collegiate Schools of Architecture since 1925. The Department of Urban Planning is a member of the Association of Collegiate Schools of Planning and has been granted recognition by the American Institute of Planners. The program of Building Technology and Administration is a member of the Associated Schools of Construction.

The College offers five-year professional degree programs leading to bachelor's degrees in architecture and

landscape architecture, and also offers work leading to the four-year degrees of Bachelor of Arts in Urban Planning and Bachelor of Science in Building Technology and Administration. At the graduate level, the College offers master's degrees in architecture and urban planning.

### **College Facilities and Services**

Architecture Hall was built in 1909 for the Alaska-Yukon-Pacific Exposition, and is one of the few Exposition buildings remaining on campus. Designed as a permanent structure, it was used as the art gallery for the Exposition. In addition to classrooms and staff offices, Architecture Hall has drafting rooms, seminar rooms, and a library (a branch of the Henry Suzzallo Library) with an extensive collection of materials related to the College's programs. Included are approximately 10,000 volumes, 8,500 pamphlets, 270 current periodicals, and 14,500 35-millimeter slides, as well as a large file of manufacturers' catalogs and brochures.

### **Honorary and Professional Societies**

Iota chapter of *Tau Sigma Delta* was organized at the University of Washington in 1924. An international honorary and professional fraternity in architecture and the allied arts, the organization promotes scholarship and professional excellence. Membership is selective and is based on scholastic achievement.

*Atelier* was formed at the inception of the school to encourage students to discuss professional problems, to unite them as a group, and to promote an increased awareness of the ethics and high standards of the professions. A social organization as well as a student society, *Atelier* schedules a number of special lectures and social events.

*Sigma Lambda Chi*, a local chapter of the national honorary fraternity, was formed in 1966. It gives recognition to outstanding students in building technology and administration, as well as furthers relationships between campus, industry, and the public.

*Building Technology and Administration Association* is open to all students in building technology and administration. The Association sponsors lectures and meetings of interest to its members and forms an effective link between the program and the building industry.

*Urban Planning Students Association* is open to all urban planning students. As a professional society, the Association sponsors lectures and meetings of interest



to planners, as well as several social functions during the school year.

## Scholarships and Financial Aids

A number of undergraduate scholarships are awarded annually to students who demonstrate outstanding scholastic ability and general excellence. Medals are presented by the American Institute of Architects, Alpha Rho Chi (national social fraternity of architecture), and the faculty of the College to top-ranking students in architecture. For graduate students in architecture several teaching assistantships are available. A series of fellowships and scholarships are also awarded to graduate students in urban planning.

## Undergraduate Programs

### Adviser

Norman J. Johnston  
206 Architecture Hall

To prepare for normal progress in the College of Architecture and Urban Planning, the student must complete, in high school, three semesters of algebra and two of plane geometry. Physics should be selected as the laboratory science. Trigonometry and freehand drawing are strongly recommended as additional electives.

Since admission to the College is competitive, in filling enrollment quotas preference will be given to those applicants who, in the judgment of the University, are best qualified to undertake its programs.

## Admission to the Five-Year Professional Programs

Admission to these programs (last three years) is selective and based upon the recommendations of the admission committees of the College. Committee review includes the applicant's achievement as indicated by the Architectural School Aptitude Test, Educational Testing Service. This test is taken at any time prior to eligibility for admission to the last three years, and is at the student's expense. Each applicant must appear for a personal interview.

## Graduation Requirements

For graduation with a degree of Bachelor of Architecture or Bachelor of Landscape Architecture, the College requires satisfying the five-year curriculum involved and three quarters of physical education activity;

for the degree of Bachelor of Arts in Urban Planning or Bachelor of Science in Building Technology and Administration, satisfaction of the related four-year curriculum is required and three quarters of physical education activity. The student majoring in architecture or landscape architecture must maintain a yearly grade-point average of 2.30 in the last three years of the professional program, and 2.50 in the last three years of work in design studio. The student majoring in urban planning or building technology and administration must maintain a yearly grade-point average of 2.30 in the last two years of the program and of 2.50 in all urban planning or building technology and administration courses.

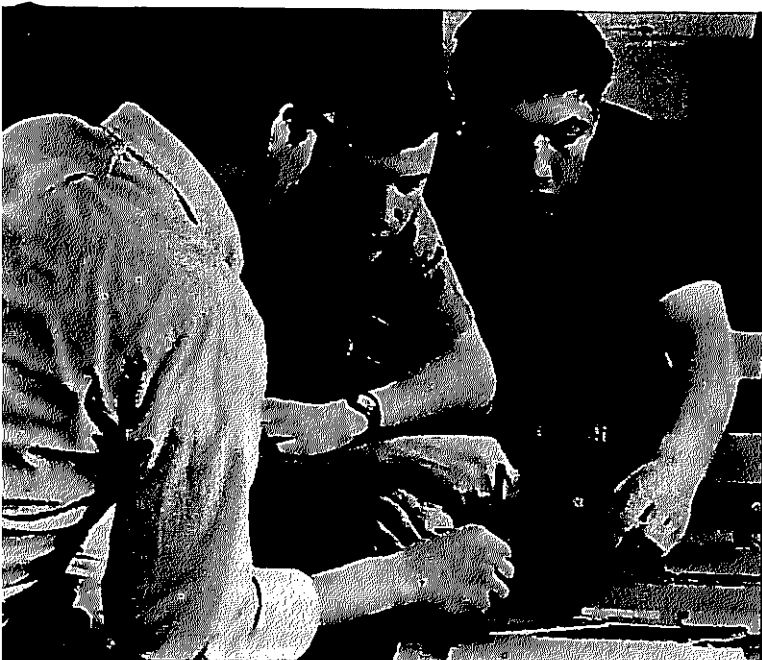
## Senior Year Residence

Senior standing is attained when 135 credits, plus the required quarters of physical education activity, have been earned. In the senior year, at least 35 credits of the required 45 must be earned in three quarters of residence. The remaining 10 credits may be earned either in residence or in the evening classes or correspondence courses offered by the University of Washington.

## Graduate Programs

The program leading to the degree of Master of Architecture stresses professional consultation with emphasis on the analysis of the forces which shape architecture, such as economics, structure, history, mechanical and electrical equipment, aesthetics, and social and psychological influences. The student selects his study in various areas of interest with special emphasis on urban design, housing and redevelopment, perception, and educational facilities programming and design. The faculty works with each student in the selection and development of studies to complement the student's investigation. In addition, graduate seminars are offered in theory of esthetics, human behavior in relationship to environmental design, decision theory, research methodology, and visual design.

Students who intend to work toward a Master of Architecture or a Master of Urban Planning degree must apply for admission to the College of Architecture and Urban Planning and to the Graduate School, and meet the requirements outlined in the *Graduate Study* section. For graduate study, the approval of both the College of Architecture and Urban Planning and the Graduate School is necessary.



## ARCHITECTURE

### Chairman

Daniel M. Streissguth  
206 Architecture

Study is offered in architecture at the undergraduate and graduate levels, leading to the degrees of Bachelor of Architecture and Master of Architecture. Within the curriculum, history provides a perspective of man's development and a reference base for an appreciation of its future implications. Theory and visual perception are stressed to understand the total effect which new space forms will have on man's environment. Knowledge of the humanities and social science is necessary to enable the student to adjust himself to his working world, thereby contributing to society through his professional competence. Methods and procedures are presented to engender ideas and stimulate the creative process. Mathematics, physics, and structures are taught to enable the student to develop new forms for a new era. The resulting program in architecture is one that sees the architect, through his creative ability and knowledge of the arts and sciences, as the provider of a physical environment conducive to fulfilling the best of man's aspirations.

### Undergraduate Program

The five-year curriculum leading to the degree of Bachelor of Architecture is as follows:

## TWO-YEAR PREPROFESSIONAL REQUIREMENTS

First Year	CREDITS
ARCH 106 INTRODUCTION TO ARCHITECTURE AND URBAN PLANNING . . . . .	5
ART 105, 106 DRAWING . . . . .	6
ART ELECTIVE . . . . .	3
ENGL 101, 102, 103 COMPOSITION . . . . .	9
MATH 104, 105 PLANE TRIGONOMETRY, COLLEGE ALGEBRA . . . . .	8
SOC 110 SURVEY OF SOCIOLOGY . . . . .	5
APPROVED ELECTIVES . . . . .	12
PHYSICAL EDUCATION ACTIVITY . . . . .	3

### Second Year

ARCH 124, 125, 126 ARCHITECTURAL DESIGN, GRADE I . . . . .	18
PHYS 114, 115, 116 GENERAL PHYSICS . . . . .	12
PHYS 117, 118, 119 GENERAL PHYSICS LABORATORY . . . . .	3
ART 258, 259 WATER COLOR, ADVANCED WATER COLOR . . . . .	6
APPROVED ELECTIVES . . . . .	9

## THREE-YEAR PROFESSIONAL REQUIREMENTS

### Third Year

ARCH 200, 201, 202 HISTORY OF ARCHITECTURE . . . . .	9
ARCH 224, 225, 226 ARCHITECTURAL DESIGN, GRADE II . . . . .	18
ARCH 235, 236, 237 MECHANICAL EQUIPMENT OF BUILDINGS . . . . .	6
ARCH 276, 277, 278 STATICS, STRENGTH OF MATERIALS, ANALYSIS AND DESIGN OF TRUSSES . . . . .	9
LA AR 230 THEORY AND PERCEPTION . . . . .	2
APPROVED ELECTIVES . . . . .	4-6

### Fourth Year

ARCH 303 HISTORY OF ARCHITECTURE . . . . .	3
ARCH 324, 325, 326 ARCHITECTURAL DESIGN, GRADE III . . . . .	18
ARCH 330 MATERIALS AND THEIR USES . . . . .	3
ARCH 338, 339 ILLUMINATION SEMINAR, ACOUSTICS SEMINAR . . . . .	4
ARCH 360 DESIGN THEORY AND ANALYSIS . . . . .	3
ARCH 370 BUILDING ECONOMICS . . . . .	2
ARCH 376, 377, 378 STRUCTURAL DESIGN: TIMBER AND STEEL, REINFORCED CONCRETE . . . . .	12
URB P 400 INTRODUCTION TO URBAN PLANNING . . . . .	3

### Fifth Year

ARCH 424, 425, 426 DESIGN, GRADE IV . . . . .	18
ARCH 430, 431, 432 CONTRACT DRAWINGS . . . . .	9
ARCH 468 PROFESSIONAL PRACTICE . . . . .	2
URB P ELECTIVE . . . . .	2
APPROVED ELECTIVES . . . . .	9-15

## Graduate Program

### Graduate Program Adviser

Phillip L. Jacobson  
206 Architecture Hall

A student seeking admission to the graduate program in Architecture must show evidence of having attained a Bachelor of Architecture degree from an accredited school of architecture or, in special cases, a degree requiring substantially the same studies. In addition, he must produce scholastic evidence of his proficiency in design, planning, structures, mechanics, aesthetics, and history to the Graduate Program Committee of the faculty of the College of Architecture and Urban Planning. This evidence will include a suitable brochure indicating recent and current work for which the appli-



cant had complete or major responsibility. All deficiencies, or lack of the necessary academic subject material required to obtain the degree of Bachelor of Architecture from the College of Architecture and Urban Planning, must be corrected before admission will be considered. If deficiencies are evident, the student must satisfy any additional requirements which are deemed necessary.

A degree of Master of Architecture will be awarded upon satisfactory completion of 45 or more credits, which will include 9 credits for a master's thesis. A foreign language is not required. A minimum of one full year (three regular quarters and the Summer Quarter of full-time registration or the equivalent) in residence is required of students seeking a degree of Master of Architecture. In special cases the degree requirements may be accomplished in three quarters upon the approval of the Graduate Program Committee.

Further inquiries regarding the program should be addressed to: Phillip L. Jacobson, College of Architecture and Urban Planning.

## PROFESSIONAL COURSES

ARCH 524, 525, 526	ADVANCED ARCHITECTURAL STUDIES (6,6,6)
ARCH 560	GRADUATE SEMINAR: HUMAN BEHAVIOR IN RELATIONSHIP TO ENVIRONMENTAL DESIGN (3)
ARCH 561	GRADUATE SEMINAR: DECISION THEORY (3)
ARCH 562	GRADUATE SEMINAR: ESTHETICS (3)
ARCH 563	GRADUATE SEMINAR: RESEARCH METHODOLOGY (3)
ARCH 600	RESEARCH (*)
ARCH 700	THESIS (*)

Generally, credit will *not* be given for having taken these courses or their equivalent at another institution.

## TYPICAL ELECTIVES

ARCH 414	VISUAL DESIGN (2)
URB P 479	THE URBAN FORM (2)
URB P 480	URBAN PLANNING ANALYSIS I (3)
URB P 482	URBAN COMMUNITY FACILITIES (2)
URB P 485	HOUSING (3)
URB P 489	HISTORY OF CITY DEVELOPMENT (3)
URB P 490	CITY PLANNING DESIGN (7)
ECON 350	PUBLIC FINANCE AND TAXATION (5)
POL S 375	URBAN GOVERNMENT AND ADMINISTRATION (5)
R EST 301	URBAN LAND ECONOMICS AND REAL ESTATE INSTITUTIONS (5)
BT & A 420	BUILDING FINANCING (2)
CE 405	CRITICAL PATH METHODS OF PROJECT SCHEDULING (3)
PHIL 446	DEVELOPMENT OF ESTHETIC THEORY (5)
PSYCH 441	PERCEPTION (5)

## Typical Program for Graduate Students in Architecture

AUTUMN QUARTER		CREDITS
ARCH 524	ADVANCED ARCHITECTURAL STUDIES . . . . .	6
ARCH 560	GRADUATE SEMINAR: HUMAN BEHAVIOR IN RELATIONSHIP TO ENVIRONMENTAL DESIGN . . . . .	3
FOUNDATION COURSES OR ELECTIVE . . . . .		3

WINTER QUARTER		CREDITS
ARCH 525	ADVANCED ARCHITECTURAL STUDIES . . . . .	6
ARCH 561	GRADUATE SEMINAR: DECISION THEORY . . . . .	3
FOUNDATION COURSES OR ELECTIVE . . . . .		3

SPRING QUARTER		CREDITS
ARCH 526	ADVANCED ARCHITECTURAL STUDIES . . . . .	6
ARCH 562	GRADUATE SEMINAR: ESTHETICS . . . . .	3
ARCH 563	GRADUATE SEMINAR: RESEARCH METHODOLOGY . . . . .	3

SUMMER QUARTER		CREDITS
ARCH 700	THESIS . . . . .	*



## LANDSCAPE ARCHITECTURE

A degree of Bachelor of Landscape Architecture is offered in a five-year program. The first two years are devoted to general education with emphasis on the natural sciences and basic approaches to "design." The first two years of the architecture curriculum may be substituted. The final three years are built around a core of landscape design reinforced by service courses in botany, engineering, forestry, etc.

The case study method is used in the design of public areas, urban redevelopment projects, and even individual residences. The curriculum is concerned with the restoration and the re-creation of new environments

where the natural has been damaged, but a major emphasis will be on the conservation of natural landscape values.

### Program of Study

The five-year curriculum leading to the degree of Bachelor of Landscape Architecture is outlined below. Richard Haag is program director.

#### TWO-YEAR PREPROFESSIONAL REQUIREMENTS

First Year	CREDITS
ARCH 106 INTRODUCTION TO ARCHITECTURE AND URBAN PLANNING . . . . .	5
ART 105, 106 DRAWING . . . . .	3
ART ELECTIVE . . . . .	3
ENGL 101, 102, 103 COMPOSITION . . . . .	9
MATH 104, 105 PLANE TRIGONOMETRY, COLLEGE ALGEBRA . . . . .	8
SOC 110 SURVEY OF SOCIOLOGY . . . . .	5
APPROVED ELECTIVES . . . . .	12
PHYSICAL EDUCATION ACTIVITY . . . . .	3

#### Second Year

ARCH 124, 125, 126 ARCHITECTURAL DESIGN, GRADE I . . . . .	18
*BIOL 101-102 GENERAL . . . . .	10
ART 258 WATER COLOR . . . . .	3
ART 272 BEGINNING SCULPTURE COMPOSITION . . . . .	3
BOT 113 ELEMENTARY PLANT CLASSIFICATION . . . . .	5
GEOL 101 PHYSICAL GEOLOGY . . . . .	5
APPROVED ELECTIVES . . . . .	4

#### THREE-YEAR PROFESSIONAL REQUIREMENTS

##### Third Year

ARCH 200, 201, 202 HISTORY OF ARCHITECTURE . . . . .	9
ARCH 224, 225, 226 ARCHITECTURAL DESIGN, GRADE II . . . . .	18
LA AR 230, 231 THEORY AND PERCEPTION, HISTORY . . . . .	5
URB P 400 INTRODUCTION TO URBAN PLANNING . . . . .	3
ART 426 ORIGINS OF MODERN ART . . . . .	3
ANTH 250 THE NATURE OF CULTURE . . . . .	2
G E 121 PLANE SURVEYING AND MEASUREMENTS . . . . .	3
GEOG 258 MAPS AND MAP READING . . . . .	2

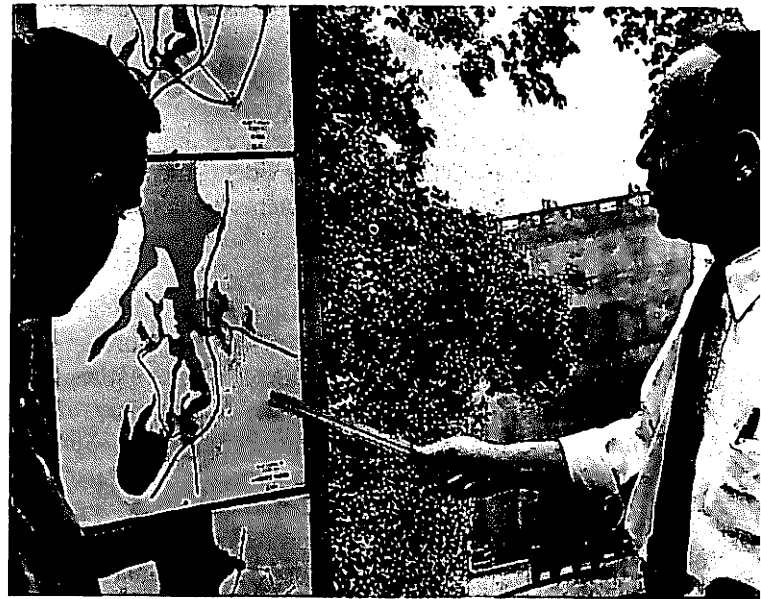
##### Fourth Year

ARCH 303 HISTORY OF ARCHITECTURE . . . . .	3
LA AR 334, 335, 336 CONSTRUCTION . . . . .	12
LA AR 350, 351, 352 LANDSCAPE DESIGN, GRADE III. . . . .	18
URB P 479 THE URBAN FORM . . . . .	2
ANTH 201 PHYSICAL ANTHROPOLOGY: MAN IN NATURE . . . . .	5
BOT 331 ORNAMENTAL PLANTS . . . . .	3
GEOG 302 THE PACIFIC NORTHWEST . . . . .	3

##### Fifth Year

LA AR 460, 461, 462 LANDSCAPE DESIGN, GRADE IV . . . . .	18
LA AR 465 PLANTING DESIGN . . . . .	4
LA AR 470 OFFICE PROCEDURE . . . . .	3
URB P 482 URBAN COMMUNITY FACILITIES . . . . .	2
FOR 204 DENDROLOGY . . . . .	5
GEOG 370 CONSERVATION OF NATURAL RESOURCES . . . . .	5
GEOG 477 URBAN GEOGRAPHY . . . . .	3 or 5
APPROVED ELECTIVES . . . . .	2-3

\*10 credits in a physical science may be substituted for Biology 101-102.



## URBAN PLANNING

### Chairman

Myer R. Wolfe  
202 Architecture

For an integrated understanding of the community and of its purposes and problems, the urban planning curricula are designed to acquaint the student with the political, physical, economic, and social structures of communities, the emerging problems of growth and decay, and the preventive and remedial methods for meeting such problems on a professional level. The curricula also utilize courses from a number of different fields such as political science, sociology, business, geography, and civil engineering.

Both a graduate and an undergraduate program in urban planning are offered by the College of Architecture and Urban Planning. The undergraduate program is a four-year course of study which leads to a Bachelor of Arts in Urban Planning degree. The graduate program, which leads to the degree of Master of Urban Planning, normally covers a two-year period. The undergraduate program is intended to provide the student with a liberal education as well as professional training in urban planning. The first two years represent a concentration of introductory, general, and basic subjects primarily available in the College of Arts and





Sciences but also usually available at the junior college level. The second two years continue the liberal education, but with the basic threads of planning emerging so that the graduate with the B.A. degree in planning would be qualified for further work at the graduate level in planning or for a position in a planning office. Emphasis of the curriculum is on humanities and social sciences as well as a year of design studio.

The graduate program is concerned with broader areas of planning research and administration. This program draws students from a variety of backgrounds such as sociology, geography, political science, civil engineering, and architecture. Selected urban study and technique courses are taken to provide a basis for professional courses. Therefore, it is desirable that students working toward eventual graduate training in urban planning discuss their undergraduate college preparation with the Urban Planning adviser.

## Undergraduate Program

### Adviser

Claudio Arenas  
202 Architecture Hall

The four-year curriculum leading to the degree of Bachelor of Urban Planning is outlined below.

## FIRST TWO-YEAR REQUIREMENTS

First Year	CREDITS
ARCH 106 INTRODUCTION TO ARCHITECTURE AND URBAN PLANNING . . . . .	5
ART 105 DRAWING . . . . .	3
ENGL 101, 102, 103 COMPOSITION . . . . .	9
MATH 104, 105 PLANE TRIGONOMETRY, COLLEGE ALGEBRA . . . . .	8
MATH 157 ELEMENTS OF CALCULUS . . . . .	3
SOC 110 SURVEY OF SOCIOLOGY . . . . .	5
APPROVED ELECTIVES . . . . .	9
PHYSICAL EDUCATION ACTIVITY . . . . .	3

### Second Year

ECON 200 INTRODUCTION . . . . .	5
ECON 201 PRINCIPLES . . . . .	5
SOC 223 SOCIAL STATISTICS . . . . .	5
SOC 430 HUMAN ECOLOGY . . . . .	5
APPROVED ELECTIVES . . . . .	25

## ADDITIONAL REQUIREMENTS

### Third Year

ARCH 124, 125, 126 ARCHITECTURAL DESIGN, GRADE I . . . . .	18
POL SCI 375 URBAN GOVERNMENT AND ADMINISTRATION . . . . .	5
POL SCI 376 STATE AND REGIONAL GOVERNMENT AND ADMINISTRATION . . . . .	5
URB P 400 INTRODUCTION . . . . .	3
URB P 482 COMMUNITY FACILITIES . . . . .	2
URB P 489 HISTORY OF CITY DEVELOPMENT . . . . .	3
APPROVED ELECTIVES . . . . .	12

### Fourth Year

ECON 350 PUBLIC FINANCE AND TAXATION . . . . .	5
GEOG 477 URBAN GEOGRAPHY . . . . .	5
URB P 479 THE URBAN FORM . . . . .	2
URB P 480 URBAN PLANNING ANALYSIS I . . . . .	3
URB P 485 HOUSING . . . . .	3
URB P 499 SPECIAL PROJECTS IN URBAN PLANNING . . . . .	5
URB P 451J REGIONAL PLANNING AND DEVELOPMENT . . . . .	
OR	
R EST 301 URBAN LAND ECONOMICS AND REAL ESTATE INSTITUTIONS . . . . .	5
APPROVED ELECTIVES . . . . .	18

## Graduate Program

### Graduate Program Adviser

Thomas Norton  
202 Architecture Hall

The degree of Master of Urban Planning will be awarded upon satisfactory completion of the courses specified below, a thesis, and an oral examination. The varied background of training and experience found among students working for this degree permits some adjustment of the student's program to meet individual needs and objectives. Further details on the program, the requirements, the emphases, financial aids, etc., may be procured by writing the Chairman of the Department of Urban Planning.

### FOUNDATION COURSES

Preferably such courses should be taken before entrance into the graduate program; the remainder must be taken after entrance.

Included should be survey or introductory courses in sociology and economics (for example, Sociology 110 or 310 and Economics 200, or General Business 101, or their equivalents). No credits toward the master's degree will be granted for these courses.

Other recommendations are introductory courses in urban planning and in housing equivalent to those given at the University of Washington: Urban Planning 400, Introduction to Urban Planning (3); and Urban Planning 485, Housing (2), or Sociology 455, Housing in the American Community (3), and the other following Urban Planning courses: 479, The Urban Form (2); 480, 481, Urban Planning Analysis I and II (3,3); 482, Urban Community Facilities (2); and 489, History of City Development (3).

In addition, there should be urban study and background courses or approved equivalent courses from other institutions. These courses are to be selected



from the following list, including at least one course from each category:

#### Economic Determinants

CONSERVATION OF NATURAL RESOURCES (GEOGRAPHY 370)  
URBAN LAND ECONOMICS AND REAL ESTATE INSTITUTIONS (REAL ESTATE 301)  
URBAN GEOGRAPHY (GEOGRAPHY 477)  
REGIONAL INCOME ANALYSIS (ECONOMICS OR GEOGRAPHY 416J)

#### Sociology

POPULATION PROBLEMS (SOCIOLOGY 331)  
URBAN COMMUNITY (SOCIOLOGY 365)  
HUMAN ECOLOGY (SOCIOLOGY 430)

#### Public Policy

\*URBAN GOVERNMENT AND ADMINISTRATION (POLITICAL SCIENCE 375)  
STATE AND REGIONAL GOVERNMENT AND ADMINISTRATION (POLITICAL SCIENCE 376)  
INTRODUCTION TO PUBLIC ADMINISTRATION (POLITICAL SCIENCE 470)  
METROPOLITAN AREA GOVERNMENT (POLITICAL SCIENCE 480)  
SEMINAR IN METROPOLITAN AND URBAN PLANNING PROBLEMS (POLITICAL SCIENCE 580)

#### Physical and General

HISTORY OF CITY DEVELOPMENT (URBAN PLANNING 489)  
SEMINAR IN URBAN RENEWAL (URBAN PLANNING 505)  
URBAN DESIGN ANALYSIS SEMINAR (URBAN PLANNING 523)  
INTRODUCTION TO ENVIRONMENTAL HEALTH (PREVENTIVE MEDICINE 422)  
TRAFFIC ENGINEERING—FUNDAMENTALS (CIVIL ENGINEERING 410)

#### Techniques

CRITICAL PATH METHODS OF PROJECT SCHEDULING (CIVIL ENGINEERING 405)  
INFORMATION SYSTEMS FOR PLANNING AND RESEARCH (URBAN PLANNING 527J)  
AUTOMATED MAPPING AND GRAPHING (URBAN PLANNING 528J)  
COMPUTER APPLICATIONS TO URBAN AND REGIONAL ANALYSIS (URBAN PLANNING 529J)  
TRANSPORTATION, FINANCE, POLICY, AND PROGRAMMING (CIVIL ENGINEERING 504)  
ECONOMIC ANALYSIS OF PUBLIC WORKS (CIVIL ENGINEERING 505)  
PUBLIC RELATIONS (COMMUNICATIONS 303)  
METHODS OF SOCIOLOGICAL RESEARCH (SOCIOLOGY 420)  
†PRINCIPLES OF CARTOGRAPHY (GEOGRAPHY 360)  
\*SOCIAL STATISTICS (SOCIOLOGY 223)

\*Ordinarily these courses are recommended depending on the student's background, effort toward specialization, and interests.

†For persons having no background in design or drafting, this course is usually required.

#### PROFESSIONAL COURSES

Students take all professional courses—the core of the program. Generally credit will *not* be given for having taken these courses or their equivalent at another institution.

URB P 400 INTRODUCTION TO URBAN PLANNING (3) (OR EQUIVALENT)  
URB P 479 THE URBAN FORM (2)  
URB P 480, 481 URBAN PLANNING ANALYSIS I AND II (3,3)  
URB P 482 URBAN COMMUNITY FACILITIES (2)

URB P 485 HOUSING (3) (OR EQUIVALENT)  
URB P 489 HISTORY OF CITY DEVELOPMENT (3)  
URB P 505 SEMINAR IN URBAN RENEWAL (2) (ELECTIVE)  
URB P 521 COMPREHENSIVE PLANNING ANALYSIS (\*)  
URB P 522 METROPOLITAN PLANNING ANALYSIS (\*)  
URB P 523 URBAN DESIGN ANALYSIS SEMINAR (2)  
URB P 527J INFORMATION SYSTEMS FOR PLANNING AND RESEARCH (3)  
URB P 528J AUTOMATED MAPPING AND GRAPHING (3)  
URB P 529J COMPUTER APPLICATIONS TO URBAN AND REGIONAL ANALYSIS (3)  
URB P 530J RESEARCH SEMINAR: GEOGRAPHY AND DEVELOPMENT (3, MAX. 6)  
URB P 540 URBAN PLANNING PROBLEMS (5)  
URB P 541 URBAN PLANNING PROBLEMS (5)  
URB P 542 URBAN PLANNING PROBLEMS (5)  
URB P 543 URBAN PLANNING PROBLEMS (5)  
URB P 544 URBAN PLANNING PROBLEMS (5)  
URB P 600 RESEARCH (\*)  
URB P 700 THESIS (\*)  
C E 521 SEMINAR IN URBAN TRANSPORTATION PLANNING (2)  
POL S 581, 582 SEMINAR IN METROPOLITAN AND URBAN PLANNING PROBLEMS (3,3)  
SOC 530 ADVANCED HUMAN ECOLOGY (3)  
or  
SOC 531 DEMOGRAPHY (3)  
R EST 520 SEMINAR IN REAL ESTATE AND URBAN LAND ECONOMICS (3)  
or  
GEOG 510 RESEARCH SEMINAR: SETTLEMENT AND URBAN GEOGRAPHY (3, MAX. 9)



## BUILDING TECHNOLOGY AND ADMINISTRATION

The Building Technology and Administration Program of the College has the objective of developing individuals for management, business, and technical positions within the building industry comprised of five general areas of activity: development, design, construction, supporting industries, and government. Within each of these areas there is need for individuals with a basic



knowledge and concern for architecture and building and with a more detailed technical competence.

**Development:** The developer has need for individuals skilled in areas such as project promotion, building finance and design, and construction liaison.

**Design:** The design professions—architecture and engineering—are steadily expanding the scope and variety of their services, involving personnel skilled in areas that include business management and development, construction financing, construction supervision, and building economics.

**Construction:** The construction industry is becoming more specialized and demanding, creating a need for individuals competent in areas such as construction management and supervision, estimating, quantity surveying, and business management.

**Supporting industries:** Mass demand and a revolution in building techniques is greatly expanding the industrial base of building, and there is need in this area for individuals skilled in areas that include materials and product research, material distribution and sales, and material and product production.

**Government:** The government, at local, state, and federal levels, is playing an expanding role in the building industry and consequently is requiring more personnel in areas such as design and construction liaison, building and contract document analysis, building finance, and code establishment and enforcement.

In order to meet the Building Technology and Administration Program's diverse requirements, the curriculum is divided into three main areas:

**Required courses:** These include architectural theory and appreciation, structural design, building construction, mechanical equipment of buildings, urban planning, the humanities, physics, mathematics, business administration, economics, and general University requirements.

**General elective courses:** Such courses are elected by the student, with the help of his adviser, to broaden his knowledge and appreciation of the society in which he lives.

**Recommended elective courses:** The student similarly elects courses to complement and strengthen his specific area of interest within the field of his major.

The student is required to earn a specific number of quarter credits in each of the above three areas in order to ensure a proper academic balance.

The program is of four years duration and leads to the degree of Bachelor of Science in Building Technology and Administration.

## Program of Study

The four-year curriculum leading to the degree of Bachelor of Science in Building Technology and Administration, outlined below, follows generally the Architecture curriculum. George R. Hutchinson is program director.

### FIRST TWO-YEAR REQUIREMENTS

First Year	CREDITS
ARCH 106 INTRODUCTION TO ARCHITECTURE AND URBAN PLANNING . . . . .	5
CHEM 100 OR 101 CHEMICAL SCIENCE OR GENERAL CHEMISTRY . . . . .	5
ENGL 101, 102, 103 COMPOSITION . . . . .	9
MATH 104, 105 PLANE TRIGONOMETRY, COLLEGE ALGEBRA . . . . .	8
PHIL 100 INTRODUCTION TO PHILOSOPHY . . . . .	5
PSYCH 100 GENERAL PSYCHOLOGY . . . . .	5
SOC 110 SURVEY OF SOCIOLOGY . . . . .	5
APPROVED ELECTIVES . . . . .	6
PHYSICAL EDUCATION ACTIVITY . . . . .	3

### Second Year

ARCH 303 HISTORY OF ARCHITECTURE . . . . .	3
ARCH 330 MATERIALS AND THEIR USES . . . . .	3
ACCTG 210, 220, 230 FUNDAMENTALS OF ACCOUNTING, BASIC ACCOUNTING ANALYSIS . . . . .	9
ECON 200 OR 211 INTRODUCTION OR GENERAL ECONOMICS . . . . .	5 or 3
ECON 340 LABOR ECONOMICS . . . . .	5
PHYS 114, 115, 116 GENERAL PHYSICS . . . . .	12
PHYS 117, 118, 119 GENERAL PHYSICS LABORATORY . . . . .	3
APPROVED ELECTIVES . . . . .	9-11

### ADDITIONAL REQUIREMENTS

#### Third Year

ARCH 276, 277, 278 STATICS, STRENGTH OF MATERIALS, ANALYSIS AND DESIGN OF TRUSSES . . . . .	9
BT&A 301, 302 BUILDING INDUSTRY . . . . .	6
BT&A 310 HISTORY OF BUILDING . . . . .	3
BT&A 320 BUILDING EQUIPMENT AND TECHNIQUES . . . . .	3
URB P 400 INTRODUCTION TO URBAN PLANNING . . . . .	3
B LAW 201 LEGAL FACTORS IN THE BUSINESS ENVIRONMENT . . . . .	3
OR	
B LAW 307 BUSINESS LAW FOR ENGINEERS . . . . .	3
PROD 301 PRINCIPLES OF OPERATIONS MANAGEMENT . . . . .	3
PROD 441 SYSTEMS DESIGN . . . . .	3
APPROVED ELECTIVES . . . . .	13

#### Fourth Year

ARCH 235, 236, 237 MECHANICAL EQUIPMENT OF BUILDINGS . . . . .	6
ARCH 376, 377, 378 STRUCTURAL DESIGN: TIMBER AND STEEL, REINFORCED CONCRETE . . . . .	12
BT&A 401, 402 BUILDING ESTIMATING . . . . .	6
BT&A 410 SENIOR STUDY . . . . .	3
BT&A 420 BUILDING FINANCING . . . . .	2
R EST 301 URBAN LAND ECONOMICS AND REAL ESTATE INSTITUTIONS . . . . .	5
APPROVED ELECTIVES . . . . .	14-17





# ARTS AND SCIENCES

**Dean**

Philip W. Cartwright  
B110 Padelford Hall

**Associate Dean**

William L. Phillips

**Assistant Dean**

Walter L. Riley

**Director of Honors**

Julian D. Barksdale

**Director of General Studies**

Glen Lutey

A liberal education shapes man toward informed judgment and participation in a democratic society. The individual's acquaintance with both past and contemporary thought in the arts and sciences, his exploration of abstract ideas and their relationships, and his ability to manipulate them are the primary concern of the College of Arts and Sciences.

To the student bent on exploring his own potential, the College offers breadth and depth in the intellectual experience unlimited by vocational or professional considerations. The departments and schools offer nearly

one hundred curricula leading to the degrees of either Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Music, or Bachelor of Science, as well as graduate study leading to master's and doctor's degrees.

Included within the subject matter areas are the Departments of Anthropology, Astronomy, Atmospheric Sciences, Botany, Chemistry, Classics, Economics, English, Far Eastern and Slavic Languages and Literature, Genetics, Geography, Geology, Germanic Languages and Literature, History, Linguistics, Mathematics, Oceanography, Philosophy, Physics, Political Science, Psychology, Romance Languages and Literature, Scandinavian Languages and Literature, Sociology, Speech, and Zoology; the Schools of Art, Communications, Drama, Home Economics, Music, and Physical and Health Education; and the Far Eastern and Russian Institute and the programs in Comparative Literature and in General Studies, which offer interdepartmental courses and curricula.

Although some common patterns of study are required of all students, the objectives of the College permit a wide variability in education aims. Certain units of the College combine professional training with general study, but any special goals of a professional or vocational nature are regarded as extensions of the basic bachelor's program.

The first courses offered by the University when it opened on November 4, 1861, were in fields now included within the College of Arts and Sciences. A law of 1863 provided that the University should consist of at least four departments, namely (1) literature, science, and arts, (2) law, (3) medicine, and (4) military science.

As the University grew, the study of the basic arts and sciences was organized within a college, first called the College of Literature, Science, and Arts, and later called successively the College of Liberal Arts, University College, and since 1939, the College of Arts and Sciences. Some former departments of the College have, from time to time, developed into separate colleges dealing with particular professions.

Today the College provides instruction to students in every unit of the University. Preprofessional programs are designed to enrich the general education of those students who will enter the professional Schools of Law, Medicine, Dentistry, Public Affairs, Social Work, or Librarianship. Students enrolled in undergraduate colleges of the University are often required to take a large part of their work in courses given in the College of Arts and Sciences, and may elect additional courses as their degree programs permit.

### **College Facilities and Services**

The College of Arts and Sciences offers a number of study, research, and cultural facilities associated with one or more units of the College which have uses beyond that of the College or department itself.

The Henry M. Suzzallo Library is described under the *General Information* section. Eighteen branch libraries for special academic subjects are located in other buildings.

The Thomas Burke Memorial Washington State Museum, housed in a newly constructed building, contains natural history collections and anthropological collections of the Pacific Northwest, Oceania, and the Far East. Three University theaters, the Showboat, the Penthouse, and the Playhouse, are used throughout the year in the School of Drama program. Radio Station KUOW, an FM station operated by the School of Communications, and television station KCTS-TV, a community-sponsored project with studios located at

the University, are used both for student training and for public service in communications. The Henry Art Gallery offers a program of exhibitions of recent painting, sculpture, printmaking, photography, and the craft media, film programs, musicales, and other special events. The Center for Asian Arts promotes the study and performance of the music, art, and drama of the Orient. The Center gives performances, arranges exhibits, and encourages work in the creation of actual works of art. Students interested in this program should consult the course offerings and degree requirements under the appropriate department or school.

Service-research organizations include the Developmental Psychology Laboratory of the Department of Psychology, which provides clinical training for graduate students, conducts research, and offers consultative service; and the Laboratory Pre-school, which is maintained for teacher training, observations, and demonstrations. The Bureau of Governmental Research and Services, an administrative unit of the Graduate School, which provides independent research and consultative services for state and local government is affiliated with the Department of Political Science. The Institute for Economic Research is a research organization affiliated with the Department of Economics. The Washington Institute for Sociological Research and the Office of Population Research are maintained by the Department of Sociology.

The Language Laboratory, with 350 individual units for students to practice hearing and speaking foreign languages; the Speech and Hearing Clinic, which offers remedial service to students and others with speech and hearing defects; and the English for Foreign Students program, administered by the Department of Linguistics, assist the student in developing his skills in oral communication.

Excellent teaching and research facilities in the physical and biological sciences are provided for students in the College. Of special interest are the Friday Harbor Laboratories, which offer unusual opportunities for work in the marine sciences; the 267-acre Arboretum, maintained for propagation of plants from all over the world; the cyclotron, Cosmic Ray Laboratory, and Van de Graaff accelerator of the Department of Physics; the three high-speed computing machines in the Research Computer Laboratory, and the oceanographic research vessels which make field surveys and studies in Puget Sound and the Pacific.



## UNDERGRADUATE PROGRAMS

### Admission to the College

#### Admission with Freshman Standing

For general University admission requirements, see *Undergraduate Education* section.

#### High School Electives

Students who expect to enter the College of Arts and Sciences should plan their high school electives carefully, both to lay the foundation for their general education which will be continued at the college level, and to ensure that they are adequately prepared to begin their study in the College. Students should select subjects in English, languages, social sciences, natural sciences, mathematics, and fine arts which will provide a well-rounded preparation for college study.

Since one of the basic proficiency requirements in the College degree program may be satisfied with mathematics skills, and since many degree programs of the College require some college mathematics, it is advisable for students to include at least 2½ units of college preparatory mathematics in their high school programs. Foreign language units beyond the minimum in the general University requirements above will allow the student to satisfy the foreign language graduation requirement more quickly.

In addition, intensive preparation in an academic area may be appropriate for students who have specific educational objectives. For example, students who expect to complete a major in mathematics or the physical sciences are generally urged to complete all of the standard mathematics courses offered by their high schools in order to avoid unnecessary delays in their progress toward a degree. Students expecting to complete major programs in botany, chemistry, communications, foreign languages, mathematics, music, oceanography, and physics should examine the recommendations of these departments.

## GRADUATION REQUIREMENTS

New requirements for all bachelor's degrees awarded by the College of Arts and Sciences were instituted in Autumn Quarter, 1962. Students who began work in the College previous to that quarter should consult with the assistant dean of the College, B10 Padelford Hall, concerning the requirements which they will be expected to meet.

In addition to the University requirements for the bachelor's degree, students in the College must fulfill basic proficiency requirements, a distribution requirement, and a major requirement.

### Basic Proficiencies

Students of the College are expected to have developed early in their college study fundamental proficiencies in the use of English and one foreign language and ability in quantitative reasoning. These abilities will make advanced study more efficient and meaningful for the student, and requiring competence in them from all students will enable the faculty to assume a minimum level of verbal and mathematical abilities in their courses. Although demonstration of these proficiencies is made a part of the degree requirements, it is expected that all students will begin to satisfy them during the first quarter of the freshman year, and most will have them completed by the end of the sophomore year.

Each of the proficiencies may be achieved through study in high school or in private, and may be demonstrated by examination. Many students, therefore, will have reached such levels upon admission to the College that they may satisfy some or part of these requirements at that time.

#### English Requirement

Competence in the use of English is so essential to success in college study that the student is asked to show proficiency in the use of English equivalent to completion of the freshman English courses (English 101, 102, 103). Students who place high on the English portions of the Washington Pre-College Testing Program or who present high scores in English on an Advanced Placement Examination of the College Entrance Examination Board are exempted from one or more quarters of this requirement, and students who do excellent work in the first two quarters of freshman English may be exempted from the third. Students normally should complete the English requirement during their first three quarters in residence, but in any event during the first four quarters.

#### Foreign Language Requirement

Each student is required to demonstrate an ability to read a foreign language which will enable him to enter into the study of its literature and, in the case of a modern foreign language, the ability to understand and express simple ideas on general topics in the spoken language. Foreign language competence is required not only because the experience of thinking in a language different from one's native language is valuable educationally, but also because the ability to read a foreign

language may be of value to the student in his advanced courses and may enable him to elect courses in foreign literatures as well as in English and American literature.

These abilities may be demonstrated either by performance on a placement examination or in courses of the foreign language departments. In terms of college courses, the proficiency which the student is expected to reach is set at the level which would represent a passing grade at the end of the second year of college study. Since all students admitted to the College will have completed in high school approximately the equivalent of one year of college study, most students will be able to complete this requirement with a year of further study in the foreign language presented for entrance. Some exceptionally well prepared students may expect to satisfy this requirement entirely on the basis of their foreign language study in high school.

Preliminary placement examinations in reading and oral comprehension will be given to students when they register for advanced foreign language courses for the first time. New students will be informed by the College Advisory Office, B10 Padelford Hall, regarding the dates and times for a placement examination in reading and, for modern languages, listening. If it appears that further instruction is needed to satisfy the requirement, the student will be placed in the course which is appropriate to his competence as indicated by his placement scores and the amount of previous foreign language instruction which he has had. If it appears that a student is likely to qualify for exemption from further language study, he will be given an additional examination in writing and speaking skills.

#### **Mathematics-Logic Requirement**

Because an elementary acquaintance with mathematics is a requisite for serious study in the natural sciences

and many of the social sciences, and because the kind of reasoning represented by mathematics and logic is an important accomplishment of the educated person, each student is expected to meet a requirement in mathematics or logic. This requirement may be satisfied by (1) presenting a certain score on the mathematics examination included in the Washington Pre-College Testing Program, or by presenting grades of B or higher in each of three years of college preparatory mathematics in high school; (2) completing Mathematics 101 (Intermediate Algebra) or another appropriate mathematics course; or (3) completing Philosophy 120 (Introduction to Logic).

#### **Distribution Requirement**

The College reserves an appreciable fraction of the student's four undergraduate years to develop in him a breadth of knowledge and appreciation and to enable him to explore subjects different in content and method from the one in which he will pursue a special competence.

Most of the courses offered in the College, and certain courses offered in other units of the University as well, have been divided into three large fields of knowledge—the Humanities, the Social Sciences, and the Natural Sciences. Each student must select, with the approval of his adviser, courses from the following list (the College List) to total 80 credits distributed so that no fewer than 20 credits and not more than 30 credits are in any group. No more than 15 credits from the department in which the student is pursuing his major field of study may be used to satisfy this requirement. Courses presented to satisfy the basic proficiency requirements may not be counted within the distribution requirement.





## THE COLLEGE LIST

### Humanities

Anthropology 431, 433, 455J  
 Architecture and Urban Planning: Architecture 100, 101, 105, 200, 201, 202, 303, 400; Landscape Architecture 230, 231; Urban Planning 400, 479  
 Art: all undergraduate courses except 490  
 Classics: all undergraduate courses except Latin 475LJ  
 Communications: Journalism 300, 404, 405, 413; Radio-TV 270, 373  
 Comparative Literature: all undergraduate courses  
 Dance 251, 252, 253, 256, 257, 258, 351, 352, 353  
 Drama 101, 146, 151, 152, 230, 247, 248, 253, 325, 331, 338, 414, 416, 451, 452, 453, 455, 461, 471, 472, 473, 474, 475, 476, 492, 495J  
 English: all undergraduate courses except 101, 102, 103, 150, 151, 303  
 Far Eastern and Russian Institute 240, 242, 280J, 302J, 495J  
 Far Eastern and Slavic Languages and Literature: all undergraduate courses  
 Germanic Languages and Literature: all undergraduate courses  
 History 280J, 316, 317, 414, 419J, 420, 429, 442, 443  
 Home Economics 240 or 347, 321, 322, 329, 429, 432, 433  
 Humanities 101, 102, 201  
 Liberal Arts 101, 111  
 Librarianship 451 or 453; 470  
 Linguistics 400, 404, 405, 406, 455J  
 Music: all undergraduate courses except 110, 120, 124-, 125, 214, 215, 216, 224, 225, 226, 240, 246, 254, 255, 256, 344, 346J, 354, 434, 435, 436, 476  
 Philosophy: all undergraduate courses except 110, 120, 230, 231, 370, 410, 460, 463, 465, 470  
 Physical and Health Education: Dance 283, 364  
 Romance Languages and Literature: all undergraduate courses  
 Scandinavian Languages and Literature: all undergraduate courses  
 Speech 100, 110, 111, 140, 220, 240, 320, 345, 349, 400, 420, 421, 440, 442, 444

### Social Sciences

Anthropology: all undergraduate courses except 201, 380, 431, 433, 455J, 480, 481, 482  
 Architecture and Urban Planning: Urban Planning 482, 485, 489  
 Biomedical History 301, 419J

Business Administration: Business Law 201; Human Relations 365 or 460; General Business 101, 444; Policy and Administration 440; International Business 310  
 Communications 201, 202, 203, 226, 302, 303, 310, 312, 320, 402, 406, 408, 409, 410, 414, 415, 443, 470, 480  
 Economics: all undergraduate courses  
 Education 479, 480  
 Far Eastern and Russian Institute: all undergraduate courses except 240, 242, 280J, 302J, 495J  
 General Studies 455-456  
 Geography: all undergraduate courses  
 History: all undergraduate courses except 280J, 316, 317, 414, 420, 429, 442, 443  
 Home Economics 350, 354, 356, 454, 457  
 Linguistics 451J, 452J, 453J, 462J, 463J  
 Philosophy 110, 120, 230, 231, 410, 460, 463, 465  
 Physical and Health Education: Health Education 250; Recreation Education 304  
 Political Science: all undergraduate courses  
 Psychology: all undergraduate courses except 301, 416, 421, 422, 423, 425, 430  
 Psychiatry 267, 450, 451, 452  
 Social Science 101, 102, 103  
 Sociology: all undergraduate courses except 223  
 Speech 230, 235, 332, 335, 339, 425, 426, 428, 432

### Natural Sciences

Anthropology 201, 380, 480, 481, 482  
 Astronomy: all undergraduate courses  
 Atmospheric Sciences: all undergraduate courses  
 Biochemistry: all undergraduate courses  
 Biological Structure 301  
 Biology: all undergraduate courses  
 Botany: all undergraduate courses  
 Chemistry: all undergraduate courses  
 Genetics: all undergraduate courses  
 Geology: all undergraduate courses  
 Home Economics 307, 407, 408, 415  
 Mathematics: all undergraduate courses except 101, 104, 114, 497J  
 Microbiology 101, 301, 400  
 Oceanography: all undergraduate courses except 110-111-112  
 Philosophy 370, 470  
 Physical Education 293, 322, 480  
 Physics all undergraduate courses  
 Psychology 301, 416, 421, 422, 423, 425, 430  
 Speech 310, 311, 415  
 Zoology: all undergraduate courses



## THE SPECIAL LIST

Of the 80 credits mentioned under "Distribution Requirement," 45 must be chosen from a subsection called the Special List. These 45 credits are made up of 15 chosen from each of the three groups of courses—the Humanities, Social Sciences, and the Natural Sciences. The Special List comprises courses most useful for introduction to the fundamental aspects of a subject. No course used to satisfy this requirement can be in the student's major department. In many departments, alternative possibilities are open to the student, depending upon the subject and how far he wishes to pursue it. The alternatives or recommended combinations are indicated in the following course list:

### Humanities

#### Fine Arts

Architecture 100, 101, 105

Art 100 or Humanities 102; or a maximum of 9 credits from 105, 106, 107 (Drawing); 109, 110, 111, 129 (Design); or 212, 213, 214 (History)

Drama 101 or 151, 146

Liberal Arts 111

Music, 15 credits from 101, 102, 103, 121, 122, 123 (Theory); 107, 108, 117, 118, 119 (Survey); or 314, 315, 316 (Ethnomusicology)

#### Language and Literature

Chinese 320

Classics 210; or no more than 9 credits from 426, 427, 428, 430

Danish 220, 221, 222

English, 15 credits from 257, 258, 259 (Types); 264, 265, 266, 267 (Masterpieces); or Humanities 101 or 201

French 304, 305, 306

German 310, 311, 312

Greek 201, 202, 203

Indic 320

Italian 304, 305, 306

Japanese 420, 421

Korean 320

Latin 201, 202, 203

Linguistics 200

Norwegian 220, 221, 222

Russian 320, 421

Spanish 304, 305, 306

Speech 100 or 220; 140

Swedish 220, 221, 222

#### Philosophy

Philosophy 100

### Social Sciences

#### History

History, 15 credits from 101, 102, 241, 280J, 305, 306, 307, or Social Science 101, 102, 103. See *Description of Courses* section for combinations not permitted.

#### Philosophy

Philosophy 110

#### Behavioral Sciences

Anthropology 100; or 202, 203

Business Law 201

Economics 200, 201, 260

Far Eastern 110 or 310, 280J

Geography 100, 207, 375

Political Science 201, 203, 311

Psychology 100 or 190, 191, 205, 306, 345

Psychiatry 267; or 450, 451

Sociology 110 or 310

### Natural Sciences

#### Physical Sciences

Chemistry, 15 credits restricted to any one series: 100, 101, 102; 140, 141, 150, 151, 160; 145H, 146H, 155H; or 101, 231, 232, 241, 242

Physics, 15 credits, restricted to any one series: 110, 111, 112, 440; 114, 115, 116, 117, 118, 119; or 121, 122, 123, 131, 132, 133

#### Earth Sciences

Astronomy 101

Atmospheric Sciences 101 or 301

Geology 101, 103, 106, 205

Oceanography 101, or 109H, or 203

#### Biological Sciences

Biology 101-102

Botany 111, 112, 113

Microbiology 101, 301

Zoology 111, 112, 114; 118 or 208; 201

#### Mathematics

Mathematics, 15 credits from 105, 124, 125, 126, 134H, 135H, 136H, 201H, 202H, or 203H

The student is urged to study the descriptions of these courses and to choose, with the help of his adviser, sequences of courses which will enable him to extend his present interests and inclinations and to acquire others. He may wish to develop his talents in, and appreciation of, at least one of the fine arts. With the help of the language in which he has a basic proficiency, he may gain an acquaintance with a culture other than his own. Various natural sciences offer him opportunities to satisfy his curiosity about the nature of the world in which he lives. Courses in the humanities and social sciences may provide him a basis for understanding the social and political problems confronting mankind. While the distribution requirement permits a wide variability in the student's educational aims, the intellectual and aesthetic qualities which it fosters are expected to become the common possession of all students of the College.



### Major Requirement

Among the characteristics of thought which the College attempts to develop in a student are the abilities to manipulate abstract ideas and to explore relationships deeply, confidence in the power of his own intellect, and an awakened intellectual curiosity. These attributes come from thorough study of a subject selected for its fundamental character and its richness of content, which aims at developing a depth of knowledge. This study leads the student to both empirical and theoretical considerations, develops in him a method of independent study, and exposes him to significant problems as yet unsolved. By providing, through a "major" requirement, the means to satisfy these liberal purposes of the College and the desire of students to become proficient in some field, the College proposes to exploit the strong interests of its students. This part of the student's program is determined by the department or school in which he does his major study. Measured in academic credits, the "major" required of each student consists of a minimum of 50 prescribed credits in a department of the College or a closely related group of departments. Descriptions of the major programs are to be found under *Departmental Programs*.

So that the student will not be tempted to specialize prematurely, the College limits to 70 the number of credits from a single department which may be counted in the 180 credits required for the degree. A department may prescribe no more than 90 credits of its own courses and of supporting courses in other departments as a major, unless it elects to require credits in addition to the 180 minimum for graduation. Certain curricula in art, music, and oceanography require more than the 180 minimum.

To be eligible for the bachelor's degree, the student must achieve at least a 2.00 cumulative grade-point average in his major, as well as a 2.00 cumulative grade-point average over-all.

### General Information

Students should apply for the bachelor degree during the first quarter of the senior year. A student may choose to graduate under the graduation requirements of the Catalog published most recently before the date of his entry into the College, provided that no more than ten years have elapsed since that date and that he has the approval of his major department. As an alternative, he may choose to fulfill the graduation requirements as outlined in the Catalog published most recently be-

fore the anticipated date of his graduation. All responsibility for fulfilling graduation requirements rests with the student concerned. A student graduating from another college of the University who wishes to receive a degree simultaneously from the College of Arts and Sciences must receive approval from the Assistant Dean of the College of Arts and Sciences (B10 Padelford Hall) at least three quarters before completing the requirements for the degree from this College. No student may graduate from the College of Arts and Sciences without a minimum of three quarters of attendance in the College.

### College Honors Program

In recognition of its special responsibility to students of superior ability, the College has established a four-year program offering opportunities for greater depth of study and culminating in an honors degree at graduation. Among the features of this program are special counseling, honors courses, honors sections of regular courses, faculty-student colloquia, and opportunities for independent study.

Students are admitted to the College Honors Program upon invitation by the Honors Council. In order to be considered for admission at entrance, a student must submit an application to the Director of Honors during his final high school semester. Approximately 5 per cent of the entering freshmen are selected on the basis of their high school records and scores on such examinations as those administered by the College Entrance Examination Board, National Merit, and the Washington Pre-College Testing Program. A periodic reclassification based on academic performance at the University makes possible the later admission of students not invited to membership at entrance.

Honors students are counseled by special Honors Advisers. During the freshman and sophomore years they are expected to arrange approximately one-half their schedules in honors courses in a variety of academic disciplines. A student may not become a candidate for an honors degree until he has been accepted (usually during the junior year) by a department which offers an honors curriculum (for departmental honors curricula see section on *Departmental Programs*). Students successfully completing a program approved by the Honors Council and the major department are graduated "With College Honors" in the appropriate discipline. Other students, not members of the College Honors Program, who demonstrate superior abilities in a single field of study, may, with the approval of the

department, participate in a departmental honors curriculum and receive a departmental honors degree, "With Distinction" in the major field.

The College Honors Program is under the supervision of an Honors Council. The Office of the Director is in B25D Padelford Hall.

## CERTIFICATION FOR TEACHING

Students following programs leading to a bachelor's degree in the College of Arts and Sciences may qualify for Provisional Certification for public school teaching in the state of Washington by including in their degree programs the courses required for certification as determined by the faculty of the College of Education. The similarity of the bachelor's degree programs of the two Colleges makes it possible for students in their first two years to transfer easily from one College to the other, while the differences between the programs provide opportunities for students to select the program which best fits their general educational interests and which best prepares them for the level at which they seek to be qualified for teaching.

Students preparing for certification in elementary education must fulfill a preprofessional elementary education minor as well as the professional education sequence of courses; they ordinarily should, therefore, enroll in the College of Education before the junior year. Students preparing for teaching in a high school or junior college may transfer to the College of Education as juniors, or may continue in the College of Arts and Sciences, including as electives the courses listed in the "Professional Education Sequence (Secondary Emphasis)" described in the *College of Education* section.

## GRADUATE PROGRAMS

Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet the general requirements outlined in the *Graduate Study* section of this Catalog, as well as the requirements established by the graduate faculty in the department or unit offering the degree program. Graduate students must satisfy the requirements for an advanced degree which are in force at the time the degree is to be awarded.

Graduate programs leading to the master's degree are available in the fields of anthropology, art, atmospheric sciences, botany, chemistry, classics, communications, comparative literature, drama, economics, English, Far Eastern and Slavic languages and literature, genetics, geography, geology, Germanic languages and literature, history, home economics, linguistics, mathematics, music, oceanography, philosophy, physical education, physics, political science, psychology, Romance languages and literature, Scandinavian languages and literature, sociology, speech, and zoology.

Graduate programs leading to the degree of Doctor of Philosophy are available in the fields of anthropology, atmospheric sciences, botany, chemistry, classics, economics, English, Far Eastern and Slavic languages and literature, genetics, geography, geology, Germanic languages and literature, history, linguistics, mathematics, music, oceanography, philosophy, physics, political science, psychology, Romance languages and literature, sociology, speech, and zoology, as well as in several interdisciplinary fields. (See section on *Interdisciplinary Graduate Degree Programs* in this Catalog.)

A graduate program leading to the degree of Doctor of Musical Arts is offered through the School of Music.





## PREMAJOR AND PREPROFESSIONAL PROGRAMS

### Advisory Office

B10 Padelford Hall

Although many students entering the College will have chosen a department of the College in which to pursue concentrated study, others will enter with objectives less precisely focused and are enrolled in the premajor program.

For those students who would like to follow a basic course of study in the College in preparation for training in professional schools, the College provides an advisory service for students in the following preprofessional programs: business, dental hygiene, dentistry, medical technology, medicine, occupational therapy, and physical therapy.

### Premajor Program

Those students in the first or second year who have not made a definite choice of major before entering the University are designated as premajor students. They may select, in consultation with an adviser, a program of studies which will meet the general requirements of the College and at the same time provide opportunity for experimentation and exploration in the many subject areas of the College. Each program is planned according to the individual needs of the student. Because an important part of the program leading to the bachelor's degree is the major concentration, the student is urged to make a selection of major whenever he is reasonably confident of his educational objectives. In no case may he continue beyond his sophomore year as a premajor.

Students preparing to enter schools of business administration or schools of law or other graduate professional schools may, upon admission to the College, select a department in which to follow a major program, or may follow a premajor program. For information concerning the requirements of various graduate and professional schools at the University of Washington, see the various sections of this *General Catalog*.

### Dental Hygiene, Preprofessional Program

The two-year predental hygiene program is designed to prepare women students for admission to the major in

dental hygiene in the School of Dentistry, described in the *School of Dentistry* section.

In this program, the applicant will complete 90 quarter credits in the College of Arts and Sciences, together with the required quarters of physical education activity. If she entered the program in Autumn Quarter, 1963, or thereafter, she will be expected to meet the basic proficiency requirements in English and mathematics and the distribution requirement of the College, and will include in her program courses in English composition, biology, chemistry, physics, psychology, and speech. Each student will be given a full-year curricular plan by the adviser.

A dental hygiene aptitude test is required prior to application. Information is available from the Department of Dental Hygiene in the School of Dentistry.

### Dentistry, Preprofessional Program

This program is designed for students in the College of Arts and Sciences who plan to enter a dental school when their preprofessional training is completed.

The minimum requirement for admission to most dental schools is two years of college training (90 academic quarter credits). The two-year course should include one year each of biology, English, inorganic chemistry, and physics; 10 credits in organic chemistry; and the required quarters of physical education activity.

Students who are interested in attending a particular dental school should choose electives to meet the requirements of that school. The adviser should be consulted about the dental aptitude test which is taken prior to filing applications.

Students who do not enter a dental school by the end of the second year must select a departmental major; the student is advised to select a major as soon as possible. First-year University of Washington School of Dentistry courses may be applied as general upper-division elective credits toward a bachelor's degree in the College of Arts and Sciences, provided the student has met the general College requirements and the requirements of his major department.

### Medical Technology, Preprofessional Program

The medical technology program is designed to train young men and women for professional work in hospital, clinic, public health, and medical research labora-

tories. The prescribed preparatory program consists of three years of preprofessional training in the College of Arts and Sciences with an emphasis upon certain courses in chemistry and biology. At the end of Winter Quarter of the third year, students apply for admission to the School of Medicine for the 12-month period of full-time instruction in medical technology. The details of the program in medical technology are listed in the *School of Medicine* section.

### **Medicine, Preprofessional Program**

This program is designed for students in the College of Arts and Sciences who plan to enter a medical school when their preprofessional training is completed.

The minimum requirement for admission to most medical schools is three years of college training (135 academic quarter credits) with a grade-point average of at least 2.50. As recommended by the Association of American Medical Colleges, the course should include at least 9 credits in English composition, 12 credits in inorganic chemistry, 6 credits in organic chemistry, 12 credits in physics, 12 credits in biology, and the required quarters of physical education activity. Many schools require a knowledge of a modern foreign language, and some require a bachelor's degree.

Students who are interested in attending a particular medical school should choose electives to meet the requirements of that school. In general, medical school admissions committees favor a broad program of studies with the inclusion of as much as possible in the humanities and social sciences. Students who have an aptitude for and an interest in the sciences, especially those who plan to do medical research or to become specialists in certain branches of medicine, are advised to take thorough training in a science such as chemistry, zoology, physics, or microbiology.

All students in this program are urged to select a major by the end of their first year and in no case later than the end of the second year. Each student, with an adviser in his major department and the premedical adviser, then plans a program that will enable him to complete the requirements for entrance into medical school and for the bachelor's degree. First-year University of Washington School of Medicine courses may be applied as general upper-division elective credits toward a bachelor's degree in the College of Arts and Sciences, provided the student has met the general College requirements and the requirements of his major department.

During the second year, the premedical adviser should be consulted about taking a medical admissions test and applying for admission to medical school. Students must arrange for the medical admissions test well in advance of their application to a medical school.

### **Occupational Therapy, Preprofessional Program**

This two-year preprofessional program is designed to prepare students for admission to the curriculum in Occupational Therapy in the School of Medicine, which confers the degree of Bachelor of Science in Occupational Therapy. Students who entered this program in Autumn Quarter, 1963, or thereafter, are expected to meet the basic proficiency and distribution requirements of the College, with minor modifications. A complete description of the occupational therapy curriculum is found in the *School of Medicine* section.

### **Physical Therapy, Preprofessional Program**

The two-year physical therapy preprofessional program in the College of Arts and Sciences prepares students for admission to the curriculum in Physical Therapy in the School of Medicine, which confers the degree of Bachelor of Science in Physical Therapy. The curriculum is fully approved by the American Physical Therapy Association and by the Council on Medical Education and Hospitals of the American Medical Association. A complete description of the four-year program in physical therapy is given in the *School of Medicine* section.

## **INTERDEPARTMENTAL PROGRAMS**

### **GENERAL STUDIES**

#### **Director**

Glen Lutey  
C18 Padelford Hall

Enrollment in General Studies is open to qualified students who wish to follow through to graduation the study of a field of knowledge or a subject of special interest not provided for in departmental curricula. Interdepartmental curricula of two types are offered by General Studies: (1) organized, established curricula, and (2) individual major programs.



### Organized Interdepartmental Curricula

Currently three area studies are offered within this category, Latin American Studies, Social Welfare, and Social Relations.

*Latin American Studies:* This area program focuses on a particular geographical and cultural area of the world. The courses which form this curriculum combine the



study of the Spanish and Portuguese languages and their literature with courses related to the Latin American area in several fields of social science. Required courses from the discipline of history focus on the colonial period and the national period of the principal Latin American nations; elective courses are available which study the history of individual nations in greater detail. Courses on international relations of the western hemisphere and the modern governments of the Latin American nations are available from the field of political science. The discipline of anthropology contributes courses concerned with the peoples of South America and the civilizations of middle America. A course in the geography of Latin America completes the curriculum. Courses in Spanish American and Portuguese American literature enable the student in this major to understand other aspects of Latin American culture.

Inquiries concerning this major program can be addressed to Dr. Joseph Sommers, Department of Romance Languages and Literature; Dr. Dauril Alden, Department of History; or to the Director of General Studies.

*Social Welfare:* A second organized major program exists for students whose field of major interest is that of social welfare, or who anticipate graduate study in the School of Social Work. The educational objectives of this curriculum are to integrate selected courses in psychology, sociology, anthropology, and economics in

order to achieve a broader and deeper understanding of human nature and human needs; to study, through philosophy, suggestions made by the most profound thinkers in our cultural heritage, concerning social ideals; to become aware, through courses in labor economics, abnormal psychology, social disorganization, the family, and race relations, of the problems shared by members of modern society; and, finally, through courses in social work, including relevant field experience and preparation of an undergraduate thesis, to examine critically the systems and structures of social welfare institutions and the manner in which these institutions meet the needs of society.

Faculty of the School of Social Work, as well as the General Studies staff, are available to advise students planning to major in this area.

*Social Relations:* A third organized interdepartmental curriculum is focused on an understanding of social relations, both between individuals and larger groups. The basic course work in the social sciences required by the major program is identical with that specified for the Social Welfare major, but the required courses which contribute the final orientation of the program are directed toward human relations in a broad range of situations.

Inquiries concerning this program should be addressed to the Director of General Studies.

### Individual Major Programs

An eligible student who finds that his individual educational objective cannot be achieved through one of the conventional major programs of the College may pursue an *interdepartmental major curriculum*, constructed to his individual needs, under General Studies. Curricula of this nature are constructed with the assistance not only of the General Studies staff and Advisory Committee, but also of a faculty supervisory committee appointed by the Dean. To be eligible for an individual major, a student must evidence not only a serious intellectual interest in achieving his objective but adequate ability to achieve it as well. As a minimum he must possess a current cumulative grade-point average of 2.50, and this minimum grade-point average must be maintained through graduation. He is expected to maintain a grade-point average of 3.00 in his major.

Inquiries concerning any of the programs mentioned above, or the possibility of major curricula focused on objectives other than those mentioned, should be ad-

dressed to the Director of General Studies, C18 Padelford Hall.

The Bachelor of Arts degree is awarded when the major is in humanities or social sciences, the Bachelor of Science degree when the major is in natural sciences. The requirements for graduation are the early selection of a special field or subject of interest and the formation of an approved schedule of courses; completion of at least 70 credits in the chosen field or subject; and a senior study giving evidence of the student's competence in his major fields. Transfer to General Studies must be completed not later than the third quarter before graduation.

### **Honors in General Studies**

#### **Adviser**

Glen Lutey  
C18 Padelford Hall

Members of the College Honors Program who have successfully completed an individual major curriculum approved by the General Studies Advisory Committee and the student's faculty supervisory committee, may receive a bachelor's degree "With College Honors in General Studies," providing the following conditions have been met:

- (1) Completion of the lower-division honors requirements specified for all honors candidates.
- (2) Completion of not less than 10 credits in an upper-division program of honors courses specified by the Director of General Studies, the program to consist of one or more honors courses in at least two fields which play significant roles in the student's particular program.
- (3) Honors credit earned for the required undergraduate thesis.
- (4) A grade-point average of at least 3.00 maintained for the upper-division years.

## **AFRICAN STUDIES**

#### **Committee**

Simon Ottenberg (Anthropology, Chairman), Jon Bridgman (History), James Crutchfield (Economics), Pierre van den Berghe (Sociology), John Williams (History), Edgar Winans (Anthropology)

The University is developing a series of courses on traditional and modern-day Africa at both the undergraduate and graduate levels. These provide the student with an areal focus to his academic training, offering him the chance to develop an interdisciplinary interest centered on a continent rapidly gaining world importance. For the graduate student, these courses afford the opportunity to prepare for a professional career in the African field.

The program permits the student to select from a variety of courses to supplement his regular academic training. Courses with African content offered at the University include Anthropology 213, 476, 513, 569J; History 478, 479, 480, 481; Sociology 362, 569J. Training in Arabic is offered in the Department of Classics. Individual study with members of the Committee on African Studies can be arranged.

## **AMERICAN STUDIES**

#### **Committee**

William Phillips (English, Chairman), George Bluestone (English), Vernon Carstensen (History), Max Savelle (History), Robert Stanton (English), Roger Stein (English)

The interdisciplinary approach to the study of American civilization is a tradition of long standing at the University of Washington, dating back to the pioneering work of Prof. Vernon L. Parrington. The research and teaching of many members of the faculty, in a variety of departments, represent present-day contributions to the field of American studies. The University is an institutional member of the American Studies Association. A standing Committee on American Studies coordinates the work in the field both on the campus and overseas.

The College of Arts and Sciences does not offer degrees in American Studies. Students following undergraduate or graduate programs in the departments of the College may, however, plan their programs to include courses in many aspects of American civilization. Such courses include:

Anthropology 210, 311, 415; Drama 476; Economics 200, 201, 260, 330, 440J, 442, 462, 463; English 267, 361, 362, 363, 434, 435; Geography 301, 302, 325, 402, 440J, 444, 448, 477; History 241, 341, 342, 343, 442, 443, 445, 446, 447, 450, 458, 459, 463, 464;



Music 347, 348; Philosophy 424; Political Science 202, 351, 370, 412, 450, 451, 460; Sociology 352, 362, 365, 371, 450; Speech 425, 426.

Members of the Committee on American Studies are available to assist departmental advisers in the preparation of programs.

## COMPARATIVE LITERATURE

### Faculty

Frank Jones (English, Chairman), Sverre Arestad (Scandinavian), Ernst Behler (Germanics), Robert Ellrich (Romance), Antonin Hruby (Germanics), Edith Kern (Romance), Willis Konick (Far Eastern and Slavic), Richard McKinnon (Far Eastern and Slavic), Otto Reinert (English), Roman Struc (Germanics), Frank Warnke (English), Hellmut Wilhelm (Far Eastern and Slavic)

Comparative literature is the study of literature in its essential nature, which is independent of ethnic, cultural, and linguistic differences.

The undergraduate program provides, first, a survey of classics which have formed literary taste over the centuries; second, an arrangement of works under three generic aspects: epic, drama, lyric. Both groups of courses stress the constant, unifying factors which underlie national differences and historical change.

In the graduate program, the comparative task proceeds by means of concentration on two or more national literatures, which, at the doctoral level, are studied in their original languages only.

The program is conducted by an interdepartmental faculty drawn from the Departments of Classics, English, Far Eastern and Slavic Languages and Literature, Germanic Languages and Literature, Romance Languages and Literature, and Scandinavian Languages and Literature.

### Undergraduate Programs

#### Adviser

Frank Jones  
A106 Padelford Hall

### GRADUATION REQUIREMENTS

#### Bachelor of Arts

The minimum course requirement for this degree is 50 credits. The following courses must be taken: Classics

210; Comparative Literature 300, 301, 302; and at least one quarter's work in a literature other than English, studied in the original tongue. The remaining credits are earned in 300- and 400-level courses chosen, in consultation with the chairman of the program, from among the offerings of Comparative Literature and the several departments. Departmental courses in foreign literature in English translation are listed under Classics, English, Far Eastern and Slavic Languages and Literature, Germanic Languages and Literature, Romance Languages and Literature, and Scandinavian Languages and Literature.

### Graduate Program

The Graduate program in Comparative Literature is described in the section on *Interdisciplinary Graduate Degree Programs* in this Catalog.

## DANCE

Courses in the performance of ballet, contemporary dance, and folk and ethnic dance; choreography; and the history of dance are offered by faculty of the School of Drama and the School of Physical and Health Education.

Physical education activities courses in the dance are intended primarily for beginning students. Those interested in concentrating in the performance of dance and those who are studying dance as a part of a major in physical education may elect other courses in dance. See Dance and Physical Education listings under *Description of Courses* section.

Inquiries concerning the program in dance should be addressed to Ruthanna Boris, Associate Professor of Drama and Director of Dance, or Dorthalee B. Horne, Associate Professor of Physical and Health Education.

## NEAR EASTERN STUDIES

### Committee

Farhat J. Ziadeh (Classics, Chairman), Harold L. Amoss (Anthropology), Walter A. Fairservis (Anthropology), Nicholas L. Heer (Classics), John B. McDiarmaid (Classics), Sol Saporta (Linguistics), Peter F. Sugar (History)



The University offers courses in the languages, literature, history, and cultures of the ancient and modern Near East for undergraduates and graduates. These courses permit a student to supplement his study in one of the departments of the College with an interest in the Near Eastern area, or to plan a special interdisciplinary program in Near Eastern studies.

Courses in Arabic and in Islamic literature are offered by the Department of Classics; courses in Turkish languages are offered by the Department of Far Eastern and Slavic Languages and Literature; and several courses relating to the Near East are offered by the Departments of Anthropology, History, and Political Science.

## **REGIONAL STUDIES: ASIA AND RUSSIA**

George E. Taylor  
Thomson Hall

Programs in Asian and Russian regional studies leading to the Bachelor of Arts and Master of Arts degrees are offered by the Department of Far Eastern and Slavic Languages and Literature. These programs are arranged with the cooperation of the Far Eastern and Russian Institute and the various departments.

### **Undergraduate Programs**

Adviser  
Ford R. Crull  
Thomson Hall

The undergraduate regional studies curriculum, leading to the Bachelor of Arts degree, combines training in a discipline with language and area specialization. The curriculum can be arranged, if desired, to fulfill the requirements of a double major. Programs can be based on the following disciplines: anthropology, art, comparative literature, economics, geography, history, linguistics, music, philosophy, political science, or sociology.

Instruction is available for the following regions: China, East Central Europe, Inner Asia, Japan, Korea, South Asia, Southeast Asia, and Russia. Adequate instruction is available for these programs in the following languages: Chinese, Japanese, Korean, Polish, Russian, Sanskrit, Serbo-Croatian, Thai, Tibetan, Turkic, and Vietnamese.

In the regional studies curriculum the requirements are: Far Eastern 110, or 310; at least 40 credits in one of the disciplines of the humanities or social sciences (excluding languages), including both basic courses in the discipline (for example, history or geography), and courses in which the discipline is applied to one of the regions listed; at least 15 additional credits in non-language courses on Asia or Russia in disciplines other than the discipline of concentration; and 30 credits or the equivalent in one Asian or Slavic language.

For complete course listings and further details refer to the Far Eastern and Russian Institute, the Department of Far Eastern and Slavic Languages and Literature, and the cooperating departments in the College of Arts and Sciences. Courses divided by region are listed under Regional Studies' Graduate Program below.

### **Graduate Program**

Graduate Program Adviser  
E. Harold Swayze  
B5J Padelford

The graduate program in regional studies combines training in one discipline with language and area (interdisciplinary) training in one or more regions. Language and area programs are offered for the following regions: China, Inner Asia, Japan, Korea, South Asia, Southeast Asia, East Central Europe, and Russia. Adequate instruction is available for these programs in the following languages: Bulgarian, Chinese, Czech, Hungarian, Japanese, Korean, Mongolian, Polish, Romanian, Russian, Sanskrit, Serbo-Croatian, Slavic, Thai, Tibetan, Turkic, and Vietnamese.

The program includes basic discipline courses and a combination of courses in several other disciplines on a particular region. For complete course listings and further details refer to the Far Eastern and Russian Institute, the Department of Far Eastern and Slavic Languages and Literature, and cooperating departments in the College of Arts and Sciences.

The courses listed below, divided by region, are called to the attention of undergraduate and graduate students who wish to plan regional studies programs:

*China:* Far Eastern 240, 290, 313J (in part), 344J, 402, 414J, 415J, 416J, 432J, 435J, 443, 462, 465J, 466J, 467J, 468J, 493J, 500, 505J, 516J, 519J, 521,



## DEPARTMENTAL PROGRAMS

## ANTHROPOLOGY

## Chairman

Kenneth E. Read  
345 Savery Hall

## Professors

Melville Jacobs, Alex D. Krieger, Fangkuei Li, Marshall T. Newman, Simon Ottenberg, Nicholas N. Poppe, George I. Quimby, Kenneth E. Read, James B. Watson, Edgar V. Winans

## Associate Professors

Walter A. Fairservis, Jr., Viola E. Garfield, Robert E. Greengo, Edward B. Harper

## Assistant Professors

John R. Atkins (acting), Isabel S. Caro, Vern Carroll, Robert A. Garfias, Charles Fenton Keyes, Laura L. Newell, Gananath Obeyesekere, LaMont West, Jr. (visiting), Peter J. Wilson

## Lecturer

Harold L. Amoss

## Research Associate

Peter Kunstadter

Anthropology—the “study of man and his works”—ranges over a wide and diverse field of inquiry, bridging the biological and social sciences as well as the humanities. It seeks to understand the observable differences and similarities in physical form, in social behavior, and in customs and beliefs found among the peoples of the world, past and present. Through systematic comparison and historical investigation, it attempts to substitute a body of objective, testable knowledge for the folklore and dogma that surround our conceptions of “human nature.” These aims require the cooperation of many specialists, and the field of anthropology includes the following specialized branches:

*Physical anthropology*—the study of man as a biological organism, including the evolution of man, racial differentiation, the biological significance of race, population genetics, and the biological basis of human behavior. *Archaeology*—the reconstruction of past cul-

\* These courses are listed under the Department of Far Eastern and Slavic Languages and Literature.

522, 523, 525, 526, 530, 531, 533, 538, 556J-557J-558J, 578J, 599, 611J-612J-613J, 614J; Anthropology 519J; Art 483; Drama 475; Geology 546; Music 316; Political Science 429. \*See also Chinese Language and Literature.

*East Europe:* Far Eastern 220, 305J, 347J, 401, 402, 405J, 426, 427J-428J, 489, 528J, 548J, 560J-561J-562J; History 426, 600; Music 316; Political Science 413. See also Bulgarian, Czech, Hungarian, Polish, Serbo-Croatian, Romanian, and Slavic Languages and Literature.

*Far East (over-all):* Far Eastern 110, 110H, 302J, 303J, 310, 313J, 432J, 456J, 461, 462, 463, 472, 473, 495J, 501, 519J, 521, 522, 523, 525, 526; Political Science 429; Music 316.

*Inner Asia:* Far Eastern 314J, 340, 341, 342, 430, 450, 598; Music 316. \*See also Mongolian, Tibetan, and Turkic Languages and Literature.

*Japan:* Far Eastern 295J, 313J (in part), 335J, 345J, 432J, 437J, 451J, 452J, 453J, 454J, 456J, 463, 500, 509J, 545J, 549J, 550J-551J-552J, 559J; Art 384; Music (consult adviser); Political Science 429. \*See also Japanese Language and Literature.

*Korea:* Far Eastern 242, 292, 313J (in part); 432J, 469, 470, 567J-568J-569J; Art 384; Political Science 429. See also Korean Language and Literature.

*South Asia:* Far Eastern 280J, 281J, 385J, 412J, 461, 472, 473, 482J, 483J, 484J, 485J, 587J; Anthropology 412, 478, 517; Art 382; Economics 465; Indic 320; Linguistics 404, 405, 406; Music 314; Political Science 540. \*See also Sanskrit and Indic Literature in English.

*Southeast Asia:* Far Eastern 303J, 316, 332J (in part), 343J, 434J, 444-445-446, 461, 462, 463, 478J, 506J, 521, 522, 523, 525, 526, 578J; Anthropology 317, 516; Music 314; Political Science 426, 429, 531. \*See also Thai and Vietnamese Language and Literature.

*Russia and East Europe:* Far Eastern 220, 243, 305J, 324, 329, 333J, 378, 401, 402, 405J, 420J, 421J, 422J, 423J, 424J, 426, 427J-428J, 429, 433J, 448J, 449J, 476J, 489, 496H, 507J, 510, 520J, 533, 534J, 535J-536J-537J, 539J, 541J, 546J-547J, 595J; Economics 390, 495; Music 316; Political Science 441. \*See also Bulgarian, Czech, Polish, Russian, Serbo-Croatian, and Slavic Languages and Literature.

tures through the study of surviving material remains, and the tracing of man's cultural evolution during the vast periods preceding written documents. *Ethnology*—the study of the cultures of living peoples, their institutions, customs, arts, beliefs, and traditions, their geographic distribution, and their historical relationships. *Social anthropology*—(sometimes included under ethnology), interested in defining types of social and cultural systems and in formulating valid generalizations about human behavior. A recent and increasingly important interest is the relation between culture and personality.

*Linguistics*—the scientific study of languages, including the analysis of the sound systems, grammar, and vocabulary of spoken languages, the historical relationships between languages, and the relation of language to other aspects of culture. (The Department of Anthropology and the Department of Linguistics offer a joint program in this field. For the full linguistic curriculum, see "Linguistics," *College of Arts and Sciences* section.)

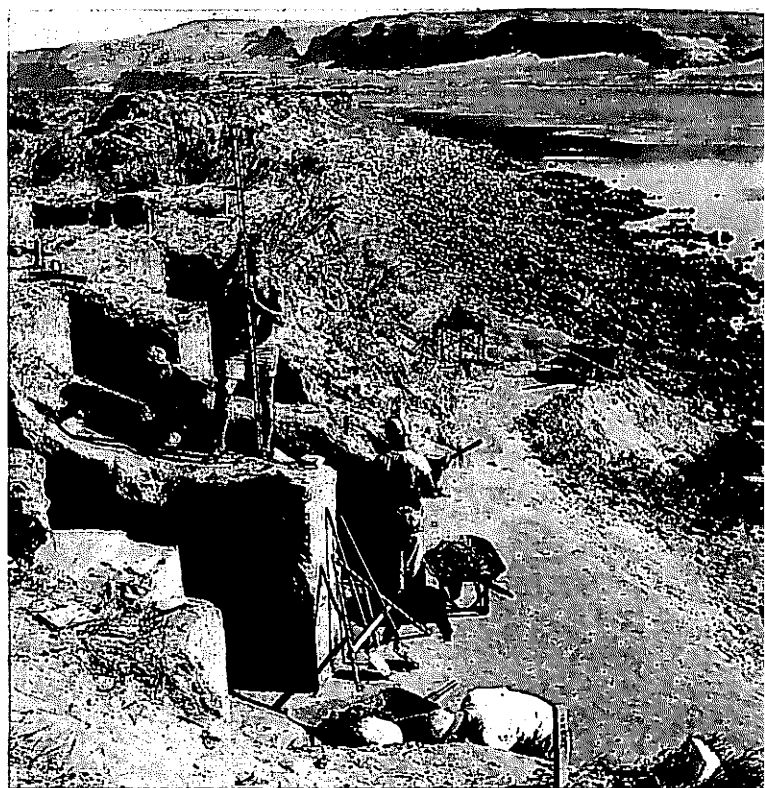
In the interests of a general, liberal education, undergraduate majors are expected to acquire a broad understanding of the five fields mentioned above and the relationships between them. The student is thus given a comparative view of human variation in time and space. He sees the wide range of cultural solutions men have devised to meet the problems posed by the physical environment and by man's biological, psychological, and social nature. He also becomes aware of the fundamental similarities shared by these apparently diverse physical and cultural forms.

The study of anthropology, therefore, fosters a better understanding of the world in which we live and a critical awareness of our own culture. A second aim of the undergraduate program is to provide a theoretical and factual background for those who wish to pursue a professional career in anthropology through graduate study.

At the graduate level, students who have demonstrated an adequate grasp of the materials of general anthropology may select one of the five fields as a field of specialization and are expected to develop special competence in that field. Students are encouraged to consider the master's degree as a stage in their progress toward the doctoral degree rather than as a terminal degree. The future will probably provide more teaching careers for persons with master's degrees in anthropology, as the growing number of junior and four-year undergraduate colleges increasingly include anthro-

pology in their curricula. Up to the present time, however, the Ph.D. degree has been a necessary qualification for a professional career in anthropology. At the professional level there are many opportunities for the application and advancement of theoretical anthropology in college teaching and research, and for its practical application in industry and government.

The Department of Anthropology offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. In addition, the Department offers major and minor academic fields for students in the College of Education; see *College of Education* section.



### Undergraduate Programs

#### Adviser

Viola E. Garfield  
345 Savery Hall

For the Bachelor of Arts degree in this curriculum, at least 50 credits in anthropology are required, including the following courses: 201, 202, 203; two area courses from 210, 211, 213, 215, 311, 314J, 315, 317, 319, 412, 415, 418; one archaeology course from 272, 273, 274; the general language course, 450; one physical



anthropology course from 480, 481, 482; two topical courses from 332, 431, 432, 433, 434, 435, 437, 438, 441, 442.

A 2.50 grade-point average in anthropology is required. If graduate work is contemplated, electives should include two foreign languages.

#### HONORS IN ANTHROPOLOGY

##### Adviser

Kenneth E. Read  
345 Savery Hall

Members of the College of Arts and Sciences Honors Program who wish to qualify for a bachelor's degree "With College Honors in Anthropology" must fulfill the requirements of that program during the freshman and sophomore years, in addition to the departmental honors requirements outlined below. With the approval of the departmental honors adviser, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Anthropology." These latter students may be selected from those anthropology majors who have demonstrated, during their junior year, superior abilities in the field of anthropology. They will be required to meet the same grade requirements for their junior and senior years as those set forth below for honors students and, in addition to fulfilling the course requirements for undergraduate majors in anthropology, must be prepared to do such additional work as the honors adviser will require.

Students desiring to become candidates for honors in anthropology should normally elect to major in anthropology prior to the beginning of their junior year and must fulfill the following departmental requirements:

- (1) Complete a minimum of 50 credits in anthropology, including the courses required of all undergraduate majors (see list under Bachelor of Arts above).
- (2) Maintain a grade-point average of 3.50 in all anthropology courses, and 3.00 in all other courses taken during their junior and senior years.
- (3) Register in the special honors quiz sections in Anthropology 100, 201, 202, and 203. Those students who have not fulfilled these lower-division requirements, on electing their major in anthropology, may be required to pass an advanced credit examination, or do such additional work as the departmental honor adviser may recommend.

(4) Register for 3 credits in Anthropology 499 (Undergraduate Research) in each quarter of their junior and senior years. During the junior year, this work will be directed by a designated member of the faculty and will be equivalent to an undergraduate proseminar. The work of the senior year will be carried out under the direction and supervision of a thesis committee appointed by the Department; all honors students will be required to submit a satisfactory senior thesis.

#### Graduate Programs

##### Graduate Program Adviser

Kenneth E. Read  
345 Savery Hall

All applications for admission to the graduate program in anthropology are considered by the Department as well as by the Graduate School of the University. In addition to the completed application form and the transcripts of record required by the Office of Admissions, which should be sent directly to the Office of Admissions, the Department requires that each applicant secure recommendations from three faculty members under whom he has studied. Such recommendations should be mailed directly to the Graduate Program Adviser, Department of Anthropology. All materials requested by the Department and the Office of Admissions must be on file *June 1* for admission to the following Autumn Quarter. An undergraduate major in anthropology is not a requirement for admission to the graduate program.

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate Study* section.

The following is a brief summary of departmental requirements. A more complete description of the graduate program and requirements, set forth in a departmental brochure, may be obtained by writing to the Graduate Program Adviser, Department of Anthropology.

Students entering the graduate program without a master's degree in anthropology must demonstrate a basic proficiency in all fields of anthropology by passing a comprehensive examination based on a series of required core courses. The core courses are: 450 Introduction to Language; 500, 501, 502 Preceptorial Reading (in cultural and social anthropology, archaeology, and physical anthropology, respectively); 567 History of Anthropological Sciences.

In addition to acquiring a general knowledge of the fields of anthropology and their interrelations in accordance with the foregoing requirements, students working for advanced degrees are expected to acquire special proficiency in one of the five fields of anthropology. The student selects the field, and the particular problems within it, upon which he wishes to concentrate. Under the guidance of a faculty Advisory Committee of his own choice, the student's program is then shaped to his individual needs.

A part of the graduate work may, with permission, be devoted to a minor in a related field. The Department also offers a joint program with the Far Eastern and Russian Institute for students who wish to undertake a Far Eastern area program as an additional field of concentration. In such cases the additional field will consist of a combination of language, history, and social science courses in the Far Eastern area as planned by a joint advisory committee of the Department and the Institute.

#### **Master of Arts**

Prospective candidates for the Master of Arts degree must satisfy the first-year requirements referred to above, demonstrate proficiency in a foreign language, complete an approved program of courses and readings, submit an acceptable thesis, and pass an oral examination covering the subject of the thesis and the student's chosen field of specialization.

#### **Doctor of Philosophy**

For the degree of Doctor of Philosophy, students must:

- (1) Present a master's degree in anthropology or secure a departmental waiver of the degree.
- (2) Give a satisfactory performance in three areal seminars, each covering a different geographical area.
- (3) Pass an approved course in statistics with a grade of B or better.
- (4) Satisfactorily complete any course and/or reading programs recommended by the Supervisory Committee in the field of specialization or in a supporting field.
- (5) Demonstrate reading proficiency in two foreign languages.
- (6) Be formally admitted to candidacy for the doctorate by creditably passing the General Examinations, consisting of a written examination, a written essay, and an oral examination, covering the student's special field of concentration and such topics as the Supervisory Committee considers relevant to that field.
- (7) Demonstrate competence in field work.

(8) Present an acceptable dissertation, normally based on field work.

(9) Pass the oral Final Examination devoted to the dissertation and general field of which it is a part.

The Ph.D. degree program usually requires three years beyond the master's degree or its equivalent. After passing the General Examinations, the Candidate normally spends a year in the field and another year in organizing the field materials and in writing the dissertation.

#### **Minor in Anthropology**

The requirements for a minor in anthropology for the master's degree are 18 credits in courses numbered 400 or above, 12 of which must be in two of the three courses numbered Anthropology 500, 501, 502. The remaining 6 credits may be selected by the student. In addition, the student must pass a written examination covering the course work taken. By special permission, the required credits may be reduced to no less than 15.

Requirements for a minor in anthropology for the doctor's degree are the same as those stated above for a minor in anthropology for the master's degree, with the additional requirement that the student complete an approved reading program. The written examination will cover the reading program as well as the course materials.

## **ART**

#### **Acting Director**

Spencer A. Moseley  
102 Art Building

#### **Acting Associate Director**

John W. Erickson  
302 Art Building

#### **Professors**

Glen E. Alps, Wendell P. Brazeau, Everett G. Du Pen, Hope L. Foote, Boyer Gonzales, Raymond L. Hill (emeritus), William J. Hixon, Pauline Johnson, Alden C. Mason, Spencer A. Moseley, Ambrose M. Patterson (emeritus), Ruth E. Penington, Robert Sperry, George Tsutakawa

#### **Associate Professors**

Frederick N. Anderson, Edna G. Benson (emeritus), Paul A. Bonifas (emeritus), John W. Erickson, Steven



D. Fuller, C. Louis Hafermehl, Viola H. Patterson, Eugene C. Pizzuto, Charles W. Smith, Lawrence D. Steefel, Jr., Valentine S. Welman

#### Assistant Professors

Elizabeth L. Curtis (emeritus), Richard F. Dahn, Michael D. Dailey, Warren T. Hill, Robert C. Jones, Howard W. Kottler, Norman K. Lundin, David O. Merrill, Richard M. Proctor, Peter M. Raven, Michael C. Spafford, Robert W. Speier, Glenn T. Webb

#### Instructors

Paul R. Jenkins, Kenneth J. Pawula, Edward L. Praczkowski

#### Lecturers

Irwin S. Caplan, Frank Del Giudice, Stephen Dunthorne, Theodore L. Rand, T. Gervais Reed, Donald F. Riecks, Millard B. Rogers

The School of Art serves a dual role within the educational structure of the University of Washington. It is both a professional school and an academic department. As a professional school it trains students for active careers in the graphic and plastic arts; as a school of the College of Arts and Sciences it offers studio and lecture courses which are open to all students, as well as a major in Art within the College's regular Bachelor of Arts program. All of its course offerings and its curriculum requirements are based on the underlying philosophy that an awareness and understanding of the visual arts are necessary to a liberal education, and that liberal education is necessary to the training of a professional artist.

The School of Art offers courses leading to the degrees of Bachelor of Arts, Bachelor of Fine Arts, Master of Fine Arts, and Master of Arts for Teachers.

The School reserves the right to retain student work for temporary or permanent exhibition.

### Undergraduate Programs

#### Adviser

Stephen Dunthorne  
209 Art Building

For undergraduate students, the School provides curricula in General Art, Art Education, and Art History which lead to a Bachelor of Arts degree, and curricula

in ceramic art, graphic design, industrial design, interior design, metal design, painting, printmaking, and sculpture which lead to a Bachelor of Fine Arts degree. The School also offers a major academic field (for elementary education majors) in the College of Education; see *College of Education* section.

Advanced standing in the School of Art is granted only on presentation of credentials from, and samples of work done in, art schools or university art departments whose standards are recognized by this School.

The work and record of accomplishment in the freshman and sophomore years of candidates for the Bachelor of Fine Arts will be reviewed at the beginning of the junior year to determine whether they will be allowed to continue in the program.

All majors in the School of Art must take the following art courses in the first year: 105, 106, 107, 109, 110, 129.

Prerequisites for all art courses must be strictly adhered to and in no case will auditors be allowed to take studio courses.

### GRADUATION REQUIREMENTS

#### Bachelor of Arts

Requirements for candidates for this degree are listed below. Students following these curricula will be required to complete a minimum of 180 credits, combining stated College of Arts and Sciences requirements with requirements in the major.

#### CURRICULUM FOR THE GENERAL MAJOR

This curriculum provides some concentration in art, but allows a wide range of electives both in art and in other fields of study. The requirements are 70 credits in art, composed of 105, 106, 107, 109, 110, 129 (the first-year program); 212, 213, 214, and 3 elective credits in art history; and 41 credits chosen from the following optional fields so that the first option includes no more than 15 credits and the others no more than 9 credits: 300, 302, 303, 304, 305 (art education); all undergraduate art history courses except 212, 213, 214; 201, 202, 203, 353, 354 (ceramics); 253, 254, 255, 340 (design); 265, 266, 267, 268 (drawing); 205 (graphics); 357, 358, 359, 457, 458, 459 (metal and jewelry); 256, 257, 258, 259, 307, 308, 309, 360, 361, 362, 463, 464, 465 (painting); 350, 351, 352, 450, 451 (printmaking); 272, 273, 274, 322, 323 (sculpture).

#### CURRICULUM IN ART EDUCATION

Students who wish to prepare for secondary school teaching should follow the curriculum prescribed below. The professional education requirements, as described in the *College of Education* section, must be fulfilled for certification to teach in the state of Washington.

The requirements are 70 credits in art, composed of 105, 106, 107, 109, 110, 129 (first-year program); 212, 213, 214, and 3 elective credits in art history; 12 to 15 credits from 201, 253, 254, 255, 272, 357, 358; 12 to 15 credits from 256, 257, 258, 360, 361, 463, 464; 9 to 12 credits from 205, 261, 350, 351, 367; and 6 to 12 credits from 300, 302, 303, 304, 305.

#### CURRICULUM IN ART HISTORY

The requirements are 26 credits in art composed of 105, 106, 107, 109, 110, 129 (first-year program); 212, 213, 214, plus 40 credits to be selected from offerings in the history, theory, and criticism of art, the history of architecture, and classical archaeology. The student should also elect courses in related subjects in his major field.

Students who plan to undertake graduate work in art history should acquire a reading knowledge of French or German. Those planning to do graduate work in oriental art should begin work in an oriental language as well.

#### Bachelor of Fine Arts

The requirements for the candidates for this degree are as follows:

Professional curricula in the following fields are offered for students who wish a greater concentration in art than is provided in the general major. Students following these curricula will be required to complete a minimum of 225 credits, combining stated College of Arts and Sciences requirements with requirements in the major.

#### CURRICULUM IN CERAMIC ART

The requirements are 131 credits in art, composed of 105, 106, 107, 109, 110, 129 (first-year program); 212, 213, 214, 325, and 6 elective credits in art history; 201, 202, 203, 353, 354, 355, 485, 486, 487 (ceramics); 15 credits in one of the following fields: painting, sculpture, printmaking, and metal; 27 elective credits in art, with a minimum of 6 credits in studio courses; and 15 elective credits from art or academic areas.

#### CURRICULUM IN GRAPHIC DESIGN

The requirements are 127 credits in art, composed of 105, 106, 107, 109, 110, 129 (first-year program); 212, 213, 214, and 3 elective credits in art history; 205, 366, 367, 368, 410, 466, 467, 468, 479, 480, and 15 credits in 498 (graphic design); 256, 257, 258, 265, 266, 267, 313, 314, 350, 351, 360, 361, 362; and 6 elective credits in art; Psychology 100; Economics 200; Communications 226.

#### CURRICULUM IN INDUSTRIAL DESIGN

The requirements are 159 credits, composed of 87 credits in art, 18 credits in architecture, and 54 other credits. The following art courses are required: 105, 106, 107, 109, 110, 120 (first-year program); 212, 213, 214, 320, 326 (art history); 316, 317, 318, 445, 446, 447 (industrial design); 201, 205, 253, 254, 272, 282, 313, 314, 357; Architecture 124, 125, 126; Mechanical Engineering 201, 202, 203, 342, 410; General Engineering 104, 351; Economics 200; Business Law 307; Communications 226; Speech 100; 15 credits in physics; Psychology 100; Marketing 301.

#### CURRICULUM IN INTERIOR DESIGN

The requirements are 130 credits, composed of 73 credits in art, 24 credits in architecture, and 5 credits in home economics. The following art courses are required: 105, 106, 107, 109, 110, 129 (first-year program); 212, 213, 214, 262, 283, 258, 280, 281, 282, 310, 311, 312, 472, 473, 474; 28 elective credits in art or humanities; Architecture 100, 101, 124 125, 126, 338; Home Economics 125, 329.

#### CURRICULUM IN METAL DESIGN

The requirements are 127 credits, including 107 credits in art. The following art courses are required: 105, 106, 107, 109, 110, 129 (first-year program); 212, 213, 214, and 9 elective credits in art history; 357, 358, 359, 457, 458, 459, and 15 credits in 498 (metal design); 205, 253, 254, 255, 256, 257, 258, 272, 273, 274; 9 approved elective credits in art; Mechanical Engineering 201, 202, 203, 342; General Engineering 104; Business Law 307; Marketing 301; Accounting 210.

#### CURRICULUM IN PAINTING

The requirements are 131 credits in art, composed of 105, 106, 107, 109, 110, 129 (first-year program); 212, 213, 214, 320, 326, and 4 elective credits in art history or Architecture 100, 101; 265, 266, 267 (drawing); 256, 257, 258, 360, 361, 362, 307, 308, 309, 463, 464, 465, 475, 476, 477 (painting); 272, 273, 274, 350, 351, 352; and 25 elective credits in art.



#### CURRICULUM IN PRINTMAKING

The requirements are 131 credits in art, composed of 105, 106, 107, 109, 110, 129 (first-year program); 212, 213, 214, 327, and 2 elective credits in art history; 350, 351, 352, 450, 451, 452, and 15 credits in 498 (printmaking); 256, 257, 258, 265, 266, 267, 272, 273, 360, 361, 362, 463, 464; and 23 elective credits in art.

#### CURRICULUM IN SCULPTURE

The requirements are 126 credits in art, composed of 105, 106, 107, 109, 110, 129 (first-year program); 212, 213, 214, 320, 326; 272, 273, 274, 322, 323, 324, 332, 333, 334, 436, 437, 438 (sculpture); 201, 202, 253, 254, 256, 257, 265, 266, 350, 351; and 24 elective credits in art.

### Graduate Programs

#### Graduate Program Adviser

Wendell Brazeau  
202 Art Building

The School of Art offers courses leading to the degrees of Master of Arts, Master of Fine Arts, and Master of Arts for Teachers. Graduate standing in the School of Art is granted only on presentation of credentials from art schools or university art or art history departments whose standards are recognized by this School. Samples of work done in these schools or art departments must also be presented by applicants for admission to the Master of Fine Arts and Master of Arts for Teachers degree programs.

In addition to Graduate School general admission requirements, students desiring to pursue a course of study leading to the master's degree must have a grade average of B or better in the undergraduate art major and must have completed the equivalent of the undergraduate degree requirements in the School of Art, University of Washington. The School of Art may require additional undergraduate work beyond the basic minimum if it is necessary to make up deficiencies or inadequacies.

#### Master of Arts

Candidates for the degree Master of Arts in the field of art history must meet the requirements of the Graduate School, demonstrate competence in French or German, pass a comprehensive examination in art history at the level of a sound general survey, offer a minimum of 36 credits in the history of art numbered 400 or above, of which 27 are course credits and 9 are thesis credits (half of the 36 credits must be in courses numbered 500 or

above), and present and defend a thesis. The thesis may be the extension of a seminar paper that demonstrated the student's familiarity with sources and his capacity for synthesis and critical evaluation.

#### Master of Fine Arts

Students accepted for admission will be required to complete a program of a minimum of 36 credits of scheduled class work and 9 credits of thesis for a total of 45 credits for the degree. No foreign language is required. The thesis is in the nature of a project, such as a series of paintings, prints, sculptures, ceramic objects, designs in metal or fabric, executed with a background of research.

A selection of the student's thesis may be reserved for inclusion in the annual exhibition of master's theses of the School of Art at the Henry Art Gallery.

#### Master of Arts for Teachers

Students accepted for admission into the M.A.T. program must have completed at least one year of successful teaching experience on the elementary, secondary, or college level, prior to initial entry. The program requires completion of a minimum of 36 credits, 9 of which may be a thesis related to the field. Additional course work, including a research study, may be taken in lieu of the thesis. No foreign language is required.

More detailed information regarding the Master of Fine Arts, Master of Arts for Teachers, and Master of Arts in the field of history of art degrees may be obtained from the Graduate Program Adviser in Art.

## ASTRONOMY

#### Chairman

George Wallerstein

#### Professors

Theodor S. Jacobsen, George Wallerstein

#### Associate Professor

Paul W. Hodge

#### Assistant Professor

James Bardeen

Astronomy is the science of the physical contents, size, form, and natural laws of the stellar universe. Its main branches deal with the positions, distances, motions,



masses, composition, and form of the celestial bodies. The principal disciplines are divided into such specialties as celestial mechanics, polar systems, stellar spectroscopy, stellar structure and evolution, interstellar matter, galactic structure, extragalactic nebulae, and cosmology.

Astronomy 101 is offered as an introductory description of astronomy for students in all fields. Astronomy 301 provides an introduction for students in the physical sciences, mathematics, and engineering with a good background in general physics and calculus. The 400-level courses are to provide background for advanced work in astronomy and are recommended for students in the physical sciences and mathematics. Graduate courses in the solar system, stellar atmospheres and interiors, interstellar matter, stellar dynamics, and galactic and extragalactic astronomy are also offered.

Undergraduates who are interested in advanced work in astronomy are urged to major in a related field such as physics and to take the 400-level as well as two or three 500-level courses in the senior year.

While there is not at present a formal advanced degree program in astronomy, plans for the master's and doctor's degrees are currently being formulated.

## **ATMOSPHERIC SCIENCES**

### **Chairman**

Phil E. Church  
201F Atmospheric Sciences Building

### **Professors**

Konrad J. Buettner, Joost A. Businger, Phil E. Church,  
Robert G. Fleagle, Richard J. Reed, Masahisa Sugiura.

### **Associate Professors**

Franklin I. Badgley, Peter V. Hobbs

### **Assistant Professors**

James Holton, John M. Wallace

### **Research Associate Professors**

Kenneth O. Bennington, Norbert Untersteiner

### **Research Assistant Professors**

Mikio Miyake, W. D. Scott

### **Research Associate**

Ya Hsueh

Atmospheric Sciences are concerned with applying the methods of theoretical and experimental physics to the study of the earth's atmosphere. The subject ranges from such topics as the microphysical processes involved in the formation of clouds and rain to a study of world-wide atmospheric circulations and the properties of the outer regions of the earth's atmosphere.

At the undergraduate level, the Department provides an elective curriculum which includes the branches of atmospheric physics, synoptic meteorology, and climatology. Students awarded a bachelor's degree by the Department are eligible for the rating of professional meteorologist given by the United States Civil Service Commission. Courses offered in the graduate program, leading to the Master of Science and Doctor of Philosophy degrees, emphasize more advanced aspects of the atmospheric sciences, including aeronomy, biometeorology, climatology, cloud physics, energy transfer, weather analysis and prediction.



## **Undergraduate Programs**

### **Advisers**

Phil E. Church  
201F Atmospheric Sciences Building

Richard J. Reed  
201C Atmospheric Sciences Building

## **GRADUATION REQUIREMENTS**

### **Bachelor of Science**

A minimum of 38 credits is required in atmospheric sciences numbered above 300, of which 20 credits



must be earned in courses above 400. Mandatory courses are 301, 340, 350, 431, 441 and their prerequisites. Courses required from other departments are: Mathematics 324, 325, and their prerequisites and Physics 121, 122, 123, 131, 132, or equivalent.

A grade of C or better must be earned in each of the required courses in mathematics and physics and in each of the mandatory courses in atmospheric sciences and their prerequisites. An over-all grade-point average of at least 2.20 must be obtained in all courses taken in atmospheric sciences.

Programs and requirements for honors students will be arranged on an individual basis, under staff supervision.

#### **HONORS IN ATMOSPHERIC SCIENCES**

Adviser

Richard J. Reed  
201C Atmospheric Sciences

The Department of Atmospheric Sciences offers an honors program at the junior and senior levels. Members of the College of Arts and Sciences Honors Program must fulfill the requirements of that program during the freshman and sophomore years. It is recommended, but not required, that prospective honors majors enroll in the honors sections of lower-division mathematics and physics courses listed as requirements for the degree in Atmospheric Sciences (Mathematics 134H, 135H, 136H, 235H, 236H, Physics 121H, 122H, 123H).

In order to obtain the bachelor's degree "With College Honors in Atmospheric Sciences," the candidate must satisfy all the regular degree requirements of the Department and must in addition earn a minimum of 6 credits in 390H (Tutorial in Atmospheric Sciences), and a minimum of 6 credits in mathematics and/or physics courses numbered above 300. Of the required 20 credits in Atmospheric Sciences courses above 400, a minimum of 10 must be earned in honors sections of the following courses: 431, 441, 442, 451.

The honors student is also required to take the graduate record examinations in mathematics and physics and at least one upper-division course outside the science group, preferably from among the following: History 316 (Science in Civilization: Antiquity to 1600), 317 (Science in Civilization: Science in Modern Society), and 420 (Science and the Enlightenment); and Philosophy 456 (Metaphysics), 460 (Introduction to the Philosophy of Science), and 470 (Advanced Logic).

With the approval of the Department, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Atmospheric Sciences." Selection of candidates for departmental honors will be made by the staff at the beginning of the junior year.

#### **Graduate Programs**

Graduate Program Advisers

R. G. Fleagle  
201E Atmospheric Sciences Building

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate Study* section. A bachelor's degree in a physical science, engineering, or mathematics is required for admission to the graduate program. The complete program for an advanced degree must be approved by the staff.

Prospective candidates for advanced degrees must take the Qualifying Examination which tests understanding of the fundamental aspects of the atmospheric sciences and the relevant mathematics and physics. It is given after completion of two quarters of graduate study. Those who pass this examination with distinction are encouraged to work toward the Ph.D.; those who pass at a lower level may continue to work toward the M.S.

#### **Master of Science**

The minimum course requirements are: 27 graduate credits exclusive of research or thesis, of which 3 must be in applied mathematics or mathematical physics and 15 must be in Atmospheric Sciences courses numbered above 500.

A thesis is required. It must demonstrate the student's ability to use research methods in a limited area and to discuss critically his own and other investigators' work.

#### **Doctor of Philosophy**

A student who passes the qualifying examination with distinction may embark on the Ph.D. program under the supervision of a faculty committee. The General Examination, which is taken at the end of the second year of residence, normally is an oral examination which tests depth of understanding of a topic within the student's area of special interest which is selected in advance.

At least half of the credits earned prior to the General Examination should be in courses numbered above 500, and at least 21 credits should be earned in approved mathematics and physics courses numbered above 400. The dissertation is an important part of the student's program; it must represent an original contribution of substantial scientific importance.

## BIOCHEMISTRY

### Chairman

Hans Neurath

J405 Health Sciences Building

Biochemistry is a study of the chemistry of life processes and as such constitutes one of the rapidly expanding branches of biological sciences. There is no curriculum leading to an undergraduate degree in biochemistry, but students following the Bachelor of Science curriculum offered by the Department of Chemistry may include as part of their degree program courses offered by the Department of Biochemistry. Courses in biochemistry are also of interest to undergraduate students in other fields, such as biology, genetics, or microbiology.

### Graduate Programs

#### Graduate Program Adviser

William J. Rutter

J405 Health Sciences Building

Students who intend to work toward the Master of Science and Doctor of Philosophy degrees in biochemistry should consult the *Graduate Study* and *School of Medicine* sections.

## BIOLOGY

Courses in biology are administered jointly by the Departments of Botany and Zoology. There is no biology curriculum leading to a degree, but students may use biology courses to satisfy some of the requirements for a major in either botany or zoology. The Departments of Botany and Zoology jointly offer a major in biology for students in the College of Education. (See *College of Education* section.)



## BOTANY

### Chairman

Richard B. Walker

342 Johnson Hall

### Professors

C. Leo Hitchcock, Bastiaan J. D. Meeuse, Daniel E. Stuntz, Richard B. Walker, Arthur R. Kruckeberg

### Associate Professors

H. Weston Blaser, Robert E. Cleland, Peter S. Dixon, Richard E. Norris

### Assistant Professors

Edward F. Haskins, Howard C. Whisler

### Lecturer

Clarence V. Muhlick

Botany includes in a broad sense all aspects of the study of plants. More specifically, study of the following are included: the structure, classification, and development of the various groups in the plant kingdom; reproduction, genetics, and evolution; the physiology and biochemistry of cells and of the multicellular plant; the relations of plants to their environments; the application of botanical information in landscaping, horticulture, pharmacy, forestry, and other



fields. In this Department, general training in these various topics may be followed by more intensive study of plants in natural habitats on land and in the water, microscopic observations, experimental studies in the greenhouse and the laboratory, herbarium studies, and biochemical experiments in growth and development.

Elementary courses in both general biology and general botany offer to the nonscience major an opportunity to learn general scientific principles as well as learn about the world of living plants in which he lives. Professional students in forestry, education, pharmacy, oceanography, and other fields may develop a knowledge of botany necessary or useful in their vocations. For others, their studies lead to a career as a professional botanist.

The Department of Botany offers courses leading to the degrees of Bachelor of Science, Master of Science, and Doctor of Philosophy. In conjunction with the Department of Zoology, a major academic field and a minor academic field in biology are offered for students in the College of Education; see *College of Education* section.

For students who do not expect to take more than 5 credits in this subject, 111 or 113 is recommended. For those who expect to take 10 credits, one of these sequences is recommended: 111 and 112, or 111 and 113, or 111, 201 (or 202 or 203), and 331. Students intending to become botany or biology majors should normally start with the Biology 210, 211, 212 sequence. All biology courses, Genetics 451, and Microbiology 301 or 400 may be used for botany credit.

Entering students with exceptional ability or preparation are encouraged to consider advanced placement examinations. The Department wishes to encourage the progress of students by allowing advanced standing where justified.

### Undergraduate Programs

#### Adviser

C. Leo Hitchcock  
343 Johnson Hall

**Bachelor of Science:** 40 credits in botany are required for the Bachelor of Science degree. Courses must include 111, 112, 113, or 311, 312, 313, depending upon the student's previous study in biology and chemistry; 371 or 472; Genetics 451; and a minimum of one

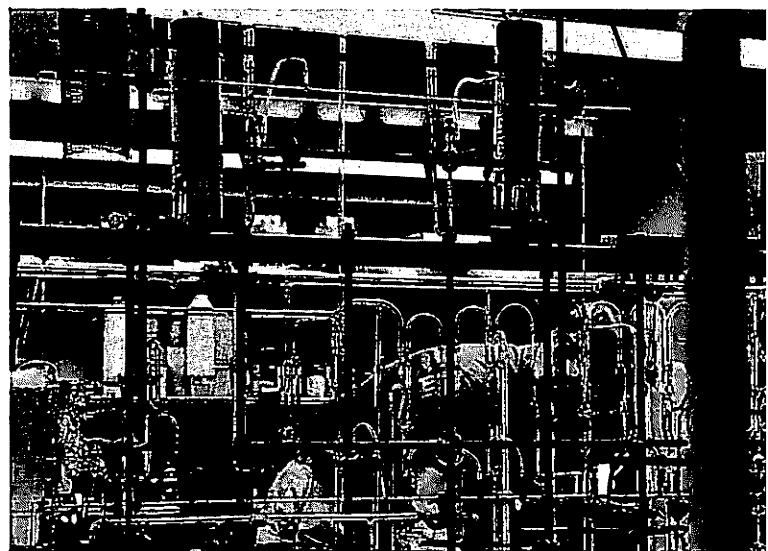
year of college chemistry, including organic chemistry. More advanced organic chemistry is recommended in lieu of Chemistry 102 for students contemplating post-graduate studies.

### Graduate Programs

#### Graduate Program Adviser

Richard B. Walker  
342 Johnson Hall

Students who intend to work toward the degree of Master of Science or Doctor of Philosophy must meet the requirements of the Graduate School as outlined in the *Graduate Study* section. Organic chemistry is a requirement for an advanced degree in the Department of Botany; Chemistry 335, 336, 337 are recommended.



## CHEMISTRY

#### Chairman

Verner Schomaker  
200 Bagley Hall

#### Professors

Arthur G. Anderson, Jr., George H. Cady, Hyp J. Dauben, David F. Eggers, Jr., Arthur W. Fairhall, Norman W. Gregory, George D. Halsey, Jr., Edward C. Lingafelter, Jr., Yeshayau Pocker, Benton S. Rabino-  
vitch, David M. Ritter, Rex J. Robinson, Verner Schomaker, Wolfgang M. Schubert, H. V. Tartar (emeritus)

#### Associate Professors

Alden L. Crittenden, Ernest R. Davidson, Martin P. Gouterman, Victorian Sivertz, Leon J. Slutsky, George H. Stout, Robert Vandenbosch, Gershon Vincow

#### Assistant Professors

William S. Chilton, Thomas L. Isenhour, C. Beat Meyer, Norman J. Rose, J. Michael Schurr, Darrell J. Woodman

#### Lecturer

Frank E. Ware

Chemistry is a branch of natural science that deals principally with the properties of substances, the changes which they undergo, and the natural laws which describe these changes. A research chemist may work with the objective only of advancing the science or he may strive to accomplish a goal having economic value. Many different careers ranging from teaching or research in pure science to industrial research or administration are open to those trained in chemistry.

Chemistry also supplies part of the essential background for medicine, engineering, and other scientific or technical subjects. Science is an important part of modern culture, and some of the courses serve as good natural science electives for students majoring in one of the humanities or social sciences.

The Department of Chemistry offers curricula leading to the degrees of Bachelor of Science, Bachelor of Arts, Master of Science (both with and without thesis), and Doctor of Philosophy.

#### Undergraduate Programs

##### Adviser

V. Sivertz  
200 Bagley Hall

For undergraduate students, the Department provides two curricula leading to bachelor's degrees: a Bachelor of Science curriculum with an intensive study of chemistry and related sciences in preparation for a professional career or for graduate study, and a Bachelor of Arts curriculum which provides a basic introduction to chemical science and allows a wider choice of electives in fields outside the physical sciences. In addition, the Department offers major and minor academic fields for students in the College of Education. (See the *College of Education* section in this Catalog.)

Students planning to major in chemistry are advised to take in high school 2 units of German and at least 3 units of mathematics, including 1½ units of algebra and ½ unit of trigonometry.

Transfer students must complete at least 9 credits in chemistry in this Department to receive a degree with a major in chemistry.

Programs leading to the Bachelor of Science are designed to prepare students for professional careers in such diverse fields as chemical physics, nuclear chemistry, instrumental analysis, industrial chemistry, biochemistry, and the chemistry of medicinals, as well as in analytical, inorganic, organic, and physical chemistry.

After the basic courses in general chemistry, physics, and mathematics, the student will take intermediate courses selected appropriately from the following groups: mathematics and physics; physical chemistry; analytical, inorganic, and nuclear chemistry; organic chemistry; and biochemistry (offered in the Department of Biochemistry). He later will be encouraged to enroll in advanced courses, including undergraduate research, related to his intended area of specialization. Plans for the student's schedule will be developed in conferences with a departmental adviser.

#### GRADUATION REQUIREMENTS

##### Bachelor of Science

The departmental requirements for the degree are mathematics through 224, one year of college physics, 48 credits in chemistry, and 21 credits of approved upper-division science electives which may include courses in biochemistry, physics, mathematics, etc. For graduation, the student must possess a reading knowledge of German, French, or Russian (the American Chemical Society recommends German), obtain a grade-point average of at least 2.50 in chemistry courses, with a C or better in each course, and achieve a total grade-point average of 2.50 or better.

During the first three years, the program generally includes Chemistry 140, 150, 151, 160, 170, 221, 335, 336, 337, 345, 346, 347, 455, 456, and 457; English 101, 102, and 103; one year of physics, including laboratory; and mathematics through 224 or its equivalent. The preceding chemistry courses and 458 constitute the 48 credits of required chemistry courses. Students with outstanding records may, with permission in advance, substitute the honors courses 145H, 146H, 155H for 140, 150, 151, 160. Chemistry 198 and 199 are electives that majors are encouraged to take during their first two years.



Upper-division science electives usually include 416 and 426. Additional chemistry electives may be chosen from 410, 415, 418, 419, 425, 427, 428, 429, 445, 446, and 499. Other upper-division electives may be chosen from such courses as Biochemistry 440, 441, 442, 444 (formerly 481, 482, 483, 484), 499; Physics 320, 323, 325, 326, 327, 371, 372, 461, 462, 463; Mathematics 302, 324, 325, 402, 403, 404, 427, 428, 429, 438; Electrical Engineering 400; Microbiology 301, 400; Atmospheric Sciences 301; Genetics 451; and others.

#### Bachelor of Arts

The program leading to this degree provides the student a broad choice of electives in fields other than science. It is especially adapted to the needs of students in premedicine and education, and of those seeking a liberal education with some concentration in science.

Requirements in this curriculum are Chemistry 140, 150, 151, 160, 170, 221, 231, 232, 241, 242 (the organic series 335, 336, 337, 345, 346 is recommended in place of the 231 series for those students whose program can accommodate it), at least 9 credits of physical chemistry lectures (455, 456, and 457 recommended, though with prior approval 350, 351, and 455 may be accepted), and 458; one year of physics, including laboratory, and mathematics through 126. The foreign language is usually German, French, or Russian. A grade of C or better should be obtained in each of the required chemistry courses.

#### Honors in Chemistry

##### Adviser

Ernest R. Davidson  
19 Bagley Hall

Members of the College of Arts and Sciences Honors Program may receive a bachelor's degree "With College Honors in Chemistry" if they fulfill the requirements of that program and, in addition, the following departmental honors requirements. With the approval of the departmental honors adviser, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum during their junior and senior years and receive a bachelor's degree "With Distinction in Chemistry."

Honors students in General Chemistry take 145H, 146H, and 155H in place of 140, 150, 151, and 160.

In addition to the regular requirements for a bachelor's degree in chemistry, a candidate for an honors degree must have a grade-point average above 3.25 in chemistry courses and above 3.00 in other courses and must present at least 15 credits selected from the following: (1) Honors work in 400-level chemistry courses, exclusive of 499, arranged by conference with the professor in charge; (2) any chemistry course numbered 500 or above in which an A or B grade is earned; (3) upper-division courses in other sciences or mathematics as approved by the chemistry honors adviser.

Candidates for a Bachelor of Science honors degree must complete a minimum of 6 credits in Chemistry 499 and submit copies of an acceptable senior thesis to the professor who supervises his work and to the honors adviser before the last day of instruction of the quarter in which the degree is to be granted.

Candidates for a Bachelor of Arts honors degree must complete the same basic 48-credit sequence of chemistry courses as that required of Bachelor of Science majors. Under (3) above, with prior approval of the chemistry honors adviser, upper-division courses outside the science group may be used. Candidates must prepare an honors paper on a topic selected in consultation with a member of the faculty and the chemistry honors adviser, each of whom must receive a copy before the last day of instruction of the quarter in which the degree is to be granted.

#### Graduate Programs

##### Graduate Program Adviser

Verner Schomaker  
200 Bagley Hall

Prospective candidates for advanced degrees must meet the requirements outlined in the *Graduate Study* section of this Catalog and be granted admission to the Graduate School. Qualifying examinations, designed to assess the student's knowledge and understanding of the material normally contained in an undergraduate program with a major in chemistry, are usually given shortly before the opening of each Autumn, Winter, or Spring Quarter. If not passed outright, these examinations lead to a set of special requirements, usually in the form of a sequence of remedial courses, which have to be satisfied within a year.

Students seeking the master's degree usually present German as their foreign language.

Students wishing to pursue the doctor's degree also take a series of cumulative examinations. These are written examinations covering mainly the student's area of specialization (analytical, inorganic, organic, or physical chemistry) that are designed to stimulate independent study and thought; to evaluate the breadth of knowledge gained from courses, seminars, and the literature; and to test the student's ability to apply this knowledge to diverse problems. The General Examination requirement for the Ph.D. is considered to be satisfied when the performance on the cumulative examinations reaches a certain satisfactory level and the language requirement has been met. The latter requirement may be satisfied by passing examinations in German and in either Russian or French.

In the Chemistry Department, teaching experience as a graduate teaching assistant or predoctoral teaching associate is a further requirement for all students working toward the doctor's degree.



## CLASSICS

### Chairman

John B. McDiarmid  
218 Denny Hall

### Professors

Harvey B. Densmore (emeritus), John B. McDiarmid,  
William M. Read, Farhat J. Ziadeh

### Associate Professors

William C. Grummel, Nicholas L. Heer, Paul Pascal,  
William F. Wyatt, Jr.

### Assistant Professors

Colin N. Edmonson, Pierre A. MacKay, Louis J. Vignoli

Classics is the study of ancient Greek and Roman civilization in all its aspects, from prehistoric times to the Middle Ages. It includes the Greek and Latin languages; the many kinds of literature written in them, such as poetry, drama, history, philosophy, rhetoric, political theory; and ancient art and archaeology.

The Department of Classics offers programs leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. For the Provisional Teaching Certificate, it offers major and minor academic fields in Latin. Candidates for the Certificate may major in Latin in this Department, under the College of Arts and Sciences, or in the College of Education.

The undergraduate curriculum in Greek and Latin is designed to provide a general education through the reading of major literary works and to form a sound basis for teaching and further study. At the graduate level, courses and seminars are offered each quarter in both languages.

Archaeology courses survey and interpret the physical remains of antiquity in the light of modern archaeological methods and excavations. A knowledge of Greek and Latin is not needed for the undergraduate courses.

Classics courses in English are intended primarily for students who have not studied Greek and Latin. The lower-division courses in literature and word-derivation are general and introductory; each of the upper-division courses is concerned with a single literary type.

Students who are interested in taking courses in Latin or Greek should begin their study at the University as early as possible, since each advanced course in the literature is offered only once every two years. Those who are uncertain of their preparation for any course or who wish to review work done elsewhere should consult the Department before registering. The prerequisite for any course may be waived at the Department's discretion.

Courses in Arabic are offered for students who wish to do further study of ancient and modern Islamic civilizations, and courses in Near Eastern literature are offered in English for interested students in all fields. See



"Near Eastern Studies" in the *Interdepartmental Programs* section of this Catalog.

Information about the curriculum, requirements, undergraduate scholarships, and graduate appointments may be obtained from the Department.

### Undergraduate Programs

#### Adviser

John B. McDiarmid  
218 Denny Hall

### GRADUATION REQUIREMENTS

#### Bachelor of Arts

#### CLASSICS MAJOR

Requirements are: 18 approved credits in upper-division Greek courses; 18 approved credits in upper-division Latin courses.

#### GREEK MAJOR

27 approved credits in upper-division Greek courses, and 9 credits chosen with the approval of the Department from courses in Latin, upper-division Greek, archaeology (Classical Archaeology 341J, 342J, 402J, 404J, 406), Classics in English (Classics 210, 422, 426, 427, 428, 430, 435, 440), ancient history (Social Science 101, History 201, 202, 400, 401, 402, 403, 404, 405, 406), and the history of ancient philosophy (Philosophy 320, 431, 433).

#### LATIN MAJOR

27 approved credits in upper-division Latin courses, and 9 credits chosen with the approval of the Department from courses in Greek, upper-division Latin, archaeology (Classical Archaeology 341J, 342J, 402J, 404J, 406), Classics in English (Classics 210, 422, 426, 427, 428, 430, 435, 440), ancient history (Social Science 101, History 201, 202, 400, 401, 402, 403, 404, 405, 406), and the history of ancient philosophy (Philosophy 320, 431, 433).

### Honors in Classics, Latin, or Greek

#### Adviser

William C. Grummel  
228A Denny Hall

Members of the College Honors Program who wish to qualify for a bachelor's degree "With College Honors in Classics" or "... in Latin" or "... in Greek" must fulfill the requirements of that program during the freshman and sophomore years in addition to the departmental

honors requirements shown below. With the approval of the Departmental Honors Committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Classics" or "... in Latin" or "... in Greek."

Requirements for admission to candidacy for an honors degree are: (1) a cumulative grade-point of 3.00 for the freshman and sophomore years, with an average of 3.50 for courses taken within the Department; (2) sufficient competence in either Latin or Greek to enter the upper-division courses in the languages.

Candidates for departmental honors "With Distinction" will be nominated by the Departmental Honors Committee during the last quarter of their sophomore year.

The departmental honors curriculum follows:

#### Lower-division preparation

In addition to Latin and/or Greek courses, honors students are advised to take honors sections of Social Science 101 or of History 201 and 202.

#### Junior and senior years

In their junior year, honor students are assigned to a departmental adviser, under whose supervision they begin an independent reading project in either Latin or Greek. In the senior year, they write a senior thesis based on research in some subject of special interest to them. Normally 9 credits are earned in the reading list and senior thesis combined, under Latin or Greek 490H.

### Graduate Programs

#### Graduate Program Adviser

John B. McDiarmid  
218 Denny Hall

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School.

#### Master of Arts

Requirements are a minimum of 27 credits in courses or seminars in Greek, Latin, and related subjects approved by the Department; a reading knowledge of either French or German; either an acceptable thesis or 9 additional credits in approved graduate courses and seminars.



### Doctor of Philosophy

Requirements are a minimum of 72 credits in courses or seminars in Greek, Latin, and related subjects approved by the Department; a reading knowledge of French and German; General Examinations for admission to candidacy; an acceptable dissertation and Final Examination on the dissertation.



## COMMUNICATIONS

### Director

Merrill Samuelson  
133 Communications Building

### Associate Director

Willard F. Shadel  
121 Communications Building

### Professors

Merritt E. Benson, Byron H. Christian (emeritus), Alex S. Edelstein, Milo Ryan, Willard F. Shadel, Henry Ladd Smith, Daniel S. Warner, Fendall W. Yerxa

### Associate Professors

William E. Ames, Howard M. Brier, Pat Cranston, John T. Kinkel, Merrill Samuelson

### Assistant Professors

Peter Clarke, William Lee Ruggels, Larry Schneider, Willis L. Winter, Jr.

### Lecturers

Arnold D. Gooder, J. Hill Williams

The study of communication in the School of Communications deals with *communications behavior* and the development of communication *concepts* and *skills*.

Preparation for professional performance in the mass media requires a consciousness of social function as well as the mastery of communications techniques.

Courses in the School examine the functions of the mass media—as an economic institution in facilitating the distribution of goods and services by advertising and as a social institution in its role of implementing democratic processes.

Through its four sequences—editorial journalism, broadcast journalism, advertising, and radio-television—the School offers professional training leading to the degree of Bachelor of Arts.

The School also offers courses leading to the degree of Master of Arts in Communications and cooperates with other departments and schools in providing courses satisfying requirements for a Ph.D. minor. The graduate program in the School emphasizes behavioral studies in communication, historical investigations, and the study of mass communication as a social institution.

The School maintains a research facility, the Communication Research Center, which contains a Graduate Student Center, reference materials, machine data-processing equipment, and a seminar room. The Center is designed to assist in the training of graduate students and to facilitate the research of the faculty of the School.

Typical communication research projects include audience studies of magazines and newspapers, analyses of the domestic and foreign press, and theoretical investigations into the communication process. The Center began its activities in 1956 and was established as a separate facility in 1964.

## Undergraduate Programs

### Adviser

William Lee Ruggels  
118 Communications Building

## GRADUATION REQUIREMENTS

### Bachelor of Arts

A major student in any sequence in the School may obtain the degree by: (1) completing the 180 credits required by the University, including the mini-



imum sequence requirements and the credits in related fields required by the School of Communications; and (2) demonstrating to the School faculty creditable competence as a practitioner in one of the communications media. A student may apply toward graduation no more than 60 credits from within the School of Communications.

Minimum requirements outside the School of Communications, in combination with those of the University and the College of Arts and Sciences, are as follows: English or American literature, 8 credits; related fields, 34 credits.

Related fields are those outside the School of Communications which should be of particular value to students of communications. Students in all sequences of the School will be required to earn at least 34 credits in courses (listed under "Social Sciences" in the College List) in the following departments: Anthropology, Economics, Geography, History, Philosophy, Political Science, Psychology, and Sociology. Each student is required to include at least 20 credits from one of the departments specified, and to include at least 20 credits of upper-division courses.

#### Transfer students

Transfer students from institutions not recognized as providing the equivalent of courses offered by the School of Communications may be accepted upon satisfactory completion of requirements established by the School. Each student, upon beginning a communications major, must complete the prescribed orientation series.

#### Programs of Study

Courses designed to give breadth to the program and required of all majors within the School of Communications are as follows: 22 credits, including Communications 201, 226, 320, Journalism 300 or Radio-Television 270, a course in communications history and social institutions (Communications 402 or 406 or 414), a course in communications theory and research (Communications 310 or 408), and a course in international and political studies (Communications 415 or 480).

**Journalism-Editorial:** In addition to the requirements for all Communications majors, students in the editorial sequence are required to take Communications 202, 203, 310, Journalism 301, 318, 319, 413, and three upper-division courses within the School of Communications. The sequence in editorial journalism

offers major and minor academic fields for students in the College of Education. (See *College of Education* section in this Catalog.)

**Journalism-Advertising:** In addition to the requirements for all Communications majors, students in the advertising sequence are required to take Radio-Television 352, Communications 303, Advertising 333, 341, 342, 440, 445, and 448, General Business 101, Marketing 301, and Economics 200 or 211.

**Journalism-Broadcast:** In addition to the requirements for all Communications majors, students in the broadcast-journalism sequence are required to take Communications 203, Radio-Television 250, 251, 376, 455, and 476, Journalism 318 or 319, and three upper-division courses within the School of Communications.

**Radio-Television:** In addition to the requirements for all Communications majors, students in the radio-television sequence are required to take Radio-Television 251, 260, 350, 352, 376, 450, 477, and two upper-division courses within the School of Communications.

#### Graduate Programs

##### Graduate Program Adviser

William E. Ames  
329 Communications Building

The School of Communications offers courses leading to the degree of Master of Arts in Communications. Graduate students elect up to three fields of study and research, including society and mass communications, history and communications, communications and law, propaganda, theory and research in mass communications, advertising, and radio-television.

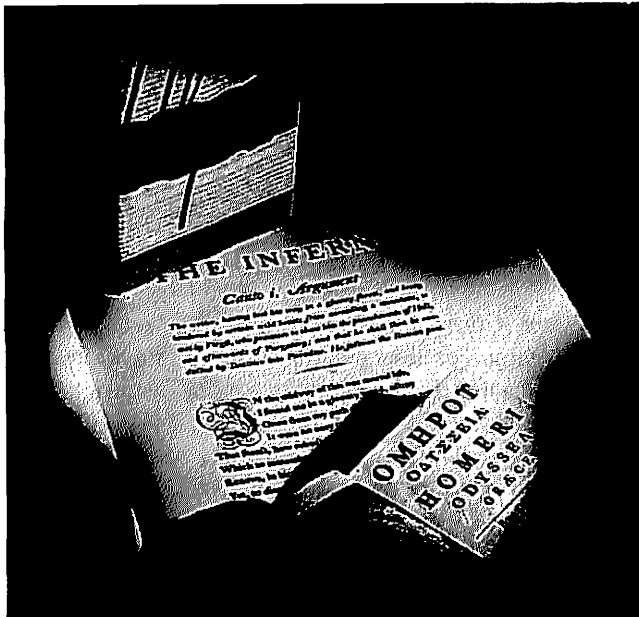
Students who wish to utilize courses in the School of Communications as a minor in graduate study leading to the degree of Doctor of Philosophy in another department should consult the Graduate Program Adviser.

#### COMPARATIVE LITERATURE

##### Chairman

Frank Jones  
A106 Padelford Hall

Both the undergraduate and graduate programs in Comparative Literature include classes in the major field



conducted by an interdepartmental faculty, as well as courses in English and other literatures offered by the Departments of English, Classics, and Far Eastern and Slavic, Germanic, Romance, and Scandinavian Languages and Literatures.

The undergraduate program is described in the *Interdepartmental Programs* section of this Catalog; departmental offerings in foreign literature in English translation are listed under the several departments named in the preceding paragraph.

Programs leading to graduate degrees are described in the *Interdisciplinary Graduate Degree Programs* section of this Catalog.

## DRAMA

### Director

Gregory A. Falls  
113 Drama-TV Building

### Professors

John A. Conway, Gregory A. Falls, Agnes M. Haaga, Donal F. Harrington, Bertram L. Joseph, Geraldine Brain Siks

### Associate Professors

Ruthanna Boris, James R. Crider, Alanson B. Davis, Robert S. Gray, Warren C. Lounsbury, Duncan Ross

### Assistant Professors

Kenneth M. Carr, Vanick S. Galstaun

### Instructor

Benjamin Johnson

### Lecturer

Aurora Valentinetti

The study of drama is concerned with the theatre arts: acting, directing, designing, and playwriting, together with theatre history, dramatic literature, and criticism. While the former are taught only in the School of Drama, many of the latter are taught in other departments. Since theatre is an ensemble art, an important part of its study is made through public and classroom productions of a great variety of plays: American and foreign, classical, and contemporary. Many courses are primarily studio courses involving lectures and theoretical materials plus direct, creative experience in the theatre arts.

Drama is one of the fine arts, and many students elect courses as an introduction to the arts. For other students it is a major subject in the humanities and suitable to a broad liberal education. Still others study drama as a beginning for a professional career, either in professional theatre or in educational theatre.

## Undergraduate Programs

### Adviser

James R. Crider  
61 Drama-TV Building

## GRADUATION REQUIREMENTS

### Bachelor of Arts

Undergraduate drama majors are required to complete 65 credits in drama courses and 10 cognate credits in English in addition to the general requirements of the College of Arts and Sciences.

All students must earn 55 credits in "core courses": 146, 247, 151, 152, 253, 210, 211, 212, 230, 298, 498, 316, 461, 461L, 471, 472, 473, and 5 credits in drama courses numbered in the 460 or 470 sequence, or an approved cognate in another department. In addition, a student must elect one of three emphasis areas and complete that course of study: Acting-Directing 248, 451, 452, and 498; or Design-Technical 310, 414, 415, 418, and 419; or Children's Drama 338, 431, 435, 438, and 435L or 438L. All drama majors are also expected to complete English 324 and 325 or 326 (Shakespeare, 10 credits).

Special minor programs may be arranged in association with related major fields.

Elementary education majors in drama (College of Education) are required to complete 46 credits as fol-



lows: 101, 146, 151, 152, 230, 247, 253, 316, 325, 331, 338, 435, 438, 438L, 461, 461L, 298 or 498, and 3 credits in a cognate course approved by the School of Drama.

### Graduate Programs

#### Graduate Program Adviser

James R. Crider

61 Drama-TV Building

It is assumed that all prospective candidates have completed the equivalent of our undergraduate drama requirements. Advanced placement examinations in acting, speech, theatre technical practices, and theatre history are given each Summer and Autumn Quarter for graduate students who may have equivalent theatre experience but not the formal course work in required undergraduate subjects. These placement tests, plus consideration by a graduate advisory committee, will determine what deficiencies, if any, a student must make up.



### Master of Arts

In addition to the general requirements of the Graduate School, master's degree students are required to complete 36 credits (Design-Technical: 39 credits), including 498, 501, 700, and 5 credits in drama courses numbered in the 470, 480, 570, or 580 sequence, or an approved cognate in another department. Further, students elect one of three areas of emphasis and complete the course requirements: Directing 455, 463, 561, 562, and one of 462, 497, or 551-552-553; Design-Technical 413, 414, 415, 510, 513, 514, 515, and 3 credits in art history or an approved equivalent; Children's Drama 435L or 438L, 451, 452, and 530.

Drama 700 (Thesis) may be either a production or a research thesis.

A program leading to the Doctor of Philosophy degree is offered through the interdisciplinary Drama Arts Group of the Graduate School. (See Drama Arts in the *Interdisciplinary Graduate Degree Programs* section of this Catalog.)

## ECONOMICS

#### Acting Chairman

Dean A. Worcester, Jr.  
301 Guthrie Hall

#### Professors

Philip W. Cartwright, James A. Crutchfield, Jr., William S. Hopkins, J. Richard Huber, Morris D. Morris, Vernon A. Mund, Douglass C. North, Walter Y. Oi, Charles M. Tiebout, D. A. Worcester

#### Associate Professors

Yoram Barzel, Henry T. Buechel, Barney Dowdle, John E. Floyd, J. Benton Gillingham, M. Bruce Johnson, Feng-hwa Mah, Kenneth M. McCaffree, William Sharpe, Judith G. Thornton

#### Assistant Professors

Lowell R. Bassett, Thomas Borcharding, Gardner Brown, Judith B. Cox, Mary L. Eysenbach, Errol Glustoff, Allan Hynes, Robert C. Lind, Sarah C. Peters, Robert N. Schoepfle, Judith C. Shapiro, Robert P. Thomas

Economics is concerned with analysis of the ways in which societies organize and carry on the production of goods and services and the distribution of these goods and services among various functional groups and individuals in the society. It is a broad field which includes the study of comparative economic systems; economic history, economic development, the theory of resource allocation, international economic relations; the determinants of cyclical fluctuations in economic activity; the interaction of governmental policies and activities, and private economic activities; the distribution of income; and various other specialized areas.

Most of the undergraduate courses in economics are primarily intended to serve the objectives of a liberal education rather than vocational or professional objectives. However, a knowledge of economics has great

practical value in contemporary society where the general economic welfare is increasingly affected by public policies, and the development of sound public policies requires a reasonably competent and informed electorate. Economic analysis is also highly useful in a vocational sense for those students majoring in business administration or planning to seek careers in business. For those students seeking careers as professional economists in education, government, or private enterprises, appropriate programs of graduate study are available.

The Department of Economics offers programs leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy.

### Undergraduate Programs

#### Adviser

Henry T. Buechel  
326 Savery Hall

### GRADUATION REQUIREMENTS

#### Bachelor of Arts

Requirements in the field of economics are: 200, 201, 281, 300, and 301, plus 30 additional credits. Of the 30 credits, 25 are to be taken in at least four fields other than theory, and the remaining 5 are to be taken either in one of the four fields so chosen or in the field of theory. Other requirements are Mathematics 105 and Accounting 210, 220, and 230.

Participants in the College of Arts and Sciences Honors Program who wish to qualify for a bachelor's degree "With College Honors in Economics" must fulfill the requirements of that program during the freshman and sophomore years, in addition to the departmental honors requirements listed below. With the approval of the departmental honors committee, qualified students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Economics."

(1) Complete the following courses (or their equivalent as defined by the Department of Economics) and maintain a grade-point average in these courses of 3.00: Economics 200H (freshman or sophomore year); 201H (freshman or sophomore year); 300 and 301 with supplementary honors work; 496H Honors Seminar (senior year); 497H Honors Directed Study (senior year). In addition, honors students will be allowed to take from 3 to 6 credits in graduate economics courses for undergraduate credit.

(2) Maintain an average over-all grade point of 3.00.

(3) Complete all other requirements for a major in economics in the College of Arts and Sciences.

(4) Present a senior thesis (Economics 497H Honors Directed Study).

### Graduate Programs

#### Graduate Program Adviser

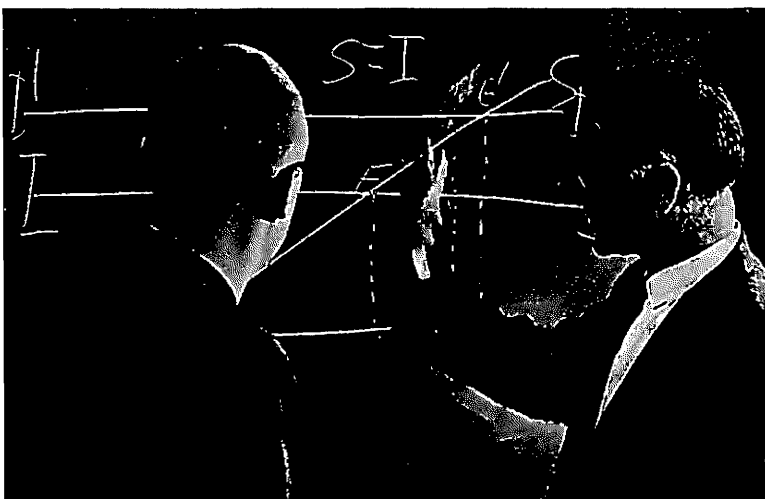
J. E. Floyd  
301B Guthrie Hall

For admission to graduate study in economics, a B average in the junior and senior years is required. A beginning graduate student with a four-year degree (B.A., B.S., etc.), but with little training in economics, should expect to take Economics 300 and 301, and other preliminary work in each field selected as is deemed necessary to begin graduate work in that field.

Students may be allowed to substitute equivalent graduate work taken at other institutions for part of the course requirements. Students should consult the *Graduate Study* section for details of regulations concerning residence and languages.

### PROGRAMS OF STUDY

The Department of Economics offers courses leading



### Honors in Economics

#### Adviser

Henry T. Buechel  
326 Savery Hall



to the degrees of Master of Arts and Doctor of Philosophy. Requirements for both advanced degrees include work in the Graduate Core Program of the Department and in some of the following fields of specialization: (1) comparative economic development, (2) economic history, (3) economic theory, (4) government regulation and industrial organization, (5) international trade, (6) labor economics, (7) public finance, and (8) statistics and econometrics.

#### **Master of Arts**

Prospective candidates for this degree with an economics major must complete Economics 500, 501, 502, and 503 in the Graduate Core Program. In addition, they must take four more courses at the 400 and 500 level and either write a thesis or take additional courses in a field of specialization. Programs can also be arranged in which the student takes a field in a related subject.

Prospective candidates for a master's degree from another department, who desire a minor in economics, must complete at least 8 credits in advanced economics courses (400 and 500 level).

#### **Doctor of Philosophy**

Prospective candidates for this degree with an economics major must complete the Graduate Core Program and three fields, two of which must be in economics. A student may offer a minor in another department related to his field of major interest, or, with permission of his graduate advisory committee, he may offer a program of selected courses outside economics as the third field.

The course program completed by each student must include some work at the 400 or 500 level in each of five fields. For this purpose, students who have completed the Graduate Core Program shall be considered to have had work in economic theory, statistics, and either comparative economic development or economic history.

Through the cooperation of the Far Eastern and Russian Institute, a student may offer, together with a minor in Far Eastern, a Far Eastern area study program as a substitute for one field. In such a case, the work offered will include the Graduate Core Program and one field in economics, one joint economics and Far Eastern field, and the Far Eastern minor. When this option is allowed, the student normally chooses a dissertation subject related to his Far Eastern specialty, and the dissertation is jointly supervised by the Institute and the Department.

The program of formal course study for a full-time student will normally require approximately two years after admission to Graduate School. If the student holds an assistantship, this period may be somewhat extended depending upon whether his undergraduate preparation fits well into the fields of specialization in his graduate program. The student must pass both written and oral examinations covering the Graduate Core Program, his selected fields, and the proposed dissertation research. Normally, a student begins work upon a doctoral dissertation following these examinations, and the student should plan on spending at least one additional year on research for the dissertation. The oral Final Examination is taken upon completion of the dissertation.

Doctoral students offering a minor in economics must demonstrate competence in a portion of the Graduate Core Program, which shall include Economics 500, 501, 502, and 503, and one field in economics. Prospective minor candidates must pass a written examination in micro- and macro-economic theory.

Prospective candidates for the degree of Doctor of Business Administration who elect to offer a field in economics will normally take Economics 500, 501, 502, 503, and a minimum of one additional course numbered 400 or 500. They must pass a written examination covering the four listed courses.

## **ENGLISH**

#### **Chairman**

Robert B. Heilman  
A101B Padelford Hall

#### **Professors**

Robert P. Adams, Edward E. Bostetter, Wayne Burns, Donald Cornu, E. Harold Eby, Donald W. Emery, David C. Fowler, James W. Hall, Albert C. Hamilton, Robert B. Heilman, Andrew R. Hilen, Jr., Helen A. Kaufman (emeritus), William F. Irmscher, Jacob Korg, Jane S. Lawson (emeritus), William Matchett, Robert O. Payne, Angelo M. Pellegrini, Arnold Stein, T. Brents Stirling, E. Ayers Taylor (emeritus), David Wagoner, Frank Joseph Warnke, Sophus K. Winther (emeritus), Lawrence J. Zillman

#### **Associate Professors**

George Bluestone, Malcolm J. Brown, Harry H. Burns, Richard I. Cook, Margaret R. Duckett, Garland O. Ethel, Florence J. Gould, Donna L. Gerstenberger,

Markham Harris, Frank W. Jones, Eric LaGuardia, Henry A. Person, William L. Phillips, Otto Reinert, Roger H. Sale, Eugene H. Smith, Robert D. Stevick, Donald S. Taylor, Margaret C. Walters



#### Assistant Professors

Edward Alexander, Sylvia F. Anderson (emeritus), Maud L. Beal (emeritus), G. Nelson Bentley, David C. Brewster, Janna P. Burgess (emeritus), Gerard H. Cox III, Elizabeth D. Dipple, Ben E. Drake, William M. Dunlop, D. Paul Farr, Malcolm A. Griffith, Muriel L. Guberlet (emeritus), Glenn W. Hatfield, Richard Boyd Hauck, Donald M. Kartiganer, Frank J. Kearful, Bertha M. Kuhn (emeritus), Milton A. Mays, James D. McCracken, Florence D. McKinlay (emeritus), Leonard Neufeldt, Martha J. Nix (emeritus), Edgar F. Racey, Jr., Viola K. Rivenburgh, Robert P. Shulman, James E. Siemon, Robert B. Stanton, Roger B. Stein, Larry J. Swingle, Elinor M. Yaggy

#### Instructors

Robert E. Barton (acting), Richard H. Conway (acting), Margaret M. Davis (acting), Brian R. Harding (acting), Donna Hoffman (acting), Carol B. Ovens (acting), Blanche B. Scott (acting), Shirley Wrangle (acting), Richard H. Yurman (acting)

#### Lecturers

Lois G. Clemens, Henrietta B. Reifler, Leota S. Willis

The Department of English offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. Certain Comparative Literature courses may be taken for credit toward degrees in English.

The Department of English teaches elementary composition, advanced composition of various kinds, English literature, American literature, and, in the Comparative Literature courses, some of the literature of other countries. In recent years the Department has won distinction in poetry; the faculty includes several practicing poets, and various graduates of the poetry courses have gained recognition. English and American literature together make up one of the great bodies of material in the humanities, and they are taught, with considerable variety, by a staff that includes widely known scholars and critics.

### Undergraduate Programs

#### Advisers

Marian Gustin, Leota Willis  
A2 Padelford Hall

For undergraduate students, the Department provides two elective curricula leading to the Bachelor of Arts degree, one in language and literature, the other in composition and advanced writing. In addition, it offers major and minor academic fields for prospective teachers on the secondary level and a major academic field for prospective teachers on the elementary level; see *College of Education* section.

### GRADUATION REQUIREMENTS

#### Bachelor of Arts Curriculum in Language and Literature

At least 50 credits in English are required. Courses must include 264 and 265 or 266 or 267; 324 and 325 or 326; three period courses in the 300 group (for the student taking 264 and 265, these are to include one course in the 341-347 group and one course in the 361-363 group; for the student taking 264 and 266, these are to include one course in the 331-337 group and one in the 361-363 group; for the student taking 264 and 267, these are to include one course in the 331-337 group and one course in the 341-347 group); two courses at the 400 level (no more than 5 credits in the 430 group may count toward the major); and one 5-credit upper-division elective. Election of one of the following is recommended to majors: 387, 447, 449, one advanced writing course.

#### Curriculum in Composition and Advanced Writing

At least 55 credits in English are required. Courses must include: any two courses from the 264-267 group; 324; two period courses at the 300 level (in periods other than those covered by the courses chosen from the 264-267 group); two literature courses at the 400 level (including 417 or 418 or 419); 20 credits in



advanced writing courses (15 credits in upper-division courses in at least two forms; *e.g.*, short story, novel, drama, poetry, expository writing). A more detailed statement of requirements is available at the English Advisory Office, and should be secured by all students majoring in English.

### Honors in English

#### Chairman

Otto Reinert

A107 Padelford Hall

Members of the College Honors Program who fulfill the requirements of that program during the freshman and sophomore years and complete the departmental honors requirements below receive a bachelor's degree "With College Honors in English." Superior students who are not members of the College Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in English."

Students can qualify for honors work at all levels. Freshmen are eligible for special sections in Freshman English. Freshmen and sophomores may apply for the College Honors Program and, if admitted, take special sections of the Masterpieces courses (264H, 265H, 266H, 267H). Students entering the departmental program from the College Program should have a 3.00 grade-point average over-all and in English. Other superior students are selected for the departmental program in the third quarter of the sophomore year or the first quarter of the junior year and usually have averages of 3.00 over-all and 3.30 in English.

Juniors and seniors in both programs take 15 of the 50 credits required for the major in courses especially designed for honor students. A total of 5 credits will be in supervised independent study (490H-491H), with individual conference and topics. The written work for this course constitutes the honors thesis. Ten hours will be in seminars on subjects of unusual literary interest not otherwise offered (499H). Each seminar will have 15 or more students.

The honors section in Freshman English is offered in the work of the first two quarters. Students who complete this work satisfactorily are exempted from the third quarter of Freshman English. Students are admitted to the honors section on a basis of their performance in the English portion of the Washington Pre-College Testing Program or the Advanced Placement Examination of the College Entrance Board.

### Graduate Programs

#### Graduate Program Adviser

Andrew R. Hilen, Jr.

A103 Padelford Hall

The purpose of graduate work in English is the acquisition of a body of learning and the development of critical skills and standards of judgment. Though having central objectives identical to all, the graduate English program can provide a background for different professional pursuits: some students may look forward to careers as scholars and college teachers; others to positions in the secondary school system; and still others to work in the fields of professional writing, editing, and publishing. The Department of English has sought, therefore, to keep its general requirements for advanced degrees sufficiently broad and flexible to permit the following emphases in courses and dissertations: classification and analysis of literary works in their historical context; theories of criticism, and the analysis and evaluation of literary works; linguistic analysis and language processes in Old and Middle English and American English with related work in other languages; projects in imaginative writing, supported by courses in criticism and literary periods and types (for the Master of Arts only).

Each student's program will be planned in consultation with a graduate adviser in the Department and will emphasize his particular interests and abilities.

#### PROGRAMS OF STUDY

Students pursuing programs of study toward advanced degrees in English must present an undergraduate English major equivalent to that at the University of Washington, which requires 50 quarter credits.

#### Master of Arts

For the Master of Arts degree, a minimum of 35 credits is required, of which 25 must be in courses numbered 500 or above. Of these, 10 credits may be in courses in other departments. A maximum of 5 quarter transfer graduate credits may be accepted if taken while a graduate student in another recognized graduate school.

The student must show a reading knowledge of an approved foreign language by the time he has fulfilled his course requirements and before he takes the written M.A. examination. He must pass a written examination on three fields chosen by him in consultation with the chairman of Graduate Programs.



In the advanced creative writing program, the student must complete 35 credits, not more than 15 of which may be in advanced writing courses, and present, in addition, a piece of original imaginative writing (thesis, 10 credits).

#### Doctor of Philosophy

Admission to the Ph.D. program is granted only upon petition to the Graduate Studies Committee after the completion of a minimum of 35 credits of graduate course work. A student pursuing a program of study toward the Ph.D. must complete a minimum of 70 credits in course work (of which 55 must be at the 500 or 600 level) before taking his General Examinations. As many as 15 credits may be in approved courses in other departments. English 505, 530, and 531 are required. Any credits accepted from another institution (not more than 35) must be from another recognized graduate school and are subject to review by the Graduate Studies Committee.

The student must show a reading knowledge of two foreign languages (usually Latin or French, and German—though, upon approval of the Graduate Studies Committee and the Dean of the Graduate School, appropriate substitutes may be accepted).

A General Examination (not given during the Summer Quarter) is based on the assumption that the student's reading and study have prepared him for the following: a preliminary written examination testing the student's command of the facts of literary history and the content of English and American literary works; a critical essay of about 5,000 words on a major literary figure chosen by the student and approved by the Graduate Studies Committee, written during the first three weeks of the quarter in which the student takes the oral examination, which will emphasize two fields of literature.

As soon as possible after he has passed his General Examination, which admits him to candidacy, the Candidate must submit for the approval of the Graduate Studies Committee a statement of the subject of his dissertation. On the basis of this statement, a dissertation committee will be recommended to the Dean of the Graduate School. The student must pass an oral Final Examination devoted to the dissertation and to the field with which it is concerned.

A more complete description of the graduate programs in English is contained in a departmental brochure.

#### Minors in English

The requirement for a minor in English for a master's

degree is 20 credits in undergraduate and graduate work combined, plus 10 credits in graduate courses earned in residence.

The requirement for a minor in English for the doctor's degree is 20 credits in undergraduate and graduate work combined, plus 20 credits in graduate courses. At least half the credits must be in courses numbered 500 or above and at least 10 must be earned in residence.

## FAR EASTERN AND RUSSIAN INSTITUTE

#### Director

George E. Taylor  
406 Thomson Hall

(For list of faculty, see *Far Eastern and Slavic Languages and Literature*.)

The Far Eastern and Russian Institute integrates undergraduate and graduate instruction and research in Far Eastern and Russian studies, provides special library facilities, and cooperates in research with other institutes in America and abroad.



The Institute offers courses in the field of the social sciences. For undergraduate students who wish to specialize in Far Eastern and Russian studies, these courses are part of a degree program offered through the Department of Far Eastern and Slavic Languages and Literature. Graduate degree programs with specialization in Far Eastern and Russian studies are also available in that department. In the social sciences, graduate programs (with Far Eastern, East European, and Russian emphasis) are sponsored by the Institute in cooperation with the Departments of Anthropology, Economics, Geography, History, Philosophy, Political Science, and Sociology. In the joint programs leading to the advanced degree in these departments, graduate



students receive training in their respective disciplines which they apply to their study of the Far East, East Europe, or Russia. These joint programs are described in the curricular announcements of the respective departments. The Institute itself does not grant degrees.

The Far Eastern and Russian Institute administers the following faculty research seminars: the Modern Chinese History Project; the Modern Japan Seminar; the Inner Asia Project, which deals with Mongolia, Tibet, and Turkestan; the Russian and East European Seminar. In each of these research seminars, faculty members from different disciplines meet regularly for discussion and criticism of their individual work. On occasion, graduate students are given the opportunity to participate in the seminars. The Institute has a limited number of research fellowships which are given to qualified graduate students.

## FAR EASTERN AND SLAVIC LANGUAGES AND LITERATURE

### Chairman

George E. Taylor  
406 Thomson Hall

### Professors

Robert J. C. Butow, Edward J. D. Conze, Kung-chuan Hsiao, W. A. Douglas Jackson, Fang-kuei Li, Lew R. Micklesen, Nicholas N. Poppe, Vincent Y. C. Shih, Marc M. Szeftel, George E. Taylor, Donald W. Treadgold, Hellmut Wilhelm, Frank G. Williston

### Associate Professors

Michael Gasster (acting), Noah D. Gershevsky, Leon N. Hurvitz, George Ivask, Feng-hwa Mah, Richard N. McKinnon, Tamako Niwa, Paul L-M Serruys, Ivar Spector, Henry S. Tatsumi, Laurence C. Thompson, Jr., Turrell V. Wylie, Isabella Y. Yen

### Assistant Professors

Imre Boba, Jack L. Dull, Antonina Filonov Gove, Edwin M. Gerow, Jack Haney, Willis Konick, Yan-shuan Lao, Fred Lukoff, Mayako Matsuda, Kenneth B. Pyle, E. Harold Swayze

### Lecturers

George V. Grekoff, Noburu Hiraga, Maeng-Sung Lee, Elias T. Novikow, Vadim O. Pahn, Henry Schwarz, Doo Soo Suh

### Instructors

James E. Augerot, Paul V. Gribanovsky, Roger Hagg-lund, Maureen A. Huddleston

The Department of Far Eastern and Slavic Languages and Literature teaches the languages of Russia, some of the East European countries, Inner Asia, East, Southeast, and South Asia. In this way it opens the door to an acquaintance with cultural and political entities different from our own. Some understanding of such entities may be regarded as indispensable to a proper understanding of our own nation and culture and the other nations and cultures of the West, and, therefore, as an integral part of a liberal education.

This aim is furthered in the Department through the study of the main creative manifestation of these entities—their literature. Other circumstances of these cultures, such as their history and geography, their social and political institutions, and their thought systems, are dealt with in courses provided by the Far Eastern and Russian Institute.

In addition to instruction in the history and the structure of these languages *per se*, the Department, in close co-operation with the Department of Linguistics, provides an introduction into the methods and concepts of the professional linguists. Finally, the Department provides training in the handling of historical texts and textual criticism and such related methods and concepts as are necessary for the professional philologist.

Courses in the Department lead to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. The Department works closely with the Far Eastern and Russian Institute.

## Undergraduate Programs

### Adviser

Ford R. Crull  
403 Thomson Hall

### PROGRAMS OF STUDY

Two degree programs are offered to undergraduate students: a language and literature curriculum in one of the Far Eastern or Slavic languages and cultures; and a regional studies curriculum which combines training in a discipline with specialization in a particular area and language.

### GRADUATION REQUIREMENTS

#### Bachelor of Arts Curriculum in Language and Literature

In the language and literature curriculum, the requirements are: Far Eastern 110 or 310; at least 55 credits in a Far Eastern language or 55 credits in Russian language; and at least 20 credits in courses dealing with the literature and culture of the area of the major

language. The student must pass the senior-level series of courses in his major language. Total language credits must be earned in courses involving instruction in the language itself; literature in English courses count only as area courses.

#### **Curriculum in Regional Studies**

The undergraduate regional studies curriculum, leading to the Bachelor of Arts degree, combines training in a discipline with language and area specialization. The curriculum can be arranged, if desired, to fulfill the requirements of a double major. Programs can be based on the following disciplines: anthropology, art, comparative literature, economics, geography, history, linguistics, music, philosophy, political science, or sociology.

Instruction is available for the following regions: China, East Central Europe, Inner Asia, Japan, Korea, South Asia, Southeast Asia, and Russia. Adequate instruction is available for these programs in the following languages: Chinese, Japanese, Korean, Polish, Russian, Sanskrit, Serbo-Croatian, Thai, Tibetan, Turkic, and Vietnamese.

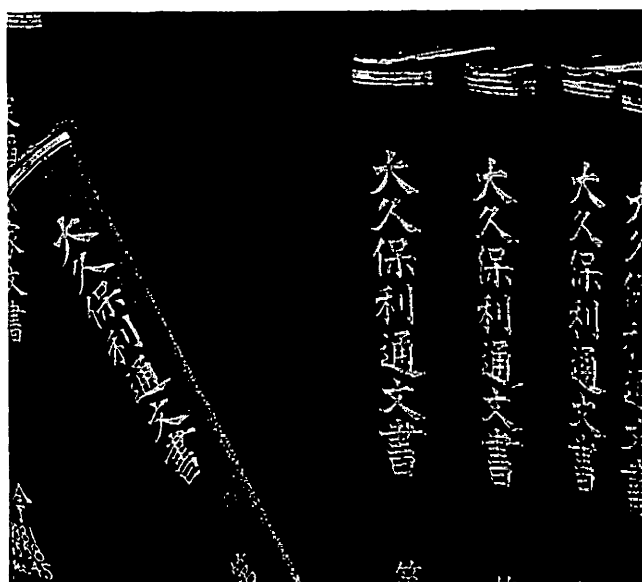
In the regional studies curriculum, the requirements are: Far Eastern 110 or 310; at least 40 credits in one of the disciplines of the humanities or social sciences (excluding languages), including both basic courses in the discipline (for example, history or geography), and courses in which the discipline is applied to one of the regions listed; at least 15 additional credits in nonlanguage courses on Asia or Russia in disciplines other than the discipline of concentration; and 30 credits or the equivalent in one Asian or Slavic language. (See also "Regional Studies: Asia and Russia" in the *Interdepartmental Programs* section of this Catalog.)

For students in the College of Education, the Department offers major and minor academic fields in Russian language and literature for those preparing to teach in secondary schools, and a major academic field in Russian language and literature for students preparing to teach in elementary schools. Major and minor academic fields are also offered in Far Eastern and Russian regional studies. (See the *College of Education* section.)

#### **Honors in Far Eastern and Slavic Languages and Literature**

##### **Adviser**

E. Harold Swayze  
B5J Padelford Hall



Departmental majors who are also members of the College of Arts and Sciences Honors Program and who fulfill the requirements of the honors program during the freshman and sophomore years in addition to the following departmental honors requirements may receive a bachelor's degree "With College Honors." Because the Department offers undergraduate majors in two separate curricula (regional studies and languages and literature) and because it is responsible for the study of a number of diverse regions, study plans of honors majors for the junior and senior years must be worked out on an individual basis in close consultation with the departmental honors adviser and the professors concerned. Nonmajor honors students may obtain honors credit in any courses in which it is available, subject to approval by the departmental honors adviser and the professor concerned. All departmental honors majors are also required to take recommended honors courses above the freshman level offered by other departments and available to honors students not majoring in those departments.

#### **Honors in Far Eastern**

##### **Departmental Requirements for Honors Majors**

All departmental majors are required to take Far Eastern 110 or 310. Honors students should enroll in the Far Eastern 110 honors section.

Honors students (both majors and nonmajors) are encouraged to enroll in 400-level courses in their junior years. These courses will provide the basic background for senior year honors work. Instructors will, at their discretion, make special arrangements for handling



honors students in such courses. (A partial list of recommended 400-level courses follows: Far Eastern 401, 402, 414J, 415J, 420J, 421J, 422J, 423J, 424J, 432J, 443, 452J, 453J, 456J, 465J, 466J, 467J, 468J, 493J; Political Science 429, 441; Chinese 455, 456, 457; Economics 495; Russian 426, 427.)

Departmental honors majors in the regional studies curriculum are required to take Far Eastern 496H, also open to nonmajor honors students. Honors majors in the language and literature curriculum must take a minimum of 15 credits in designated honors courses in their senior year.

Junior-level honors students may take Far Eastern 499H, subject to approval by the departmental honors adviser and the professor involved.

The honors major will be given a comprehensive examination by his major professor early in his final quarter of residence. A senior thesis is not required. However, the honors major is expected to demonstrate in his comprehensive examination and in his papers, prepared for senior-level honors courses, a capacity for effective research and writing.

Honors majors must maintain a minimum grade-point average of 3.00 for four years of work, including a 3.00 minimum for all departmental courses.

## Graduate Programs

### Graduate Program Adviser

E. Harold Swayze  
B5J Padelford Hall

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate Study* section. Applicants for admission to the Graduate School are required to submit directly to the Graduate Program Adviser two letters of recommendation plus a statement of the plan of study and advanced degree objectives.

### Master of Arts

The Department offers courses leading to the Master of Arts degree with specialization in language and literature and in regional studies.

The Master of Arts degree with specialization in languages and literature is offered in any language and literature for which the Department is responsible and for which there are staff, curriculum, and library holdings

necessary for research on the master's level. A prerequisite for this degree is the ability to do research in the language appropriate to the student's field of interest. In addition to course work and seminars in the appropriate language and literature, students are expected to take work relating to the history and culture of the area and in the fields of linguistics or comparative literature. General requirements are 45 credits (including a minimum of 12 in seminar work) plus an additional 9 credits for a thesis.

The Master of Arts degree with specialization in regional studies combines training in one discipline with language and area (interdisciplinary) training in one or more regions. Language and area programs are offered for the following regions: China, Inner Asia, Japan, Korea, South Asia, Southeast Asia, East Central Europe, and Russia. Adequate instruction is available for these programs in the following languages: Bulgarian, Chinese, Czech, Hungarian, Japanese, Korean, Mongolian, Polish, Romanian, Russian, Sanskrit, Serbo-Croatian, Slavic, Thai, Tibetan, Turkic, and Vietnamese.

Curriculum requirements: General requirements are a minimum of 45 credits (including at least 12 in seminar work) plus an additional 9 credits for a thesis. These credits include basic discipline courses and a combination of courses in several other disciplines on a particular region. (See also "Regional Studies: Asia and Russia," in the *Interdepartmental Programs* section.)

In exceptional cases, a Master of Arts degree with specialization in Far Eastern regional studies may be arranged without a working knowledge of a Far Eastern language. In such cases, special departmental permission and a strong training in a discipline is required.

### Doctor of Philosophy

The Department of Far Eastern and Slavic Languages and Literature offers a program leading to the Doctor of Philosophy degree with a specialization in any of the languages or literatures for which the Department is responsible and for which there are available the staff, curriculum, and library holdings necessary for research on the doctoral level.

Students interested in working for this degree must have, as a minimum requirement for beginning their programs, the equivalent of a strong major in any language or literature or in Far Eastern, East European, or Russian area studies.

Each prospective candidate must present a program covering four fields of study. The fields may be in a single language and literature for which the Department is responsible, or in a combination of such languages and literatures, or in a combination of three fields within the Department plus a field in either linguistics or comparative literature.

The Department requires all students to have some familiarity with a second Far Eastern or Slavic language and culture and recommends work in either linguistics or comparative literature.

All prospective candidates are expected to be familiar with the history, society, and culture of the country whose language and literature they are studying. In cases where it would be appropriate, a field may be approved in another discipline dealing with the area involved.

## GENERAL STUDIES

### Director

Glen Lutey

C18 Padelford Hall

For the program offered under General Studies, see *Interdepartmental Programs* section.



## GENETICS

### Chairman and Graduate Program Adviser

Herschel L. Roman

J205 Biochemistry-Genetics Building

### Professors

August H. Doermann, Howard C. Douglas, Stanley M. Gartler, Benjamin D. Hall, Brian J. McCarthy, Arno G. Motulsky, Herschel L. Roman, William J. Rutter, Laurence M. Sandler

### Associate Professors

Nils Aall Barricelli, Jonathan A. Gallant, Donald C. Hawthorne, David R. Stadler

### Assistant Professors

Eugene W. Nester, Reinhard F. Stettler

The Department of Genetics offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy. In addition, courses are given by the Department for undergraduates majoring in the biological sciences and in related areas. The Department does not offer an undergraduate major in genetics. However, it is suggested that students who foresee the possibility of graduate work in genetics consult with the Chairman of the Department concerning an undergraduate curriculum best suited for this purpose.

## GEOGRAPHY

### Chairman

John C. Sherman

406 Smith Hall

### Professors

Phillip Bacon, G. Donald Hudson, W. A. Douglas Jackson, Howard H. Martin (emeritus), Marion E. Marts, John C. Sherman, Morgan D. Thomas, Charles M. Tiebout, Edward L. Ullman

### Associate Professors

Ronald R. Boyce, Richard A. Cooley, Frances M. Earle, Willis R. Heath, Richard L. Morrill, Joseph Velikonja

### Assistant Professor

Douglas K. Fleming, George H. Kakiuchi

Geography is the study of the distribution of man and his works on the earth—the location of activities and the development of regions. Some of the topics studied both systematically and in regional combination are: the location of industries and cities and their support, urban patterns, agricultural regions, transport flows and facilities, trade areas, political areas, boundaries



and capitals, natural resources and land use. Basic to geography is the development of theories of spatial location and interaction in order to interpret the order on the earth's surface and to aid in understanding and prediction. A basic tool of all geography is the map.

The Department of Geography offers programs of study leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. In addition, the Department offers major and minor academic fields for students in the College of Education. (See *College of Education* section.)

### Undergraduate Programs

#### Advisers

John C. Sherman  
406 Smith Hall

George H. Kakiuchi  
404B Smith Hall

The program each student follows, including 50 credits in geography, is developed jointly by himself and the departmental adviser. The primary objective is to serve the student's broad intellectual interests in geography and in other fields including those allied to geography. The undergraduate program also prepares the student for professional training appropriate to advanced degrees. A secondary objective is to prepare those students who plan careers in cartography.

#### Bachelor of Arts

The general pattern of programs leading to the Bachelor of Arts degree is: (1) Geography 100; three courses on the 200 level including Geography 207; three courses on the 300 level (Geography 360, one systematic and one regional); and three courses on the 400 level (two systematic and one regional); and (2) a minimum of three courses in two fields related to geography, mainly the social sciences, earth sciences, or mathematics.

### Graduate Programs

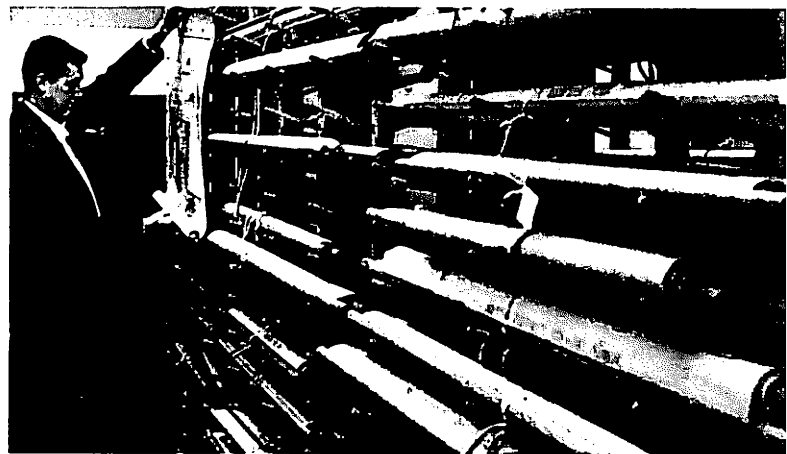
#### Graduate Program Adviser

Donald Hudson  
406 Smith Hall

#### PROGRAMS OF STUDY

Programs of study leading to the degrees of Master of Arts and Doctor of Philosophy are developed jointly by each student and the Graduate Program Adviser.

These programs are flexible, each taking into account the student's preparation, professional objectives, and scholarly interests. Within this framework, the Department offers some areas of special competence:



Urban, Transportation, and Industrial Geography; Regional Development and Theory and Method in Economic Geography; Social and Political Geography; The Geography of the Far East, especially China and Japan, and the Soviet Union and Eastern Europe; Cartography and Quantitative Methods.

Graduate students are expected to acquire competence in fields allied to their center of interest. These include, for example, competence in economic theory, mathematics, and statistics, an appropriate foreign language such as Russian or a Far Eastern language, and an appropriate social science.

Advantage is made of close relationships with other units within the University. These include the Far Eastern and Russian Institute, the Center for Urban and Regional Development, the Graduate School of Public Affairs, the Transportation Research Group, and the Bureau of Community Development.

Doctoral students, who wish to specialize in the geography of the Soviet Union or Eastern Europe, China, Japan, or other areas which are represented in the Department of Geography and the Far Eastern and Russian Institute, must take courses relevant to the individual's area of interest in at least three fields. One of these fields must include a graduate seminar. A working knowledge of the language(s) appropriate to the individual's area of interest must be attained. Programs of study in the Department will be arranged in cooperation with the Far Eastern and Russian Institute.

Courses and seminars pertinent to graduate study in the Department are offered in other departments of the College of Arts and Sciences and in professional schools or colleges such as Business Administration and Engineering. With regard to the Far East and the Soviet Union, opportunities for studies supplementary to geography are unique. Representative fields are history, economics, and political science. Language instruction includes Chinese, Japanese, Korean, Mongolian, Tibetan, Turkic, Russian, and other Asiatic and Slavic languages.

In economic geography, pertinent offerings are available in such fields as economics, political science, sociology, mathematics, civil engineering (transportation, data processing), and urban planning. Training in cartography draws on instruction in mathematics, civil engineering (photogrammetry, geodesy, data processing), sociology, and art.

Admission, residence, credit, and other requirements for the Master of Arts degree and the degree of Doctor of Philosophy are set forth in the *Graduate Study* section.



## GEOLOGY

### Chairman

Howard A. Coombs  
42 Johnson Hall

### Professors

Julian D. Barksdale, Howard A. Coombs, Richard Fuller, George E. Goodspeed (emeritus), V. Standish Mallory, Mark F. Meier, Peter H. Misch, Harry E. Wheeler

### Associate Professors

Robert C. Bostrom, Bates McKee, Stephen C. Porter

### Assistant Professors

Eric S. Cheney, Nikolas I. Christensen, Robert S. Crosson, Randall L. Gresens, John M. Rensberger, Joseph A. Vance, John T. Whetten

Geology is the science of the earth—an organized body of knowledge about the globe on which we live. The geologist is concerned with the earth in terms of materials which compose it, the nature of its interior, the shape of its surface, the natural processes acting upon it, and its history. The historical aspect sets it apart most distinctly from other physical sciences.

Geologists as a group are engaged in research and teaching at universities, research with governmental agencies, research with large petroleum companies, the successful planning and construction of modern engineering structures, and in the discovery and exploitation of petroleum and mineral resources.

A basic knowledge of chemistry, physics, and mathematics is fundamental to the study of geologic phenomena. Botany and zoology are essential to the study of fossil plants and animals. Geology thus involves the application of all science and scientific methods in the study of the earth and its resources.

The Department of Geology offers courses leading to the degrees of Bachelor of Science, Master of Science, and Doctor of Philosophy. In addition, the Department offers major and minor academic fields for students in the College of Education; see the *College of Education* section.

## Undergraduate Programs

### Advisers

Bates McKee  
46 Johnson Hall

Randall L. Gresens  
54 Johnson Hall

## GRADUATION REQUIREMENTS

### Bachelor of Science

Candidates for this degree with a major in geology must fulfill the departmental requirements listed below.

### FRESHMAN YEAR

Geology 205 (Physical Geology); Chemistry 140, 150, 151, 160, 170 (General Chemistry and Qualitative Analysis); Mathematics 105, 124, 125 (College Algebra and Calculus with Analytic Geometry).

**SOPHOMORE YEAR**

Geology 220 (Mineralogy); 225 (Igneous and Metamorphic Petrology); 326 (Sedimentary Petrology); Physics 121, 122, 123, 131, 132, 133 (General Physics and Laboratory).

**JUNIOR YEAR**

Geology 330 (General Paleontology); 340 (Structural Geology); 361 (Stratigraphy); 362 (Interpretation of Geologic History).

**SENIOR YEAR**

10 credits in 400-level electives in geology.

A student intending to take graduate work should include the Field Course (401-402) as well as a foreign language (French, German, or Russian) in his undergraduate curriculum.

**Graduate Programs**

Graduate Program Adviser

V. Standish Mallory  
104 Johnson Hall

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate Study* section. All prospective candidates for advanced degrees in geology must have completed essentially the same academic work as outlined in the undergraduate curriculum.

**PROGRAMS OF STUDY**

All students must present an approved field course such as 401-402 or other field experience which is approved by the Department. All graduate students take a comprehensive written examination.

**Master of Science**

A thesis or research paper demonstrating original and independent research in a limited area is required of all master degree students. For the thesis program, 36 credits must be submitted. A total of 45 credits, with a minimum of 36 credits in work other than field geology, are required for the nonthesis program. The language requirement for this degree must be met with either French, German, or Russian.

**Doctor of Philosophy**

All prospective candidates must have either an M.S. or M.A. degree. For the Doctor of Philosophy degree the student must present any two of the following languages: Russian, French, German. The Ph.D. oral

General Examinations are administered by a Supervisory Committee appointed by the Dean of the Graduate School and, when successfully passed, signify admission to candidacy.

**GERMANIC LANGUAGES  
AND LITERATURE****Chairman**

William H. Rey  
340 Denny Hall

**Professors**

Ernst Behler, Raymond Immerwahr, William H. Rey

**Associate Professors**

Gerhard Baumgaertel, George C. Buck, Antonin Hruby, Ernst Loeb, Herman C. Meyer, Annemarie M. Sauerlander, Roman S. Struc, Richard F. Wilkie

**Assistant Professors**

Hellmut Ammerlahn, Felice Ankele (emeritus), Gunter H. Hertling, Else Hünert-Hofmann, Horst Rabura, Joseph Voyles, Elenora M. Wesner (emeritus)

**Instructors**

Maria Cetinich, Eugene Egert, Alan Galt, Friedrich von Kries, Kathrin Maloof, Helmut Pfanner, Otto R. Siebenmann

**Lecturer**

Willi Fischer, Elsa W. Sherwin

The departmental program is concerned, in part, with the development of the skills of speaking, comprehending, reading, and writing the German language. Instruction also aims to clarify the historical development of German in its relationship to English and



other European languages, and to develop an awareness of the differences in thought patterns reflected in the divergent structure, syntax, and idioms between the native and foreign language.

The program stresses present-day Germany, its history, and its role in Western civilization, with particular emphasis on the study of the literature and the intellectual, philosophical, and artistic movements which it represents.

From the most elementary language classes to the most advanced lectures on literature, maximum active use of the German language on the part of both teacher and student is stressed in such exercises as pattern drills, questions and answers, oral discussions, and report and essay writing.

The expanding importance of foreign languages in elementary, secondary, and higher education has created an urgent need for qualified teachers of German; there are also growing vocational opportunities for students competent in German in governmental, industrial, and commercial positions.

The Department of Germanic Languages and Literature offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. In addition, the Department offers major and minor academic fields for students in the College of Education; see *College of Education* section. Students who have studied German in high school are placed in first- or second-year courses according to the extent of their high school work and their performance on placement examinations.

### **Undergraduate Programs**

#### **Adviser**

Herman C. Meyer  
340 Denny Hall

### **GRADUATION REQUIREMENTS**

#### **Bachelor of Arts**

In this curriculum, at least 45 credits are required for the major and 27 credits for the minor. First- and second-year German courses, scientific German, and courses in English translation are not counted toward the major or minor.

Lower-division courses are designed to develop the basic language skills through the oral-aural approach, stressing the development of vocabulary and aiming

at fluency and accuracy in reading, speaking, and writing.

The third quarter of second-year German is divided into an advanced reading course (203, 3 credits) and a conversation course (207, 2 credits). Prospective majors, minors, and those students planning to take the upper-division literature courses are required to take both 203 and 207.

Upper-division courses emphasize conversation and composition with a series in each year (301, 302, 303; 401, 402, 403; 3 credits each). In addition, the sequence in literature (310, 311, 312; 3 credits each) introduces juniors to the study of classical writers. This is followed in the senior year by the sequence 410, 411, 412, which is devoted to Modern German Literature and Civilization, and by 413, 414, 415, dealing with the older period. The following electives are available: 404, 405; other courses may be taken by permission. A grade of C or better must be earned in each of these upper-division courses. A 2.50 grade-point average is required in German courses beyond the second year.

### **Honors in Germanics**

#### **Adviser**

Annemarie Sauerlander  
343 Denny Hall

The German Department offers an honors program from the second through the fourth year. No honors sections exist on the first-year level. Honors sections are available in 201, 202, 203, 207, 301, 302, 303, 310, 311, 312, 401, 402, 403, in addition to the seniors honors colloquium series (490H, 491H, 492H).

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program during the freshman and sophomore years, in addition to the following departmental honors requirements, are eligible to receive a bachelor's degree "With College Honors in German." With the approval of the departmental honors committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor degree "With Distinction in German." Departmental honors requirements are: (1) a cumulative grade-point average of 3.00 and a grade-point average of 3.50 in German courses; (2) a minimum of 20 credits in upper-division German honors courses; and (3) a senior thesis developed in the senior honors colloquium.



## Graduate Programs

### Graduate Program Adviser

Ernst Loeb  
345 Denny Hall

### Admission

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School. Prospective candidates for advanced degrees in Germanics must have the equivalent of an undergraduate major in German.

### PROGRAMS OF STUDY

#### Master of Arts

Students must, in addition to fulfilling other general requirements of the Graduate School, complete a program of 36 credits. If the student minors in some other department, he may take a minimum of 24 credits in Germanics, which must include Bibliography (501).

The M.A. program is designed for three quarters and consists of a compact schedule of courses, which are repeated every year. The courses are carefully coordinated with the upper-division program so that junior, senior, and M.A. year form a well-integrated unit. Under this comprehensive study plan, a student with a major in German will normally obtain his M.A. degree three years after attaining the upper-division level. The courses in the modern field are devoted to Lessing (531), Schiller (538), Goethe I, II (534, 535), Romanticism (515), Nineteenth-Century Drama (516), Nineteenth-Century Prose (517), and Twentieth-Century Literature (518). They are complemented by courses in Middle High German (556) and Middle High German Literature I, II (557, 558), Bibliography (501), and Linguistic Analysis of German (405). Instead of a thesis, the student is required to write two extensive term papers which should give evidence of his scholarly abilities and of his growth during the M.A. year. These papers will be kept on file so that they can be taken into consideration for the student's final evaluation. At the end of the M.A. year, the student must pass a comprehensive written examination. This examination has to be taken by all graduate students regardless of whether or not they wish to proceed toward the doctorate. On the basis of the student's classroom performance, his term papers, and examinations, the departmental Committee on Graduate Studies will: (1) recommend to the Graduate School that the Master of Arts degree be granted or withheld; (2) advise the student on the desirability of a subsequent academic career.

In exceptional cases, advanced students who have taken courses of the M.A. program before their graduation may receive permission from the head of the Department to obtain at least 9 of the 36 required credits by writing a thesis, which should give proof of their superior experience and qualifications.

For a minor in Germanics, a minimum of 12 credits in advanced graduate courses is required. The student must have the equivalent of a baccalaureate degree in German at this University.

### Doctor of Philosophy

For a major in Germanics, the student must complete all of the stated requirements of the Graduate School, pursue his studies for at least three graduate years, pass General Examinations on the field, and submit a satisfactory dissertation which demonstrates a mastery of scholarly procedure and is an acceptable contribution to knowledge. The student must complete a minimum of 90 credits in course work after admission to the Graduate School (54 credits beyond the M.A.) before taking his General Examinations. If he minors in another department, he may elect a minimum of 36 credits in Germanics. If his entire program lies within the field of Germanics, he must elect 36 credits in modern literature (since 1500) and 18 credits in philology and the older literature or vice versa. The General Examinations, which are both written and oral, will not be confined to courses taken at the University or elsewhere, but will endeavor to demonstrate the student's breadth of knowledge, which he has acquired by independent reading and study. His intensive training in areas of special interest and his abilities in critical evaluation will also be tested.

For a minor in Germanics, a minimum of 18 credits in advanced graduate courses is required. The student must have the equivalent of a master's degree in German at this University.

## HISTORY

### Chairman

Robert E. Burke  
308 Smith Hall

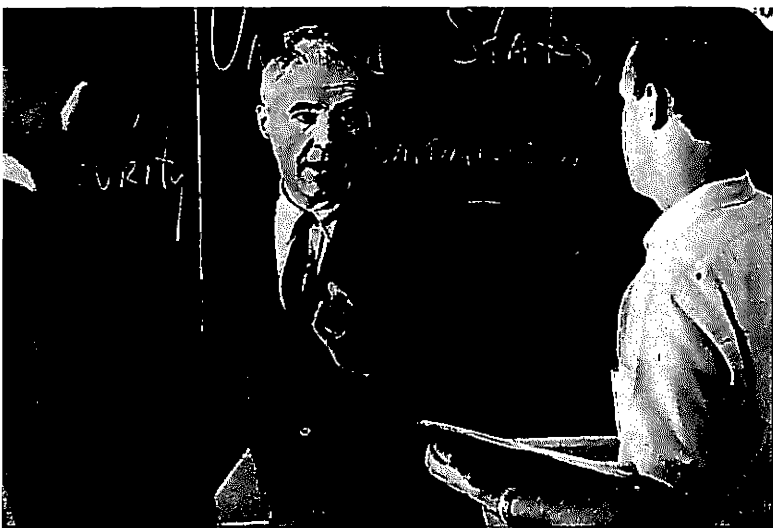
### Professors

Arthur Bestor, Robert E. Burke, Robert J. C. Butow, Vernon Carstensen, Giovanni Costigan, Edith Dobie (emeritus), Gordon Griffiths, W. Stull Holt, Solomon

Katz, Ernst Levy (emeritus), Otis A. Pease, David H. Pinkney, Thomas J. Pressly, Max Savelle, Marc Szeftel, Donald W. Treadgold

**Associate Professors**

Dauril Alden, Michael Gasster (acting), Donald E. Emerson, Howard Kaminsky, Scott H. Lytle, Peter F. Sugar



**Assistant Professors**

Jon M. Bridgman, Joan Connelly, Jack L. Dull, Lancelot L. Farrar, Jr., Arther L. Ferrill, Thomas L. Hankins, Fred J. Levy, Paul Mosher, Lewis O. Saum, Robert F. Scholz, Carl E. Solberg, John W. Spellman, Carol G. Thomas (acting), John A. Williams

History is a discipline requiring the study of human affairs at many different periods of time and in various parts of the world. It is significant not only for those preparing for a professional career in law or government or teaching, but also for those who wish a deeper comprehension of world affairs and an understanding of events.

*Nihil humanum alienum.* There is no human activity which is not a proper subject for the historian. It is the nature of the evidence rather than its subject which has provided the traditional boundary to "history." Most historians have limited themselves to the evidence of the written record, though they have been forced to recognize that there are vast ranges of the human past and present which must be elucidated by other kinds of evidence, by methods which their colleagues in the other social sciences have succeeded in developing.

The study of history may be useful to the person preparing for a career in law or government or teaching, but its chief claim to a place in the curriculum rests upon the hope that the person who studies it may gain in his capacity to see himself in relation to his society, and his own society in historical perspective.

The Department of History offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. History majors in the College of Arts and Sciences may take the courses in the College of Education required for the teaching certificate. In addition, the Department of History offers major and minor academic fields for secondary education majors, and a major academic field for elementary education majors in the College of Education. See the *College of Education* section.

**Undergraduate Programs**

**Advisers**

308 Smith Hall

The undergraduate majoring in history will be encouraged, with the help of an adviser, to plan a program of history courses providing both depth and breadth—an intensive exploration of one country, region, or period combined with an extensive introduction to other countries, regions, and periods, and a study of the appropriate foreign languages. He should take course work in the other social sciences and in the humanities that are best suited to provide perspective suggested by his own developing interests.

**Biomedical History**

Chas. W. Bodemer

A225 Health Sciences Bldg.

The Division of Biomedical History in the School of Medicine offers courses and sponsors research in the history of medicine and allied sciences. Courses are available to undergraduates, medical students, and graduate students. Students who intend to enroll in these courses should consult the *School of Medicine* section.

**GRADUATION REQUIREMENTS**

**Bachelor of Arts**

For a Bachelor of Arts degree, 50 credits in history are required, with the exception of those students who are working for honors in history who need 60 credits (including History 309H-391H and 490H-491H). Courses must include either Social Science 101, 102, and 103 (History of Civilization), or History 101 and



102, or the equivalent in the more advanced courses; History 241 or any other 5-credit course in United States history; and at least 25 credits in upper-division history courses.

Students who plan to undertake graduate work in history should begin to acquire a reading knowledge of foreign languages, especially French and German.

### Honors In History

Adviser

Dauril Alden

The History Department offers honors sections in History 101, 102, 201, and 202; in Social Science 101, 102, and 103; and two honors sequences open only to juniors and seniors, History 390H-391H and 490H-491H, both involving a special essay. History 490H-491H and the honors sections in the lower-division courses are open to any member in good standing in the College of Arts and Sciences Honors Program, and to other superior students with permission of the instructor. All applicants for 390H-391H must obtain the permission of the instructor.

There are two forms of honors degrees. Students enrolled in the College Honors Program become candidates for the bachelor's degree "With College Honors in History." Other qualified students may participate in the departmental honors program and become candidates for the bachelor's degree "With Distinction in History."

In order to graduate with either honors degree, a student must complete at least one of the two upper-division honors sequences (History 390H-391H and History 490H-491H), and achieve distinction in the major essay written for it; attain a cumulative grade-point average of 3.00; and complete at least 60 credits in History with a grade-point average of 3.30. A member of the College Honors Program must fulfill that program's other requirements as well.

### Graduate Programs

Graduate Program Adviser

Arther Ferrill  
315 Smith Hall

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as

outlined in the *Graduate Study* section. Before beginning graduate work, students should have completed an undergraduate history major or the equivalent. It is expected that students specializing in Far Eastern history will have had sound undergraduate preparation in history.

Applicants for admission to graduate degree programs in history are required to submit (1) three letters of recommendation from instructors acquainted with their academic qualifications; (2) a typewritten summary or *précis* (at least 1,000 words) of a paper written in class or otherwise on some historical topic; (3) evidence of reasonable competence in at least one foreign language. They will be expected to take the examination in this language at the beginning of their first quarter at the University. Failure to pass such examination will result in reducing the academic program in history by at least one course to allow further language study. Applicants failing the language examination will repeat the examination in subsequent quarters, and continue with a reduced program until the language requirement is satisfied. Students who plan to become candidates for the Ph.D. degree will present themselves for examination in the second foreign language at the beginning of their first quarter in the Ph.D. program. If unsuccessful, such student's program will be correspondingly reduced to permit further study in the second language.

Students wishing to enter graduate study in history are expected to submit their applications and supporting documents prior to February 1. All applications will then be considered by the Department as well as by the Graduate School of the University and the resulting decisions will be announced by April 1. Later applications and applications for admission to other than the Autumn Quarter will be considered, but the applicants must recognize that all available space may be taken.

In addition to submitting a regular application for admission to the Graduate School, each applicant is expected to file with the Department of History certain additional documents, including three letters of recommendation and a sample of written work. Full information may be obtained from the Graduate Program Adviser, Department of History.

### PROGRAMS OF STUDY

The requirements for both advanced degrees include work in selected fields of history. Each field is a brief period or a restricted topic which is part of a general subject in one of the major divisions of history. These

divisions are: (1) ancient history, (2) medieval and Byzantine history, (3) history of Europe 1450-1789, (4) history of Europe since 1789, (5) history of the United States (including the colonial period), (6) history of the Americas (other than the United States), (7) history of England and of the British Empire and Commonwealth, (8) history of Russia and Eastern Europe, (9) history of Asia before 1600, (10) history of Asia since 1600, (11) history of science.

Field courses that can be classified alternatively in different divisions may be counted in either, provided the spirit of the requirement of distribution is not violated. Subjects within divisions 10 and 11 may be selected by arrangement with the Department of History and the Far Eastern and Russian Institute. Students may petition the Graduate Studies Committee of the Department of History for recognition of a division different from those specified above.

#### **Master of Arts**

In history there are two programs leading to the degree of Master of Arts. The professional program is planned as the first year of a scholar's career, and the assumption is that the student expects to continue working for the degree of Doctor of Philosophy. The second or general program is designed to meet the interests and purposes of secondary school teachers and other students who think of the M.A. as a terminal degree. The major emphasis is placed upon reading and lecture courses which will enrich and broaden the student's knowledge of history rather than upon technical problems of research and original scholarship.

A student in the professional program must complete 500, 501, and 502, one seminar, and graduate courses in two fields selected for special study. The subjects from which the student selects the fields should be in different divisions of history as described above. In addition, he must have a reading knowledge of one foreign language and must submit an acceptable thesis, the writing of which should involve original research and the fundamentals of historical method.

A student in the general program must complete 500, 501, and 502, four courses numbered in the 400's (two in each of two divisions of history), and one graduate course in a field selected for special study. In addition, he must have a reading knowledge of a foreign language and must submit an acceptable thesis, the emphasis of which may be on interpretation rather than on research.

A student in the professional program who studies in Far Eastern and Russian history must meet the requirements indicated above, except that he may take 500, or 501, or 502. One of the three fields is arranged in cooperation with the Far Eastern and Russian Institute.

The prerequisite for a minor in history for the master's degree is an undergraduate program in history or such preparation as the Department deems satisfactory. For this minor, 15 credits in history are required in courses numbered 400 and 500, subject to the approval of the Department.

#### **Doctor of Philosophy**

Prospective candidates must complete 500, 501, 502 and at least two years of seminar work, including participation in the advanced seminar, and prepare at least four fields from subjects in the divisions of history described above. (Only in a single division may students choose two fields.) In addition, they must have a reading knowledge of two foreign languages related to their major fields of study.

Students majoring in Far Eastern and Russian history are expected to satisfy the same requirements, except that only one year of seminar work in the Department of History is required, and they are expected to take 502 and either 500 or 501. Two fields are arranged in cooperation with the Far Eastern and Russian Institute.

A history minor for the doctor's degree requires 500, 501, 502, and 25 credits in courses numbered 400 and 500, subject to the approval of the Department.

## **HOME ECONOMICS**

#### **Director**

Mary Louise Johnson  
201 Raitt Hall

#### **Professors**

Grace G. Denny (emeritus), Mary L. Johnson, Miriam E. Lowenberg (visiting), Blanche Payne (emeritus), Jennie I. Rowntree (emeritus), Margaret E. Terrell

#### **Associate Professors**

Doris J. Brockway, Florence T. Hall, Richard H. Klemer (visiting), Gertrude Lienkaemper (visiting), Laura E. McAdams

#### **Assistant Professors**

Grace G. Granberg, Dorothy I. Henderson, Elaine R. Monsen, Mabel M. Nielsen, Marguerite P. Schroeder

**Instructors**

Marian Arlin, Virginia Campbell, M. Joan Price, Alice W. Sandstrom, Dorothy J. Smith

**Lecturers**

Jeanette Crum, Margaret B. Murdoch, Mabel K. Shigaya



Home Economics synthesizes knowledge drawn from its own research, from the physical, biological, and social sciences, and from the arts, and applies this knowledge for the purpose of improving the lives of families and individuals.

The educational objectives of the degree programs in the School of Home Economics are to provide a liberal education, to develop competence and creativeness in extending, applying, and disseminating knowledge related to personal and family living, and to allow sufficient specialization for a student to prepare for a profession or graduate work.

The School of Home Economics offers six curricula leading to the bachelor's degree for students in the College of Arts and Sciences, as well as major and minor academic fields for students in the College of Education (see *College of Education* section). The School also offers courses leading to the degrees of Master of Arts, Master of Science, Master of Arts in Home Economics, and Master of Science in Home Economics.

**Special Facilities**

The School maintains a Home-Management House in which home economics students spend five weeks gain-

ing practical experience in management and group living.

**Undergraduate Programs****Advisers**

Margaret Murdoch  
307B Raitt Hall

Florence T. Hall  
315 Raitt Hall

Rosalie King  
202 Raitt Hall

**PROGRAMS OF STUDY****Bachelor of Science**

Candidates for this degree may choose one of the following:

**CURRICULUM IN INSTITUTION ADMINISTRATION,  
A—DIETETICS**

The following courses are required for students who plan careers as dietitians in food service: *Home Economics* 125, 148, 216, 307, 315, 347, 372, 407, 408, 415, 457, 472, 473, 474, 475. *Other*: Art 109 or 129 or equivalent; Chemistry 140, 150, 151, 231, 232, 241, 242; Economics 200 or equivalent; Education 333; Mathematics 101; Microbiology 301; Zoology 208. Students who wish to prepare for a hospital internship must take Biochemistry 405 and 406. A year's internship in an approved administrative or hospital dietetics course following completion of academic requirements is necessary for American Dietetic Association membership.

**CURRICULUM IN INSTITUTION ADMINISTRATION,  
B—EXECUTIVE HOUSEKEEPING**

This curriculum is designed for students who plan careers as executive housekeepers in hospitals, hotels, or other institutions. A year's internship following this program qualifies the student for membership in the National Executive Housekeepers Association. The following courses are required: *Home Economics* 125, 134, 148, 216, 307, 347, 354, 356, 457, 473, 474, 475, upper-division elective (2 credits). *Other*: Art 109 or 129, or equivalent; Chemistry 101 and 102 or equivalent; Economics 200 or equivalent; Education 333; Microbiology 301; Physics 114 or equivalent; Speech 100 or 230, or equivalent; Zoology 118 or 208, or equivalent.

**Bachelor of Arts**

Candidates for the Bachelor of Arts degree may choose one of the following:

#### CURRICULUM IN TEXTILES, CLOTHING, AND ART

This curriculum is designed for students whose primary professional interest is in costume design and construction. The following courses are required: *Home Economics* 125, 134, 234, 300, 334, 347, 354, 356, 425, 432, 433, 434, 435, 436. *Other*: Art 105, 106, 109, 110, 129, 369, 370, 371; Chemistry 101 and 102 or equivalent; Economics 200 or equivalent; Social Science 101 and 102 or equivalent.

#### CURRICULUM IN DESIGN FOR APPAREL MANUFACTURING

The purpose of this curriculum is to equip qualified students with the knowledge and skills essential in designing for apparel manufacturing. Practical experience in factories is required and is provided by registration in Home Economics 380. For such experience, the student is paid an amount relatively equivalent to tuition costs. Skill in typing is highly desirable. The following courses are required: *Home Economics* 125, 134, 234, 334, 347, 380, 425, 432, 433, 434, 435, 436, approved elective. *Other*: Art 105, 106, 109, 110, 129, 369, 370, 371; Chemistry 101 and 102 or equivalent; Economics 200 or equivalent; Marketing 301; Social Science 101 and 102 or equivalent.

#### CURRICULUM IN HOME ECONOMICS EDUCATION

Students who plan to teach home economics in Washington high schools must include the following courses which meet the requirements for the Vocational Certificate, as well as for the Provisional Certificate, Secondary Level, which is issued through the College of Education (see the *College of Education* section for other requirements for certification): Home Economics 125, 134, 148, 216, 234, 307, 315, 316, 338, 347, 348, 354, 356, 457, approved elective. *Education requirements*: 288, 305, 308, 309, 332, 370S, 371S or 371X, 445, and approved elective, which may be deferred until the fifth year; Speech 101. *Other*: Art 109 or 129 or equivalent; Chemistry 101, 102 or equivalent; Economics 200 or equivalent; Microbiology 301; Psychology 100, 306, 320; Speech 100 or equivalent; Zoology 118 or 208. A course in vocational education (Education 445) is also required for a Vocational Certificate. See the *College of Education* section for requirements for the fifth year and the Standard General Certificate.

#### CURRICULUM IN HOME ECONOMICS (NONPROFESSIONAL GENERAL)

This curriculum is for students who want a broad home economics background without specialization. The following courses are required: *Home Economics* 125, 134, 148, 216, 234, 307, 315, 347, 348, 354, 356,

457, approved elective. *Other*: Art 109 or 129, or equivalent; Chemistry 101 and 102 or equivalent; Economics 200 or equivalent; Psychology 100, 306, 320; Zoology 118 or 208, or equivalent; Microbiology 301 or equivalent.

#### Honors In Home Economics

##### Adviser

Florence T. Hall  
315 Raitt Hall

A student may enter the upper-division School of Home Economics Honors Program if she has successfully fulfilled the lower-division requirements of the College of Arts and Sciences Honors Program.

To maintain honors standing in the School, students shall be required to carry a minimum of 14 credits per quarter and to maintain a minimum grade-point average of 3.00.

To graduate "With College Honors in Home Economics," the student must meet the following requirements:

(1) Complete independent study projects in addition to the regular requirements in three of the following courses: Home Economics 307, 315, 338, 347, 354, 356. A 495 special problems course may be substituted for one of these additional independent study projects. In registration, courses taken for honors credit should be designated by the letter "H" immediately following the course number. Only upper-division home economics majors in the College of Arts and Sciences Honors Program may register for the honors section of the above courses.

(2) Complete a 6-credit senior thesis in major area of interest (Home Economics 496H).

In order to provide for curriculum flexibility, College honors students majoring in home economics may substitute 6 senior thesis credits plus other approved credits up to a maximum of 15 for home economics credits usually required in the curriculum they are following. They must, of course, complete a minimum of 50 credits in home economics as required by the College.

#### Graduate Programs

##### Graduate Program Adviser

Mary L. Johnson  
201 Raitt Hall



### PROGRAMS OF STUDY

The applicant for admission to the Graduate School should have at least a B or 3.00 grade-point average for the courses taken during the junior and senior years of his undergraduate study. The master's degree programs require a minimum of 45 credits. Half of the work, including the thesis, must be in courses numbered 500 or above. The Graduate Program Adviser must approve all proposed graduate programs.

#### Master of Arts and Master of Science

The Master of Arts degree is attained by work in textiles and clothing; the Master of Science degree, by work in foods and nutrition. Study in either area may be combined with home economics education or family economics. A minimum of 12 credits in a field related to home economics is required.

#### Master of Arts in Home Economics

#### Master of Science in Home Economics

There is no foreign language requirement for these degrees. The major area of study and the thesis may be in clothing, family economics, foods, home economics education, home furnishing, home management, institution administration, nutrition, or textiles. The student may combine up to three related areas in home economics with up to 15 credits in related fields such as the biological, physical or social sciences, art, education, or public health. Students must present acceptable undergraduate preparation in home economics and basic fields.

#### Dietetic Internship

The School of Home Economics offers an administrative internship for those who wish to become dietitians in lunchrooms, restaurants, or dormitories. The internship courses may apply toward an advanced degree *if the student has been admitted to the Graduate School*. Completion of the internship makes students eligible for membership in the American Dietetic Association.

## LINGUISTICS

#### Chairman

Sol Saporta  
B106 Padelford

#### Professors

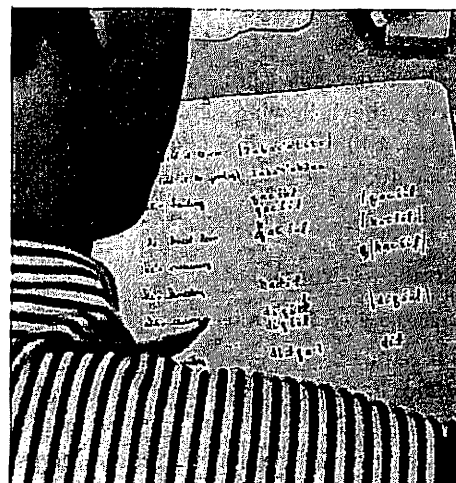
Melville Jacobs, Fang-Kuei Li, Nicholas N. Poppe,  
Sol Saporta

#### Associate Professors

Laurence C. Thompson, William F. Wyatt, Jr.

#### Assistant Professors

Heles Contreras, Antonina Gove, George V. Grekoff (acting), Fred Lukoff, Allan R. Keiler (visiting), Meri Lehtinen (acting), Larry Selinker.



#### Lecturer

Maeng-Sung Lee

Linguistics is the scientific study of language, which is one of the most characteristic forms of human behavior. In contrast to other disciplines concerned with languages, linguistics deals with them from the point of view of their internal structure as systems of communication. Courses provide training in the method and theory of language analysis and description as well as techniques for dealing with language change and genetic relationships.

The University offers upper-division courses in linguistics, providing an introduction to method and theory and a program of studies for graduate students, leading to master's and doctoral degrees in linguistics. The program is administered by the Department of Linguistics in cooperation with various departments.

#### Undergraduate Programs

No undergraduate degrees are offered in linguistics; however, introductory courses in linguistic method and theory are open to qualified undergraduates who wish to acquire a basic knowledge of the field.

This training serves as a valuable adjunct to students majoring in anthropology, English, or another lan-



guage and literature, mathematics, psychology, or speech, and provides the essential basis for graduate work in general linguistics and related specialties. Courses at the 400 level are available to graduate students who have been unable to acquire equivalent training before beginning graduate work. Undergraduates planning to work for an advanced degree in general linguistics are especially encouraged to complete this training prior to graduation.

For students wishing to take a full complement of work, the following schedule is recommended: junior year: 400, 451J, 452J, 453J, 462J, 463J; senior year: 404, 405, 406, 441, 454J, 455J.

## **Graduate Programs**

### **Graduate Program Adviser**

Sol Saporta

B106 Padelford Hall

In addition to the normal requirements of the Graduate School for admission to study for an advanced degree, the student admitted to the program in linguistics must have completed the equivalent of 45 quarter credits (30 semester credits) of undergraduate college credits in language study. This requirement implies the attainment of proficiency in one language other than English or, in the instance of a non-native speaker of English, a course of study and proficiency in a language other than his native speech. The Graduate School may be consulted when there is need for special determination regarding meeting the requirements for admission. To register for courses, students should consult with the Graduate Program Adviser in Linguistics.

## **PROGRAMS OF STUDY**

### **Master of Arts**

Requirements for the Master of Arts degree are as follows: (1) A reading knowledge of German or French or Russian, to be demonstrated as soon as possible, preferably before the end of one year of graduate study; (2) the following courses: 400, 404, 405, 406, 451J, 452J, 453J, 462J, 463J, 501, 502, 503. If a student has already taken any of the 400 courses or their equivalent as an undergraduate, he must take a corresponding number of credits in other linguistics courses (up to the minimum total of 27 credits); (3) additional work in linguistics, or supporting areas, to provide a total of at least 18 credits in courses numbered 500 or above, including 9 credits for the thesis; (4) successful performance in a comprehensive exam-

ination in General Linguistics, based on a current master's reading list prepared by the Department; (5) completion of a thesis acceptable to the student's committee; (6) attendance at a linguistic institute is strongly recommended.

### **Doctor of Philosophy**

A student may plan to proceed directly for the doctoral degree without an M.A., but the Committee reserves the right to require any individual student to present himself as a candidate for the M.A. before accepting him as a prospective candidate for the Ph.D. Requirements for the Ph.D. include 36 credits in linguistics or supporting areas, in lieu of the M.A., plus the following (subject to readjustment by the student's Committee): a reading knowledge of two of the following—French, German, Russian; Linguistics 504, 505, 506, or 514, 515, 516, 530, and 599; 15 additional credits in linguistics or supporting areas, as approved by the Committee; an examination, usually conducted at the conclusion of course work in, first, descriptive linguistics, second, historical-comparative linguistics, and third, a specialty of the candidate's choice, e.g., Germanic, Romance, Slavic, Chinese, Altaic, American Indian linguistics, Southeast Asian linguistics, etc.; independent research in the analysis of a language utilizing a native speaker or speakers and/or manuscripts in the language, and finally, a dissertation suitable for publication and constituting a contribution to knowledge.

## **MATHEMATICS**

### **Chairman**

R. S. Pierce

C138 Padelford Hall

### **Professors**

Carl B. Allendoerfer, Maynard G. Arsove, John P. Ballantine (emeritus), Ross A. Beaumont, Z. William Birnbaum, Robert M. Blumenthal, Francis H. Brownell III, Douglas G. Chapman, Harry H. Corson, Clyde M. Cramlet (emeritus), Roy Dubisch, Theodor Ganea, Irving L. Glicksberg, Allen A. Goldstein, Branko Grünbaum, Edwin Hewitt, James P. Jans, Victor L. Klee, Lee H. McFarlan (emeritus), Ernest A. Michael, Robert R. Phelps, Richard S. Pierce, Ronald Pyke, Roy W. Winger (emeritus), Herbert S. Zuckerman

### **Associate Professors**

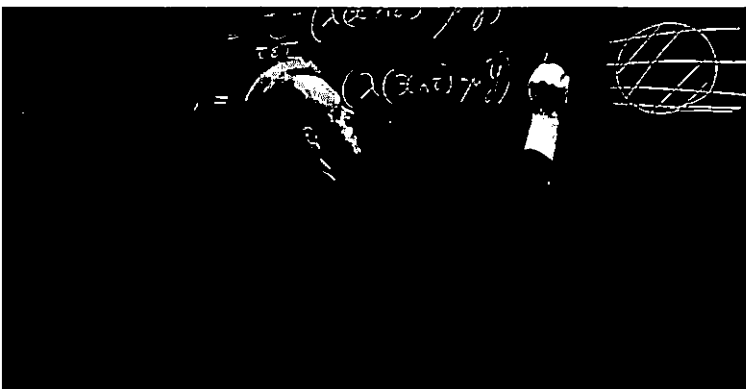
Sherwin P. Avann, Lutz Bungart, Casper R. Curjel, David B. Dekker, Ramesh A. Gangolli, Mary E. Haller,



Charles R. Hobby, Arthur R. Jerbert (emeritus), Harold H. Johnson, J. Maurice Kingston, Gunter Lumer, Anne C. Morel, Isaac Namioka, Ronald J. Nunke, Roger W. Richardson, Robert W. Ritchie, Leonard Sarason, Jack Segal, N. Donald Ylvisaker

#### Assistant Professors

Ralph E. DeMarr, Richard Duke, Lloyd D. Fisher, Jr., Morton M. Hackman, Norman Hosay, Thomas W. Hungerford, Robert I. Jewett, Michael H. McAndrew,



George S. Monk, Kathleen B. O'Keefe, Srinivasa Ramasujam, William E. Ritter, Lewis C. Robertson, Ralph J. Rockafellar, John V. Ryff, Sol Schwartzman, Galen R. Shorack, David M. Topping, Alan Troy, John W. Van Ness, Garth Warner, Kenneth Whyburn, John W. Woll, Jr., William B. Woolf

#### Lecturers

Marjorie M. Lortz, Helen C. Zuckerman

Traditionally, mathematics has been the basic language of physical science and engineering, but recently it has also become of major importance for students in social science, business administration, and biological science. Mathematics is also an essential element of a liberal education, and students from humanities and the arts are encouraged to broaden their education by enrolling in appropriate courses in the Department. The Department of Mathematics serves the University by offering a wide selection of undergraduate and graduate courses which are organized to meet a great variety of mathematical needs.

Mathematics is also a discipline in its own right, and interesting and profitable careers are open to students who specialize in the subject. In order to prepare students for these careers, the Department offers a wide range of degree programs including a general bache-

lor's degree, a specialized bachelor's degree, several master's degrees, and a doctor's degree. In addition to pure mathematics, programs are available in mathematical statistics, numerical analysis, and teacher education. The Department cooperates closely with the Department of Physics and the College of Engineering in providing instruction in the area of applied mathematics. Several departments offer courses which are of interest to applied mathematics majors. Particular attention is directed to the courses Aeronautics and Astronautics 562, 563, 564 (Methods of Partial Differential Equations I, II, III).

#### Special Facilities

The Laboratory of Statistical Research, directed by Z. William Birnbaum, provides a focus for statistical activity within the University. Through the facilities of the Laboratory, instruction is given for students intending to be professional statisticians, and also for students who plan to use mathematical statistics in other fields, such as biology, economics, education, psychology, or sociology. The Laboratory also provides consulting services to other divisions of the University.

The University of Washington Computer Center is equipped with an IBM 7040-7094 direct coupled computer system, a Burroughs B5500, and miscellaneous supporting equipment. It provides computing services to all areas of the University and is also available to all students. D. B. Dekker is Faculty Director of the Center and Carl B. Young, Director of Operations.

A graduate program in biostatistics leading to the degrees of Master of Science and Doctor of Philosophy is administered by the Graduate School Biomathematics Group. Faculty in the Department of Mathematics and certain other departments in the College of Arts and Sciences and certain departments in the School of Medicine cooperate in this program. Information concerning the program will be found in the *Interdisciplinary Graduate Degree Programs* section of this Catalog.

#### Undergraduate Programs

##### Advisers

J. Maurice Kingston  
C36B Padelford Hall

Marjorie M. Lortz  
C36C Padelford Hall

Students planning to take courses in mathematics, either as mathematics majors, or as part of some other cur-

riculum, are strongly advised to elect four years of mathematics in high school. Mastery of these four years of work will prepare them to enter Mathematics 124 (Calculus with Analytic Geometry), which is the first course of university level offered by the Department. Admission to this course is based upon high school records and a placement test given by the Bureau of Testing. Students who have completed a full year of calculus in high school, preceded by accelerated study, are encouraged to take the Advanced Placement Test in Mathematics given by the College Entrance Examination Board. Those whose scores on this examination are satisfactory will be placed in Mathematics 125 or 126 and given university credit for the courses in calculus which they have been allowed to skip. Alternatively, these students may be qualified to enter the freshman honors course.

As a service to entering students who have had less than four years of high school mathematics, the Department offers the following courses which duplicate high school material: 101 (Intermediate Algebra), 104 Plane Trigonometry), 105 (College Algebra). Mathematics 105 may be taken for University credit. If a student has not had the equivalent of 101 and/or 104, these courses may be taken and applied toward the total credit requirement for graduation. Specific information on this matter may be obtained by consulting the appropriate department or college material in this Catalog.

In order to enter 104 or 105, students must have the high school prerequisites listed under the detailed course descriptions (see *Description of Courses* section in this Catalog) and also must obtain satisfactory scores on the mathematics section of the Washington Pre-College Testing Program.

## GRADUATION REQUIREMENTS

### Bachelor of Arts

The B.A. degree is designed for liberal arts majors who have only modest professional aims in mathematics. It also provides a suitable program for prospective high school teachers of mathematics. Grades in all mathematics courses to be counted toward this degree must be C or better, and a grade-point average of at least 2.00 in all mathematics courses must be maintained. There are two curricular options:

### LIBERAL ARTS OPTION

A minimum of 50 credits in mathematics beyond trigonometry is required. Courses must include 124, 125, 126, 224, and 32 credits in approved electives.

## TEACHER PREPARATION OPTION

A minimum of 50 credits in mathematics beyond trigonometry is required. Courses must include 124, 125, 126, 224, 302, 391, 392, 411, 412, 444, 445, and 11 credits in approved electives.

### Bachelor of Science

The B.S. degree is designed for students who wish professional training in mathematics as preparation for graduate study or industrial employment. Grades in all mathematics courses to be counted toward this degree must be C or better, and a grade-point average of at least 2.50 in all mathematics courses must be maintained. Candidates for the degree must elect one year of general physics and are strongly urged to obtain a reading knowledge of French, German, or Russian. There are three curricular options:

### MATHEMATICS OPTION

A minimum of 54 credits in mathematics beyond college algebra is required. Courses must include 124, 125, 126, 224, and 36 credits in approved electives. The electives must include 9 upper-division credits in each of two of the four categories: algebra, analysis, geometry, and statistics. This sequence of courses is recommended but not prescribed:

*Freshman year:* 124, 125, 126, general physics

*Sophomore year:* 224, 238, 302, 324, 325

*Junior year:* 402, 403, 404, 438

*Senior year:* 424, 425, 426, 441, 442, 443

### MATHEMATICAL STATISTICS OPTION

A minimum of 50 credits in mathematics beyond college algebra is required. Courses must include 124, 125, 126, 224, 238, 302, 303, 324, 481, 482, 483, 484, and 491. An additional requirement is 9 approved credits in mathematics or in applied statistics.

### NUMERICAL ANALYSIS OPTION

A minimum of 56 credits in mathematics beyond college algebra is required. Courses must include 114, 124, 125, 126, 224, 238, 302, 303, 374, 438, 464, 465, and 466, and 6 credits in approved electives.

## HONORS IN MATHEMATICS

### Adviser

W. B. Woolf

C124 Padelford Hall

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program



during the freshman and sophomore years, in addition to the departmental honors requirements listed below, receive a bachelor's degree "With College Honors in Mathematics." With the approval of the departmental honors committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Mathematics."

There are four departmental requirements for honors: (1) meet all requirements for a bachelor of science degree in mathematics; (2) complete the following courses: 302, 402, 403, 404, 424, 425, 426, and at least two quarters of 496H; (3) demonstrate a proficiency in one of the following languages: French, German, or Russian; (4) attain a grade-point average of 3.50 or better in all mathematics courses. In addition, it is strongly recommended that students in the honors program take the special freshman and sophomore honors courses, 134H, 135H, 136H, 234H, 235H, and 236H.

### Graduate Programs

#### Graduate Program Adviser

James P. Jans

C34 Padelford Hall

The student's minimum undergraduate preparation for an advanced degree in mathematics must be equivalent to the requirements for a mathematics major for the bachelor's degree. Students presenting only the minimum amount of undergraduate mathematics cannot expect to earn a master's degree in less than two years.

The Department offers programs leading to the degrees of Master of Arts, Master of Arts for Teachers, Master of Science, Master of Science in Mathematical Statistics, and Doctor of Philosophy.

Since one foreign language is required for all the above master's degrees, except the Master of Arts for Teachers, and two languages are required for the doctor's degree, students seeking admission are advised as undergraduates to elect languages. French, German, and Russian are the only languages acceptable toward these degrees.

The minor in mathematics for a master's degree requires at least 12 credits in approved courses numbered 400 or above. At least 9 of these are to be taken in residence.

### PROGRAMS OF STUDY

#### Master of Arts (Thesis Program)

A minimum of 27 approved credits in courses numbered 400 or above, with at least 9 credits in courses numbered 500 or above, is prescribed. These courses must include at least 6 credits in each of algebra, analysis, and one other field. The thesis (additional 9 credits) for this degree, while demonstrating ability and aptitude, may be largely expository.

#### Master of Arts (Nonthesis Program)

A minimum of 36 approved credits in courses numbered 400 or above, with at least 18 of these credits in courses numbered 500 or above, is prescribed. The 18 credits in courses numbered 500 or above should be distributed over no more than three sequences. The total credits should include at least 6 credits each in algebra, analysis, and one other field. The final examination will be a comprehensive one.

#### Master of Arts for Teachers

The program for this degree is planned to increase the mathematical background of present or prospective high school teachers of mathematics. Thus the program is devoted primarily to courses in mathematics chosen for their relevance to the mathematics curriculum of the high school.

A minimum of 36 credits is required, of which at least 33 must be in mathematics at the 400 level or above. The 3 credits remaining may be in either mathematics at the 400 level or above, or at the 300 level or above in a field other than mathematics. At least 18 of the required 36 credits must be at the level of 500 or above, of which at least 15 must be in mathematics courses. Up to 9 of these credits may be in Mathematics 700 (Thesis).

#### Master of Science

A minimum of 27 approved credits in courses numbered 400 or above, with at least 18 credits in courses numbered 500 or above, is prescribed. These courses must include at least 6 credits in each of algebra, analysis, and one other field. The thesis (additional 9 credits) should demonstrate the student's ability to engage in independent research.

Under certain circumstances, this degree may also be awarded to a student who has passed the General Examinations for the Ph.D. degree. In such a case, no thesis is required.

#### Master of Science in Mathematical Statistics

The undergraduate preparation should consist of courses in probability and statistical inference equivalent to 481

and 482. The student must present a minimum of 27 approved credits in mathematics courses numbered 400 or above. This work may include, on approval, some courses in mathematical statistics needed to make up deficiencies in undergraduate preparation and must include 15 credits in mathematical statistics or probability courses numbered 500 or above. The thesis (9 credits) should demonstrate the student's ability to engage in independent research.

#### Doctor of Philosophy

The General Examination of a prospective candidate for the Doctor of Philosophy degree covers: (1) the subject matter usually covered in first-year graduate courses in algebra, real variable, and two other fields chosen by the student and approved by his Supervisory Committee; and (2) additional material related to the student's field of special interest, such as that included in second-year graduate courses.

The *minor for the degree of Doctor of Philosophy* requires a minimum of 33 approved credits in courses numbered 400 or above, including at least 6 credits in each of three of the four categories: algebra, analysis, geometry, and statistics.



## MICROBIOLOGY

#### Chairman

Charles A. Evans

G305 Health Sciences Building

Microbiology is the science of microscopic organisms, their biological characteristics, chemical activities, industrial uses, and disease-producing mechanisms. The related fields concerned with parasites, viruses, and immunity are included in the work of this Department.

The Department of Microbiology offers a four-year curriculum leading to a bachelor's degree in the College of Arts and Sciences. An honors program leading to a bachelor's degree with honors or distinction is available to qualified students. The purpose of the undergraduate degree is to prepare the individual to assume the responsibilities of a microbiologist upon graduation. It also provides the background for advanced degree work should the student's capabilities warrant it.

The degrees of Master of Science and Doctor of Philosophy are also offered in this field.

### Undergraduate Programs

#### Adviser

Esther Duchow

G301 Health Sciences Building

#### GRADUATION REQUIREMENTS

The requirements are: 30 credits in microbiology courses, including 400; 10 credits in botany or zoology or Biology 101-102; Physics 114, 115, 116; Chemistry 140, 150, 151, 160, 170, 221, 231, 232, 241 (or, instead of the last three courses, 335, 336, 345, 346); and Mathematics 124. Genetics 451, Botany 461, and Zoology 423 may be counted toward the 30 credits in microbiology courses.

A combined grade-point average of 2.50 in biology and chemistry courses is required for admission to Microbiology 400 and 441-; a grade-point average of 2.00 in microbiology courses is required for graduation.

During their third and fourth years, most students take specialized courses in microbiology and related fields of interest. The following courses are recommended for all students: Microbiology 320, 400, 430, and 441-442; Genetics 451; Botany 461; and Biochemistry 440, 441, 442.

In addition to the above courses, the following are suggested for students with an interest in either general or medical microbiology:

*General:* Microbiology 499; Zoology 400, 400L, 423.

*Medical:* Microbiology 322, 443, 444; Biological Structure 301, 330; Pathology 440-; Zoology 458. For a complete listing and description of medical courses, see *Description of Courses* section.



## Honors In Microbiology

### Advisers

Neal B. Groman  
H325 Health Sciences Building

Eugene W. Nester  
H335 Health Sciences Building

Members of the College of Arts and Sciences Honors Program may be admitted to the Honors Program in Microbiology during their junior year, or any time prior to that, subject to staff approval. They must fulfill the requirements of the College of Arts and Sciences Honors Program during the freshman and sophomore years (see *Honors* section), and while doing so are urged to take as many honors courses in undergraduate chemistry, physics, and mathematics as their program will permit.

Students graduating "With College Honors in Microbiology" must comply with the requirements for a Bachelor of Science degree. Their junior and senior years must include Microbiology 400 (Fundamentals of Bacteriology); 430 (Microbial Metabolism); preparation of a thesis based on laboratory and library research, including a minimum of 6 credits in 499H (Undergraduate Research), and an over-all grade-point average of 3.25.

With the approval of the Department, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Microbiology."

## Graduate Programs

### Graduate Program Adviser

Howard C. Douglas  
H309 Health Sciences Building

Students who intend to work toward the Master of Science or Doctor of Philosophy degree must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section. Prospective candidates for advanced degrees are selected primarily upon the basis of scholarship and motivation. The fields of specialization for advanced degrees are general and medical bacteriology, microbial physiology and genetics, immunology, virology, and medical mycology. An undergraduate record of at least a B average is considered an indication that the student is capable of more advanced work.

While the academic background of students entering graduate work in microbiology is variable, it is generally agreed that a strong background in chemistry and biology is essential. One year of physics and mathematics through analytic geometry and calculus is also strongly recommended.



## MUSIC

### Director

William Bergsma  
104 Music Building

### Professors

William Bergsma, Stanley Chapple, R. Alec Harman (visiting), Eva Heinitz, Randolph Hokanson, Demar B. Irvine, Berthe P. Jacobson (emeritus), Leon Lishner, George F. McKay, Kathleen Munro (emeritus), Theodore F. Normann, Bela Siki, Vilem M. Sokol, John W. Verrall, August H. Werner (emeritus), Emanuel R. Zetlin

### Associate Professors

James M. Beale, Jr., Irene N. Bostwick, Henry L. Clarke, William D. Cole, Walter A. Eichinger, Else J. Geissmar, Edison D. Harris, Gerald Kechley, George C. Kirchner (emeritus), John T. Moore, Ralph R. Rosinbum, William O. Smith (visiting), Miriam Terry, Walter C. Welke, Edith Woodcock (emeritus)

### Assistant Professors

William Adriaansz, Warren Babb, Rodney Eichenberger, Robert A. Garfias, Donald McInnes, Neal O'Doan, Robert Suderburg, Paul D. Tufts

### Instructors

Kenneth Benshoof, Charles Troy, Mishika Tsuda

### Lecturer

Clifford Cunha

#### **The Philadelphia Quartet**

Veda Reynolds (first violin), Irwin Eisenberg (second violin), Alan Iglitzin (viola), Charles Brennand (cello)

Music, as a creative art, is studied through its literature, compositional techniques, and in the laboratory of performance. The general student may enroll in survey courses or participate, as qualified, in the performance life of the School of Music. Courses of study for the music major include the disciplines of composition, performance, history, theory, ethnomusicology, and music education; and extend through undergraduate training to the master's and doctor's level.

All music majors must qualify for private instruction in performance. Admission to private lessons is by audition before the appropriate faculty. No special charge is made for private instruction, for practice facilities, or use of the School's instruments.

The School's performing groups are the University Singers (no audition required), the 40-voice University Chorale, the Madrigal Singers; the University Symphony Orchestra and the Sinfonietta; the Opera Theater, Festival Opera, the Opera Workshop; the University Band, the 45-piece Wind Sinfonietta, the Marching Band; the Collegium Musicum; the Gagaku ensemble; and many chamber music ensembles.

These groups cooperate with the School of Drama in production of musicals; with stations KUOW and KCTS-TV (Channel 9) in the presentation of musical events; with the Seattle Opera Guild and Seattle Public Schools in the production of touring chamber operas; and with the Division of Continuing Education in offering faculty and student concerts and recitals throughout the state.

The Philadelphia Quartet, in residence to the universities and colleges of Washington, gives approximately twenty concerts a year under the auspices of the School of Music.

#### **Special Facilities**

The School of Music is housed in a five-story, sound-controlled modern building which contains a small recital hall (285 seats), an acoustics studio, 19 large class and rehearsal rooms, 21 teaching studios, 15 offices, 41 practice rooms; 42 grand pianos, 54 upright pianos; one baroque organ, three practice organs; four harpsichords; a collection of baroque instruments; a collection of orchestral and band instruments; collections of Indian, Korean, and Japanese instruments; the Music Library (20,000 books and scores); the Record

Library (15,000 records and tapes); and the Kinscella Collection of American music.

Chapters of *Mu Phi Epsilon*, the national music sorority; of *Phi Mu Alpha*, the national music fraternity; and a student chapter of the Music Educators National Conference are based at the School of Music.

#### **Financial Aid**

The Brechemin Family Foundation offers annually, through the School of Music, a number of scholarships in performance areas. These scholarships normally carry stipends of \$1,800, are renewable, and are awarded by faculty vote in auditions held each April at the School of Music, as are a number of other prizes and awards. For audition appointments, write the Undergraduate Adviser, Room 105, Music Building.

Music students are eligible for scholarships offered by the University at large. Certain of these (such as the Milnora de Beelen Scholarships for sophomore, junior, and senior women) give special consideration to music majors. Students planning teaching careers may be eligible for loans under the National Defense Act. A special feature of these loans is that a percentage (up to 50 per cent) is forgiven graduates who teach in secondary and higher education. Applicants for scholarships and loans administered by the University should write the Office of Dean of Students, 333 Student Union Building.

Student help is employed at hourly rates as accompanists, ushers, librarians, orchestra and band managers, and as assistants in performance. Applicants should consult the School's Administrative Assistant, 104 Music Building.

#### **Graduate Financial Aid**

Doctoral students may apply for Graduate School Research Assistantships and National Defense Education Act Fellowships. Teaching Assistantships are available in theory, sight-singing, history, piano, music education, opera coaching, opera staging, conducting, and ethnomusicology. Applicants should write to the Graduate Program Adviser, 108 Music Building. Hourly employment is available to readers, copyists, librarians, accompanists, and assistants in performance; consult the Administrative Secretary, 104 Music Building. Seattle and its suburbs afford substantial employment opportunities to qualified performers and teachers.

#### **Undergraduate Programs**

##### **Adviser**

Paul D. Tufts  
105 Music Building



An advanced level of preparation, representing a number of years of private study, is expected in the major performance area. Ear-training, sight-singing, and studies in music history and theory are strongly encouraged. Advanced preparation in these areas may result in advanced standing and credit by examination.

The student is urged to complete the preparation in academic studies recommended by the College of Arts and Sciences. Early study of French or German is particularly useful for students planning graduate study.

All entering music majors must pass an examination in basic piano as follows: be able to play all major and harmonic minor scales; a simple piece by Bach; an easy sonatina; an easy composition by a romantic or contemporary composer; be able to read at sight music of moderate difficulty. Students proficient in another instrument or in voice, but deficient in basic piano, may begin their musical studies, but must enroll in 110A until basic piano proficiency is established.

The School of Music offers a four-year program leading to the degree of Bachelor of Arts, and a five-year program leading to the degrees of Bachelor of Arts and Bachelor of Music to be awarded concurrently. A four-year program leading to the degree Bachelor of Music is offered to a limited number of students.

For four-year programs leading to the bachelor's degree and teacher certification at the secondary or elementary level, see the *College of Education* section.

The core of each of the undergraduate curricula is represented by the following course of study intended to develop an understanding of music through the study of its theory and history.

#### Music Theory-History Core

COURSES	CREDITS
101, 102, 103 FIRST-YEAR THEORY (2,2,2)	6
114, 115, 116 SIGHT SINGING (1,1,1)	3
201, 202, 203 SECOND-YEAR THEORY (3,3,3)	9
207, 208, 209 MUSIC AFTER 1750 (2,2,2)	6
307, 308 MUSIC BEFORE 1750 (2,3)	5
309 MUSIC AFTER 1920 (2)	2
321 MODAL COUNTERPOINT (3)	3
322 TONAL COUNTERPOINT (2)	2
323 CONTEMPORARY IDIOMS (3)	3
481 HARMONIC ANALYSIS (3)	3
THEORY OR HISTORY ELECTIVES	12
	<hr/> 54

#### Bachelor of Arts

This degree is offered with a major in Music, and is intended for students who wish to emphasize general competence in music within the framework of a liberal education. Candidates are expected to acquire performance skills and ensemble experience comparable

with those of the mature and intelligent adult amateur. The student has the option of additional concentration in either the theory-history aspects or the performance aspects of music.

#### Music Theory-History Option

COURSES	CREDITS
MUSIC THEORY-HISTORY CORE	54
330 VOCAL OR INSTRUMENTAL INSTRUCTION	9
ENSEMBLES	6
	<hr/> 69

#### Vocal or Instrumental Option

COURSES	CREDITS
MUSIC THEORY-HISTORY CORE, WITHOUT ELECTIVES	42
130 OR 230 VOCAL OR INSTRUMENTAL INSTRUCTION	9
330 OR 430 VOCAL OR INSTRUMENTAL INSTRUCTION	9
ENSEMBLES	9
	<hr/> 69

Students wishing to pursue the theory-history option, with emphasis in ethnomusicology, should consult with their music adviser regarding suitable electives to include languages and area studies outside of music.

#### Bachelor of Arts and Bachelor of Music (Concurrent)

This combined five-year program is intended for students who desire the advantages of a liberal education together with strong professional preparation. The requirements for the Bachelor of Arts and Bachelor of Music degrees are to be taken concurrently over a five-year period. Students contemplating graduate studies in music are strongly urged to pursue this curriculum.

Students who already hold an approved Bachelor of Arts degree may earn the Bachelor of Music degree separately, but must expect an extended period of study before the requirements can be fulfilled.

A grade-point average of 2.50 in music courses is required for graduation. Candidates for the concurrent Bachelor of Music degree "With Distinction in Music" must obtain a grade-point average of 3.20 in music courses.

#### Composition Major

COURSES	CREDITS
MUSIC THEORY-HISTORY CORE, TO INCLUDE	
353 ORCHESTRATION; 408 BAROQUE MUSIC;	
409 CONTEMPORARY MUSIC; 421 MODAL COUNTERPOINT;	
AND 422 TONAL COUNTERPOINT	54
191, 291, 391, 491 COMPOSITION	24
284, 384, 385, 386 CONDUCTING (1,1,1,1)	4
VOCAL OR INSTRUMENTAL INSTRUCTION	24*
ENSEMBLES	18
	<hr/> 124

\*Students proficient in performance may be permitted to substitute courses in theory or music history for not more than 6 of these credits.



## Music History Major

COURSES	CREDITS
MUSIC THEORY-HISTORY CORE, TO INCLUDE	
353 ORCHESTRATION; 422 TONAL COUNTERPOINT;	
452 MUSICAL FORM; AND 3 CREDITS FROM	
314, 315, 316 MUSIC CULTURES OF THE WORLD . . . . .	54
407 MEDIEVAL AND RENAISSANCE MUSIC (3)	
408 BAROQUE MUSIC (3)	
409 CONTEMPORARY MUSIC (3) . . . . .	9
MUSIC HISTORY ELECTIVES . . . . .	15
284, 384, 385, 386 CONDUCTING (1,1,1,1) . . . . .	4
VOCAL OR INSTRUMENTAL INSTRUCTION . . . . .	24*
ENSEMBLES . . . . .	18
	124

\*Students proficient in performance may be permitted to substitute courses in theory or music history for not more than 6 of these credits.

Students intending to pursue graduate studies are strongly advised to establish proficiency in German or French, and to acquire some acquaintance with one or two additional foreign languages. For emphasis in ethnomusicology, consult the music adviser regarding suitable area studies other than music.

## Music Education Major

COURSES	CREDITS
MUSIC THEORY-HISTORY CORE, TO INCLUDE	
353 ORCHESTRATION OR 354 BAND ARRANGING;	
AND 422 TONAL COUNTERPOINT . . . . .	54
344 ELEMENTARY SCHOOL MUSIC (3)	
346J THE TEACHING OF ELEMENTARY MUSIC (3)	
474 THE CURRICULUM IN MUSIC EDUCATION (2)	
476 THE GENERAL MUSIC CLASS (2) . . . . .	10
MAJOR PERFORMANCE MEDIUM . . . . .	24
SECONDARY PERFORMANCE MEDIUM . . . . .	12
PERFORMANCE ELECTIVES . . . . .	6
284, 384, 385, 386 CONDUCTING (1,1,1,1) . . . . .	4
ENSEMBLES . . . . .	12
	122

The performance media must include not less than 3 credits in 130 Vocal or Instrumental Instruction (Piano) and 110C Class Instruction (Voice).

*Vocal Music Option:* Major and secondary performance media should be piano and voice, or voice and piano.

*Instrumental Music Option:* Major performance medium should be an orchestral or band instrument. The secondary and/or elective performance media should include the following or equivalent proficiency: 214, 215, 216, 234, 235, 236 String Techniques I, II; 244, 245, 246 Woodwind Techniques; 256 Percussion Techniques; and 264, 265, 266 Brass Techniques.

## Piano Major

COURSES	CREDITS
MUSIC THEORY-HISTORY CORE, TO INCLUDE	
331, 332, 333 KEYBOARD TRANSPOSITION AND	
IMPROVISATION; 422 TONAL COUNTERPOINT . . . . .	54
150, 250, 350 (PRIVATE INSTRUCTION: PIANO) . . . . .	27
450 (TWO YEARS) (PRIVATE INSTRUCTION: PIANO) . . . . .	18
451 SENIOR RECITAL . . . . .	1
334, 335, 336 ACCOMPANYING (2,2,2) . . . . .	6
337, 338, 339 REPERTOIRE (PIANO) (1,1,1) . . . . .	3

434, 435, 436 PEDAGOGY (PIANO) (2,2,2) . . . . .	6
ENSEMBLES . . . . .	18
	133

## Violin\* or Violoncello Major

COURSES	CREDITS
MUSIC THEORY-HISTORY CORE, TO INCLUDE	
303 KEYBOARD HARMONY; 367 HISTORY OF CHAMBER	
MUSIC; AND 422 TONAL COUNTERPOINT . . . . .	54
150, 250, 350 (PRIVATE INSTRUCTION: VIOLIN OR VIOLONCELLO) . . . . .	27
450 (TWO YEARS) VOCAL OR INSTRUMENTAL INSTRUCTION (VIOLIN OR VIOLONCELLO) . . . . .	18
451 SENIOR RECITAL . . . . .	1
434, 435, 436 PEDAGOGY (VIOLIN OR CELLO) (2,2,2) . . . . .	6
130 (PRIVATE INSTRUCTION: PIANO) OR 210A (CLASS INSTRUCTION: PIANO) . . . . .	6
284, 384A, 385A, 386A CONDUCTING (1,1,1,1) . . . . .	4
ENSEMBLES . . . . .	21
	137

\*Violinists should complete one quarter of viola.

## Voice Major\*

COURSES	CREDITS
MUSIC THEORY-HISTORY CORE . . . . .	54
150, 250, 350 (PRIVATE INSTRUCTION: VOICE) . . . . .	27
450 (TWO YEARS) VOCAL INSTRUCTION . . . . .	18
451 SENIOR RECITAL . . . . .	1
130 (PRIVATE INSTRUCTION: PIANO) OR 210A (CLASS INSTRUCTION: PIANO) . . . . .	6
111, 112, 113 RHYTHMIC MOVEMENT (1,1,1) . . . . .	3
211 MUSIC THEATER TECHNIQUE . . . . .	1
334 ACCOMPANYING . . . . .	2
337, 338, 339 REPERTOIRE (SONG) (1,1,1) . . . . .	3
434, 435, 436 PEDAGOGY (VOICE) (2,2,2) . . . . .	6
284, 384, 385, 386 CONDUCTING (1,1,1,1) . . . . .	4
ENSEMBLES . . . . .	12
	137

\*Voice majors should establish proficiency in French, German, or Italian and complete an additional 15 credits in a *second* language from this group, as well as 5 credits in Speech 310, Speech Science.

## Organ Major

COURSES	CREDITS
MUSIC THEORY-HISTORY CORE, TO INCLUDE	
303 KEYBOARD HARMONY; 422 TONAL COUNTERPOINT . . . . .	54
150, 250, 350 (PRIVATE INSTRUCTION: ORGAN) . . . . .	27
450 (TWO YEARS) (PRIVATE INSTRUCTION: ORGAN) . . . . .	18
451 SENIOR RECITAL . . . . .	1
110C CLASS INSTRUCTION: VOICE OR 130 (PRIVATE INSTRUCTION: VOICE) . . . . .	6
331, 332, 333 KEYBOARD TRANSPOSITION & IMPROVISATION . . . . .	6
334, 335 ACCOMPANYING (2,2) . . . . .	4
337, 338, 339 REPERTOIRE (ORGAN) (1,1,1) . . . . .	3
284, 384, 385, 386 CONDUCTING (1,1,1,1) . . . . .	4
ENSEMBLES . . . . .	12
	135

## Orchestral Instrument Major

COURSES	CREDITS
MUSIC THEORY-HISTORY CORE, TO INCLUDE	
367 HISTORY OF CHAMBER MUSIC . . . . .	54
150, 250, 350 (PRIVATE INSTRUCTION: ORCHESTRAL INSTRUMENT) . . . . .	27
450 (PRIVATE INSTRUCTION: ORCHESTRAL INSTRUMENT) . . . . .	18
451 SENIOR RECITAL . . . . .	1
130 (PRIVATE INSTRUCTION: PIANO) OR 210A (CLASS INSTRUCTION: PIANO) . . . . .	6
284, 384, 385, 386 CONDUCTING (1,1,1,1) . . . . .	4
ENSEMBLES . . . . .	21
	131



### **Bachelor of Music**

The Bachelor of Music degree is intended for a limited number of specially qualified students who wish to emphasize professional training in performance within a four-year program. A minimum of 180 credits is required, of which 60 credits must be taken in departments other than Music. The 60 credits should include the basic proficiency requirement of the College of Arts and Sciences in freshman English and (as a distribution requirement from the College List in this Catalog) no less than 20 credits (of which 15 must be from the Special List also in this Catalog) in each of two fields.

A grade-point average of 3.20 in music courses is required for graduation.

All majors in this program must complete 54 credits in a theory-history sequence to include 101, 102, 103, 114, 115, 116, 201, 202, 203, 207, 208, 209, 307, 308, 309, 321, 322, 323, 481, and 12 credits to complete the total.

Specific requirements for each special area are as follows:

**PIANO MAJOR:** A minimum total of 122 credits in music is required. Courses must include 50 credits in 150, 250, 350, 351, 450, 451; 12 credits in Ensembles; 6 credits in approved electives in music.

**ORGAN MAJOR:** A minimum total of 123 credits in music is required. Courses must include 50 credits in 150, 250, 350, 351, 450, 451; 12 credits in Ensembles; 7 credits in approved electives in music.

**VIOLIN OR VIOLONCELLO MAJOR:** A minimum total of 124 credits in music is required. Courses must include 50 credits in 150, 250, 350, 351, 450, 451; 12 credits in Ensembles; 8 credits in approved electives in music.

**VOICE MAJOR:** A minimum total of 128 credits in music is required. Courses must include 50 credits in 150, 250, 350, 351, 450, 451; 12 credits in Ensembles; 12 credits in approved electives in music.

**ORCHESTRAL INSTRUMENT MAJOR:** A minimum total of 125 credits in music is required. Courses must include 43 credits in 150, 250, 350, 450, 451; 21 credits in Ensembles; 7 credits in approved electives in music.

**COMPOSITION MAJOR:** A minimum of 122 credits in music is required. Courses must include 24 credits in Composition from 191, 291, 391, 491; 12 credits in Ensembles; 16 credits in vocal or instrumental instruction; 16 credits in approved electives in music.

### **Honors in Music**

#### **Adviser**

John T. Moore  
202 Music Building

Music majors who are members of the College of Arts and Sciences Honors Program and who fulfill the requirements of that program during their freshman and sophomore years will be eligible for a bachelor's degree "With College Honors in Music" upon completion of the requirements of the departmental honors curriculum.

With approval of the School of Music Honors Committee, superior students who are not members of the College Honors Program but who are pursuing either the five-year combined Bachelor of Arts and Bachelor of Music or the four-year Bachelor of Arts curriculum with emphasis in music history-theory may participate in the School of Music honors curriculum and receive a bachelor's degree "With Distinction in Music."

The departmental honors requirements are: (1) completion of 18 credits from the following honors sections in: Music 307, 322, 422, 447, 481, 499; (2) a cumulative grade-point average of at least 3.00 and a grade-point average in music courses of 3.20 or better.

### **Graduate Programs**

#### **Graduate Program Adviser**

Demar Irvine  
108 Music Building

Graduate study in music may follow one of two general paths. In the programs leading to the degrees of Master of Arts and Doctor of Philosophy, the emphasis is upon the acquisition of a body of knowledge and the development of critical and research skills, as in the fields of music theory, music history, musicology, or ethnomusicology. In the programs leading to the degrees of Master of Arts in Music and Doctor of Musical Arts, the emphasis is upon the application of knowledge and

the advancement of professional competence, as in the fields of composition, performance, teaching, conducting, or opera direction and production.

Whichever path the student chooses, his scope should not be limited. The scholar needs as background such a lively acquaintance with music as can be obtained only through training and experience in performance. Conversely, the composer, performer, or teacher requires the insight to be gained through investigation of the theory, history, and principles of his art.

Completion of one of the undergraduate majors, or the equivalent, with a superior scholastic record (B average or better), is the normal prerequisite to graduate study in the same field. A change of major emphasis will involve some adjustment of prerequisites. The student is expected to have had a reasonably broad liberal education along with the previous musical training; the bachelor's degree should have included not less than one-fourth, and preferably one-third, of its content in departments outside of music, in the humanities, social sciences, and natural sciences. Students not fully qualified for graduate standing may wish to apply for Unclassified-5 status pending further preparation.

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate Study* section. Application for admission to the Graduate School must be made through the Admissions Office well in advance of intended enrollment. The applicant should also initiate correspondence or a conference with the Graduate Program Adviser, explaining the nature of his training and experience, the educational goals he seeks through graduate study, and his career plans. Supporting evidence in the form of letters of recommendation, musical compositions, programs, and tape recordings of performances or research papers, should be submitted as requested. Admission to graduate vocal or instrumental instruction (Music 550) is by jury examination only.

#### **Master of Arts**

A minimum of 36 credits is required, of which 15 credits must be in courses numbered 500 or above, and 9 credits represent the thesis. Students must have a reading knowledge of one foreign language. The emphasis in this program will be in music history and literature, or in music theory. The purpose of the thesis is to develop the student's capacity for independent investigation.

#### **Master of Arts in Music**

Specializations are offered in composition, music teach-

ing, opera production, music performance (piano, violin, voice, organ, or another approved instrument), and conducting. The student may elect the thesis or the nonthesis option. Students must have a reading knowledge of one foreign language.

*Thesis Option:* The requirements are a minimum of 45 approved credits, of which 18 must be in courses numbered 500 or above, and 9 credits represent the thesis.

*Nonthesis Option:* The student must complete a minimum of 45 approved course credits, of which 24 must be in courses numbered 500 or above, and pass a comprehensive Final Examination. Before being admitted to the examination, the student must submit a qualifying essay demonstrating that he is able to discuss musical subjects with competence and insight, and in clear English.

#### **Doctor of Musical Arts**

This degree is offered with a choice of emphasis in some major branch of performance, or in original composition, or in music teaching. Students entering this program are expected to have had some professional experience in addition to their formal training. The purpose of the program is to develop expertise in the creative and applied aspects of music, supported by a firm command of the theoretical and historical aspects together with a modest degree of breadth in cognate areas outside of music.

A reading knowledge of two foreign languages is required. In lieu of a single longer dissertation, submission may be in three parts. One part must be a research paper; the other two may be additional research papers, or musical compositions, or essays of a critical or methodological nature.

#### **Doctor of Philosophy**

This degree is offered in Music, and with opportunity for specialization in musicology or music theory. Students must have a reading knowledge of French and German, and of such other languages as are necessary for research in the field of the dissertation. Candidates must present an acceptable dissertation representing original and independent investigation.

Regulations governing doctor's degrees are outlined in the *Graduate Study* section. A minimum of three years of recent graduate study is required of which not less than two years must be spent in residence at the University of Washington.



## OCEANOGRAPHY

### Chairman

Richard H. Fleming  
116 Oceanography Barge

### Professors

Karl Banse, Clifford A. Barnes, Joe S. Creager, Richard H. Fleming, Maurice Rattray, Jr., Francis A. Richards

### Associate Professors

Lawrence K. Coachman, T. Saunders English, M. Grant Gross, Jr. (on leave)

### Assistant Professors

Lee C. Bennett, Jr., James C. Kelley, Joyce C. Lewin, Dean A. McManus, George S. Pond, Peter B. Taylor, John T. Whetten

### Research Appointments

George C. Anderson, Dora P. Henry, Y. Rammohanroy Nayudu (Associate Professors); Alyn C. Duxbury, Hsin-Yi Ling, Clive R. B. Lister, (Assistant Professors); William A. Anikouchine, Robert E. Burns, Michael L. Healy, Gunnar I. Roden (Instructors and Research Associates); Walter C. Sands, Philip L. Taylor (Lecturers)

Oceanography is the science of the seas. It is a natural or environmental science which attempts to explain all processes in the ocean and the interrelation of the ocean with the earth and the universe. Oceanography includes studies of the chemical composition of sea water; the body of sea water in motion; the interactions between sea and atmosphere, and between sea and solid earth; the sediments and rocks beneath the sea; the physics of the sea and sea floor; and the life in the sea.

The student planning to enter oceanography should elect physics, chemistry, and four years of mathematics

in high school. Preparation in French, German, or Russian is recommended. The time necessary to obtain a degree will be prolonged if the student is not prepared to enter university-level science courses.

The Department of Oceanography offers curricula for the degrees of Bachelor of Arts, Bachelor of Science, Master of Science, and Doctor of Philosophy. In many courses, students work at sea on vessels of the department. Summer Quarter instruction is offered both on the main campus and at the Friday Harbor Laboratories in the San Juan Islands.

### Undergraduate Programs

#### Advising Office

124 Oceanography Building

### GRADUATION REQUIREMENTS

#### Bachelor of Arts

The student in the Bachelor of Arts curriculum must meet the requirements of the College of Arts and Sciences and complete: Chemistry 140, 150, 151, 160, 170, 221; Geology 205 or 310; Mathematics 124, 125, 126; Oceanography 203, 405 or 450; 401, 402 or 404J, 410, 412; 421-422, 423, 433 and 435, or 434 and 435; Physics 121, 122, 123, 131, 132; Zoology 111.

#### Bachelor of Science

The Bachelor of Science curriculum is recommended for students contemplating graduate studies. The curriculum requires approximately 35 credits in oceanography and the basic sciences, beyond the curriculum for the Bachelor of Arts. The student should elect one of four options before completing the first two years. French, German, and Russian are the recommended languages. All requirements of the College of Arts and Sciences must be satisfied. In addition to Oceanography 110-111-112 (required for freshmen and sophomores), 443, 460, and 499, the requirements for the options are:

*Biological Oceanography Option:* Biology 473, 473L; Botany 112, 446; Genetics 451, 451L; Mathematics 281, 382; Oceanography 401, 402, 434, 435; Zoology 112, 433, 434, 456.

*Chemical Oceanography Option:* Chemistry 335, 336, 337, 345, 346, 455, 456, 457, 458 (347 recommended), and 6 additional credits in chemistry courses numbered above 402; Mathematics 281, 382; Oceanography

404J, 405, 410, 412, 424, 433, 435; 401, 402 may be substituted for 404J, 410, 412.

*Geological Oceanography Option:* Geology 220, 225, 326, 330, 340, 361, 423; Mathematics 281; Oceanography 401, 402, 433, 435, 450, 452, 453.

*Physical Oceanography Option:* Mathematics 224, 238, 324, 325, 391, 392, 438; Oceanography 404J, 405, 410, 411, 412, 433, 435; Physics 221, 222; and *either* Geophysics 403J and Physics 325, 326, 327, 371, 372; *or* Atmospheric Sciences 340, 431, 432, 441, 442.

## Honors in Oceanography

### Adviser

T. Saunders English  
321 Oceanography Building

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program during the first eight quarters of study and the departmental honors requirements, receive a degree "With College Honors in Oceanography." With the approval of the departmental honors committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Oceanography."

Requirements for honors students in the Department of Oceanography are: (1) grade requirements for admission to candidacy for an honors degree are a minimum average of 3.00 in oceanography courses and a minimum average of 3.00 in all other courses; (2) candidates for departmental honors will be selected by the departmental honors committee after completion of the sophomore year and before completion of the junior year; (3) honors courses in the Department of Oceanography, as follows:

Oceanography 180H (Lower-Division Tutorial—Honors, 6 credits); 280H (Introduction to Oceanography—Honors, 5 credits); 380H\* (Upper-Division Tutorial—Honors, 6 credits); 480H\* (Undergraduate Research—Honors, 6 credits); 488H (Field Experience—Honors, 2-6, max. 6 credits); 489H (Undergraduate Thesis—Honors, 1-6, max. 6 credits).

Honors credit is available to honors students in other courses by special arrangement with the professor and the departmental honors adviser; some advanced and graduate courses are open to honors students by arrangement. No regular courses are required of honors

students that are not required of all oceanography majors.

A senior thesis will be required for each honors student. A comprehensive examination may be required of each honors student as part of the thesis requirement.

## Graduate Programs

### Graduate Program Adviser

Lawrence K. Coachman  
208 Oceanography Building

Students who have majored in Oceanography or one of the supporting sciences and have shown an aptitude for graduate study can be accepted for graduate work in the Department of Oceanography. Their admission will be based on grade records, letters of recommendation, and the results of the Graduate Record Examination. Students who have not majored in Oceanography should acquire a background equivalent to the basic science requirements for the Bachelor of Science in Oceanography. Students with weak undergraduate preparation must expect to spend more time in earning a graduate degree. Additional information can be obtained from the Graduate Program Adviser.

The student specializes in biological, chemical, geological, or physical oceanography; interdisciplinary studies are possible. He is expected to acquire as background the material covered in Oceanography 401, 402 or 404J, 410, 412; 433 or 434, 435; 405 or 450; 421-422, 423, 460, and 520. All requirements of the Graduate School must be satisfied.

### Master of Science

The Department offers a thesis and a nonthesis program leading to the Master of Science degree. In both, the student and his adviser prepare a program of study to be approved by the student's Supervisory Committee. Proficiency in one foreign language, usually Russian, German, French, or Japanese, must be demonstrated, and Graduate School requirements for residence and course credits fulfilled. A qualifying written examination is required.

In the thesis program, a thesis approved by the Supervisory Committee must be prepared and presented at a departmental seminar. The nonthesis program requires an approved research activity in lieu of a thesis and the Supervisory Committee will decide whether a written or oral report is necessary.



### Doctor of Philosophy

The student and his Supervisory Committee prepare a program of study and research. A reading knowledge of two scientific languages, usually Russian, German, French, or Japanese, is required. The student must pass a General Examination in oceanography and supporting fields. He then completes the research for his dissertation and prepares for his Final Examination.



## PHILOSOPHY

### Chairman

Robert J. Richman  
264 Savery Hall

### Professors

Melvin Rader, Robert J. Richman, Arthur Smullyan

### Associate Professors

John F. Boler, Paul Dietrichson, David Keyt

### Assistant Professors

Kenneth Clatterbaugh, Charles Marks, James Mish'alani, John Moulton, James Smith, Laurent Stern

### Instructor

John Chambless

Philosophy is an effort to clarify the concepts and principles presupposed by the main areas of practice

and inquiry. The Department of Philosophy accordingly offers courses in logic, ethics, social philosophy, epistemology and metaphysics, philosophy of religion, and aesthetics. In addition, the history of ideas is studied in order to throw light on the contemporary problems encountered in each of the areas of philosophical investigation. For students who plan to teach in this field, programs leading to the doctorate are available. For most students, however, the study of philosophy is valuable as an important contribution to a liberal education.

Students majoring in other fields will find Philosophy 100, 110, 120, 200, 215, 267, 320, and 322 of particular interest.

### Undergraduate Programs

#### Adviser

John R. Moulton  
252 Savery Hall

### GRADUATION REQUIREMENTS

#### Bachelor of Arts

The requirements are: 50 credits in philosophy, including 110 or 215, 120, 320, 322, and at least one from 321, 325, or 326.

### Honors in Philosophy

#### Adviser

John R. Moulton  
252 Savery Hall

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program during the freshman and sophomore years in addition to the following departmental honors requirements receive a bachelor's degree "With College Honors in Philosophy." With the approval of the Departmental Honors Committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Philosophy." Honors students in philosophy must have a grade-point average higher than 3.00 in philosophy courses and must take 480H in the junior and/or senior year. They are also required to take at least two other courses numbered 400 or above, which must be approved by the Departmental Honors Committee. Special honors sections of Philosophy 100, 120, and 215 are regularly offered.

\* The student will elect one or both.

## Graduate Programs

### Graduate Program Adviser

Robert J. Richman  
264 Savery Hall

### Master of Arts

The Department requires that students for the Master of Arts degree take a four-hour written, general qualifying examination to test the student's fitness for the master's degree program. This examination is normally to be taken the first time it is offered after the student's entrance into the graduate program. Under unusual circumstances the Graduate Program Adviser may permit a student to postpone taking this examination until the second time it is offered after the student's entrance. The examination is normally given in November and again in May.

Only after passing the general qualifying examination may the student register for thesis credit and thus formally undertake work on his thesis for the master's degree. Residence and credit requirements include a full year of residence, 9 credits per quarter plus 9 thesis credits (36 credits). In addition to the 9 thesis credits, 9 others must be in 500-level courses. The student is required to write a thesis acceptable to his committee, and must pass a final oral examination on his thesis.

### Doctor of Philosophy

Normally it is expected that the prospective candidate for the Doctor of Philosophy degree has satisfied all requirements for the master's degree. Students in the Ph.D. program are required to pass the General Examination in four parts covering the fields of logic, metaphysics and epistemology, ethics and other normative fields, and a special field to be selected by the student in consultation with the Graduate Program Adviser. The student is expected to have taken courses and seminars in these fields and his program must be approved by his Supervisory Committee. In addition, he must prepare an acceptable dissertation and pass the oral Final Examination on it.

## PHYSICAL AND HEALTH EDUCATION

### Chairman for Women

Ruth Abernathy  
105 Hutchinson Hall



### Chairman for Men

Russell K. Cutler  
210 Edmundson Pavilion

### WOMEN

#### Professor

Ruth Abernathy, Marion R. Broer, Ruth M. Wilson

#### Associate Professors

Katherine S. Fox, Dorthalee B. Horne, M. Kathro Kidwell, Dorothy G. MacLean, Leone H. Webber

#### Assistant Professors

Mary J. Gaines, Bonnie J. Purdy, Betty Jane Wills

#### Instructors

Norma J. Carr, Janette Green, Ginny Studer

### MEN

#### Associate Professors

Russell K. Cutler, Eric L. Hughes, Norman F. Kunde, Caswell A. Mills, Clifford L. Peek, G. Spencer Reeves, Leonard W. Stevens, John A. Torney, Jr.

#### Assistant Professor

Robert W. Buckley

#### Lecturers

Raymond C. Bennett, Wilbur M. Duckworth, Richard D. Erickson, Robert W. Hendershott, Stanley J. Hiserman, Richard N. Huey, Richard M. Jochums, Jr., M. Fillip Leanderson, Kenneth Lehman, Leo W. Marty, James Owens, John J. Pariseau, Robert A. Peterson, William W. Quillian, Robert J. Schwarzkopf, James A. Smith, Peter Steilberg, Karl Stingl, John Tallman, Thomas O. Tipps, Donald C. Zech



The School of Physical and Health Education functions in three main areas: (1) the physical education activity program which provides courses required of undergraduate University students; (2) the program in intramural sports recreation, which provides organized competition, sports clubs, and sports recreational facilities which all students may use on a voluntary basis; (3) the prescribed professional education programs, which provide four-year curricula in (a) physical education, (b) recreational leadership, and (c) teacher education in both physical education and health education. These professional curricula lead to the degree of Bachelor of Arts. Students must satisfy the College requirements.

The teacher education curricula are offered for students in both the College of Education and the College of Arts and Sciences. For students in the College of Education, the School offers majors and minors in physical education and health education, secondary level, and majors in physical education and health education, elementary level. (See *College of Education* section in this Catalog.)

The degrees of Master of Science and Master of Science in Physical Education are available through graduate study. Students working for the degree of Doctor of Philosophy in other departments may obtain a minor in physical education.

## Undergraduate Programs

### Advisory Office (Women)

101 Hutchinson Hall

### Advisory Office (Men)

210 Edmundson Pavilion

## BACHELOR OF ARTS—MEN

### General Curriculum in Physical Education

The general curriculum satisfies requirements for a Bachelor of Arts degree with a major in physical education, but not for a teaching certificate.

The requirements are: Biological Structure 301, Biology 101-102 or Zoology 111, 112; Zoology 118 and 118L or 208; Health Education 291, 429, 465; Physical Education 164, 165, 166, 190, 264, 265, 266, 293, 309, 322, 340, 345, 363, 370, 371, 450, 493; and Recreation Education 304, 324.

### Curriculum in Recreational Leadership

This curriculum prepares personnel for employment in municipal, county, and other tax-supported programs, as well as for industrial, military services, hospital, institutional, commercial, or voluntary agencies in conducting or administering recreation services. The program of study with electives as offered provides opportunity to meet the basic requirements for these specialized areas. Students graduate with a major in recreational leadership and a Bachelor of Arts degree.

Specific requirements for the recreational leadership major are: Recreation Education 254, 304, 324, 334, 344, 354, 374, 434, 454; Health Education 291, 292; Physical Education 164, 165, 166, 265, 266, 295 or 364, 309, 340; Accounting 210; Business Communications 301; Human Relations 365; Education 455 or 309; Political Science 202; Communications 303; Journalism 300; 6 credits chosen from Art 105, 107, 109, 110, 129 or 201; 5 credits chosen from Drama 101, 102, 103, 230, 324, 325, 331 or 338; Librarianship 452; Music 107 or 121, 122, 123.

### Teacher Education Curricula

The two teacher education curricula offered by the School of Physical and Health Education may be taken through either the College of Arts and Sciences or the College of Education. Graduation requirements vary in the two colleges. Students, therefore, are directed to consult the respective sections in this Catalog.

### Curriculum for Teacher Education in Physical Education

Students who wish to emphasize high school physical education teaching should follow this curriculum which includes the requirements for the Bachelor of Arts degree in either the College of Arts and Sciences or the College of Education.

All electives must be chosen in consultation with an adviser.

The requirements are: Biological Structure 301; Biology 101-102 or Zoology 111, 112; English 101, 102, 103; Psychology 100; Sociology 110; Speech 100; Zoology 118 and 118L or 208; Health Education 291, 429, 465; Physical Education 164, 165, 166, 190, 264, 265, 266, 293, 309, 322, 340, 345, 358, 361, 363, 364, 370, 371, 372 or 373, 447, 450, 493; and Recreation Education 304, 324. All requirements for teaching certification listed in the *College of Education* section must be fulfilled; students should consult with advisers in the College of Education concerning courses in education.



Physical education majors may elect varsity or freshman intercollegiate sports for required physical education activity credit.

#### **Curriculum for Teacher Education in Health Education**

Students who desire to teach health education in schools may follow this curriculum which includes teacher certification at the secondary or elementary levels, and requirements for the Bachelor of Arts degree in either the College of Arts and Sciences or the College of Education. All electives must be chosen in consultation with an adviser.

The requirements are: Biology 101-102; Chemistry 101, 102; English 101, 102, 103; Physical Education Activities; Sociology 110; Sociology 453 or Home Economics 356; Home Economics 300; Biological Structure 301; Speech 100; Psychology 100; Health Education 291, 429, 453, 454, 465; Microbiology 301; Preventive Medicine 420, 422, 424, 461; Psychiatry 267 or 450 or Education 408; Zoology 118 and 118L or 208.

Recommended electives are: Health Education 451, 454, 465; Genetics 351; Preventive Medicine 492; Psychiatry 267, 450; Education 408; Sociology 453; Home Economics 356.

A health education curriculum leading to a Bachelor of Science degree without a teaching certificate is offered through the Department of Preventive Medicine.

#### **BACHELOR OF ARTS—WOMEN**

For the degree of Bachelor of Arts, students may choose a curriculum in physical education, recreational leadership, or teacher education in both physical education and health education.

#### **General Curriculum In Physical Education**

This curriculum gives a general, basic background in physical education and leads to the Bachelor of Arts degree but not to a teaching certificate. The requirements are Physical Education 271 or 272; 273, 280, 281, 284, 293, 374, 375, 376; Dance 283, 377; Health Education 291, 292; Chemistry 100 or high school chemistry; Biological Structure 301; Physics 114; Zoology 118 and 118L or 208; Recreation Education 344; Home Economics 300; Sociology 110.

#### **Curriculum In Recreational Leadership**

This curriculum prepares a student for a career in professional recreation with positions available in such areas as county and city park departments; the armed

services, industry, hospitals, and service organizations such as Girl Scouts and Camp Fire Girls. The requirements are Dance 282, 283; Physical Education 272, 280, 284, 375, 436; Health Education 292; Recreation Education 304, 324, 344, 454; Biological Structure 301; Forestry 456; Librarianship 452; Speech 332; Art 100 or Education 376; and an Art elective; Drama 325 or 326, 338; plus 20 to 28 credits in two areas of specialization.

#### **Teacher Education Curricula**

The two teacher-education curricula offered by the School of Physical and Health Education may be taken through either the College of Arts and Sciences or the College of Education. Students in the College of Arts and Sciences also must satisfy the Teacher Certification requirements as described in the *College of Education* section of this Catalog.

*Curriculum for Teacher Education in Physical Education:* The curriculum in teacher education in physical education prepares a student for teaching at the secondary or college level. The requirements are Dance 282, 283; Physical Education 271, 272, 273, 280, 281, 284, 293, 374, 375, 376, or Dance 377, Physical Education 304 or 305-306, 322, 345, 436, 450, N466, 480; Recreation Education 344; Health Education 291, 292, 453; Home Economics 300; Biological Structure 301; Physics 114; Zoology 118 and 118L or 208.

*Curriculum for Teacher Education in Health Education:* The curriculum in Health Education is designed to prepare qualified personnel to teach health; to assume leadership in the execution of health education programs; and to assist in coordinating health education in the schools. The requirements are Biology 101-102; Chemistry 101 and 102; Zoology 118 and 118L or 208; Biological Structure 301; Microbiology 301; Home Economics 300; Psychiatry 267 or 450 or Education 408; Psychology 100; Sociology 110, 453 or Home Economics 356; Health Education 291, 429, 453, 454, 465; Preventive Medicine 420, 422, 424, 461; Speech 100.

#### **Honors Program—Women**

The Department is developing an Honors Program to provide special opportunities for outstanding students. At the present time upperclassmen may investigate areas of particular interest through enrollment in Special Studies in Physical Education and Undergraduate Research. A comprehensive paper, or research report, must be submitted at the completion of each course. Students are invited to participate in this program on



the basis of scholastic record and faculty recommendation. Some adjustment of the major requirements stated previously is made for students enrolled in this program.

### Graduate Programs

#### Graduate Program Adviser (Women)

Ruth M. Wilson  
105 Hutchinson Hall

#### Graduate Program Adviser (Men)

G. S. Reeves  
210 Edmundson Pavilion

The School of Physical and Health Education offers courses leading to the degrees of Master of Science and Master of Science in Physical Education. Students pursuing a doctoral program in other departments may obtain a minor in physical education.

#### Master's Degrees

The master's degree programs aim to prepare personnel who will contribute to the further growth of their profession through development and refinement of concepts and philosophy, participation in research, leadership of colleagues, and stimulation of their future teacher-education and recreational-leadership students. These programs aim to inspire students to question objectively and to search for basic answers through scientific processes. Specifically, the objectives are to provide situations and experiences which stimulate the development of an inquiring mind, critical thinking, and increased skill in effective oral and written expression; to provide a background for clear interpretation and intelligent application of research literature; to promote increased understanding of basic concepts, current philosophies, and major issues and trends in the fields of physical education, health education, and recreation education.

For the master's degree with a specialization in physical education, at least 21 credits, including the thesis, must be in courses numbered 500 and above. There is no foreign language requirement for the degree Master of Science in Physical Education. In the Department for Men, a total of 41 credits, including Physical Education 600 or equivalent, and 10 approved credits in supporting courses are required. In the Department for Women, students must meet the Graduate School's general requirements for course work; additional requirements will be determined in conference with the Graduate Program Adviser; a minimum of 6 credits must be in Physical Education 600.

Students in other departments working for the master's degree or a doctor's degree with a minor in physical education must have completed essentially the same program of study as outlined in one of the undergraduate curricula of the School of Physical and Health Education.

For a minor in physical education for the master's degree, a student must present a minimum of 26 preparatory credits in physical education and one course in human physiology as well as 12 credits in courses numbered 500 and above; for the doctor's degree, 35 approved credits in health education, physical education, or recreation education courses.



## PHYSICS

#### Chairman

Ronald Geballe  
215 Physics Hall

#### Professors

Marshall Baker, John S. Blair, David Bodansky, Henry L. Brakel (emeritus), Kenneth C. Clark, Jay G. Dash, Hans G. Dehmelt, George W. Farwell, Ronald Geballe, James B. Gerhart, Isaac Halpern, Joseph E. Henderson, Ernest M. Henley, Boris A. Jacobson, Jere J. Lord, Seth H. Neddermeyer, Fred H. Schmidt, Edward A. Stern, Edwin A. Uehling, Clinton L. Utterback (emeritus), Lawrence Wilets, Robert W. Williams

#### Associate Professors

Paul M. Higgs (emeritus), Ray W. Kenworthy, Llewellyn A. Sanderman, John F. Streib, Jr.

#### Assistant Professors

David Boulware, Victor Cook, John Cramer, Howard F. Davis, Edward N. Fortson, Robert L. Ingalls, William D. McCormick, Mark N. McDermott, Ivan Muzinich, Philip C. Peters, Robert D. Puff.

Physics is the study of the fundamental structure of matter and the interactions of its constituents. Physicists are concerned with the continuing development of concepts needed for a precise description of nature and with experiments to test such concepts.

For students of the liberal arts, the study of physics provides an introduction to modern ideas about the most basic and elemental aspects of nature. For students in all scientific and technical fields, physics is an indispensable tool. Students majoring in physics are preparing for careers in teaching, in research, and in industry.

The Department of Physics offers courses leading to the degrees of Bachelor of Science, Master of Science, and Doctor of Philosophy. Undergraduate majors obtain a basic preparation in principal fields of physics and a wide choice of electives in other subjects, and they may further elect to follow a program of advanced studies which prepares them for professional and graduate careers. In addition, the Department offers major and minor academic fields for students in the College of Education.

Recommended preparation for undergraduate physics majors includes high school physics and  $3\frac{1}{2}$  units of high school mathematics. High school chemistry and additional mathematics are desirable. Students who enter without this preparation may be delayed in their progress toward graduation.

#### Undergraduate Programs

##### Adviser

L. A. Sanderman  
214 Physics Hall

A program of study in physics may vary considerably in extent, depending upon the values which the student wishes to derive from his education. The available choices range from an adequate basic education in physics to a full preparation for graduate study.

#### GRADUATION REQUIREMENTS

The required curriculum, for those who want both a basic education in physics and a broad array of electives, includes a minimum of 51 credits in physics courses, plus courses in mathematics and other sciences. The required courses are: Physics 121, 122, 123, 131, 132, 133, 221, 222, 225, 226, 320, 323, 325, 326, 327, 371, 372; Mathematics 124, 125, 126, 224, 324, 325 or 134H, 135H, 136H, 234H, 235H, 236H; and a minimum of 9 credits chosen from sciences other than physics and mathematics, or from courses in the history or philosophy of science.

For those who want a more extensive program of advanced undergraduate physics in preparation for graduate study or a professional career, the following courses are strongly recommended: Physics 461, 462, 463 (to be taken *instead* of 320, 323), 471, 472, 473, 481, 482, 483; and Mathematics 427, 428, 429.

No grade less than C in any required physics course is acceptable toward a physics major.

#### Honors in Physics

##### Adviser

J. B. Gerhart  
208 Physics Hall

With the approval of the Department, superior students may be selected to participate in the departmental honors curriculum. Members of the College of Arts and Sciences Honors Program majoring in physics, who fulfill the requirements of that program during their freshman and sophomore years, may be selected to participate in the departmental honors curriculum to become candidates for the bachelor's degree "With College Honors in Physics." Undergraduates majoring in physics who are selected to participate in the departmental honors curriculum but who are not members of the College Honors Program may be recommended for the degree of Bachelor of Science "With Distinction in Physics."

A student may be selected to participate in the physics honors curriculum at any time in his undergraduate program, though such selection ordinarily is not made until late in the sophomore year. Selection is based upon academic excellence in physics and upon promise of developing into an original and productive scientist.

To be recommended for an honors degree in physics, students must have (1) been selected to participate in the physics honors curriculum no later than the first



quarter of their senior year; (2) completed an approved course of study to the satisfaction of the department by the time of graduation; (3) completed any additional requirements set by the College of Arts and Sciences.

Because the needs of honors students are diverse, there is no specified program of studies for students in the physics honors curriculum. Instead, it is required that the student's course of study: (1) be appropriate to his special abilities; (2) provide a sound basis for further study of physics; (3) include the senior honors seminar, Physics 485H, 486H, 487H; and (4) include a minimum of 3 credits of approved undergraduate research (Physics 499H) or independent study (Physics 401H, 402H, 403H). In addition, it is strongly recommended that each candidate for an honors degree take the special honors section of Physics 121, 122, and 123.

Because the requirements listed above are expressed only in broad terms, the following comments are offered to clarify the intent of the physics honors curriculum. A typical physics honors candidate will achieve a grade-point average in physics courses of 3.30 or better, and an over-all grade-point average of 3.00 or better. His course of study usually will encompass that described in the preceding section as preparation for graduate study or a professional career in physics. In addition, it is expected that his choice of electives will conform to the spirit of the College's intent that its graduates be liberally educated.

## Graduate Programs

Graduate Program Adviser

L. Wilets

323 Physics Hall

The Department of Physics offers programs leading to the degrees of Master of Science and Doctor of Philosophy. Specific departmental requirements are described briefly below. More complete information can be obtained by writing to the Graduate Program Adviser.

Undergraduate preparation is expected to include upper-division courses in electricity and magnetism, optics, mechanics, atomic and nuclear physics, mathematical physics, advanced calculus, and differential equations. A deficiency among these may delay completion of a degree by as much as one year. A reading knowledge of Russian, French, or German is desirable.

Prospective candidates for advanced degrees in physics are expected to pass certain examinations as part of the departmental degree requirements. The first, a written preliminary examination, is designed to assess the student's knowledge and understanding of the material normally included in an undergraduate program with a major in physics. On the basis of his performance in the preliminary examination, together with his over-all record, a student will be placed in one of three categories: (A) students who qualify to proceed in a program leading either to the degree of Doctor of Philosophy or the degree of Master of Science; (B) students who qualify to proceed in a program leading only to the degree of Master of Science; and (C) students who do not qualify to proceed in a program leading to any degree. A student placed in either category (B) or (C) who wishes to qualify for a higher category should attempt the examination again the next time it is given. Ordinarily, a student is expected to take the preliminary examination during the first quarter of regular graduate study; the examination is given during the Spring and Autumn Quarters. No student is permitted to take the preliminary examination more than two times except by special departmental approval.

### Master of Science

A student working for this degree must satisfy the following requirements: (1) A minimum of 36 approved credits must be submitted, of which at least 18 must be in courses numbered 500 or above. These 18 credits must include a minimum of 3 credits in Physics 600 (for which a faculty sponsor is necessary), and a minimum of 12 credits in other physics graduate courses. No thesis is required. (2) The prospective candidate must obtain the classification of A or B in the preliminary examination either the first or second time this examination is taken. (3) Reading proficiency in a foreign language must be demonstrated by examination. Chinese, French, German, Japanese, and Russian are acceptable for this purpose. (4) The student must pass a Final Examination which usually is oral.

Students working toward a master's degree in another field who wish to have a minor in physics must submit 9 credits in courses numbered 300 or above and 9 credits in courses numbered 400 and above.

### Doctor of Philosophy

The student is expected to obtain, by virtue of studies here or elsewhere, a background in physics equivalent to that provided by the following sequence of basic

graduate courses: Analytical Mechanics, Electromagnetism and Relativity, Quantum Mechanics, and Thermodynamics and Statistical Mechanics. In addition, the Department offers many specialized courses from which the student, in consultation with his adviser, will select those appropriate to his interests.

A student is encouraged to take courses in fields other than physics. This outside work may be presented as either a minor or as individual courses. Details should be arranged by the student in consultation with his adviser or supervisory committee. Particular attention is called to offerings of the Departments of Astronomy, Chemistry, Electrical Engineering, and Mathematics.

Reading proficiency in two foreign languages must be demonstrated by examination. French, German, or Russian must be selected as one of the languages. Chinese, French, German, Italian, Japanese, Russian, or Spanish are acceptable as the second language.

In addition to the preliminary examination, prospective candidates for the degree of Doctor of Philosophy must pass, successively, a written qualifying examination, a General Examination for admission to candidacy, and a Final Examination. The qualifying examination is designed to assess the depth of the student's knowledge of the principal branches of physics. Students are permitted to take the qualifying examination only after passing the preliminary examination with sufficiently high standing to be placed in category (A). A student in the program leading to the Ph.D. is expected to take the qualifying examination in his second year of regular graduate study. The qualifying examination is given in the Autumn Quarter, and again in the Spring Quarter each year.

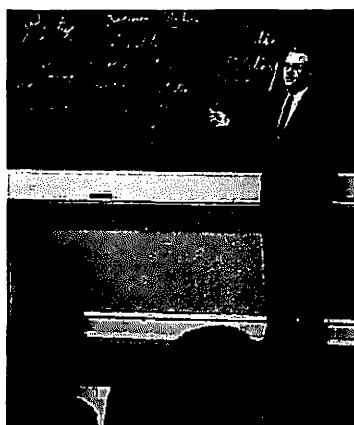
In the oral General Examination, a student is examined on topics related to the area of physics in which he plans to do his dissertation research. In order to take this examination, a student must have passed the qualifying examination and, ordinarily, he must have been accepted by a member of the staff as a research student. The General Examination should be taken as soon as possible after passing the qualifying examination, usually early in his third year of regular graduate study. On passing it, he is admitted formally to candidacy for the Ph.D.

A Candidate for this degree is required to conduct an original and independent investigation in one of the fields of physics. Results of this research are submitted as a dissertation. In his Final Examination, the

Candidate presents these results orally and is examined in his field of research.

Each student bears responsibility for being informed of the dates on which the examinations are offered and for planning his own program so that he can take the examinations at appropriate times.

If physics is to be used as a minor subject by a student for the doctor's degree in another department, the student should acquire training equivalent to a bachelor's degree in physics and, in addition, take three graduate courses in physics.



## POLITICAL SCIENCE

### Chairman

Hugh A. Bone  
206 Smith Hall

### Professors

Hugh A. Bone, Kenneth C. Cole, William J. Gore, Dell G. Hitchner, Linden A. Mander, Charles E. Martin (emeritus), George Modelski, John S. Reshetar, Jr., George A. Shipman, Donald H. Webster

### Associate Professors

Charles W. Cassinelli, Alex Gottfried, William H. Harbold, Morton Kroll, Walter Riley, Robert Warren

### Assistant Professors

James J. Best, Paul Brass, Herbert Kagi, Peter Meekison, Robert Myhr, Theodore Putterman, Peter H. Rohn, Roger Smith, Richard Stevens

Political science is concerned with the general problem of government in all its manifestations, past and present. This includes the theory of obedience, the



background of legal rules which determine the competence of government officers, the institutions through which the government functions, political behavior and the various interests which influence government through political parties, interest groups, and public opinion. In a democratic society, the political scientist has an obligation to investigate, analyze, and recommend programs and policies to make government at all levels a more effective agent of the people.

For most students, political science must be viewed primarily as one of the social sciences which constitutes an essential part of a liberal education. It is for this more general value, rather than immediate vocational applications, that prospective lawyers and other students elect courses in political science. Some students, however, plan on careers in government or teaching. For these it will become a professional field.

The Department of Political Science offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. It offers major and minor academic fields for students in the College of Education; it also cooperates with the College of Architecture and Urban Planning in a program leading to the degree of Master of Urban Planning. See also the sections for the *College of Education* and the *College of Architecture and Urban Planning*.

The basic requirements for the undergraduate major are set forth in the general curriculum described below. General majors are expected to have a substantial background of elective courses in the College of Arts and Sciences. However, transfer students from other colleges may be able to complete a satisfactory program without undue loss of time, and students in the School of Law may use credits for elective purposes under the conditions set forth in the Arts-Law curriculum. Since political science provides a classic background for prospective Law School students, the departmental adviser is prepared to give special counseling to pre-law students.

The Bureau of Governmental Research and Services, an administrative unit of the Graduate School, is a separate research agency under the direction of a member of the Department of Political Science to provide independent research and consultative services for state and local government. It conducts the annual Institute of Government and maintains liaison, on behalf of the University, with the Association of Washington Cities.

The Washington State-Northern Idaho Center for Edu-

cation in Politics is an affiliate of the National Center for Education in Politics operating under the direction of a member of the Department. It fosters political research, promotes participation in political organizations through legislative internships, and sponsors conferences and workshops in practical politics. The University of Washington Center for Education in Politics is an affiliate of this group and operates several campus programs each year. The Department of Political Science faculty directs this project.

### Undergraduate Programs

#### Advisers

John Kress, Lynn Roberts  
204 Smith Hall

Maintenance of a better than C average in political science courses is expected of every political science major. Accordingly, no student whose cumulative grade-point average in political science courses taken at this University is less than 2.25 may take his Bachelor of Arts degree in any political science curriculum.

#### General Curriculum

A student majoring in political science must complete a course of study designed to meet his particular needs, developed by him, and approved by the Department. In addition to meeting general University and College requirements, the program must include a minimum of 50 credits in political science. The program must also include two of the introductory courses Political Science 201, 202, and 203. The remaining credits must be distributed among the following three broad fields to the extent of at least 10 upper-division credits in each; political theory and public law; government, politics, and public administration; comparative government and international relations. Courses intended primarily for nonmajors are not to be used to satisfy the distribution requirement but may be used as political science electives.

A reading and translating knowledge of at least one modern foreign language is strongly recommended. The Arts and Sciences language requirement must be fulfilled.

### Honors in Political Science

#### Adviser

William H. Harbold  
208 Smith Hall

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program during the freshman and sophomore years, in addition to the following departmental honors requirements, receive a bachelor's degree "With College Honors in Political Science." With the approval of the departmental honors committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Political Science."

Honors sections are available in 201, 202, and 203. Majors in political science are eligible to participate in the honors program at the beginning of their junior year, but no later than the second quarter thereof, if they have maintained a general grade-point average of 3.00, and have maintained in at least 10 credits of political science a grade-point average of 3.25. Work of similar distinction must be continued if the student is to remain in the program.

Honors students are required to complete 15 credits in the Honors Seminar, 398H, although with the approval of their adviser, 5 credits in 499H may be substituted for five of these. These credits may be used as electives in the normal major program. Honors students must also present to the departmental honors committee, no later than the sixth week of their final quarter before graduation, a research paper or essay, and must pass with distinction a comprehensive examination, which will be scheduled according to need at the end of each quarter.

As opportunity permits, special honors sections of regular upper-division courses in political science will be given for honors students. Not only these, but also the similar offerings of other schools and departments, when open to nonmajors, are recommended to participants in this program.

## **Graduate Programs**

Graduate Program Adviser  
Dell G. Hitchner  
208E Smith Hall

The Department of Political Science offers a program of studies leading to the degrees of Master of Arts and Doctor of Philosophy. Admission to the program requires the completion of an undergraduate major in political science or its equivalent, and the satisfaction of

the criteria of the Graduate School. Although the Department has a number of standard requirements for higher degrees, every effort will be made to devise programs according to the needs and interests of individual students. Students must meet the requirements of the Graduate School for higher degrees.

## **PROGRAMS OF STUDY**

### **Master of Arts**

A minimum of 36 credits is required for the Master of Arts degree, with at least 18 credits at or above the 500 level. Courses numbered 300 may be used in graduate programs only under special circumstances. Each student must submit an essay of distinction and pass a comprehensive examination in any three of the following areas of political science: political theory, public law, comparative government, public administration, international relations, American government and politics; urban, state, and regional government; area studies. Appropriate courses from outside the discipline of political science may be included in any of these areas.

### **Master of Public Administration**

A curriculum leading to this degree is offered by the Graduate School of Public Affairs; see the *Graduate School of Public Affairs* section in this Catalog.

### **Doctor of Philosophy**

A minimum of 108 credits is required, including 36 allowed for the dissertation. Of the remaining 72 credits, at least 48 must be at the 500 level or above. Upon completion of the 72 credits, the student must pass a comprehensive examination covering four fields. In addition to using courses in disciplines other than political science to help satisfy these field requirements, the student may, with the approval of his supervisory committee, prepare one of the four fields entirely in another related discipline. A program may be constructed from among the following seven areas of political science: political theory and methodology, public law, comparative government and special area studies; public administration and comparative administration; international politics, international law, international organization, and foreign policy; American government, politics, and public policy; regional, state, metropolitan, and urban government.

With the approval of his committee, the student may use at most one of these areas—normally that in which he writes his dissertation—to satisfy two of his field requirements. Each program should provide as wide as possible coverage of the discipline of political science.



## PREVENTIVE MEDICINE

### Chairman

J. Thomas Grayston, M.D.  
F358 Health Sciences Building

Preventive medicine is dedicated to the prevention of disease and the promotion of health. A major area in preventive medicine is concerned with the influence of environment on man. This area, environmental health, seeks to eliminate disease transmission by environmental factors such as air, water, food, and vectors, and to improve the environment in order to reduce the risk of exposure to industrial or occupational hazards and to enhance man's efficiency and comfort.

### Undergraduate Program

#### Adviser

Jack B. Hatlen  
F350 Health Sciences Building

The Department of Preventive Medicine, School of Medicine, offers a curriculum in environmental health leading to a Bachelor of Science degree from the College of Arts and Sciences. The purpose of this undergraduate program is to prepare people with sufficient technical knowledge so that they can evaluate environmental conditions and prescribe modification of those conditions detrimental to man's health and well being. A person working in the field of environmental health must have a working knowledge of the biological, physical, social, and health sciences as a background for his specialized preparation in preventive medicine. A curriculum in health education is offered by the School of Physical and Health Education.

### GRADUATION REQUIREMENTS

#### Bachelor of Science

All requirements for a degree from the College of Arts and Sciences must be met.

Required courses include: Chemistry 140, 150, 151, 160, 170, and 231 or 102; Biology 101-102 or Zoology 111 and 112; Physics 114, 115, and 116, and Mathematics 105 or 124.

A total of 50 credits in preventive medicine and closely related subjects is required, including 323, 420, 422, 440, 441, 442, 450, 453, 472, 480, and/or 499. Related courses, which may be counted toward the necessary 50 credits, are Microbiology 301 or 400, Civil Engineering 350, Business Law 201, Economics 211.



## PSYCHOLOGY

### Chairman

Arthur A. Lumsdaine  
M40 Denny Hall

### Professors

Allen L. Edwards, Erwin A. Esper (emeritus), Paul E. Fields, Eugene H. Galanter, A. Paul Horst, Earl B. Hunt, Roger B. Loucks, Arthur A. Lumsdaine, Irwin A. Sarason, Moncrieff H. Smith, Jr., Ezra Stotland, Charles Riddell Strother, William R. Wilson (emeritus), Lloyd S. Woodburne

### Associate Professors

Joseph Becker, Robert C. Bolles, Sidney S. Culbert, Mitchell Glickstein, Louise B. Heathers, George P. Horton, Margery H. Krieger (acting), Robert B. Lockard, Benjamin B. McKeever

### Assistant Professors

Lee R. Beach, Helen L. Bee, Joseph C. Campione, Lance K. Canon, Eleanor Evans, Thomas G. Hermans (emeritus), Clifford E. Lunneborg, Jr., Walter L. Makous, Barry A. Nyman (acting), Robert R. Pagano, F. Michael Rabinowitz, H. Herbert Wells III, Gary H. Winkel (acting)

### Lecturers

K. Eileen Allen, Irwin S. Dreiblat, Robert E. Guild, Florence R. Harris, Thomas F. Hodgson, Margaret S. Johnston, Arnold Katz, John B. Marks, Albert Paige, Michael G. Saslow, Davida Y. Teller, Nathaniel N. Wagner

The undergraduate and graduate curricula and associated research activities in psychology stem from the dual scientific and professional character of the discipline: (1) Psychology as a branch of basic science,



which seeks to describe and understand the behavior of organisms, both human and infra-human, normal and abnormal; and (2) the technology and profession of psychology, which further seeks to apply its basic findings and techniques to interpret human experience coherently, to predict and develop human capabilities more efficiently, and to improve man's ability to interact effectively with his physical and social environment.

Psychology is concerned with the individual organism rather than the collective or group as the primary unit of analysis. It attempts to discover how individuals are motivated; how they perceive the world; how they learn and develop over the course of their life histories; how they choose among alternative courses of action; how individuals perform in groups and social organizations.

Basic courses in psychology (such as Psychology 100, 190, 191, 205, 222, 301, 306, etc.) are intended to provide a foundation for those wishing to take advanced work in psychology as undergraduate or graduate majors or minors. Some of these courses (*e.g.*, 100, 205, 301, 306) should also provide an orientation helpful in daily life and develop a basis for understanding and utilizing the services of psychologists in relation to other fields of professional endeavor.

Though the undergraduate offerings of the Department are not intended to train the student for any particular occupational role, they are of special value to students planning careers in the biological sciences, sociology, economics, political science, business and industry, the medical and legal professions, teaching, nursing, and social work. Students interested in psychology as a professional career should anticipate from three to five years of graduate training.

A major in psychology frequently appeals to students concerned with problems of social and individual betterment. The prospective major, however, is advised that the primary emphasis of the Department is upon the scientific inquiry into basic phenomena and principles of behavior rather than upon the development of service skills. Courses are designed to further an awareness of the fundamental principles of psychology, its research findings, and the means by which psychological knowledge is acquired. Major standing is recommended for students who not only are interested in psychological problems, but also are ready to pursue the rigorous course of study required to achieve the competence needed to seek effective solutions to these problems.

The Department of Psychology offers courses leading to the degrees of Bachelor of Science, Master of Science,

and Doctor of Philosophy. A group of the Graduate School composed of graduate faculty members of the Departments of Physiology and Biophysics and Psychology offers a joint program in physiology and psychology leading to the degree of Doctor of Philosophy. In addition, the Department offers major and minor academic fields for students in the College of Education. (See the *College of Education* section.)

## **Undergraduate Programs**

### **Adviser**

Cathryn A. Reed  
M38C Denny Hall

A student planning to enter the Department must have completed Psychology 100 or 190, 191, and 301, normally with grades of A or B. If the student's psychology grades, as well as his general record, are acceptable to the Department, the student will be allowed to transfer to the Department as an undergraduate major.

## **GRADUATION REQUIREMENTS**

### **Bachelor of Science**

For the Bachelor of Science degree, the Department requires a minimum of 50 credits with a minimal grade-point average of 2.50: 40 credits selected from the course list of undergraduate offerings in psychology (including 100 or 190, 191, and 301), and, because of the interconnection of psychology with other sciences, 10 credits beyond the natural science distribution requirements of the College chosen from the offerings in the Departments of Chemistry, Physics, or Zoology. These 10 additional credits should be selected from courses that will serve to enrich the student's skills in psychology and, normally, the psychology major would be expected to take all 10 credits in a single collateral science. The student, in addition, must satisfactorily complete at least one course in calculus (Mathematics 124 or the equivalent) as part of his natural science distribution requirements. Transfer students must complete a minimum of 15 credits chosen from the undergraduate list in psychology with a minimal grade-point average of 2.50 and must have the appropriate mathematics and science background.

Because reading knowledge in two foreign languages generally is required for the doctorate at a large proportion of colleges and universities, students intending to seek advanced training are advised to elect languages as undergraduates, preferably French, German, or Russian.



## Honors in Psychology

### Adviser

Moncrieff H. Smith, Jr.  
419G Denny Hall

In association with the College of Arts and Sciences Honors Program, the Department offers an enriched course of study designed to meet the needs of high-ability students. Special sections of 190H (Introduction to the Scientific Analysis of Behavior), and of 191H (Laboratory in the Scientific Analysis of Behavior), are available to all students of honors caliber regardless of field of major interest.

Honors students planning to major in psychology should normally apply for admission to the Department prior to the beginning of the junior year. To be accepted by the Department, the student must (1) be a member in good standing of the College Honors Program; and (2) have completed 190H (or equivalent), 191H (or equivalent), and 301 with a minimum grade of B in each.

Candidates for the Bachelor of Science "With College Honors in Psychology" must (1) fulfill the requirements of the College Honors Program; (2) fulfill the departmental requirements for majors with the exception that they must elect at least three 400-level courses in psychology; (3) satisfactorily complete the Honors Seminars (350H and 450H) and Honors Thesis (451H-452H); and (4) maintain a minimal grade-point average of 3.50 in all courses in psychology and of 3.00 in courses in all other disciplines.

With the approval of the Departmental Honors Committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive the degree of Bachelor of Science "With Distinction in Psychology." Because of limited facilities, admission of regular students to the program is by petition only. Candidates for this degree must satisfactorily complete the prescribed upper-division honors curriculum; achieve a minimal grade-point average of 3.30 in courses in psychology and a cumulative grade-point average of 3.00.

## Graduate Programs

### Graduate Program Adviser

Arthur A. Lumsdaine  
M38A Denny Hall

The graduate program is directed toward the development of mature scholars, teachers, and scientists who

are able to advance the science of psychology. The constraints on a student are primarily those arising from the student's own imagination and interests, the current interests and skills of the Department faculty, and the faculties of associated graduate departments.

The requirements for admission to graduate study in Psychology are adequate intellectual ability and the desire for a career dedicated to the science. Applicants must have a bachelor's degree and meet other general requirements of the Graduate School (see *Graduate Study* section). Though many applicants will have an undergraduate major in psychology, this is not a requirement for admission. Undergraduate records that reveal a good science background, including mathematics, are regarded favorably. Work in zoology, chemistry, and physics is a valuable adjunct to the prospective psychologist, as is a grounding in mathematics to the level of calculus and beyond. This is *not to imply* that background in basic undergraduate psychology is unnecessary, but is meant to indicate that a formal major is not mandatory. Course work in philosophy (logic, epistemology, philosophy of science, etc.) is also desirable preparation for graduate study.

It is required that the applicant take the aptitude portion, verbal and quantitative, of the Graduate Record Examination administered by the Educational Testing Service. Registration for this examination is made by writing directly to Educational Testing Services, Box 966, Princeton, New Jersey 08540, or 1947 Center Street, Berkeley, California 94704. Additional information on admission should be obtained directly from the Selection Committee, Department of Psychology. The applicant is admitted to the departmental graduate program during Autumn Quarter only. The Committee begins to process applications for the coming year during the month of January. No individual applications will be considered until all the materials requested by the Department and the Graduate School are received.

Each incoming graduate student is assigned to a faculty member who will act as his adviser. This assignment is not meant to be a permanent one and may be changed later in the year if this proves to be desirable.

All first-year or incoming graduate students are required to complete satisfactorily the three-quarter core curriculum during their first year: (1) the pro-seminar (503, 504, 505, 506, 507, 508); (2) the experimental design and quantitative techniques sequence (514-515; and 516 or 517 or 518); and (3) at least two quarters of laboratory in two different areas (406, 441, 520,

521, 522). Part of the purpose of this first-year program is avowedly evaluative, but more important, it is exploration of the substance and methodology of modern psychology that will serve as the base for the student's further studies and research.

#### **PROGRAMS OF STUDY**

##### **Master of Science**

Upon completion of the first-year course sequences, an appropriate research program, and the general requirements of the Graduate School (residency, foreign language reading knowledge examination, etc.), the student may elect to work toward the Master of Science degree. He is not required, however, to do so. Recommendations for specific supporting work will be made in consultation with the student's faculty adviser.

##### **Doctor of Philosophy**

Students who have successfully completed the first-year program may continue toward a Doctor of Philosophy degree in course work, seminars, and research. In consultation with the student's faculty adviser, appropriate programs are planned for the student which are compatible with the requirements of the Graduate School and fulfill the various potentialities of his talent. Although no fixed time is set, it is expected that the degree will be granted three to five years after matriculation.

The Graduate School requires also that all students exhibit competence in reading two modern foreign languages before application for the General Examinations. The student is expected to have developed the language skills that are needed either before he matriculates or as quickly as possible thereafter. Some language departments make available special courses for graduate students that will prepare them for the language examinations.

The Department participates in an interdisciplinary doctoral program in physiology and psychology administered by the Physiology Psychology Group of the Graduate School. Students interested in the degree program can obtain details from Dr. Moncrieff H. Smith, Jr., in care of the Department of Psychology.

The Department offers a program of graduate study in clinical psychology that is designed to provide the student with training in the substantive fields and methodologies of psychology (i.e., developmental, learn-

ing, perception, physiological, social, etc.) which are a necessary foundation for the analysis and modification of deviant behavior. The program is designed, also, to provide the student with the special skills in research which are essential for the discovery of new knowledge and methods of prevention, assessment, and treatment. An internship (pre- or postdoctoral) will be required for the student interested in preparation for general clinical psychological practice. Public Health fellowships and Veterans Administration stipends are available and the University program is accredited by the American Psychological Association.

##### **Minors in Psychology**

Students who are enrolled in graduate programs in other departments and wish to take offerings or minors in the Department of Psychology should contact either the Graduate Program Adviser or the appropriate professor to make these arrangements. No formal examination will be required if the student receives grades of B or better in each course.

The requirements for a minor in psychology for the master's degree are 15 graduate credits in psychology, including Psychology 301, and are subject to departmental approval. It is expected that the student electing a minor in psychology will have completed a minimum of 25-30 credits in basic psychology courses prior to graduate study.

The requirements for a minor in psychology for the doctor's degree are 30 graduate credits in psychology, including Psychology 301, and are subject to departmental approval.

Courses below the level of 400 may not be used to fulfill the departmental requirements for an advanced degree in psychology.

## **ROMANCE LANGUAGES AND LITERATURE**

##### **Chairman**

Constantine G. Christofides  
C104C Padelford Hall

##### **Professors**

Constantine G. Christofides, Carlos Garcíá-Prada (emeritus), Abraham C. Keller, Edith Kern, Howard L. Nostrand, Sol Saporta, William C. E. Wilson



#### Associate Professors

A. Emerson Creore, Jean F. David, Lionel J. Friedman, Victor E. Hanzeli, Wolfgang Leiner, Marcelino Peñuelas, Lurline V. Simpson, Joseph Sommers, Aníbal Vargas-Barón, Clotilde M. Wilson

#### Assistant Professors

Judith A. Bernard, Rodney Bodden, Heles Contreras, Robert C. Dale, Arcadio Díaz-Quñones, Robert J. Ellrich, William H. W. Field, Branko Lenski, Paul C. McRill, John P. O'Connell, Michio Oka, Michael P. Predmore, Oliver W. Rolfe, Fernando G. Salinero, Richard Vernier, Victor W. Wortley

#### Instructors

Duane W. Mylerberg

#### Lecturers

Michelle Bonhôte, Frances B. Creore, Pia Friedrich, Jacqueline Leiner

Within the large and important family of Romance languages, those which are most widely spoken and which have the richest literatures are French, Spanish, Italian, and Portuguese. In each of these, the Department offers an undergraduate program combining the acquisition of language skills (speaking, reading, writing, understanding) with the history and the interpretation of literature.

On the graduate level (and in some cases in upper-division undergraduate work), advanced study is possible in several areas: history of literature and literary criticism; analysis and structure of the language, its historical development, and its relation to other languages; investigation of the language-learning process, and the consequent design of teaching methods, materi-

als, equipment, and curricula; description of the cultural and social context essential to an understanding of a language and its literature.

The study of a foreign language and literature forms an important part of any student's general education. Pursued as a vocational interest, it may lead to careers in international political, legal, business, and professional relations, and to teaching at all levels from the elementary grades to the graduate school.

The Department of Romance Languages and Literature offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy.

Major and minor academic fields for the Provisional Teaching Certificate are offered in French and Spanish. Candidates for the certificate may major in this Department as students in either the College of Arts and Sciences or the College of Education (see the *College of Education* section). A curriculum in Latin-American Studies is provided by General Studies (See *Interdepartmental Programs* section).

The Department offers courses in translation, which require no knowledge of a foreign language. These courses are recommended to students in other departments but are not applicable to undergraduate or graduate majors in the Department of Romance Languages and Literature.

Students entering from high school must have their language skills evaluated by means of a placement test before they may register for any course in the Department. (See *Undergraduate Education* section.)

*Any of the prerequisites for courses in this Department may be waived at the adviser's discretion.* Students with A or high B standing in elementary and intermediate courses in this Department are encouraged to skip one or more quarters between 101- and 301, or to enroll in the honors sections.

### Undergraduate Programs

#### Advisory Office

C108 Padelford Hall

#### Advisers

Robert C. Dale (French)  
William C. E. Wilson (Spanish)  
Pia Friedrich (Italian)  
Lurline V. Simpson (Education majors)

## GRADUATION REQUIREMENTS

A Bachelor of Arts degree may be obtained with a major in French, Spanish, Italian, Portuguese, or Romance linguistics. The general requirements for an undergraduate major in a Romance language are proficiency in the language and knowledge of the literature and culture of France, the Hispanic people, Italy, or Portugal. The curriculum for the undergraduate major in Romance linguistics places its main emphasis on language and linguistics, rather than (but not to the exclusion of) literature. The following programs are designed to develop the required proficiency in the various fields.

### French Major

A minimum of 42 credits of course work (or equivalent) in French beyond the level of 222, plus Romance 401. Required are: 301, 302, and 303; 304, 305, and 306; 308, 309, 310, or 311; 6 credits in conversation; 409; 12 credits, none of which may be transfer credits, in literature courses numbered above 400.

### Spanish Major

A minimum of 42 credits of course work (or equivalent) in Spanish beyond the level of 203, plus Romance 401. Required are: 301, 302, and 303; 304, 305, and 306; 308, 309, or 310; 6 credits in advanced conversation (327, 330, 430); 409; 12 credits, none of which may be transfer credits, in literature courses numbered above 400. (See also Latin-American Studies, *Interdepartmental Programs* section.)

### Italian Major

Required are: 201, 202, and 203; 301, 302, and 303; 304, 305, and 306; 6 credits in advanced conversation (327); Romance 401. The remainder of the student's program will consist of supervised study and courses as arranged.

### Portuguese Major

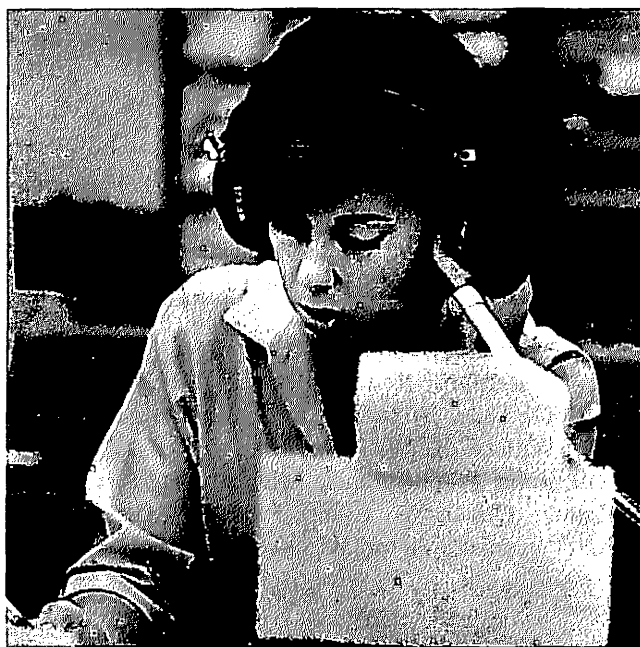
The Portuguese major consists of an individualized program of courses selected from those listed under the departmental heading, and may include supervised study and exercises in the Language Laboratory.

### Romance Linguistics Major

Prerequisite: two college years (or equivalent) of study in each of two Romance languages. Required courses beyond this prerequisite are: 20 credits in third-year language courses in two Romance languages (recommended division: 10 each); 15 credits in literature courses, including a whole survey sequence; two courses in language structure (400 level); Romance 401 and 402; Spanish or French 474; a senior essay (2 credits).

Recommended electives: general linguistics courses included in the College List (see *College of Arts and Sciences* section). Thorough preparation for the senior essay requires that majors begin course work in Romance linguistics and Linguistics by the start of their junior year.

In all curricula, credits may be arranged for study abroad, preferably during the junior year, subject to University regulations governing transfer credit. Summer study abroad is encouraged.



## Honors in French or Spanish

### Adviser (French)

Robert Ellrich  
C247 Padelford Hall

### Adviser (Spanish)

William C. E. Wilson  
C110 Padelford Hall

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program during the freshman and sophomore years, in addition to the following departmental honors requirements, receive a bachelor's degree "With College Honors in French" or "With College Honors in Spanish." With the approval of the departmental honors committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in French" or ". . . Spanish."



Candidates for departmental honors must have an over-all grade-point average of 3.00 with 3.30 in Romance languages. These averages must be maintained through graduation. Qualified students may be accepted as honors candidates at the time of their first registration for courses numbered above 300.

The requirements for the major with college honors or distinction in French are as follows: French 301H, 302H, 303H; 327H (6 credits); 304H, 305H, 306H, 490H (5 or 10 credits); plus non-honors courses 308 or 309 or 310 or 311; 409; Romance 401; plus electives in upper-division literature courses offered by the Department. (Credits earned in the Honors Seminar, French 490H, may be used in fulfilling the departmental requirement of four 400-level literature courses.)

The requirements for the major with college honors or distinction in Spanish are: Spanish 327H (6 credits), 304H, 305H, 306H; plus non-honors courses Spanish 301, 302, 303, 308 or 309 or 310; 409, and Romance 401; plus electives in upper-division literature courses offered by the Department (12 credits).

First- and second-year honors courses are open to members of the College Honors Program and, with permission, to other qualified students. These courses are: French or Spanish 102H, 103H, 201H, 202H, French 222H, and Spanish 203H.

### **Graduate Programs**

#### **Graduate Program Adviser**

A. Emerson Creore  
C261 Padelford Hall

The Department of Romance Languages and Literature offers several programs of graduate study leading to the degrees of Master of Arts and Doctor of Philosophy.

A prospective candidate may be admitted to an advanced degree program upon satisfactory completion of an undergraduate major or its equivalent, and approval of the Graduate Program Adviser.

Students are responsible for knowing and fulfilling the general requirements of the Graduate School.

#### **Master of Arts**

The Master of Arts degree program is offered in the following areas of specialization: (1) French language and literature, (2) Spanish language and literature, (3) Romance linguistics, or Romance linguistics and

language learning. The student must complete 36 applicable course credits and, in addition, pass a comprehensive examination based on syllabi drawn up by the Department.

In exceptional cases, a student with a genuine research project and sufficient training will be permitted to take the Master of Arts degree with a thesis, upon prior approval by the student's Supervisory Committee.

#### **Doctor of Philosophy**

The doctoral program is offered with the following fields of specialization: (1) Romance literature, (2) Romance linguistics, (3) language and language learning, (4) French or Spanish language and literature. Supporting courses are offered in Italian and Portuguese.

The Master of Arts degree is a prerequisite for the Ph.D. General Examination, unless an exception is granted by the student's Supervisory Committee.

General requirements for the various fields of specialization are: (1) A prospective candidate must be accepted by the Graduate School and the Graduate Studies Committee of the Department, which will then assign him to an adviser. (2) The student must have proficiency in the major language as certified by the adviser. (3) The student must pass a reading knowledge examination in two foreign languages other than the major, one of which must be a non-Romance language. (4) The student must complete one of the programs for the degree as certified by his Supervisory Committee. Each program requires completion of 90 applicable course credits earned in graduate status, of which 50 must be earned in courses numbered 500 and above; plus a dissertation. (5) After the completion of 90 course credits as specified above, the student must pass the General Examination. (6) A dissertation approved in subject and content by the student's adviser and Dissertation Reading Committee must be submitted in completed form to the chairman of his Supervisory Committee six weeks before the date of the Final Examination. (7) The student must pass the Final Examination.

Special requirements for the various fields of specialization are as follows:

#### **ROMANCE LITERATURE**

In addition to a knowledge of the nature of language and training in bibliography, the student's course work will normally include at least 30 credits in each of two

Romance literatures. Whatever the combination of these two literatures, every student will be examined on a minimum of one literary figure in French, Italian, and Spanish. The authors in Italian and Spanish will normally be Dante and Cervantes. A major figure in French must be approved by the adviser and the student's Supervisory Committee.

The student will be expected to demonstrate in the General Examination thorough knowledge of one literary genre or period in the literatures embraced in his program.

### ROMANCE LINGUISTICS

Approximately half of the student's course work will be in Romance linguistics and the history and structure of individual Romance languages. The other half will be divided equally between courses in general linguistics and in one Romance literature. The student should have a knowledge of literary works such as is expected of M.A. candidates in that literature.

### LANGUAGE AND LANGUAGE LEARNING

Students are expected to develop a minimum competence in each of the three fields listed below, with further specialization in any two. A minimum of 50 credits of course work in sequences determined by the student and his adviser must be taken in the Department of Romance Languages and Literature.

(1) *Linguistics*: The student will be expected to acquire a command of current developments in linguistics, both theoretical and applied, and to demonstrate the ability to relate these principles to the analysis and teaching of one principal Romance language. In addition, he must be competent in the descriptive and historical analysis of one Romance language as represented by such courses as French and Spanish 400 and courses in general linguistics. Specifically recommended are Romance 505, 506, and French or Spanish 474.

(2) *Psychology of Language*: The student will be expected to acquire a knowledge of the methodology of language teaching, and the application of psychological principles and the use of experimentation, tests, and measurement in connection with the language-learning process. The following courses are among those designed to develop this competence: Psychology 301 (Statistical Methods) and 447 (Psychology of Language).

(3) *Literature*: The student is expected to complete the equivalent of a Ph.D. minor (to be determined by his Supervisory Committee) in a Romance literature. Romance 475DJ and 475EJ are also recommended.

### FRENCH OR SPANISH LANGUAGE AND LITERATURE

Students specializing in a single Romance literature will devote two-thirds of their course work to the field of specialization. They may devote the remainder of their work to studies, within or outside the Department, in a historical period, a literary genre, or any humanistic field relevant to the research specialization as represented by the choice of a doctoral dissertation subject.



### SCANDINAVIAN LANGUAGES AND LITERATURE

#### Chairman

Walter Johnson  
C8B Padelford Hall

#### Professors

Sverre Arestad, Walter Johnson

The curriculum in Scandinavian Languages and Literature is designed to give students control of various skills (reading, speaking, writing) in Danish, Norwegian, and Swedish so that they can proceed to a study of the respective literatures and cultures on an advanced level. Open to all students are a variety of courses given in English; for example, an introduction to Scandinavia, particularly for freshmen, and for the more advanced study of the drama and the novel.

The Department of Scandinavian Languages and Literature offers courses leading to the degrees of Bachelor of Arts and Master of Arts. For undergraduate students, it offers an elective curriculum with a major in Norwegian or Swedish, as well as courses in Danish and literature courses in English.



### Undergraduate Programs

Sverre Arestad (Norwegian)  
C8D Padelford Hall

Walter Johnson (Swedish)  
C8B Padelford Hall

#### Bachelor of Arts

For the Bachelor of Arts degree, at least 50 credits in the major language are required, of which 25 must be in upper-division courses.

#### Norwegian Major

Required courses are: Norwegian 101-102, 103, 220, 221, 222, 300, 301, 302, 450, and 490. Other courses may be substituted with the approval of the adviser.

#### Swedish Major

Required courses are: Swedish 101-102, 103, 220, 221, 222, 300, 301, 302, 450, and 490. Other courses may be substituted with the approval of the adviser.

### Honors in Scandinavian Languages and Literature

#### Adviser (Norwegian)

Sverre Arestad  
C8D Padelford Hall

#### Adviser (Swedish)

Walter Johnson  
C8B Padelford Hall

The Scandinavian Department does not offer a formal honors curriculum. On the basis of a long tradition, however, provisions exist for the exceptional student to do work of an intensive nature in the Department. Arrangements can be made through the College Honors Council to permit the qualified student who has, as a member of the College of Arts and Sciences Honors Program, also fulfilled the requirements of that program during the freshman and sophomore years to graduate "With College Honors in Norwegian" or "With College Honors in Swedish." With the approval of the departmental honors adviser and the College Honors Council, superior students who are not members of the College Honors Program may participate in the directed intensive work and receive a bachelor's degree "With Distinction in Norwegian" or "With Distinction in Swedish."

### Graduate Programs

#### Graduate Program Adviser

Walter Johnson  
C8B Padelford Hall

#### Master of Arts

Students who intend to work toward the master's degree must meet the requirements of the Graduate School. Each student must pass a reading examination in a language determined by the Department. Students must obtain 20 credits in courses numbered 500 and above. Either a thesis or nonthesis program may be selected.

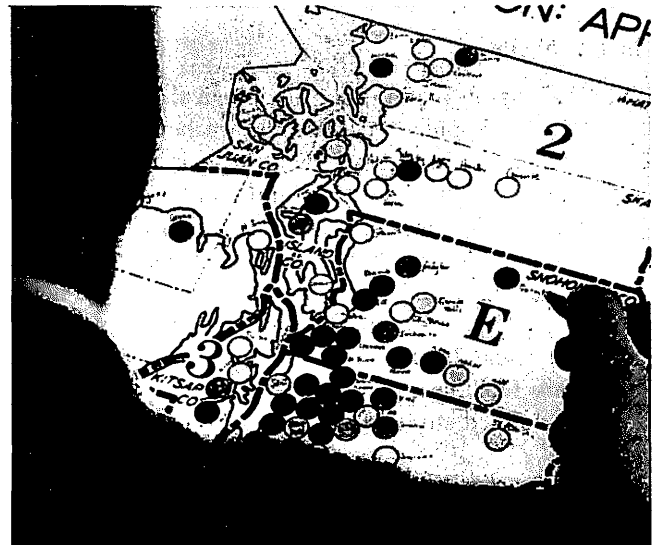
## SOCIOLOGY

#### Chairman

S. Frank Miyamoto  
202A Guthrie Hall

#### Professors

William R. Catton, Jr., Stuart C. Dodd, Robert E. L. Faris, Edward Gross, Norman S. Hayner (emeritus), Otto N. Larsen, S. Frank Miyamoto, Calvin F. Schmid



#### Associate Professors

E. A. T. Barth, Herbert Costner, Richard Emerson, Robert K. Leik, Pierre van den Berghe, L. W. Wager

#### Assistant Professors

Ronald Akers, Robert Burgess, Joseph C. Cohen, Frederick Campbell, John F. Scott, Lawrence J. Sharp, Gerald Thielbar



Sociology is the study of forms, processes, and consequences of interaction among persons, groups, and organizations. Sociologists develop and test cause-and-effect generalizations about processes and structures of group life. Among the important subfields in sociology are the distribution, composition, and change of population; human ecology; the nature and development of custom; group formation; communication and mass behavior; the form and function of complex organizations; institutional aspects of society; and processes of change and disorganization. Instruction in subject matter is accompanied by an emphasis on understanding research methods and theory construction essential for extending the boundaries of knowledge. Students of sociology acquire a foundation for work in human affairs in many applied fields.

The Department of Sociology offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. In addition, it offers major and minor academic fields for students in the College of Education. (See the *College of Education* section.) Students using sociology as a major academic field in the School of Education must meet the same requirements as a sociology major.

### **Special Facilities**

The Washington Institute for Sociological Research and the Office of Population Research are both part of the Department of Sociology. The Research Institute is available to graduate students and faculty. Its projects are primarily in long-term basic research. The Office of Population Research has been designed to expand the research and student-training programs in the fields of demography and human ecology as well as to carry on basic research. As a part of the training program, laboratory facilities and research fellowships are available to qualified students.

### **Undergraduate Programs**

#### **Adviser**

Robert B. Throckmorton  
204A Guthrie Hall

#### **Bachelor of Arts**

In this curriculum, at least 50 credits in sociology are required. Courses must include: 110 or 310; 223; 230 or 331 or 430; 240; and 352 or 450. Students should choose sociology electives from among the seven fields of specialization. A 2.30 grade-point average in sociology courses is required for graduation in this curriculum.

### **Honors in Sociology**

#### **Adviser**

William R. Catton, Jr.  
201D Guthrie Hall

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program during the freshman and sophomore years in addition to the following departmental honors requirements receive a bachelor's degree "With College Honors in Sociology." With the approval of the departmental honors committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Sociology." Students admitted to the honors program in sociology usually are planning to do graduate work and are enrolled in separate honors sections of Sociology 110, in which enriched instruction and personal attention are provided. Honors sections are also offered for Sociology 223, 240, and 270, when possible. In each of these there is greater emphasis on research problems and techniques than in regular sections. Nonmajors who are in the College Honors Program are also eligible for these special sections. Honors students majoring in sociology are also expected to enroll in Sociology 423, 496H, 497H, and 498H as a special part of the regular requirement of 50 credits in the major field. Students in this program are expected to maintain a higher grade-point average than other students.

### **Graduate Programs**

#### **Graduate Program Adviser**

E. A. T. Barth  
204B Guthrie Hall

All graduate students must complete undergraduate requirements for a major in sociology. Students whose undergraduate work in sociology is considered inadequate may be required to pass a qualifying examination before being admitted to graduate courses.

#### **Master of Arts**

Students are required to complete at least 27 credits of course work, plus thesis. At least 9 of the course credits must be in courses numbered 500 or above. A reading knowledge of one foreign language related to the student's field of study is a Graduate School requirement. A general examination is required by the Department. A minor in another department or a program of supporting courses must also be taken. A mas-



ter's thesis must be written, and submitted seven weeks before the degree is to be granted.

#### **Doctor of Philosophy**

The degree of Master of Arts should normally precede the Ph.D. This requirement may be waived by formal action of the Department.

Students in the doctoral program must complete a program of courses approved by his Supervisory Committee. Half of the credits, including the dissertation, must be in courses numbered 500 or above. The residence requirement is three years, two of them at the University of Washington. One of the two years must be spent in continuous full-time residence. A reading knowledge of two foreign languages is required. A written General Examination will cover four fields of specialization, one of which must be Field II Research Methods and Social Statistics. A minor sequence or a program of related courses, in addition to these fields, is also required.

A dissertation topic, with a written prospectus sponsored by a member of the faculty, must be submitted to the Supervisory Committee for approval before beginning work on the dissertation. The completed dissertation is to be submitted to the chairman of the Supervisory Committee seven weeks prior to the conferring of the degree. An oral Final Examination is given on the dissertation and the field in which it lies.

Students should also read carefully the general requirements for advanced degrees presented in the *Graduate Study* section.

## **SPEECH**

#### **Chairman**

Barnet Baskerville  
115 Parrington Hall

#### **Professors**

Barnet Baskerville, James A. Carrell, Laura I. Crowell, Horace G. Rahskopf, Frederick W. Orr (emeritus), William R. Tiffany

#### **Associate Professors**

Winfred W. Bird, Albert L. Franzke (emeritus), Dominic A. LaRusso, Adah L. Miner, Oliver W. Nelson, Thomas R. Nilsen, John M. Palmer, Orville L. Pence, Marcel E. Wingate, Phillip A. Yantis



#### **Assistant Professors**

Delmond Bennett, Haig A. Bosmajian, Don M. Burks, Mark S. Klyn, LuVern Kunze, Chester C. Long, Robert Post, Elizabeth Prather, Kenneth K. Sereno, David B. Strother, Gary Thompson (acting)

#### **Instructors**

John R. Anderson, Robert Halle, Myron D. Weybright

#### **Lecturers**

Margaret Baker, Michael Hogan

As an academic discipline, speech education aims to provide an understanding of the nature of speech as a form of behavior and a social process, to improve its use for individual, social, and professional purposes, and to aid the general intellectual and social competence of the individual.

Professionally, speech education is concerned with preparing students for careers in teaching, speech pathology and audiology, as well as with assisting in preparation for careers which involve extensive use of oral communication, such as law, the ministry, or business.

The work of the Department is organized in the following areas: voice and phonetics, rhetoric and public address, argument and discussion, oral interpretation of literature, teaching of speech, radio-TV speech, speech pathology and audiology. General courses give basic training and an over-all view of the field.

The Department of Speech offers courses of study leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. In addition, it offers for students in the College of Education both major

and minor academic fields in Speech Education at the secondary level; and major academic fields in Speech Education and Speech and Hearing Therapy at the elementary level. (See the *College of Education* section.)

Related courses of special interest to speech students are offered by the Departments of English, Biology, Philosophy, Psychology, and Sociology, the Schools of Drama and Communications, as well as the College of Education.

## **Undergraduate Programs**

### **Adviser**

Michael Hogan  
109 Parrington Hall

## **GRADUATION REQUIREMENTS**

### **Bachelor of Arts**

In this curriculum, at least 50 credits in approved courses are required. These must include: 100, 140, 220, 230, 310, 332, 400, and one additional course in speech science (*e.g.*, 311, 370, 415, 480). In case of individual need, additional specific courses may be required. The student's selection of courses for meeting group requirements will be made with the approval of the Department. During the junior and senior years, he may specialize in one or more of the areas of speech study.

Students majoring in speech who wish to specialize in speech, pathology, and audiology are required to complete the following courses: 100, 311, 370, 371, 373, 475, 480, 481, 482, 485, 487, and 374-484 (9 credits), and one of the following: 140, 220, 230, 332, or 415.

Students who transfer to a major in speech after entrance to the University must present a cumulative grade-point average of 2.50 in all University courses unless otherwise authorized by the Department, and students majoring in speech are required to maintain a grade-point average of 2.50 in all speech courses.

## **Graduate Programs**

### **Graduate Program Advisers**

Horace Rahskopf (General Speech)  
119A Parrington Hall

James A. Carrell (Speech Pathology and Audiology)  
1320 Northeast Campus Parkway

Students who intend to work toward an advanced degree in speech must meet the requirements of the Graduate School as outlined in the *Graduate Study* section and present a background of undergraduate study acceptable to the Department, as outlined in its Graduate Student Guide.

### **Master of Arts**

**Thesis Program:** Prospective candidates must complete 31 credits in approved courses including Speech 501 or equivalent and appropriate supporting courses in closely related areas. Students must submit an acceptable thesis (9 credits) and pass a comprehensive examination.

**Nonthesis Program:** Students must complete a minimum of 45 credits in approved courses including Speech 501 or equivalent and at least one seminar in the area of specialization. Ordinarily at least 10 credits should be in supporting courses from closely related areas. Although the student in this program is not required to write a thesis, he must show evidence of ability in independent study and research, and must pass a comprehensive examination.

### **Doctor of Philosophy**

Two major areas of concentration are available: (1) public address and rhetoric, including argumentation and discussion, and (2) speech pathology and audiology, including experimental phonetics. For the Ph.D., no precise number of credits is prescribed. However, the requirement of three years of full-time residence suggests a total of not less than 108 credits, of which approximately one-third should be devoted to the dissertation.

## **ZOOLOGY**

### **Chairman**

Donald S. Farner  
Johnson Hall

### **Assistant Chairman**

Richard C. Snyder  
Johnson Hall

### **Professors**

W. Thomas Edmondson, Donald S. Farner, Ernst Flory, Aubrey Gorbman, Melville H. Hatch, Wellington S. Hsu, Paul L. Illg, Trevor Kincaid (emeritus), Arthur W. Martin, Jr., Richard C. Snyder, Arthur Svihla (emeritus), Arthur H. Whiteley

**Associate Professors**

Robert L. Fernald, W. Mary Griffiths (acting), Alan J. Kohn, Gordon H. Orians, Kenneth L. Osterud, Dixy Lee Ray, Frank Richardson

**Assistant Professors**

Robert D. Cahn, Richard A. Cloney, William E. Hahn (visiting), Martin E. Morton (visiting), Robert T. Paine

**Lecturer and Research Professor**

Ingrith Deyrup-Olsen

The Department of Zoology offers, at the undergraduate level, basic experience and orientation toward a variety of applied biological professional fields, such as medicine, agriculture, forestry, fisheries, teaching, and other phases of academic zoology. For advanced undergraduate and graduate students, the Department offers training and facilities for research in many of the specialties that have been mentioned. For the liberal arts student, zoology is a foundation science.

Zoology is broadly concerned with the manifestations, structural and functional, of animal life. Many recognized disciplines have developed within zoology. Among the specialties in which the Department has gained particular strength are morphology (structure) at all levels from electron microscopy to comparative gross anatomy; systematics and taxonomy (the description of animal species and recognition of their relations and evolution); embryology (descriptive and experimental at the morphological and biochemical levels); physiology at the minute cellular level and at the level of organ systems. The Department has an especially strong group of zoologists interested in the study of invertebrates, who profit from the University's proximity to a rich, varied, and interesting fauna. Reflecting a current trend, the Department has developed a group of ecologists who are concerned with a variety of aspects of population biology and animal community structure.

The Department of Zoology offers programs leading to the degrees of Bachelor of Arts, Bachelor of Science, Master of Science, and Doctor of Philosophy. Undergraduate students working toward a bachelor's degree are offered two curricula: an elective curriculum, for those who want a broad liberal arts education, and a prescribed curriculum for those who are preparing for graduate study or a professional career in zoology. In conjunction with the Department of Botany, a major academic field in biology is offered for students in the College of Education, in addition to a minor academic field in zoology; see *College of Education* section.

**Undergraduate Programs****Advisory Office**

146 Johnson Hall

Students who plan to take a degree in zoology should declare their major no later than the beginning of the junior year. Applicants must present an approved selection of courses in the major with a grade-point average of not less than 2.00.

The following courses are given to meet the needs of other students and will not be accepted for major credit: Zoology 114, 118, 118L, and 208.

**GRADUATION REQUIREMENTS****Bachelor of Arts**

Requirements for this degree include the general College requirements for the baccalaureate degree. The minimum requirement (50 credits) for the departmental major will include: Zoology 111, 112, and Botany 112 (5 credits each); *or* Biology 210, 211, 212 (5 credits each); *or* Biology 101-102 (5 credits each) *and* Zoology 201 (4 credits); Genetics 351 or 451 (3 credits).

The required courses listed above are designed to introduce the student to the field of biology as a whole. In addition, a program of advanced courses is to be selected by the student in consultation with a departmental adviser. This selection permits some degree of specialization in areas of particular interest to the student. Further, to provide breadth of training in biology, the total program should include experience with the major areas and approaches: cellular, developmental, morphological, physiological, ecological, and evolutionary biology.

Electives to complete the 50 credits required for the major are to be chosen from upper-division courses in zoology, biology, botany, genetics; Microbiology 400 and 430; Biochemistry 440, 441, 442; and Oceanography 403. A minimum of 15 credits must be chosen from those listed as "Biology" or "Zoology."

Additional requirements: General chemistry and organic or physical chemistry; Mathematics 105.

#### Bachelor of Science

The requirements for this degree include the general College requirements for the baccalaureate degree. The minimum credit requirement (50 credits) for the departmental major will include:

ZOOLOGY 111, 112, BOTANY 112 . . . . .	15
or	
BIOLOGY 210, 211, 212 . . . . .	15
or	
BIOLOGY 101-102, ZOOLOGY 201 . . . . .	14
GENETICS 351 or 451 . . . . .	3
BIOLOGY 472 . . . . .	3
ZOOLOGY 400, 400L, or 458, 458L . . . . .	6
ZOOLOGY 433, 434, or 453-454 . . . . .	10
ZOOLOGY 456 . . . . .	5

Electives are to be chosen from upper-division courses in zoology or biology, or approved courses in other biology departments, to total a minimum of 50 credits in the major field.

Courses other than those listed as "Zoology" and "Biology" which will be accepted are Biochemistry 440, 441, 442; Microbiology 400, 430; Oceanography 403; upper-division courses in botany and genetics.

Additional requirements: general chemistry and organic or physical chemistry; general physics, with laboratory optional; Mathematics 105, and one of the following: Mathematics 124, Mathematics 157, or a course in statistics.

## Honors in Zoology

#### Adviser

Alan J. Kohn  
113 Johnson Hall

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program during the freshman and sophomore years in addition to the departmental honors requirements receive a bachelor's degree "With College Honors in Zoology."

Candidates for a Bachelor of Arts or Bachelor of Science honors degree will fulfill the departmental requirements by selecting the appropriate courses from the following list: Zoology 330H, 362H, 400H, 402H, 403H, 409H, 409LH, 423H, 433H, 434H, 435H, 438H, 444H, 453H-454H, 456H, 457H, 457LH, 458H, 462H, 464H, 465H, 490H, 498H, Biology 210H, 211H, 212H, 401H, 401LH, 472H, 472LH, 473H, 473LH. (All of the foregoing courses have dual listings.) Zoology 490H (Undergraduate Seminar) is required in the senior year. Zoology 491H (Topics in Zoological Research) is strongly recommended. Honors sections of Zoology 111 and 112 are available for all members of the College Honors Program.

An over-all grade-point average of 3.00 or higher must be maintained by all candidates for an honors degree. No comprehensive examination or honors thesis is required.

With the approval of the departmental honors committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Zoology." Students whose record merits such recognition will be selected at the end of their junior year and will complete their program by taking honors courses in the Department.

## Graduate Programs

#### Graduate Program Adviser

Richard A. Cloney  
9 Burke Memorial Washington State Museum

The Department of Zoology offers courses of study leading to the degrees of Master of Science and Doctor of Philosophy. Students seeking an advanced degree must meet the admission requirements of the Graduate School and, in addition, be accepted by the Department. A choice of supervisor need not be made imme-

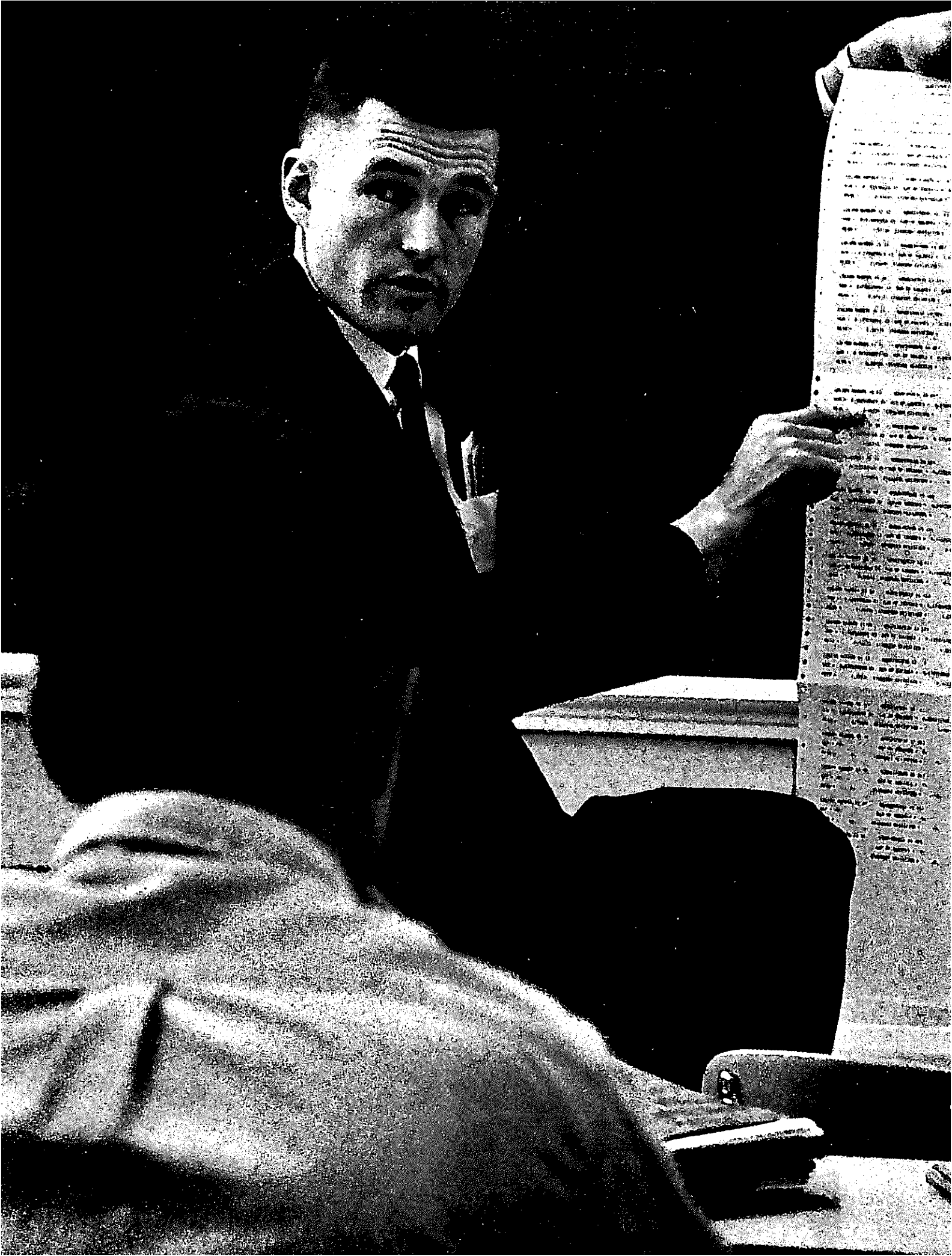


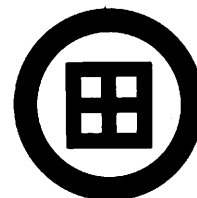
diately, but should not ordinarily be delayed into the second year of graduate work. A program of course work for each student will be developed under the direction of the Graduate Program Adviser, or his supervisor and a faculty committee.

Students are required to complete satisfactorily, by the end of their second year of residence, written departmental examinations covering basic fields from the fol-

lowing list: physiology, cell biology and gene action, ecology and evolution, development, vertebrate morphology, and invertebrate morphology. Three fields are required for the master's program; four fields for the doctoral program.

A departmental brochure, available on request, furnishes a detailed account of the requirements and procedures involved in the programs for advanced degrees.





# BUSINESS ADMINISTRATION

## **Dean**

Kermit O. Hanson  
115 Mackenzie Hall

## **Associate Dean**

Fremont E. Kast (acting)  
117 Mackenzie Hall

## **DEPARTMENT OF ACCOUNTING**

### **Chairman**

Lauren M. Walker

### **Professors**

Kenneth B. Berg, David H. Li, Arthur N. Lorig, Julius A. Roller, Lauren M. Walker

### **Associate Professors**

William J. Bruns, Jr., Don T. DeCoster, Loyd C. Heath, Fred J. Mueller, Gerhard G. Mueller, W. Thomas Porter, Jr.

### **Assistant Professors**

Gerald Cleveland, Daniel L. McDonald (acting), George I. Prater, Austin M. Smith (acting), William R. Welke, Hiroshi Yoshida (visiting)

## **Lecturers**

Fletcher O. Johnson, Robert M. Simpson, Cecilia Tierney (visiting)

## **DEPARTMENT OF FINANCE AND STATISTICS**

### **Chairman**

Stephen H. Archer

### **Professors**

Stephen H. Archer, Kermit O. Hanson (Dean), Charles N. Henning, Dudley W. Johnson, Vincent M. Jolivet

### **Associate Professors**

George J. Brabb, John J. Brosky, John S. Y. Chiu, Charles A. D'Ambrosio, William Piggott, William F. Sharpe

### **Assistant Professors**

Earl J. Bell, Hans G. Daellenbach (acting), Charles W. Haley, Bruce H. Olson, Alfred N. Page

### **Lecturer**

Hildegard R. Hendrickson

## **DEPARTMENT OF GENERAL BUSINESS**

### **Chairman**

Dwight E. Robinson



#### **Professors**

Philip J. Bourque, S. Darden Brown (emeritus), Edward J. Chambers, Joseph Demmery (emeritus), Leonard D. Goldberg, Sumner Marcus, R. Joseph Monsen, Dwight E. Robinson, Warren R. Seyfried, Bayard O. Wheeler

#### **Associate Professors**

William R. Greiner, Jack Lessinger, Lynn H. Peters (visiting), Robert H. Scott, Benjamin Stora (visiting), James A. Wickman

#### **DEPARTMENT OF MARKETING, TRANSPORTATION, AND INTERNATIONAL BUSINESS**

##### **Chairman**

Guy G. Gordon

#### **Professors**

Stanley H. Brewer, Henry A. Burd (emeritus), Lowell J. Chawner (visiting), Nathanael H. Engle (emeritus), Warren W. Etcheson, Guy G. Gordon, Endel J. Kolde, Wallace I. Little, Charles J. Miller, Charles E. Peck, Louis C. Wagner

#### **Associate Professors**

Harrison L. Grathwohl, Virgil E. Harder, Robert W. Little, Herta A. Murphy, John J. Wheatley

#### **Assistant Professors**

Frederick L. Denman, John C. Narver, Wilhelm Niederreiter (acting), Sadaomi Oshikawa

#### **DEPARTMENT OF POLICY, PERSONNEL RELATIONS, AND PRODUCTION**

##### **Chairman**

Wendell L. French

#### **Professors**

Theodore J. Barnowe, Edward G. Brown, Wendell L. French, Dale A. Henning, Richard A. Johnson, Fremont E. Kast, Preston P. LeBreton, Jim Rosenzweig, Albert N. Schreiber, William G. Scott (visiting), Robert A. Sutermeister

#### **Associate Professors**

Margaret P. Fenn, Henry P. Knowles, Harry R. Knudson, Jr., Robert C. Meier, William T. Newell, Borje O. Saxberg, Roger C. Vergin, Robert T. Woodworth

#### **Assistant Professors**

James S. Garrison, Richard B. Peterson (acting)

The major mission of the School of Business Administration is to graduate students with substantial background in the underlying fields of knowledge basic to responsible citizenship and essential to an understanding of business as a leading social institution of our time.

Education for business is perceived as a lifelong process. The curricula are designed to provide students with a sound foundation upon which they may continue their learning experience after graduation. The School thus becomes a catalyst for the instilling of values and ways of thought about one of man's most important activities—business—and the society in which it operates.

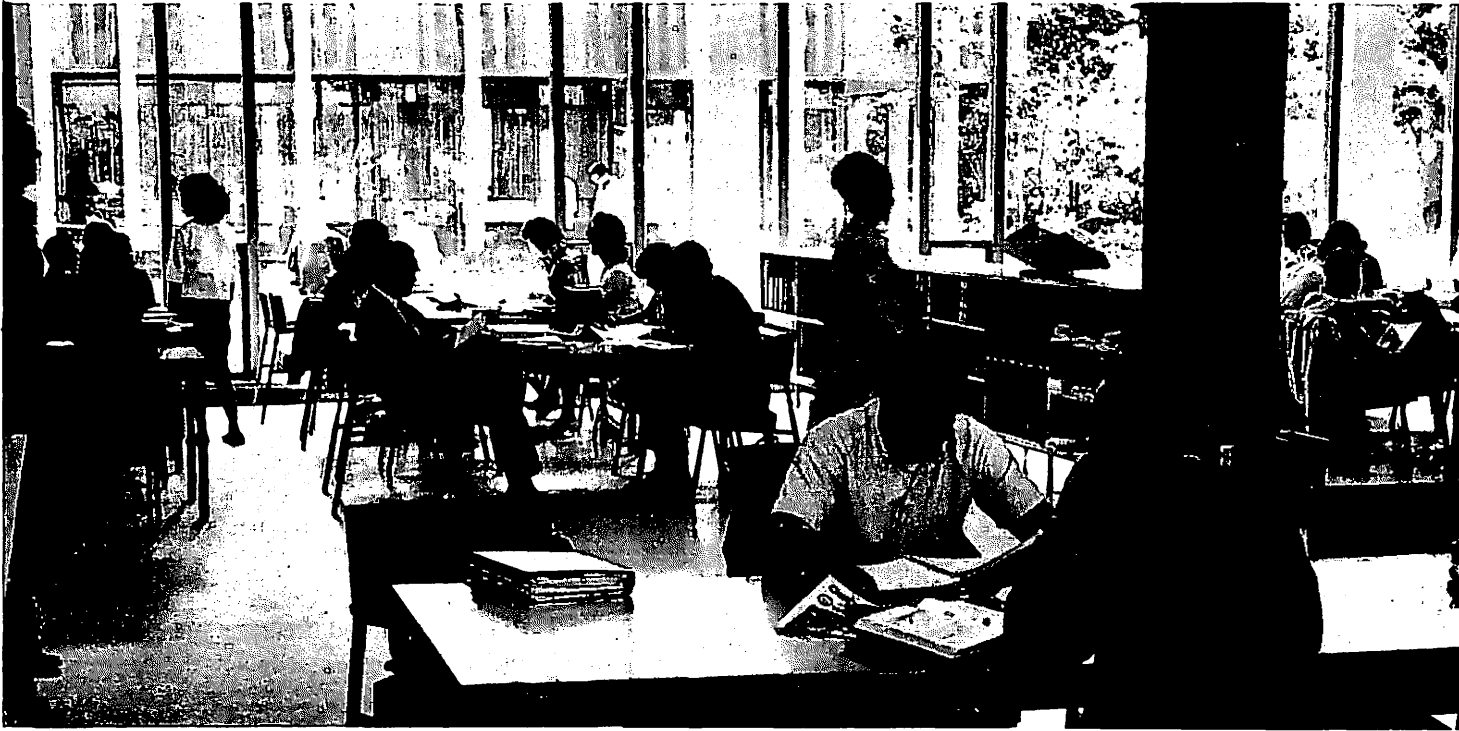
The students learn to view business as a segment of the whole of knowledge, with roots in the liberal arts and sciences. Within this setting, the major emphasis is on business and its specialized or functional areas.

Through exposure to curricula having proper balance between business and relevant disciplines, the students develop inquiring and analytical minds. They also acquire understanding of the interrelationships between the business world—its institutions, philosophies, policies, and procedures—and the social environment in which they will spend the remainder of their adult years.

The School seeks to create and maintain an intellectual atmosphere conducive to the pursuit of knowledge for its own sake. It strives to encourage both faculty and students to push forward the frontiers of business knowledge and to lead in the development of business thought.

The School (then known as the College of Business Administration) was established in 1917. Since 1921, it has been a member of the American Association of Collegiate Schools of Business. Today it has a senior faculty of 90 members, an undergraduate enrollment of 2,000 students. The Graduate School of Business Administration has an enrollment of 300.

The School offers courses leading to the degree of Bachelor of Arts in Business Administration, and the Graduate School of Business Administration offers courses leading to the degrees Master of Business Administration, Master of Arts, and Doctor of Business Administration. The Graduate School also cooperates with other colleges and departments in a program leading to the degree of Master of Urban Planning.



### School Facilities and Services

Two new buildings, Balmer Hall and Mackenzie Hall, serve as the centers for most School activities.

*Balmer Hall*, named after Thomas Balmer, former President of the University of Washington Board of Regents, contains a large number of lecture and seminar rooms and the Business Administration Library.

*Mackenzie Hall*, named in memory of Professor Donald Mackenzie, chairman of the Department of Accounting, Finance, and Business Statistics from 1949 to 1955, is the School's administrative and faculty center. It contains the Dean's Office, the Office of Graduate Programs, the Office of Undergraduate Programs, the Office of Faculty Publications, and the Faculty Research offices, as well as faculty conference rooms and individual faculty offices.

The *Business Administration Library*, which occupies the first floor of Balmer Hall, has an outstanding collection of general and specialized materials on all phases of business, including books, magazines, periodicals, pamphlets, government publications, annual reports, indexes, bibliographies, and loose-leaf services. These sources, and the Library's reserve and reference service,

supply the basic class and seminar needs of the students. Supplementary and additional primary research material are available in the University's main library and other specialized branch libraries located on the campus.

The University of Washington *Business Review* is a journal published bimonthly during the academic year (February, April, June, October, and December) by the School of Business Administration. The magazine serves as a means of disseminating information of wide interest to students of business, to the business community, and to other universities. Articles present significant results of business research; describe and evaluate trends and techniques in business administration and the business environment; and (in some cases) present regional business analyses. The magazine is distributed on a paid subscription basis to bureaus of business research and libraries of other universities. Current subscription rates are \$3.50 for one year, \$8.00 for three years.

The School of Business Administration also publishes monographs of general interest to the business community and of a scholarly nature. Currently, four series of monographs are being published: (1) the Business Studies Series, for studies of general interest; (2) the Management Series, for studies related to business management theories, practices, and procedures;

(3) the International Business Series, for studies of international business, including business in foreign countries; and (4) Occasional Papers, for shorter or special studies, sometimes in preliminary form. In addition to the regular series of publications, special studies (often financed by research grants) are published when they appear to be of general interest and to make a scholarly contribution to the study of business.

#### **Honorary Societies and Professional Clubs**

The clubs and fraternal organizations in the School are organized to further interest and promote higher standards in the various phases of business administration by acquainting members with their fellow students, the faculty, and with local business leaders.

The purpose of the *Accounting Club* is to promote and encourage professional and social contact among students, instructors, and practicing accountants. Semi-monthly meetings are held in which career objectives and topics of current interest in accounting are discussed. Membership is open to all students interested in accounting.

*Alpha Kappa Psi* is a national commerce fraternity. Rho Chapter, at the University, is open to first-quarter sophomore business administration students who have an over-all grade-point average of 2.50 or better.

*Beta Alpha Psi* is an active national accounting fraternity dedicated to furthering the professional aspects of its membership and profession. Delta Chapter is composed of accounting majors with a minimum of 20 credits in accounting and a cumulative grade-point average of 3.00 in accounting and 2.50 in all subjects. Membership is limited to students who successfully pass a five-hour examination covering accounting law, theory, and problems.

*Beta Gamma Sigma*, national honorary fraternity, is made up of men and women with high scholarship and outstanding character in schools of commerce and business administration. Seniors with an over-all grade-point average of 3.30 and juniors with an over-all grade-point average of 3.50 are eligible for membership in Washington's Alpha Chapter.

The *Finance Club* is organized to promote interest and knowledge in the several fields of finance, including banking, business finance, investments, and international

finance. Membership is open to all interested students who are regularly enrolled.

*The International Association of Students in Economics and Commerce* is an organization of students with interests in foreign exchange traineeships. It is open to all interested students.

*Marketing Club*, affiliated with the American Marketing Association, is open to all students interested in marketing.

*Pan Xenia*, a professional international foreign trade fraternity, is open to men with a satisfactory rating, majoring in international business, political science, economics, or any international field.

#### **Placement Services**

Each year several hundred organizations from business, government, and education contact the University to interview applicants for a great variety of positions.

The Business and Arts Placement Office, located in 135 Mackenzie Hall, provides information and assistance to graduating students and alumni of the School of Business Administration seeking full-time career employment. In addition to scheduling of campus interviews each year, the office performs employment office service on an individual basis, currently listing around 500 positions a year. Company brochures and general career information are provided for students and alumni seeking full-time employment. Students and alumni are invited to visit this office for vocational and employment information.

Part-time and temporary work off campus in fields other than business administration may be obtained through the Student Employment Office. Applications are accepted from students or graduates of the University and from the wives or husbands of University students. Application must be made in person after residence in Seattle has been established.

Students may also obtain information about part-time and temporary work from the office in Lewis Hall Annex.

Placement in jobs on the campus is handled by the University's Personnel Department located in the Parkway Personnel Office, 4014 University Way N.E., and the ASUW Personnel Office, located in the Student Union Building.



## UNDERGRADUATE PROGRAMS

### Director

Virgil E. Harder  
139-140 Mackenzie Hall

### Undergraduate Office

137 Mackenzie Hall

### Admission

The School of Business Administration offers a two-year program covering the junior and senior years, leading to the degree of Bachelor of Arts in Business Administration. Students transferring from one of the colleges or schools of the University to the School of Business Administration must have obtained at least junior standing and a "C" grade average. Students transferring from colleges or schools other than the University of Washington must have obtained at least junior standing and must meet the general admission requirements of the University.

The requirements for admission are the following specific units and courses or their equivalents:

Accounting 210, 220, 230 . . .	9 quarter credits
Business Law 201 or 202 . . .	3 quarter credits
Business Statistics 201 . . .	3 quarter credits
Economics 200, 201 . . .	10 quarter credits
English 101, 102, 103 . . .	9 quarter credits
Mathematics 105, 157 . . .	9 quarter credits
Behavioral Sciences (psychology, sociology, and anthropology) . . .	10 quarter credits
A balanced program comprised of additional credits in the humanities, social sciences, and the natural sciences. . . . .	37 quarter credits
<hr/>	
Total . . . . .	90

Authorization may be granted for the satisfaction of a limited number of unit and curriculum requirements after admission to the School.

After notification of admission, and before registration, entering students should visit or write to the School for assistance in planning their course programs. Advisers are available at all times to help students plan their programs of study, both for School core requirements and for the major sequence.

### High School Mathematics Preparation

Students who expect to enter the business administration program at the University of Washington as juniors should note that 9 quarter credits of college algebra (Mathematics 105) and elements of calculus (Mathematics 157) are a requirement for admission; it is advisable for students to include at least 2½ units of college preparatory mathematics in their high school programs.

### Graduation Requirements

#### Bachelor of Arts in Business Administration

Students working toward this degree in business administration must meet certain general requirements of the University and the School, as well as the particular course requirements of their major department. For graduation, a total of 180 academic credits with a cumulative grade-point average of 2.00 is required.

Students in other schools and colleges of the University who wish simultaneously to receive a degree from the School of Business Administration must receive approval from the Dean of the School of Business Administration at least three quarters before completing the requirements for the degree from this School.

Minimum requirements of the School of Business Administration are: 72 credits earned in courses in Business Administration; 75 credits in courses which are not in Business Administration. No more than 18 credits in advanced ROTC subjects may be applied toward graduation, except in the case of students in the Navy Supply Corps.

Any student transferring into the School of Business Administration with 135 or more earned credits will be required to accumulate a minimum of 45 additional credits subsequent to his admission into the School. Of these 45 credits, at least 35 must be earned in a minimum of three quarters in residence.

Students preparing to teach business subjects at the secondary level normally will enroll in the College of Education, major in business education, and graduate with the bachelor's degree. (See *College of Education* section.)

### Curriculum

In addition to the 90 required quarter credits previously outlined, the following 90 additional quarter credits are required for the degree of Bachelor of Arts in Business Administration.

### Business Administration Core

B LAW 201	LEGAL FACTORS IN THE BUSINESS ENVIRONMENT	
or		
B LAW 202	BUSINESS AGREEMENTS (whichever is not included in 3 units required for admission) . . . . .	3
B CMU 301	WRITTEN BUSINESS COMMUNICATIONS . . . . .	3
B STAT 301	QUANTITATIVE METHODS FOR BUSINESS DECISIONS . . . . .	3
FIN 320	MONEY, FINANCIAL INSTITUTIONS, AND INCOME . . . . .	4
FIN 350	BUSINESS FINANCE . . . . .	4
G BUS 439	ANALYSIS OF BUSINESS CONDITIONS . . . . .	4
G BUS 444	BUSINESS AND SOCIETY . . . . .	4
HUM REL 460	HUMAN RELATIONS IN BUSINESS AND INDUSTRY	4
MKTG 301	MARKETING, TRANSPORTATION, AND INTERNATIONAL BUSINESS: AN INTEGRATIVE ANALYSIS . . . . .	5
MKTG 350	MARKETING AND PHYSICAL DISTRIBUTION MANAGEMENT (DOMESTIC AND FOREIGN) . . . . .	3
PERS 301	INDUSTRIAL RELATIONS . . . . .	3
POL & AD 470	BUSINESS POLICY . . . . .	4
PROD 301	PRINCIPLES OF OPERATIONS MANAGEMENT . . . . .	3
Plus one additional course from:		
ACCTG 475	ADMINISTRATIVE CONTROLS (3)	
G BUS 441	MANAGERIAL ECONOMICS (3)	
POL & AD 440	ORGANIZATION THEORY (3) . . . . .	3
		50
MAJOR REQUIREMENTS AND ELECTIVES . . . . .		40
		90

### Major Requirements

For courses see major requirements under each Departmental Program section.

### Electives

Electives must bring total credits to 180, and non-Business Administration credits to a minimum of 75. Physical Education Activity courses are in addition to the 180 total credit requirement and the 75 non-Business Administration credits.

### Honors Program

The Honors Program of the School of Business Administration is designed to meet the needs of students of superior academic achievement. Through a flexible program of courses, reading, independent study, and consultations with faculty members, it is designed to bring to the superior student the kinds of intellectual challenges which will permit him to work to the full limit of his abilities. The program is highly interdisciplinary and integrative. Students are given opportunities to transcend their regular work in business subjects and to consider the relevancy of many nonbusiness areas to the problems of management. In addition, courses are offered which explore in depth subject-matter having direct, functional importance and utility to the science and art of business administration.

Periodic announcements are made setting forth specific offerings in the Honors Program as well as eligibility requirements. All students with junior or senior standing with cumulative grade-point averages of 3.50 or better are usually invited to participate in the program. The nature and content of the honors seminar are determined by the rotating honors faculty with the concurrence of the School Honors Committee. Further information about the program can be obtained from the Director.

### Major Areas of Study

Students in both undergraduate and graduate programs in business administration concentrate their study or elect to major in one of the areas of study described briefly in the paragraphs which follow.

In addition to these major areas of study, courses also are offered in business law, business communications, human relations in business and industry, and policy and administration.

## ACCOUNTING

The Accounting curriculum provides a rigorous educational experience centered on developing and communicating financial and operational information for business and governmental units. The curriculum provides foundations for careers in accounting (public accounting; industrial or private accounting; governmental and institutional accounting) or for a general business career, as well as for certain nonbusiness professions such as law.

The requirements for a major are: Accounting 301, 302, 303, 311, 411, 421, and 5 elective credits in 400-level accounting courses (except 444J, 475, and 499).

## BUSINESS AND ITS ENVIRONMENT

The Business and Its Environment curriculum is intended primarily for graduate students and may constitute one of the four area requirements for the degree of Doctor of Business Administration. The central objective of this curriculum is the evaluation of social, economic, and governmental influences on business and the related contribution of business to society, emphasizing external relationships which influence business management.



## BUSINESS STATISTICS AND OPERATIONS RESEARCH

The Business Statistics and Operations Research curriculum provides education in analysis of business problems. Courses required for all undergraduate students in the School provide (1) a background of classical statistical inference based upon sampling procedures, and (2) analytical and statistical techniques for improving business decision making. Among subjects of study are classical statistical inference, modern statistical decision theory, use of the computer, and the mathematical methods of operations research. The requirements for a major are: Business Statistics 200, 401, 450; Accounting 311 (Cost Accounting); plus three courses elected from Business Statistics 330, 340, 444J, 451, 460.

## FINANCE

The central objective of the finance curriculum is an understanding of the role of financial assets, liabilities, and institutions in the process of income creation and resource allocation, in the economy and within the business firm. Courses required for all undergraduate students in the School provide (1) analysis of the role of money and financial institutions in income creation, and (2) analysis of resource allocation through financial management within the firm. Students who major in finance may be interested in careers in banks or other financial institutions, in financial management (treasurers, controllers, and financial administrators), and in investment management. The requirements for a major are: Finance 360, 420, 450; Accounting 375 (Topics in Financial Reporting); plus 6 credits from Finance 327, 361, 423, 428, 453, 461.

## GENERAL BUSINESS

The General Business major is designed for students who desire broad preparation in more than one area of study rather than intensive specialization. The over all purpose of the program is to provide the foundation for a general understanding of the functions of the business firm and of the American business system.

Students majoring in General Business should select courses from at least three fields of Business Administration. A total of 18 credits is required. Two courses numbered 400 must be included. Not more than two courses in any one field will count toward satisfaction of major requirements.

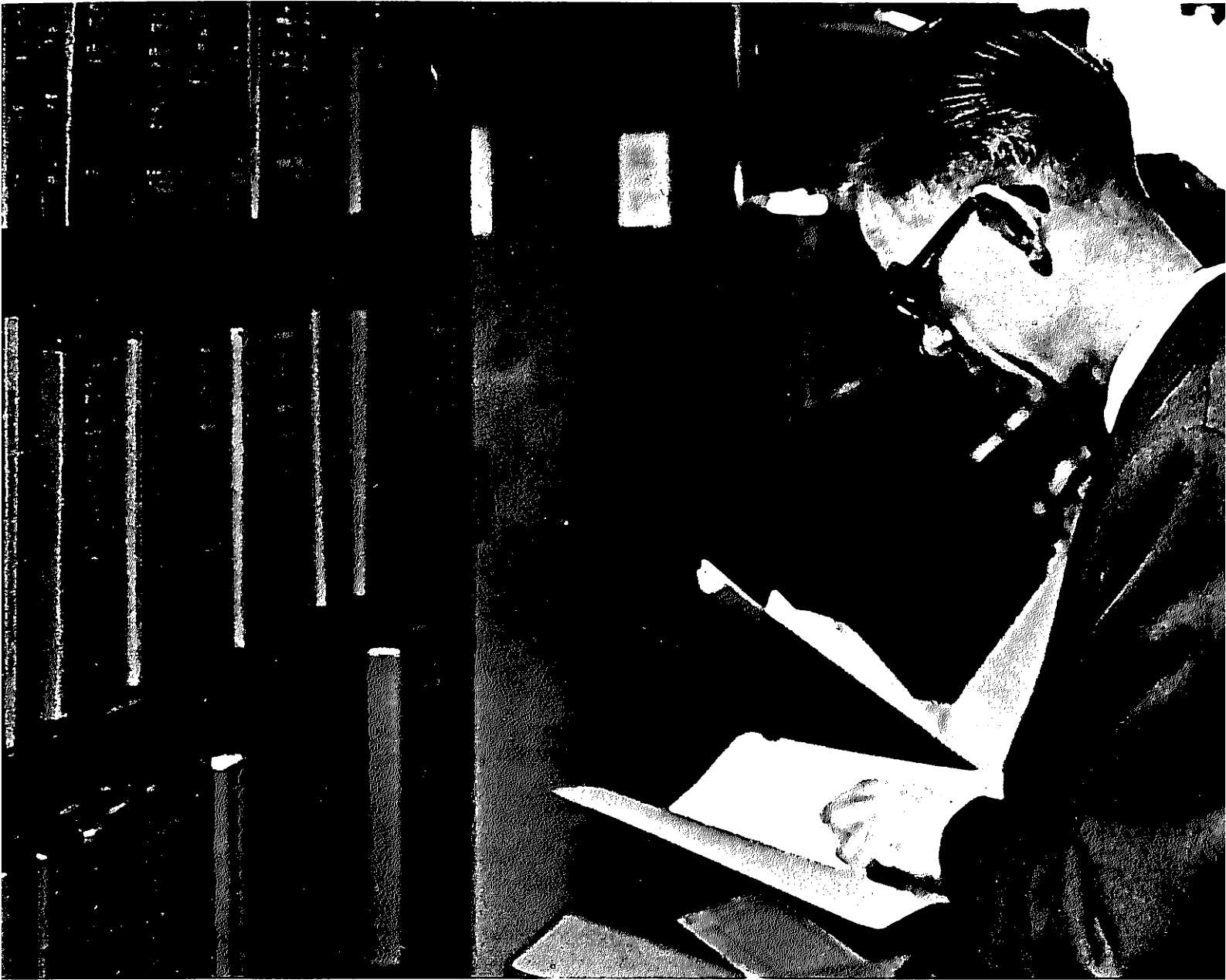


## INTERNATIONAL BUSINESS

International business—including international trade, licensing, and other United States companies' operations abroad—has become a major factor in our domestic economic well-being as well as an important instrument of national foreign policy. The curriculum prepares students for careers in overseas operations of manufacturing, marketing, and financial establishments, import and export houses, international agencies, and international trade service organizations. The requirements for a major are: International Business 310, 320, 370, and 470. Courses in foreign languages are strongly recommended.

## MARKETING

Marketing is the major integrative force in business today; it precedes and conditions all other functions in most business firms. In both domestic and foreign marketing, sound decisions in the areas of consumer behavior, channels of distribution, determination and measurement of markets, pricing, physical movement



of goods, product development and mix, promotions, and sales administration are fundamental to business success. Such decisions should be based on a knowledge of marketing concepts and relationships, planning and control, tools, principles, and policies. The curriculum prepares students to enter industrial marketing organizations, manufacturing and wholesaling institutions, retail stores, advertising, and research and government agencies. The requirements for a major are: Marketing 421, 491, plus any two of these courses: Marketing 371, 381, 391, 401, Transportation 372, or International Business 420.

## **PERSONNEL AND INDUSTRIAL RELATIONS**

This area deals with the human resources of organizations, including the recruitment of applicants, selection of employees and employee development, motivation, evaluation and compensation, and union-management relations. The requirements for a major are: Personnel and Industrial Relations 345, 346, and 450; eight additional credits from labor economics, psychology, anthropology, sociology; and/or Mechanical Engineering 417 (Methods Analysis) or 418 (Work Simplification).



## PRODUCTION

The production curriculum is concerned with the use of the physical resources in organizations. It provides two approaches: (1) the functional approach, and (2) the institutional approach. The functional approach involves the design and management of internal operating systems and is concerned with the production function found in all business enterprises. It includes the administration of materials, equipment, manpower, methods, and standards for the purpose of creating goods and services.

Those who major in production, in addition, advance to the institutional approach which involves the administration of manufacturing and other production-oriented enterprises. This includes specialized training in industrial organization and management, production planning and control, purchasing and materials management, production methods, operations analysis, and in the use of electronic computers in solving problems in these areas. The requirements for the major are: Production 441, 442, 443, 460; Accounting 311; and Business Statistics 444J.

## REAL ESTATE

The area of real estate and urban land economics encompasses the nature, allocation, use, and management of real estate and land resources. The integration of basic theory and market practice provides essential background for the professional management of real estate resources, as well as more generalized interest. The curriculum includes Real Estate 301, 410, 495 and 496. Courses required outside of the School of Business Administration are Geography 477 (Urban Geography) and Urban Planning 400 (Introduction to Urban Planning).

## RISK AND INSURANCE

Courses in Risk and Insurance prepare the student for professional practice in the insurance industry and in risk management. They also supplement other areas of study in the School, particularly finance and management.

The student will find job opportunities open to him in underwriting, claims adjusting, insurance company rep-

resentation, general insurance company management, and sales. As a corporate risk manager he will protect assets and earning power from threats of accidental loss.

After graduation the student will want to study further to qualify himself for professional designations in insurance. His course work provides a sound basis for Chartered Life Underwriter (C.L.U.) and Chartered Property-Casualty Underwriter (C.P.C.U.) study.

As a Risk and Insurance major the student should consult with a member of the Risk and Insurance faculty to arrange his schedule. Courses required for a major are: Risk and Insurance 310, 320, 330, *either* 432 *or* 438, and 480.

## TRANSPORTATION

The transportation industry and the services it performs are indispensable to our dynamic economy. New developments in physical distribution management are revolutionizing long-established business practices. This curriculum is designed for students who plan careers in, or wish a working knowledge of, the many phases of the transportation industry. The requirements for a major are: Transportation 310, 372, 440, 471, and either 481 or 491.

## GRADUATE PROGRAMS

### Graduate Program Adviser

Richard A. Johnson  
109 Mackenzie Hall

### Admission

Students wishing to work toward advanced degrees in business administration must first file an application for admission to the University of Washington Graduate School. The Admissions Office evaluates the application and then forwards it to the Graduate School of Business Administration for review. Admission must be approved by both the Graduate School of Business Administration and the Graduate School.

Applicants also must submit their scores on the Admission Test for Graduate Study in Business. Inquiries





concerning this test should be addressed to the Educational Testing Service, Box 966, Princeton, New Jersey 08540. Arrangements should be made for this examination well in advance of the quarter in which the student desires to enter.

### **Programs of Study**

The Graduate School of Business Administration offers courses leading to the degrees of Master of Business Administration, Master of Arts, and Doctor of Business Administration. Graduate training is given in these areas of concentration:

Accounting

Business and Its Environment

Business Statistics and Operations Research

Finance

International Business

Marketing

Personnel and Industrial Relations

Policy and Administration

Production

Real Estate

Risk and Insurance

Transportation

The above areas shall not be held to exclude others which may be appropriate in special instances. There

is no foreign language requirement for the M.B.A. and D.B.A. degrees.

Two options are offered in the master's degree programs—the Master of Business Administration (M.B.A.) and the Master of Arts (M.A.) in the business field.

Properly qualified students who are graduates of the University of Washington or of other colleges or universities of recognized rank may be admitted to the master's degree programs. Ordinarily, the applicant should have at least a B or 3.00 grade-point average for courses taken during the junior and senior years of his undergraduate study. Students who do not meet this grade-point level may be recommended for admission if they can be properly accommodated, and (1) if they have a grade-point average of 3.25 or higher during their senior year; (2) if they rank in the upper third of their collegiate graduating class; or (3) if they have achieved a high score in the Admission Test for Graduate Study in Business.

Up to 9 graduate credits taken while a graduate student in the graduate school of another accredited institution may be accepted toward a master's degree. All work for a master's degree (including transfer credits) must be completed within six years.

### **Master of Business Administration**

The M.B.A. program is designed for students who are preparing for professional careers in business management. The broad objective is to help the student



develop the analytical tools and understanding of business administration which will be of continuing value throughout his career.

The program has been designed for students who hold bachelor's degrees in business administration and also for students who hold bachelor's degrees in arts and sciences, engineering, and other areas of study. Students with adequate preparation in business administration and economics may complete the program in a minimum of four quarters (one calendar year). A period of two academic years (six quarters) is required for students who have had no undergraduate courses in business administration; this period may be reduced for students with some undergraduate work in business.

The program consists of Core I courses for students who do not have a bachelor's degree in business, Core II courses for all students, a concentration area of study, and a substantial number of elective credits. These requirements are set forth in more detail below:

Core I		Credits
Acctg 500	Managerial Accounting . . . . .	5
B & I E 500	Business Economics & Forecasting . . . . .	5
Bus Stat 500	Business Statistics (Prerequisite, calculus) . . . . .	3
Fin 500	Financial Institutions & Financial Management . . . . .	5
Hum Rel 500	Human Relations—Organizational Behavior . . . . .	3
Mktg 500	Marketing Fundamentals . . . . .	2
Mktg 501	Marketing Management . . . . .	3
Prod 500	Operations Management . . . . .	3
Total Core I Credits . . . . .		29

Core II		
Acctg 592	Seminar in Administrative Controls . . . . .	3
B & I E 510	Business and Public Policy . . . . .	3
Bus Stat 510	Quantitative Methods . . . . .	3
Pol & Ad 550	Organization and Management . . . . .	3
Pol & Ad 593	Policy Determination & Administration . . . . .	3
Research 571-572	Research Reports . . . . .	6

Area of Concentration

Selected from any of the areas of graduate study listed in the section on Advanced Degrees; if the area selected is represented in Core II, credits earned therein are included in the total credits for the area . . . . . 6-12

Electives

Limited to a maximum of 6 credits in any area other than the area of concentration . . . . . 18-12

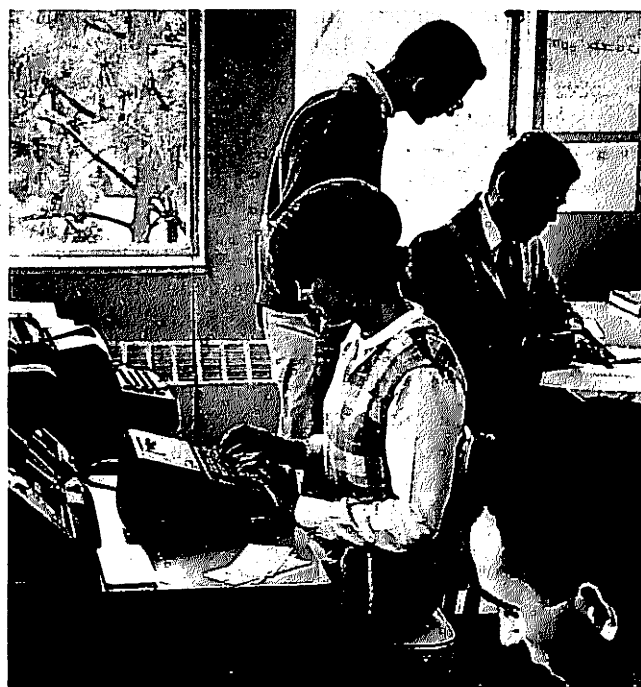
Total Advanced Credits . . . . . 45\*

Total Credits for Two-Year Program

(A minimum of 36 credits must be earned in courses numbered above 501.) . . . . . 74\*

In addition to the above course requirements, students will be required to pass a written examination during their final quarter of residence. The examination will test the student's ability to integrate the material covered in Cores I and II.

Those entering students who have not previously satisfied Core I requirements should plan to commence their programs during Autumn Quarter.



\*Only 45 credits are required for students for whom Core I requirements have been waived. Waiver for specific course requirements in Core I also may be granted to students who have completed equivalent courses. Credits earned in Core I courses may not be applied toward satisfaction of the minimum 45 credit requirement.

## **Master of Arts**

The M.A. program is designed for students who desire greater specialization than is possible under the M.B.A. program. Students electing the M.A. program usually have an objective other than preparation for a career as a professional manager; some are interested in becoming technical business specialists, some are interested in research careers, and others are interested in teaching careers in a limited subject area.

Students who lack undergraduate preparation in business administration normally will be required to complete the Core I courses in the M.B.A. program. All students in the M.A. program must complete a minimum of 45 credits including thesis credits, beyond Core I courses. A minimum of 15 credits, exclusive of the 9 credits for thesis must be earned in the major field. A minor may be taken in the Graduate School of Business Administration or elsewhere; a minimum of 9 credits is required in the minor field. If the minor is elected outside the Graduate School of Business Administration, requirements of the department offering the minor must be met.

A minimum of 18 credits exclusive of thesis must be earned in courses numbered above 501. Remaining course credits may be in approved upper-division courses for graduate credit.

The student also is required to have a reading knowledge of an acceptable foreign language, as determined by examination.

### **Minor in Business Administration**

Students working for a master's degree in other colleges who elect a minor in the Graduate School of Business Administration must have as a background 15 credits in acceptable courses in business administration. The student must earn a minimum of 15 credits in approved upper-division and graduate courses in one field of business administration.

## **Doctor of Business Administration**

A requirement for consideration for the Doctor of Business Administration program is a grade-point average of at least 3.25 during the preceding year of graduate study and submission of a score for the Admission Test for Graduate Study in Business. Applications for admission to the D.B.A. program must be accompanied by three letters of recommendation, at least two of which must come from former instructors.

**Requirements of study:** The D.B.A. program is designed to further advanced study in business administration for persons preparing for careers in teaching, business, and government; since the inception of the program, the majority of D.B.A. graduates have entered university teaching careers. Students who complete this program are expected to possess the professional administrative competency which is the objective of the M.B.A. program, and are required to demonstrate academic competence in four areas of study, at least three of which must be in the Graduate School of Business Administration. In addition, the student must show evidence of competency in business research, computer technology, and a knowledge of economics pertinent to his area. Thus, the objective of the D.B.A. program is to provide breadth of training in the integrative processes involved in administrative planning and control, concurrently with subject area specialization which will enable a graduate to participate actively in advancing the frontiers of knowledge both in teaching and research in his primary areas.

The residence requirement for the doctor's degree is three years, two of which must be at the University. Since one of the two years must be spent in continuous full-time residence (three out of four consecutive quarters), the residence requirement for the doctor's degree cannot be met solely with summer study. All work for the D.B.A. degree must be completed within ten years. (This includes applicable work which may be transferred from other institutions.) There is no foreign language requirement for the D.B.A. degree.

**Admission to Candidacy:** At the end of the student's two years of graduate study as approved by his Supervisory Committee, the chairman of the committee may present to the Dean of the Graduate School for approval a warrant permitting the student to take the General Examinations for admission to candidacy. The General Examinations consist of written and oral parts in all of the prospective candidate's areas. Written examinations are scheduled by the Graduate Study

Committee; students may sit for all written examinations in a single quarter, or they may sit for individual area examinations as scheduled during three consecutive academic quarters. The oral examination is taken after all written examinations have been passed.

No student is regarded by the Graduate School as a Candidate for the doctor's degree until after the warrant certifying the successful completion of the General Examinations has been filed with the Graduate School



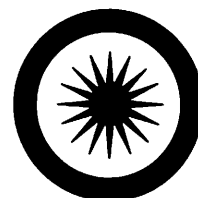
Office by the chairman of his Supervisory Committee. After his admission to candidacy, the student ordinarily devotes his time to the completion of his research work to be embodied in the dissertation and to preparation for his Final Examination.

**Dissertation and Final Examination:** The Candidate's dissertation must represent original and independent investigation. It should reflect not only his mastery of research techniques but also his ability to select

an important problem for investigation and to deal with it competently. Instructions for the preparation of the dissertation in acceptable form may be obtained at the Graduate School Office.

The Final Examination is oral and will normally be taken not less than two quarters after the General Examination. It is primarily on the dissertation and its field, and will not be given until after the dissertation has been accepted.





## EDUCATION

### **Dean**

Gordon C. Lee  
210 Miller Hall

### **Associate Dean**

John E. Corbally  
210 Miller

### **Assistant Dean**

Homer Boroughs, Jr.  
200 Miller Hall

### **Professors**

Athol R. Baily, Homer Boroughs, Jr., Lawrence M. Brammer, John E. Corbally, Henry R. Fea, Maurice F. Freehill, Frederic T. Giles, Norris G. Haring, Alice H. Hayden, Jacob T. Hunt, John Jarolimek, Gordon C. Lee (Chairman), Francis F. Powers, Gilbert Sax, George D. Strayer, Jr., Gerald M. Torkelson

### **Associate Professors**

Dale L. Bolton, J. Robert Briggs, Charles O. Burgess, Clifford D. Foster (Executive Secretary), Jack E. Kittell, Cecilia MacDonald, David L. Madsen, Rufus C. Salyer, Sam L. Sebesta, Robert E. Tostberg, Sylvia Vopni

### **Assistant Professors**

Robert A. Anderson, Robert L. Brown, D. Cecil Clark, Ellis D. Evans, Jerald R. Forster, Nathan Gross, Bar-

bara B. Hauck, Francis P. Hunkins, Thomas C. Lovitt, Merle L. Meacham, Dianne L. Monson, Roger G. Olstad, Gordon S. Purrington, Sterling S. Stott, Stanton P. Thalberg, Donald R. Theophilus, Jr. (acting)

### **Emeritus**

Harriett V. Batie, Thomas R. Cole, Edgar M. Draper, August Dvorak, John H. Jessup, Edwin B. Stevens

### **Lecturers**

Ernest W. Campbell, William E. Kline, Thomas D. F. Langen

### **Representatives of Departments and Schools Affiliated With the College of Education**

Kenneth E. Read, Viola E. Garfield (Anthropology); Spencer Moseley (acting), Pauline Johnson (Art); Richard B. Walker, H. Weston Blaser (Botany); Verner Schomaker, David M. Ritter (Chemistry); J. B. McDiar-mid, William M. Read (Classics); Merrill Samuelson, Howard M. Brier (Communications); Donal F. Harrington (acting), Agnes Haaga (Drama); Dean A. Worcester, Jr., J. Richard Huber (Economics); Robert B. Heilman, William F. Irmscher (English); George E. Taylor, Willis A. Konick (Far Eastern); John C. Sherman, George H. Kakiuchi (Geography); Howard A. Coombs, Bates McKee (Geology); William H. Rey,

Horst M. Rabura (Germanic Languages); Robert E. Burke, Gordon Griffiths (History); Mary Louise Johnson, Laura E. McAdams (Home Economics); Irving Lieberman, Eleanor S. Ahlers (Librarianship); Richard S. Pierce, J. Maurice Kingston (Mathematics); William Bergsma, T. F. Normann (Music); G. Spencer Reeves (acting); Clifford L. Peek (Physical and Health Education, Department for Men); Ruth Abernathy, Katharine S. Fox (Physical and Health Education, Department for Women); G. Spencer Reeves (Health Education); Ronald Geballe, Ernest M. Henley (Physics); Hugh A. Bone, Alex Gottfried (Political Science); Arthur A. Lumsdaine, Robert R. Pagano (Psychology); Constantine Christofides, Pia Friedrich (Romance Languages); Walter Johnson, Barbara Morgridge (Scandinavian Languages); S. Frank Miyamoto (acting) (Sociology); Barnett Baskerville, Dominic A. La Russo (Speech); Donald S. Farner, Ingrith Olsen (Zoology)

#### **Members-at-Large**

Julian D. Barksdale (Geology), Ernest A. T. Barth (Sociology), James S. Bethel (Forestry), Walter A. Fairservis, Jr. (Burke Memorial Washington State Museum), Richard H. Fleming (Oceanography)

#### **Faculty Consultants, Bureau of School Service**

Donald W. Emery, Associate Director, Bureau of School Service (English); Eugene H. Smith, Director, Advanced Placement Program (English); Phillip Bacon (Geography); C. Frank Brockman, Conservation Education (Forestry); Frances Creore (Romance Languages); Roy Dubisch (Mathematics); Eleanor Evans (Psychology); J. B. Gillingham (Economics); Howard L. Nostrand (Romance Languages); Ingrith Olsen (Biological Sciences); Thomas J. Pressly (History); L. A. Sanderman, Physical Science (Physics)

#### **BUREAU OF SCHOOL SERVICE**

##### **Acting Director**

Ernest W. Campbell  
M200 Miller

##### **Associate Director**

Donald W. Emery

##### **Director, Advanced Placement**

Eugene H. Smith

##### **Special Consultants**

Joe A. Chandler, Eleanor Evans

The teacher is the transmitter of knowledge to each generation; he is responsible for the continuation of his particular society and interpretations of it in relation to all other societies.

The College of Education offers programs for the preparation of teachers and school administrators, and programs for the advanced study of education. In conjunction with other colleges of the University, the College seeks to provide broad training in the liberal arts and sciences, designed to develop the knowledge, understanding, skills, and abilities that are characteristic of citizenship in a free, democratic society.

The several programs offered by the College of Education in undergraduate and graduate work are designed to: (1) Help the prospective teacher develop competence and sophistication in one or more teaching fields and to develop proficiency in the teaching process through study and practice. (2) Introduce students to the study of education as a basic social institution and to the profession of teaching. (3) Through research, observation, and direct experience, develop the understanding of growth and development in children, youths, and adults. (4) Develop the understanding of teaching and learning processes as they affect the selection, organization, presentation, and evaluation of curriculum materials and resources for various age levels and ability groups. (5) Promote and foster research and advanced study in the several branches of the field of education for which post-baccalaureate work is appropriate. (6) Assist each student in developing a workable philosophy of education and an appreciation of the ethical responsibilities of a professional educator in a free society. An extensive schedule of classroom observation and directed teaching is made available through cooperative arrangement with the public schools in the greater Seattle area.

Through the Bureau of School Service, the College provides a wide variety of professional services to the schools and communities of the state of Washington. Upon request, faculty members from all parts of the University can be made available for in-service training and to act in advisory capacities.

#### **Accreditation**

Full accreditation, retroactive to September 1, 1965, has been granted to the College by the National Council for the Accreditation of Teacher Education. The College is also a member of the University Council for Educational Administration.



## College Facilities and Services

The *College of Education Record* is published four times a year. In addition to book reviews, education news notes, and occasional College announcements, the journal contains articles on a variety of subjects for teachers and administrators. Bulletins on the graduate degree program and the training of public school teachers keep students and educators acquainted with changes in these areas.

The College of Education maintains a close liaison with public schools in both the Seattle area and throughout the state. In cooperation with the State Department of Public Instruction and school districts in all parts of the state, the College carries out the training program for the Standard Certificate through in-service work, individual visits, and conferences with beginning teachers and their administrators. The College also maintains special programs for observation, research, and practice in the public schools of the Seattle area and in other nearby districts; the regular student teaching program provides every person who seeks a teaching certificate with a quarter of full-time practice teaching, working with a master teacher in a public school.

### Employment

The Office of School and College Placement helps qualified students and graduates find teaching and administrative positions. Those who wish to use this service should register with the Office, 120 Miller Hall, during the first quarter of their senior year, and should obtain recommendations before leaving the University, while their work and personal qualities are clear in the minds of their instructors. These records are kept in the Office files for use when needed.

### Student Activities

Any college student who is preparing to teach may become a member of SEA (*Student Education Association*) by joining the College chapter. Campus meetings are held on a regular schedule; in addition there are four regional meetings a year and a state convention in the spring.

*Phi Delta Kappa*, for men, and *Pi Lambda Theta*, for women, are national professional organizations for education students. Upper-division and graduate students who maintain high scholarship and show outstanding professional promise may be invited to join one of these organizations.

## UNDERGRADUATE PROGRAMS

### Advisory Office

Rufus C. Salyer  
Director, Advisory Services  
207 Miller Hall

Hesper Brehm  
207 Miller Hall

### Bachelor of Arts

Students working toward the Bachelor of Arts degree in the College of Education must meet certain general requirements of the University and the College as well as the particular requirements of their major and minor departments.

Requirements for the Bachelor of Arts degree awarded by the College of Education were instituted and took effect Autumn Quarter, 1964. Students entering the College of Education during that quarter and thereafter are governed by these requirements.\*

To qualify for the Bachelor of Arts degree, students in the College of Education, in addition to meeting the University requirements, must fulfill basic proficiency requirements, a distribution requirement, a major and minor requirement, and a certification requirement.

### Basic Proficiencies

Students of the College are expected to have developed early in their college study fundamental proficiencies in the use of English and ability in quantitative reasoning. These abilities will make advanced study more efficient and more meaningful for the student, and requiring competence in them from all students will enable the faculty to assume a minimal student level of verbal and mathematical skill. Although demonstration of these proficiencies is made a part of the degree requirements, it is expected that all students will begin to satisfy them during the first quarter of the freshman year, and most will have them completed by the end of the sophomore year.

Each of the proficiencies may be achieved through study in high school or in private, and may be demonstrated by examination. Many students, therefore, will have

\* A student from a Washington community college transferring with 40 or more credits earned since Autumn Quarter, 1960, and prior to Autumn Quarter, 1964, who enters the University prior to Autumn Quarter, 1966, may complete the degree and certification requirements in effect at that time (1960-1963).



reached such levels upon admission to the College that they may satisfy some or all of these requirements at that time.

The graduation requirements of the College of Education do not include study of a foreign language. However, language proficiency for the teacher is clearly valuable, and the College strongly recommends that students develop a degree of competence in at least one foreign language as a part of the preparation for teaching.

Courses presented to meet the basic proficiency requirements in the College of Education cannot be applied to satisfy the distribution requirement.

#### **English Requirement**

Competence in the use of English is so essential to success in college study that the student is asked to show proficiency equivalent to completion of the freshman English courses (English 101, 102, 103). Students who place high on the English portions of the Washington Pre-College Testing Program or who present high scores in English on an Advanced Placement Examination of the College Entrance Examination Board are exempted from one or more quarters of this requirement, and students who do excellent work in the first two quarters of freshman English may be exempted from the third. Students normally should complete this requirement during their first three quarters in residence, but in any event, during the first four quarters.

#### **Mathematics-Logic Requirement**

Because an elementary acquaintance with mathematics is a requisite for serious study in the natural sciences and many of the social sciences, and because the kind of reasoning represented by mathematics and logic is an important accomplishment of the educated person, each student is expected to meet a requirement in mathematics or logic. This requirement may be satisfied by (1) presenting a certain score on the Mathematics Achievement Test, a part of the Washington Pre-College Testing Program; (2) completing Mathematics 101, Intermediate Algebra, or another appropriate mathematics course; or (3) completing Philosophy 120, Introduction to Logic.

#### **Distribution Requirement**

The College reserves an appreciable fraction of the student's four undergraduate years to develop in him a breadth of knowledge and appreciation and to enable

him to explore subjects different in content and method from those in which he will pursue a special competence. For the purposes of general education, a listing of appropriate courses has been prepared, divided into three large fields of knowledge—the humanities, the social sciences, and the natural sciences. Each student must select, with the approval of his adviser, courses from the following list to total at least 60 credits distributed so that no fewer than 20 credits are in any one of the three basic areas. In meeting the distribution requirement, no more than 20 credits of the total shall be taken from any one department.

#### **Humanities**

Anthropology 431, 433, 455J

Architecture and Urban Planning: Architecture 100, 101, 105, 200, 201, 202, 303, 400; Landscape Architecture 230, 231; Urban Planning 400, 479

Art: all undergraduate courses except 490

Classics: all undergraduate courses except Latin 475LJ

Communications: Journalism 300, 404, 405, 413; Radio-TV 270, 373

Comparative Literature: all undergraduate courses

Dance 251, 252, 253, 256, 257, 258, 351, 352, 353  
Drama 101, 146, 151, 152, 230, 247, 248, 253, 325, 331, 338, 414, 416, 451, 452, 453, 455, 461, 471, 472, 473, 474, 475, 476, 492, 495J

English: all undergraduate courses except 101, 102, 103, 150, 151, 303

Far Eastern and Russian Institute 240, 242, 280J, 302J, 495J

Far Eastern and Slavic Languages and Literature: all undergraduate courses

Germanic Languages and Literature: all undergraduate courses

History 280J, 316, 317, 414, 419J, 420, 429, 442, 443  
Home Economics 240 or 347, 321, 322, 329, 429, 432, 433

Humanities 101, 102, 201

Liberal Arts 101, 111

Librarianship 451 or 453; 470

Linguistics 400, 404, 405, 406, 455J

Music: all undergraduate courses except 110, 120, 124-125, 214, 215, 216, 224, 225, 226, 240, 246, 254, 255, 256, 344, 346J, 354, 434, 435, 436, 476

Philosophy: all undergraduate courses except 110, 120, 230, 231, 370, 410, 460, 463, 465, 470

Physical and Health Education: Dance 283, 364

Romance Languages and Literature: all undergraduate courses



Scandinavian Languages and Literature: all undergraduate courses

Speech 100, 110, 111, 140, 220, 240, 320, 345, 349, 400, 420, 421, 440, 442, 444

### Social Sciences

Anthropology: all undergraduate courses except 201, 380, 431, 433, 455J, 480, 481, 482

Architecture and Urban Planning: Urban Planning 482, 485, 489

Biomedical History 301, 419J

Business Administration: Business Law 201; Human Relations 365 or 460; General Business 101, 444; Policy and Administration 440; International Business 310

Communications: 201, 202, 203, 226, 302, 303, 310, 312, 320, 402, 406, 408, 409, 410, 414, 415, 443, 470, 480

Economics: all undergraduate courses

Far Eastern and Russian Institute: all undergraduate courses except 240, 242, 280J, 302J, 495J

General Studies 455-456

Geography: all undergraduate courses

History: all undergraduate courses except 208J, 316, 317, 414, 420, 429, 442, 443

Home Economics 350, 354, 356, 454, 457

Linguistics 451J, 452J, 453J, 462J, 463J

Philosophy 110, 120, 230, 231, 410, 460, 463, 465

Physical and Health Education: Health Education 250; Recreation Education 304

Political Science: all undergraduate courses

Psychology: all undergraduate courses except 301, 416, 421, 422, 423, 425, 430

Psychiatry 267, 450, 451, 452

Social Science 101, 102, 103

Sociology: all undergraduate courses except 223

Speech 230, 235, 332, 335, 339, 425, 426, 428, 432

### Natural Sciences

Anthropology 201, 380, 480, 481, 482

Astronomy: all undergraduate courses

Atmospheric Sciences: all undergraduate courses

Biochemistry: all undergraduate courses

Biological Structure 301

Biology: all undergraduate courses

Botany: all undergraduate courses

Chemistry: all undergraduate courses

Genetics: all undergraduate courses

Geology: all undergraduate courses

Home Economics 307, 407, 408, 415

Mathematics: all undergraduate courses except 101, 104, 114, 497J

Microbiology: 101, 301, 400

Oceanography: all undergraduate courses except 110-111-112

Philosophy 370, 470

Physical Education 293, 322, 480

Physics: all undergraduate courses

Psychology 301, 416, 421, 422, 423, 425, 430

Speech 310, 311, 415

Zoology: all undergraduate courses

### Major and Minor Requirements

The College of Education requires for graduation the satisfactory completion of an approved *major* and *minor*. Students electing an elementary school teaching emphasis will complete the minor in Elementary Education. In certain instances, a major and minor may be taken in different aspects of the same field, but only where such a procedure is clearly appropriate to preparation for teaching. Such major-minor combinations must be approved by the Dean and the Executive Committee of the College of Education. Major or minor departmental requirements are indicated under Programs in Education.

## TEACHER CERTIFICATION

Teacher education and certification in the state of Washington are controlled by the State Board of Education. All colleges and universities preparing teachers must conform to the general certification pattern established by the Board. Two certificates are authorized within the regular certification pattern—the *Provisional Certificate* and the *Standard Certificate*.

The *Provisional Certificate* is a temporary teaching certificate which is valid for a three-year period and is renewable *once* for an additional three-year period. Completion of 12 quarter credits after issuance of Provisional Certificate plus a minimum of one year of successful teaching is necessary to renew the certificate. The certificate will show the subject areas of competence as well as the level(s) on which the holder is prepared to teach. Beginning teachers are to be assigned in accordance with their stipulated competencies.

The *Standard Certificate* requirements must be completed during the six-year period of the Provisional Certificate. The Standard Certificate is valid as long as the holder teaches and for five years thereafter.

All persons seeking certification at the University of Washington must have been admitted to a baccalaureate degree program, or as an Unclassified-5 or graduate student at this University. Requirements for teaching certificates shall be those prescribed by the College of Education at the time the certificate is to be granted.

Specific details concerning the earning of each of the certificates at the University of Washington are presented in the discussion following this introduction.

Information on out-of-state transfers, emergency, and special certificates can be obtained from the State Department of Public Instruction, Olympia, Washington.

The certificate patterns outlined below provide the typical student a program approved by the faculty of the College of Education which is consonant with the requirements of the State Board of Education. Students who can demonstrate equivalent competence in any of the stipulated areas, as indicated by previous course work, by a record of past professional experience, or by the successful completion of advanced credit examinations, may request through the Advisory Office in the College of Education appropriate waivers for presentation to the Dean.

The professional course sequence outlined for the Provisional and Standard Certificates makes provisions for the gaining of an understanding of various age groups, a comprehension of the learning process, an introduction to the techniques and methods employed in the classroom, information concerning the history and philosophy of American education, all brought into focus by a school visitation program and directed teaching experience. Students are also urged to participate in the "September Experience" Program which is explained fully in the Introduction to Teaching course (Education 288); complete information is also available from the Director of Student Teaching, 200 Miller Hall.

### The Provisional Certificate

(Elementary Emphasis, Grades K-6)

The Provisional Certificate (elementary emphasis) will be awarded upon demonstration of such general scholarship and such evidence of physical and mental health as give promise of success, and upon completion of (1) a bachelor's degree, (2) an authorized major (2.00 minimum grade-point average required), (3) the professional elementary education minor (2.00 minimum grade-point average required), (4) the professional edu-

cation sequence (elementary), (5) student teaching. Admission to any phase of the teacher education program is not automatic.

### The Professional Education Sequence

(Elementary Emphasis)

COURSES	CREDITS
EDUC 288	INTRODUCTION TO TEACHING . . . . . 1
*SPCH 101	SPEECH FOR TEACHERS . . . . . 3
EDUC 302	CHILD STUDY AND DEVELOPMENT; PREREQUISITES, 288, CUMULATIVE GRADE-POINT AVERAGE 2.50 . . . 3
EDUC 308	EVALUATION IN EDUCATION . . . . . 3
EDUC 309	INTRODUCTION TO EDUCATIONAL PSYCHOLOGY; PREREQUISITE, 302; 308 SHOULD PRECEDE BUT MAY BE TAKEN CONCURRENTLY IF NECESSARY . . . 3
EDUC 371K OR 371E	STUDENT TEACHING, KINDERGARTEN OR ELEMENTARY; PREREQUISITES, 309; SPEECH 101; COMPLETION OF REQUIRED PORTION OF THE ELEMENTARY EDUCATION MINOR; 2.00 GRADE-POINT AVERAGE IN PROFESSIONAL EDUCATION; 2.50 CUMULATIVE GRADE-POINT AVERAGE; 120 CREDITS; PERMISSION . . . . . 15
EDUC 410 OR 412 OR 479 OR 480 OR 488	EDUCATIONAL SOCIOLOGY; FOUNDATIONS OF FREEDOM AND EDUCATION; CRUCIAL ISSUES OF EDUCATION; HISTORY OF EDUCATION; PHILOSOPHY OF EDUCATION; PREREQUISITE, EDUC 371K OR 371E . . . . . 3
	COMPLETION OF ONE OF THE ABOVE COURSES WILL SATISFY THIS REQUIREMENT. STUDENTS MAY, WITH THE APPROVAL OF THE ADVISORY OFFICE OF THE COLLEGE OF EDUCATION, DELAY FULFILLMENT OF THIS REQUIREMENT UNTIL THE FIFTH YEAR (STANDARD CERTIFICATE PROGRAM)
†HIST 464	HISTORY OF WASHINGTON AND PACIFIC NORTHWEST 5
TOTAL CREDITS	36

\* Students having completed one or more semesters of speech (principles, theory, and proficiency) in high school may petition for an examination which, if passed, may be substituted for Speech 101, without academic credit. Transfer students with one or more college speech courses may apply for a waiver. Address all questions to the Speech Department.

† May be taken during the fifth year but *must* be completed *before* Standard Certification. May be satisfied by successful examination at the Office of the County Superintendent of Schools.

### The Professional Elementary Education Minor

Requirements are 30-31 credits for Provisional Certification plus 10-14 credits for Standard Certification, fifth year.

COURSES	CREDITS
EDUC 374E	READING IN THE ELEMENTARY SCHOOL; PREREQUISITE, 302 . . . . . 3
EDUC 375H	LANGUAGE ARTS IN THE ELEMENTARY SCHOOL; PREREQUISITE, 302 . . . . . 3
EDUC 375M	SOCIAL STUDIES IN THE ELEMENTARY SCHOOL; PREREQUISITES, 302 AND GEOGRAPHY 100 . . . . 3
GEOG 100	INTRODUCTION TO GEOGRAPHY . . . . . 5
EDUC 375S	SCIENCE IN THE ELEMENTARY SCHOOL; PREREQUISITE, 302 . . . . . 3
	AND A MINIMUM OF 5 CREDITS IN A SCIENCE COURSE TO BE SELECTED FROM THE FOLLOWING LIST (SELECT ONE): ATMOSPHERIC SCIENCES 101; BIOLOGY 101-102 (10 CREDITS); BOTANY 111, 112; CHEMISTRY 100, 101; GEOLOGY 101; OCEANOGRAPHY 101; PHYSICS 110, 111; ZOOLOGY 111, 118 . . 5



EDUC 379	MATHEMATICS IN THE ELEMENTARY SCHOOL; PREREQUISITES, 302 AND MATHEMATICS 170 . . . . .	3
MATH 170	THEORY OF ARITHMETIC . . . . .	3
*EDUC 376	ART IN THE ELEMENTARY SCHOOL . . . . .	3
	PREREQUISITES, 302 AND ART 105 (3) OR 109 (3) OR 129 (2) . . . . .	2 OR 3
*EDUC 377	MUSIC IN THE ELEMENTARY SCHOOL; PREREQUI- SITES, 302 AND MUSIC 104 . . . . .	3
MUSIC 104	MUSIC FUNDAMENTALS . . . . .	2
*EDUC 338	HEALTH IN THE ELEMENTARY SCHOOL; PREREQ- UISITE, 302 . . . . .	2
*EDUC 378	PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL; PREREQUISITE, 302 . . . . .	3
		30-31

\* Students are normally expected to complete *all* of the requirements for the Elementary Education minor prior to Provisional Certification. *One* of the starred courses must be included for the Provisional Certificate. The others may, with the approval of the Advisory Office of the College of Education, be deferred until the fifth year (Standard Certificate Program).

### The Provisional Certificate

(Secondary Emphasis, Grades 7-12)

The Provisional Certificate (secondary emphasis) will be awarded upon demonstration of such general scholarship and such evidence of physical and mental health as give promise of success, and upon completion of (1) a bachelor's degree, (2) an authorized major (2.00 minimum grade-point average required), (3) the professional education sequence (secondary), (4)† student teaching. Admission to any phase of the teacher education program is not automatic.

### The Professional Education Sequence

(Secondary Emphasis)

COURSES		CREDITS
EDUC 288	INTRODUCTION TO TEACHING . . . . .	1
*SPCH 101	SPEECH FOR TEACHERS . . . . .	3
EDUC 305	ADOLESCENCE AND YOUTH; PREREQUISITES, 288, CUMULATIVE GRADE-POINT AVERAGE 2.50 . . . . .	3
EDUC 308	EVALUATION IN EDUCATION . . . . .	3
EDUC 309	INTRODUCTION TO EDUCATIONAL PSYCHOLOGY; PREREQUISITE, 305; 308 SHOULD PRECEDE, BUT MAY BE TAKEN CONCURRENTLY IF NECESSARY . . . . .	3
EDUC 370s	TEACHING IN THE SECONDARY SCHOOL; PREREQUISITE, 309 . . . . .	2
†(EDUC)	SPECIAL METHODS . . . . .	2-3
‡EDUC 371x	OR 371s STUDENT TEACHING, JR. OR SR. HIGH SCHOOL; PREREQUISITES, SPEECH 101; EDUC 370s IF REQUIRED; 120 CREDITS (MINIMUM); 2.00 GRADE-POINT AVERAGE IN PROFESSIONAL EDU- CATION; 2.50 CUMULATIVE GRADE-POINT AVERAGE; PERMISSION . . . . .	15
EDUC 410 OR	412 OR 479 OR 480 OR 488 EDUCATIONAL SOCIO- LOGY; FOUNDATIONS OF FREEDOM AND EDUCATION; CRUCIAL ISSUES IN EDUCATION; HISTORY OF EDU- CATION; PHILOSOPHY OF EDUCATION; PREREQUI- SITES, EDUC 371x OR 371s. COMPLETION OF ONE OF THE ABOVE COURSES WILL SATISFY THE RE- QUIREMENT. STUDENTS MAY, WITH THE APPROVAL OF THE ADVISORY OFFICE OF THE COLLEGE OF ED-	

UCATION, DELAY FULFILLMENT OF THIS REQUIRE- MENT UNTIL THE FIFTH YEAR . . . . .	3
(STANDARD CERTIFICATE PROGRAM)	
§HIST 464	HISTORY OF WASHINGTON AND PACIFIC NORTHWEST
TOTAL CREDITS . . . . .	33-36

\* Students having completed one or more semesters of speech (principles, theory, and proficiency) in high school may petition for an examination which, if passed, may be substituted for Speech 101 without academic credit. Transfer students with one or more college speech courses may apply for a waiver. Address all questions to the Speech Department.

† Special methods courses are not required unless stipulated by the major or minor department.

‡ Students enrolling in 371X or 371S with majors in social studies field must have completed course work in geography, economics, world history, United States history, and Washington State history prior to student teaching.

§ May be taken during the fifth year but *must* be completed *before* Standard Certification. May be satisfied by successful examination at the Office of the County Superintendent of Schools.

## MAJOR AND MINOR PROGRAMS IN EDUCATION

Following is a listing of the major and minor academic fields for elementary and secondary teachers. It is the responsibility of the student to consult the department in which he plans to take his work to verify the requirements.

### Anthropology

Teaching Major: Secondary School Emphasis

(45 approved credits required)

COURSES	CREDITS
201 PHYSICAL ANTHROPOLOGY: MAN IN NATURE . . . . .	5
202 CULTURAL ANTHROPOLOGY: COMPARISON AND ANALYSIS . . . . .	5
203 PREHISTORIC CULTURES OF THE NEW WORLD . . . . .	5
210 NORTH AMERICAN INDIANS (3) OR	
211 OCEANIA (3) OR	
213 AFRICA (3) OR	
215 NATIVE PEOPLES OF SOUTH AMERICA (3) OR	
*272 PREHISTORIC CULTURES OF NORTH AMERICA (3) OR	
*274 PREHISTORIC CULTURES OF SOUTH AMERICA (3) . . . . .	3
311 INDIAN CULTURES OF THE PACIFIC NORTHWEST (3) OR	
315 PEOPLES OF THE FAR NORTH (3) OR	
415 THE CHARACTER OF ESKIMO LIFE (3) . . . . .	3
450 INTRODUCTION TO LANGUAGE . . . . .	3
332 THE RELIGIONS OF PRIMITIVE PEOPLES (3) OR	
432 MAGIC, RELIGION, AND PHILOSOPHY (3) OR	
433 PRIMITIVE ART (3) OR	
435 PRIMITIVE AND PEASANT ECONOMIC SYSTEMS (3) OR	
437 PRIMITIVE POLITICAL INSTITUTIONS (3) OR	
442 CHILDHOOD AND SOCIETY (3) . . . . .	3

APPROVED ANTHROPOLOGY ELECTIVES CHOSEN AFTER CONSULTATION REGARDING THE STUDENT'S SPECIAL FIELD OF INTEREST . . . . .

18  
45

\* 272 and 274 will change to 472 and 474, beginning of Autumn Quarter, 1967.

**Anthropology Major: Elementary School Emphasis**

(45 approved credits required. Requirements are the same as for the Teaching Major: Secondary School Emphasis.)

**Teaching Minor: Secondary School Emphasis**

(35 approved credits required)

COURSES	CREDITS
201 PHYSICAL ANTHROPOLOGY: MAN IN NATURE . . . . .	5
202 CULTURAL ANTHROPOLOGY: COMPARISON AND ANALYSIS . . . . .	5
203 PREHISTORIC CULTURES OF THE NEW WORLD . . . . .	5
APPROVED ANTHROPOLOGY ELECTIVES CHOSEN AFTER CONSULTATION REGARDING THE STUDENT'S SPECIAL FIELD OF INTEREST . . . . .	20
	<hr/> 35

**Art****Teaching Major: Secondary School Emphasis**

(75 approved credits required)

COURSES	CREDITS
105, 106, 107 DRAWING (3,3,3) . . . . .	9
109, 110 DESIGN (3,3) . . . . .	6
129 APPRECIATION OF DESIGN . . . . .	2
212, 213, 214 HISTORY OF WESTERN ART (3,3,3) . . . . .	9
APPROVED ART HISTORY ELECTIVES . . . . .	3

**ART SUBJECT AREAS (Minimum of 41 credits items 1 through 4)**

1. 201 CERAMIC ART (3); 253, 254, 255 DESIGN AND MATERIALS (3,3,3); 272 BEGINNING SCULPTURE COMPOSITION (3); 357 METAL DESIGN (3); 358 JEWELRY DESIGN (3) . . . . .	TO TOTAL 12-15
2. 256, 257 PAINTING (3,3); 258 WATER COLOR (3); 360, 361 LIFE (3,3); 463, 464 COMPOSITION (3,3) . . . . .	TO TOTAL 12-15
3. 205 LETTERING (3); 261 ELEMENTS OF INTERIOR DESIGN (3); 350, 351 PRINTMAKING (3,3); 367 GRAPHIC DESIGN (3) . . . . .	TO TOTAL 9-12
4. 300, 302, 303, 304, 305 ART EDUCATION: CRAFTS (3,3,3,3,3) . . . . .	TO TOTAL 6-12
EDUC 319 ELEMENTARY ART EDUCATION (2); 320 THE TEACHING OF ART (3) . . . . .	5
	<hr/> 75

**Art Major: Elementary School Emphasis**

(53 approved credits required)

COURSES	CREDITS
105, 106, 107 DRAWING (3,3,3) . . . . .	9
109, 110 DESIGN (3,3) . . . . .	6
129 APPRECIATION OF DESIGN . . . . .	2
212, 213, 214 HISTORY OF WESTERN ART (3,3,3) . . . . .	9
253, 254, 255 DESIGN AND MATERIALS (3,3,3) . . . . .	TO TOTAL 6
256, 257 PAINTING (3,3); 258 WATER COLOR (3) . . . . .	TO TOTAL 6
300, 302, 303, 304, 305 ART EDUCATION: CRAFTS (3,3,3,3,3) . . . . .	TO TOTAL 6
APPROVED ART ELECTIVES (ANY COURSES WHERE PREREQUISITES ARE SATISFIED) . . . . .	6
EDUC 376 ART IN THE ELEMENTARY SCHOOL . . . . .	3
	<hr/> 53

**Teaching Minor: Secondary School Emphasis**

(35 approved credits required)

COURSES	CREDITS
105, 106, 107 DRAWING (3,3,3) . . . . .	9
109, 110 DESIGN (3,3) . . . . .	6
129 APPRECIATION OF DESIGN . . . . .	2
212, 213, 214 HISTORY OF WESTERN ART (3,3,3) . . . . .	9
253 DESIGN AND MATERIALS (3) OR	
254 DESIGN AND MATERIALS (3) OR	
255 DESIGN AND MATERIALS (3) . . . . .	3
256 PAINTING (3) OR	
258 WATER COLOR (3) . . . . .	3
300 ART EDUCATION: CRAFTS (3) OR	
302 ART EDUCATION: CRAFTS (3) OR	
303 ART EDUCATION: CRAFTS (3) OR	
304 ART EDUCATION: CRAFTS (3) OR	
305 ART EDUCATION: CRAFTS (3) . . . . .	3
	<hr/> 35

**Biology****Biology Teaching Major: Secondary School Emphasis**

(53-55 approved credits required. Of these, no more than 20 credits will be allowed for freshman-level courses. The biology major should give serious consideration to chemistry as his minor academic field.)

COURSES	CREDITS
BIOL 101-102 GENERAL BIOLOGY (5-5) AND	
BOT 112 THE PLANT KINGDOM (5), 113 ELEMENTARY PLANT CLASSIFICATION (5) OR	
ZOOL 111, 112 GENERAL ZOOLOGY (5,5) AND	
BOT 111 ELEMENTARY BOTANY (5), 112 THE PLANT KINGDOM (5), 113 ELEMENTARY PLANT CLASSIFICATION (5) AND	
ZOOL 111 OR 112 GENERAL ZOOLOGY (5,5) . . . . .	20
CHEM 102 GENERAL AND ORGANIC CHEMISTRY (5) OR	
CHEM 160 GENERAL CHEMISTRY (3) . . . . .	3-5
ORGANIC CHEMISTRY IS STRONGLY RECOMMENDED.	
ONE COURSE EACH IN THE FOLLOWING FIELDS: GENETICS, MICROBIOLOGY, ANIMAL PHYSIOLOGY, PLANT PHYSIOLOGY, VERTEBRATE ZOOLOGY, AND INVERTEBRATE ZOOLOGY . . . . .	30
	<hr/> 53-55

**Biology Major: Elementary School Emphasis**

(48-50 approved credits required. Of these, no more than 20 credits will be allowed for freshman-level courses.)

COURSES	CREDITS
BIOL 101-102 GENERAL BIOLOGY (5-5) AND	
BOT 112 THE PLANT KINGDOM (5), 113 ELEMENTARY PLANT CLASSIFICATION (5) OR	
ZOOL 111, 112 GENERAL ZOOLOGY (5,5) AND	
BOT 112 THE PLANT KINGDOM (5), 113 ELEMENTARY PLANT CLASSIFICATION (5) OR	
ZOOL 111 OR 112 GENERAL ZOOLOGY (5,5) . . . . .	20
CHEM 102 GENERAL AND ORGANIC CHEMISTRY (5) OR	
CHEM 160 GENERAL CHEMISTRY (3) . . . . .	3-5
ORGANIC CHEMISTRY IS STRONGLY RECOMMENDED.	
APPROVED ELECTIVES IN ADVANCE COURSES MUST INCLUDE AT LEAST 5 CREDITS IN BOTANY AND 10 CREDITS IN ZOOLOGY . . . . .	25
	<hr/> 48-50

**RECOMMENDED ADVANCED COURSES:**

BOT 201, 202, 203	PLANT PROPAGATION (2,2,2)
BOT 331	ORNAMENTAL PLANTS (3)
BOT 371	ELEMENTARY PLANT PHYSIOLOGY (5)
GENETICS 351	HUMAN GENETICS (3), OR 451 GENETICS (3)
MICRO 301	GENERAL MICROBIOLOGY (5)
ZOOL 201	CELL BIOLOGY (4)
ZOOL 208	ELEMENTARY HUMAN PHYSIOLOGY (5) OR
ZOOL 458	VERTEBRATE PHYSIOLOGY (6)
ZOOL 330	NATURAL HISTORY OF MARINE INVERTEBRATES (5)
ZOOL 362	NATURAL HISTORY OF VERTEBRATES (5)

**Teaching Minor: Secondary School Emphasis**

(30 approved credits required. In addition to elementary courses, at least one course in botany and one course in zoology are required. One 5-credit course must be upper division. The Biology Teaching Minor is recommended only for students whose teaching major is in one of the sciences.)

**Business Education****Teaching Major: Secondary School Emphasis**

(59 approved credits required)

COURSES	CREDITS
ACCTG 210, 220	FUNDAMENTALS OF ACCOUNTING (3,3) . . . . . 6
ACCTG 230	BASIC ACCOUNTING ANALYSIS . . . . . 3
GEN BUS 101	BUSINESS: AN INTRODUCTORY ANALYSIS . . . . . 5
BUS LAW 201	LEGAL FACTORS IN THE BUSINESS ENVIRONMENT . . . . . 3
ECON 200	INTRODUCTION TO ECONOMICS . . . . . 5
ECON 201	PRINCIPLES OF ECONOMICS . . . . . 5
FIN 320	MONEY, FINANCIAL INSTITUTIONS, AND INCOME . . . . . 4
*FIN 350	BUSINESS FINANCE (4) OR
*MKTG 381	RETAILING (5) OR
*GEN BUS 361	BUSINESS HISTORY (3) . . . . . 3
GEN BUS 444	BUSINESS AND SOCIETY . . . . . 4
MKTG 301	MARKETING, TRANSPORTATION, AND INTERNATIONAL BUSINESS; AN INTEGRATIVE ANALYSIS . . . . . 5
SEC STUDIES 111	SECRETARIAL STUDIES . . . . . 2
SEC STUDIES 112	SECRETARIAL STUDIES . . . . . 2
SEC STUDIES 115	OFFICE MACHINES . . . . . 3
SEC STUDIES 320	SECRETARIAL PRACTICE . . . . . 5
†SEC STUDIES 310	ADVANCED SECRETARIAL STUDIES (5); PREREQUISITES, TWO YEARS OF HIGH SCHOOL SHORTHAND AND/OR DEMONSTRATED SHORT- HAND COMPETENCE; AND
†SEC STUDIES 311	ADVANCED SECRETARIAL STUDIES (5) OR DEPARTMENTAL PROFICIENCY EXAMINATION 0-10
EDUC 324	THE TEACHING OF BUSINESS EDUCATION: BOOKKEEPING AND GENERAL BUSINESS . . . . . 2
EDUC 325	THE TEACHING OF BUSINESS EDUCATION: TYPEWRITING, SHORTHAND, TRANSCRIPTION, AND BUSINESS COMMUNICATIONS . . . . . 2
	<hr/> 59

\* May be deferred until fifth year.

† Required only if student plans to teach shorthand.

Students with extensive study in economics, history, sociology, political science, psychology, or English may offer this work in partial satisfaction of the specified broad area courses in Business Administration.

**Business Education Major: Elementary School Emphasis**

(37 approved credits required)

COURSES	CREDITS
GEN BUS 101	BUSINESS: AN INTRODUCTORY ANALYSIS . . . . . 5
GEN BUS 361	BUSINESS HISTORY . . . . . 3
FIN 320	MONEY, FINANCIAL INSTITUTIONS, AND INCOME . . . . . 4
ECON 200	INTRODUCTION TO ECONOMICS . . . . . 5
BUS LAW 201	LEGAL FACTORS IN THE BUSINESS ENVIRONMENT . . . . . 3
ACCTG 210, 220	FUNDAMENTALS OF ACCOUNTING (3,3) . . . . . 6
SEC STUDIES 111	SECRETARIAL STUDIES . . . . . 2
SEC STUDIES 112	SECRETARIAL STUDIES . . . . . 2
SEC STUDIES 320	SECRETARIAL PRACTICE . . . . . 5
EDUC 324	THE TEACHING OF BUSINESS EDUCATION: BOOKKEEPING AND GENERAL BUSINESS . . . . . 2
	<hr/> 37

**Teaching Minor: Secondary School Emphasis**

(28 approved credits required)

COURSES	CREDITS
GEN BUS 101	BUSINESS: AN INTRODUCTORY ANALYSIS . . . . . 5
ECON 200	INTRODUCTION TO ECONOMICS . . . . . 5
BUS LAW 201	LEGAL FACTORS IN THE BUSINESS ENVIRONMENT . . . . . 3
ACCTG 210, 220	FUNDAMENTALS OF ACCOUNTING (3,3) . . . . . 6
SEC STUDIES 111	SECRETARIAL STUDIES . . . . . 2
SEC STUDIES 112	SECRETARIAL STUDIES . . . . . 2
SEC STUDIES 115	OFFICE MACHINES . . . . . 3
EDUC 324	THE TEACHING OF BUSINESS EDUCATION: BOOKKEEPING AND GENERAL BUSINESS . . . . . 2
	<hr/> 28

**Chemistry****Teaching Major: Secondary School Emphasis**

(55 approved credits required. A grade of C or better must be obtained in each required chemistry course—or approved equivalent.)

COURSES	CREDITS
CHEM 140, 150, 151, 160	GENERAL CHEMISTRY AND LABORATORY (3,3,2,3) . . . . . 11
CHEM 170	QUALITATIVE ANALYSIS . . . . . 3
CHEM 221	QUANTITATIVE ANALYSIS . . . . . 5
CHEM 231, 232, 241, 242	ORGANIC CHEMISTRY AND LABORATORY (3,3,2,2) . . . . . 10
CHEM 350, 351	ELEMENTARY PHYSICAL CHEMISTRY (3,3) . . . . . 6
PHYS 114, 115, 116, 117, 118, 119	GENERAL PHYSICS AND LABORATORY (4,4,4,1,1,1) OR APPROVED EQUIVALENT . . . . . 15
MATH 101	INTERMEDIATE ALGEBRA (3) AND
MATH 105	COLLEGE ALGEBRA (5) OR
FOUR YEARS	HIGH SCHOOL MATHEMATICS PLUS QUALIFYING EXAMINATION . . . . . 0-8
MATH 124	CALCULUS WITH ANALYTIC GEOMETRY . . . . . 5
	<hr/> 55-63

**Chemistry Major: Elementary School Emphasis**

(55 approved credits required. Grades of C or better must be maintained in each required chemistry course—or approved equivalent.)

COURSES	CREDITS
CHEM 140, 150, 151, 160 GENERAL CHEMISTRY (3,3,2,3) . . . . .	11
CHEM 170 QUALITATIVE ANALYSIS . . . . .	3
CHEM 221 QUANTITATIVE ANALYSIS . . . . .	5
CHEM 231, 232, 241, 242 ORGANIC CHEMISTRY AND LABORATORY (3,3,2,2) . . . . .	10
CHEM 350, 351 ELEMENTARY PHYSICAL CHEMISTRY (3,3) . . . . .	6
PHYS 114, 115, 116, 117, 118, 119 GENERAL PHYSICS AND LABORATORY (4,4,4,1,1,1) OR APPROVED EQUIVALENT . . . . .	15
MATH 101 INTERMEDIATE ALGEBRA (3) AND MATH 105 COLLEGE ALGEBRA (5) OR FOUR YEARS HIGH SCHOOL MATHEMATICS PLUS QUALIFYING EXAMINATION . . . . .	0-8
MATH 124 CALCULUS WITH ANALYTIC GEOMETRY . . . . .	5
	55-63

**Teaching Minor: Secondary School Emphasis**

(37 approved credits required. Grades of C or better must be maintained in each required chemistry course—or approved equivalent.)

COURSES	CREDITS
CHEM 140, 150, 151, 160 GENERAL CHEMISTRY (3,3,2,3) . . . . .	11
CHEM 170 QUALITATIVE ANALYSIS . . . . .	3
CHEM 221 QUANTITATIVE ANALYSIS . . . . .	5
CHEM 231, 232, 241 ORGANIC CHEMISTRY AND LABORATORY (3,3,2) . . . . .	8
PHYS 110, 111, 112 GENERAL PHYSICS (3,3,4) OR APPROVED EQUIVALENT . . . . .	10
	37

**Drama****\*Combined Teaching Major and Minor: Secondary School Emphasis**

(75 approved credits required)

COURSES	CREDITS
146 THEATRE VOICE AND SPEECH . . . . .	3
151, 152 ACTING (3,3) . . . . .	6
210, 211, 212 THEATRE TECHNICAL PRACTICE (4,4,4) . . . . .	12
230 INTRODUCTION TO CHILDREN'S DRAMA . . . . .	2
247 THEATRE VOICE AND SPEECH . . . . .	2
253 ACTING . . . . .	3
298 THEATRE PRODUCTION . . . . .	1
316 THEATRICAL MAKE-UP . . . . .	2
461, 461L THEORY AND FUNDAMENTALS OF DIRECTING AND LABORATORY (2,1) . . . . .	3
498 THEATRE PRODUCTION . . . . .	1
EMPHASIS AREAS (SELECT ONE): . . . . .	10
1. ACTING-DIRECTING: 248 THEATRE VOICE AND SPEECH (2); 451, 452 ADVANCED ACTING (3,3); 498 THEATRE PRODUCTION (2);	
2. CHILDREN'S DRAMA: 338 CREATIVE DRAMATICS (3); 431 FUNDAMENTALS OF PUPPETRY (2); 435 CHILDREN'S THEATRE DIRECTING (2); 438 CREATIVE DRAMATICS (2); 435L CHILDREN'S THEATRE DIRECTING LABORATORY (1) OR 438L CREATIVE DRAMATICS LABORATORY (1)	

3. DESIGN-TECHNICAL: 310 RENDERING FOR THE THEATRE (2);  
414 SCENE DESIGN (2); 415 STAGE COSTUME DESIGN (2);  
418 SCENE PAINTING (2); 419 STAGE LIGHTING (2)

DRAMA MAJOR TOTAL 45

DRAMA 471, 472, 473 HISTORY OF WORLD THEATRE AND DRAMA CLASSIC AND ORIENTAL; MEDIEVAL AND RENAISSANCE; MODERN (5,5,5) . . . . .	15
APPROVED DRAMA COURSE IN 470's (5) OR APPROVED DRAMA COURSE IN 480's (5) OR APPROVED DRAMA COGNATE (5) (SEE FOLLOWING LIST) . . . . .	5
ENGL 324 SHAKESPEARE (5) . . . . .	5
ENGL 325 OR 326 SHAKESPEARE (5,5) . . . . .	5
DRAMATIC LITERATURE MINOR TOTAL	30
COMBINED MAJOR AND MINOR TOTAL	75

\* Satisfaction of the Combined Teaching Major and Minor also satisfies the minor area degree requirements for Education.

**RECOMMENDED DRAMA COGNATE COURSES**

CLAS 427 GREEK AND ROMAN TRAGEDY IN ENGLISH (3)	
COMP LIT 301 WORLD CLASSICS OF GERMANY, RUSSIA, AND SCANDINAVIA (5)	
ENGL 259 INTRODUCTION TO MODERN DRAMA (5)	
ENGL 322 ELIZABETHAN AND JACOBAN DRAMA (5)	
ENGL 335 RESTORATION LITERATURE: 1660-1700 (5)	
ENGL 410 TYPES OF DRAMATIC LITERATURE: COMEDY (5)	
ENGL 411 TYPES OF DRAMATIC LITERATURE: TRAGEDY (5)	
ENGL 513 SHAKESPEARE'S DRAMATIC CONTEMPORARIES (5)	
ENGL 517, 518, 519 SHAKESPEARE (5,5,5)	
FREN 417 RACINE AND MOLIÈRE IN ENGLISH (3)	
HUM 102 THE ARTS (5)	
JAP 423 STUDIES IN JAPANESE DRAMA IN ENGLISH (5)	
MUSIC 487, 488 HISTORY OF OPERA (3,3)	
RUSS 422 RUSSIAN PLAYS IN ENGLISH (5)	
SCAND 382 TWENTIETH-CENTURY SCANDINAVIAN DRAMA IN ENGLISH (2)	
SCAND 480 IBSEN AND HIS MAJOR PLAYS IN ENGLISH (2)	
SCAND 481 STRINDBERG AND HIS MAJOR PLAYS IN ENGLISH (2)	
SPAN 420 SPANISH LITERATURE OF THE EIGHTEENTH CENTURY (3)	

**Drama Major: Elementary School Emphasis**

(45 approved credits required)

COURSES	CREDITS
101 INTRODUCTION TO THE THEATRE . . . . .	5
146 THEATRE VOICE AND SPEECH . . . . .	3
151, 152, 253 ACTING (3,3,3) . . . . .	9
230 INTRODUCTION TO CHILDREN'S DRAMA . . . . .	2
247 THEATRE VOICE AND SPEECH . . . . .	2
316 THEATRICAL MAKE-UP . . . . .	2
325 PLAY PRODUCTION . . . . .	5
331 PUPPETRY . . . . .	3
338 CREATIVE DRAMATICS . . . . .	3
435 CHILDREN'S THEATRE DIRECTING . . . . .	2
438, 438L CREATIVE DRAMATICS AND LABORATORY (2,1) . . . . .	3
461 THEORY AND FUNDAMENTALS OF DIRECTING . . . . .	2
461L THEORY AND FUNDAMENTALS OF DIRECTING LABORATORY . . . . .	1
298 OR 498 THEATRE PRODUCTION . . . . .	1
APPROVED DRAMA COGNATE (3) (SEE ABOVE LIST OF RECOMMENDED DRAMA COGNATE COURSES) . . . . .	3
	46



**Teaching Minor: Secondary School Emphasis**  
(26 approved credits required)

COURSES	CREDITS
101 INTRODUCTION TO THE THEATRE . . . . .	5
146 THEATRE VOICE AND SPEECH . . . . .	3
151, 152 ACTING (3,3) . . . . .	6
230 INTRODUCTION TO CHILDREN'S DRAMA . . . . .	2
298 THEATRE PRODUCTION . . . . .	1
316 THEATRICAL MAKE-UP . . . . .	2
325, 326 PLAY PRODUCTION (5,5) . . . . .	10
	<hr/> 29

**Economics**

**Teaching Major: Secondary School Emphasis**  
(65-72 approved credits required)

COURSES	CREDITS
ECON 200 INTRODUCTION TO ECONOMICS (MACRO-ECONOMICS) . . . . .	5
ECON 201 PRINCIPLES OF ECONOMICS (MICRO-ECONOMICS) . . . . .	5
ECON 300 INTERMEDIATE PRICE THEORY . . . . .	5
ECON 301 NATIONAL INCOME ANALYSIS . . . . .	5
ONE ADDITIONAL COURSE IN ECONOMICS . . . . .	5
ACCTG 210 FUNDAMENTALS OF ACCOUNTING (3) AND	
ACCTG 220 FUNDAMENTALS OF ACCOUNTING (3) AND	
ACCTG 230 BASIC ACCOUNTING ANALYSIS (3) OR	
ACCTG 210 FUNDAMENTALS OF ACCOUNTING (3) AND	
FIN 320 MONEY, FINANCIAL INSTITUTIONS, AND INCOME (4) AND	
FIN 350 BUSINESS FINANCE (4) . . . . .	8-9
ECON 281 INTRODUCTION TO ECONOMIC STATISTICS (5) OR	
OTHER APPROVED COURSE IN STATISTICS . . . . .	5-6
APPROVED ELECTIVES IN ECONOMICS, OTHER SOCIAL SCIENCES, OR	
BUSINESS ADMINISTRATION . . . . .	20
	<hr/> 58-60

**Economics Major: Elementary School Emphasis**

(45 approved credits required, chosen from the courses required for the Economics Teaching Major: Secondary School Emphasis.)

**Teaching Minor: Secondary School Emphasis**  
(25 approved credits required)

COURSES	CREDITS
200 INTRODUCTION TO ECONOMICS . . . . .	5
201 PRINCIPLES OF ECONOMICS . . . . .	5
TWO APPROVED UPPER-DIVISION ECONOMICS COURSES FROM TWO	
DIFFERENT FIELDS OF SPECIALIZATION; AND ANY RECOMMENDED	
ELECTIVE COURSES TO COMPLETE THE FIELD . . . . .	15
	<hr/> 25

**English**

**Teaching Major: Secondary School Emphasis**  
(59 approved credits required)

COURSES	CREDITS
257 INTRODUCTION TO POETRY . . . . .	5
264 ENGLISH MASTERPIECES: BEGINNINGS THROUGH	
SHAKESPEARE (TO 1600) . . . . .	5
265 ENGLISH MASTERPIECES: DONNE THROUGH BLAKE (1600-1800)	5
271 EXPOSITORY WRITING; PLUS THREE ADDITIONAL CREDITS	
IN ADVANCED WRITING . . . . .	6
324 SHAKESPEARE . . . . .	5

341 ROMANTIC POETS (BLAKE, WORDSWORTH, COLERIDGE) (5) OR	
342 ROMANTIC POETS (BYRON, SHELLEY, KEATS) (5) OR	
344 VICTORIAN POETS (BROWNING, TENNYSON, AND	
OTHERS) (5) OR	
347 NINETEENTH-CENTURY PROSE (5) . . . . .	5
361 AMERICAN LITERATURE: BEGINNINGS-1800 AND THE	
TRANSCENDENTALISTS (5) OR	
362 AMERICAN LITERATURE: 1800-1860 (5) OR	
363 AMERICAN LITERATURE: 1860-1900 (5) . . . . .	5
387 ENGLISH GRAMMAR (5) OR	
447 HISTORY OF THE ENGLISH LANGUAGE (5) . . . . .	5
417 OR 418 OR 419 THE ENGLISH NOVEL (5,5,5) . . . . .	5
430 ENGLISH LITERATURE: 1900-1930 (5) OR	
431 ENGLISH LITERATURE: SINCE 1930 (5) OR	
434 AMERICAN LITERATURE: 1900-1930 (5) OR	
435 AMERICAN LITERATURE: SINCE 1930 (5) . . . . .	5
SPEECH 140 ORAL INTERPRETATION . . . . .	5
EDUC 326 THE TEACHING OF ENGLISH . . . . .	3
	<hr/> 59

**English Major: Elementary School Emphasis**  
(45 approved credits required)

COURSES	CREDITS
257 INTRODUCTION TO POETRY . . . . .	5
264 ENGLISH MASTERPIECES: BEGINNINGS THROUGH SHAKESPEARE	
(TO 1600) . . . . .	5
265 ENGLISH MASTERPIECES: DONNE THROUGH BLAKE	
(1600-1800) . . . . .	5
267 AMERICAN MASTERPIECES: BEGINNINGS TO 1900 . . . . .	5
271 EXPOSITORY WRITING . . . . .	3
324 SHAKESPEARE . . . . .	5
387 ENGLISH GRAMMAR (5) OR	
447 HISTORY OF THE ENGLISH LANGUAGE (5) . . . . .	5
341 ROMANTIC POETS (BLAKE, WORDSWORTH, COLERIDGE) (5) OR	
342 ROMANTIC POETS (BYRON, SHELLEY, KEATS) (5) OR	
344 VICTORIAN POETS (TENNYSON, BROWNING, AND	
OTHERS) (5) OR	
347 NINETEENTH-CENTURY PROSE (5) OR	
417 OR 418 OR 419 THE ENGLISH NOVEL (5,5,5) . . . . .	5
430 ENGLISH LITERATURE: 1900-1930 (5) OR	
431 ENGLISH LITERATURE: SINCE 1930 (5) OR	
434 AMERICAN LITERATURE: 1900-1930 (5) OR	
435 AMERICAN LITERATURE: SINCE 1930 (5) . . . . .	5
APPROVED ELECTIVES . . . . .	2 OR MORE
	<hr/> 45

**Teaching Minor: Secondary School Emphasis**  
(41 approved credits required)

COURSES	CREDITS
265 ENGLISH MASTERPIECES: DONNE THROUGH BLAKE	
(1600-1800) . . . . .	5
266 ENGLISH MASTERPIECES: WORDSWORTH THROUGH HARDY	
(1800-1900) . . . . .	5
267 AMERICAN MASTERPIECES: BEGINNINGS TO 1900 . . . . .	5
271 EXPOSITORY WRITING . . . . .	3
324 SHAKESPEARE . . . . .	5
387 ENGLISH GRAMMAR . . . . .	5
430 ENGLISH LITERATURE: 1900-1930 (5) OR	
431 ENGLISH LITERATURE: SINCE 1930 (5) OR	
434 AMERICAN LITERATURE: 1900-1930 (5) OR	
435 AMERICAN LITERATURE: SINCE 1930 (5) . . . . .	5
SPCH 140 ORAL INTERPRETATION . . . . .	5
EDUC 326 THE TEACHING OF ENGLISH . . . . .	3
	<hr/> 41



## Far Eastern and Slavic Languages and Literature

### Teaching Major: Secondary School Emphasis

(60 approved credits required)

COURSES	CREDITS
FAR E 110 OR 310 THE FAR EAST IN THE MODERN WORLD . . . . .	5
FAR E 345J JAPANESE GOVERNMENT (5) OR FAR E 454J HISTORY OF MODERN JAPAN . . . . .	5
FAR E 243 RUSSIAN CIVILIZATION (5) OR FAR E 423J TWENTIETH-CENTURY RUSSIA (5) (NOTE PREREQUISITES) . . . . .	5
FAR E 290 HISTORY OF CHINA (5) OR FAR E 443 CHINESE SOCIAL INSTITUTIONS (5) OR FAR E 468J MODERN CHINESE HISTORY . . . . .	5
FAR E 316 HISTORY OF SOUTHEASTERN ASIA . . . . .	5
CHIN 320 CHINESE LITERATURE IN ENGLISH (5) OR JAP 420 JAPANESE LITERARY TRADITION (5) OR JAP 421 MODERN JAPANESE LITERATURE IN ENGLISH (5) . . . . .	5
RUSS 320 RUSSIAN LITERATURE IN ENGLISH (5) OR RUSS 421 CONTEMPORARY RUSSIAN LITERATURE IN ENGLISH (5) . . . . .	5
GEOG 313J EAST ASIA (5) . . . . .	5
GEOG 333J THE SOVIET UNION . . . . .	5
POL S 344J CHINESE GOVERNMENT (5) OR POL S 414J CHINESE POLITICAL THOUGHT . . . . .	5
POL S 429 INTERNATIONAL RELATIONS IN THE FAR EAST (5) OR POL S 432J AMERICAN FOREIGN POLICY IN THE FAR EAST (5) . . . . .	5
POL S 420J FOREIGN RELATIONS OF THE SOVIET UNION (5) OR POL S 441J POLITICAL INSTITUTIONS OF THE SOVIET UNION (5) . . . . .	5
	<hr/> 60

### Far Eastern and Slavic Languages and Literature Major: Elementary School Emphasis

(Requirements are the same as for the Teaching Major:  
Secondary School Emphasis)

### Teaching Minor: Secondary School Emphasis

(30 approved credits required)

COURSES	CREDITS
FAR E 110 OR 310 THE FAR EAST IN THE MODERN WORLD . . . . .	5
FAR E 240 CHINESE CIVILIZATION (5) OR GEOG 313J EAST ASIA (5) OR GEOG 333J THE SOVIET UNION (5) OR POL S 344J CHINESE GOVERNMENT (5) OR POL S 345J JAPANESE GOVERNMENT (5) OR POL S 414J CHINESE POLITICAL THOUGHT (5) . . . . .	10
FAR E 243 RUSSIAN CIVILIZATION (5) OR FAR E 423J TWENTIETH-CENTURY RUSSIA (5) (NOTE PREREQUISITES) . . . . .	5
FAR E 290 HISTORY OF CHINA (5) OR FAR E 468J MODERN CHINESE HISTORY (5) OR FAR E 316 HISTORY OF SOUTHEASTERN ASIA (5) OR FAR E 454J HISTORY OF MODERN JAPAN (5) . . . . .	5
POL S 429 INTERNATIONAL RELATIONS IN THE FAR EAST (5) OR POL S 432J AMERICAN FOREIGN POLICY IN THE FAR EAST (5) OR POL S 420J FOREIGN RELATIONS OF THE SOVIET UNION (5) OR POL S 441J POLITICAL INSTITUTIONS OF THE SOVIET UNION (5) . . . . .	5
	<hr/> 30

## French (Romance Languages and Literature)

### Teaching Major: Secondary School Emphasis

(45 approved credits required, and a proficiency in oral and written French, knowledge of French literature and culture, and training in the application of modern principles, materials, and methods of foreign-language teaching. The candidate will be required to take certain tests to demonstrate his acquisition of the language skills; satisfaction of the remainder of the requirements is to be certified by an adviser in the Department of Romance Languages and Literature. The candidate's program of study, supervised by a Department adviser, should normally include the following courses.)

COURSES	CREDITS
101-102, 103 ELEMENTARY (5-5,5) OR APPROVED EQUIVALENT . . . . .	15
201, 202 INTERMEDIATE (5,5) OR APPROVED EQUIVALENT . . . . .	10
222 INTRODUCTION TO FRENCH LITERATURE (5) OR APPROVED EQUIVALENT . . . . .	5
301, 302 ADVANCED SYNTAX AND COMPOSITION (3,3) . . . . .	6
303 FRENCH STYLISTICS . . . . .	3
304 SURVEY OF FRENCH LITERATURE: 1100-1635 (3) 305 SURVEY OF FRENCH LITERATURE: 1635-1800 (3) 306 SURVEY OF FRENCH LITERATURE: 1800-1960 (3) . . . . .	9
308 SEVENTEENTH-CENTURY FRENCH LITERATURE (3) OR 310 NINETEENTH-CENTURY FRENCH LITERATURE (3) OR 311 TWENTIETH-CENTURY FRENCH LITERATURE (3) . . . . .	3
327 ADVANCED CONVERSATION (2, MAX. 8) OR 330 CONVERSATIONAL FRENCH (2½ OR 4, MAX. 8) OR 430 ADVANCED CONVERSATIONAL FRENCH (2½ OR 4, MAX. 8) . . . . .	TO TOTAL 8
409 ADVANCED PHONETICS (3) . . . . .	3
APPROVED ELECTIVES IN ROMANCE LANGUAGES AND LITERATURE COURSES NUMBERED ABOVE 400 . . . . .	9
ROM 401 INTRODUCTION TO ROMANCE LINGUISTICS (3) . . . . .	3
EDUC 329S THE TEACHING OF FRENCH: SECONDARY EMPHASIS . . . . .	3
	<hr/> TO TOTAL 45

Credit may be arranged for study abroad, preferably during the junior year, subject to the regulations governing transfer credit and provided the student's plan is approved in advance by the Registrar's Office and by the departments in which he is studying. Summer study abroad is encouraged.

### Teaching Major: Elementary School Emphasis

(Requirements are the same as for the Teaching Major:  
Secondary School Emphasis.)

### Teaching Minor: Secondary School Emphasis

(36 approved credits required. Requirements are the same as for the Teaching Major: Secondary School Emphasis, with one exception—electives in the Romance Languages and Literature courses numbered above 400 are not required of the candidate for the French Teaching Minor.)



## Geography

**Teaching Major: Secondary School Emphasis**  
(50 approved credits required)

COURSES	CREDITS
100 INTRODUCTION TO GEOGRAPHY . . . . .	5
205 PHYSICAL GEOGRAPHY . . . . .	5
207 ECONOMIC GEOGRAPHY . . . . .	5
258 MAPS AND MAP READING . . . . .	2
302 THE PACIFIC NORTHWEST . . . . .	3
402 UNITED STATES . . . . .	5
APPROVED GEOGRAPHY UPPER-DIVISION ELECTIVE COURSES . . . . .	25
	<hr/> 50

**Geography Major: Elementary School Emphasis**  
(45 approved credits required)

COURSES	CREDITS
100 INTRODUCTION TO GEOGRAPHY . . . . .	5
205 PHYSICAL GEOGRAPHY . . . . .	5
207 ECONOMIC GEOGRAPHY . . . . .	5
258 MAPS AND MAP READING . . . . .	2
302 THE PACIFIC NORTHWEST . . . . .	3
402 UNITED STATES . . . . .	5
APPROVED GEOGRAPHY UPPER-DIVISION ELECTIVE COURSES . . . . .	20
	<hr/> 45

**Teaching Minor: Secondary School Emphasis**  
(26 approved credits required)

COURSES	CREDITS
100 INTRODUCTION TO GEOGRAPHY . . . . .	5
205 PHYSICAL GEOGRAPHY . . . . .	5
302 THE PACIFIC NORTHWEST . . . . .	3
325 HISTORICAL GEOGRAPHY OF AMERICA . . . . .	3
370 CONSERVATION OF NATURAL RESOURCES . . . . .	5
APPROVED GEOGRAPHY ELECTIVE ON 400-LEVEL . . . . .	5
	<hr/> 26

## Geology

**Teaching Major: Secondary School Emphasis**  
(64 approved credits required. 10 credits of electives may be taken during the student's fifth year.)

COURSES	CREDITS
CHEM 140, 150, 151, 160 GENERAL CHEMISTRY AND LABORATORY (3,3,2,3) . . . . .	11
PHYS 114, 115, 116, 117, 118, 119 (4,4,4,1,1,1) OR 121, 122, 123, 131, 132, 133 (4,4,4,1,1,1) GENERAL PHYSICS AND LABORATORY . . . . .	15
MATH 104 PLANE TRIGONOMETRY (3) OR HIGH SCHOOL TRIGONOMETRY EQUIVALENT . . . . .	3
GEOL 205 PHYSICAL GEOLOGY (5) OR GEOL 101 PHYSICAL GEOLOGY (5) . . . . .	5
GEOL 103 EARTH HISTORY (5) OR GEOL 208 GEOLOGY OF THE NORTHWEST (5) . . . . .	5
GEOL 220 MINERALOGY . . . . .	5
GEOL 225 IGNEOUS AND METAMORPHIC PETROLOGY . . . . .	5
GEOL 326 SEDIMENTARY PETROLOGY . . . . .	5
APPROVED UPPER-DIVISION GEOLOGY ELECTIVES OR APPROVED COURSES IN RELATED FIELDS . . . . .	10
	<hr/> 64

**Geology Major: Elementary School Emphasis**

(64 approved credits required. 10 credits of electives may be taken during the student's fifth year.)

COURSES	CREDITS
CHEM 140, 150, 151, 160 GENERAL CHEMISTRY AND LABORATORY (3,3,2,3) . . . . .	11
BIOL 101-102 GENERAL BIOLOGY (5-5) OR ZOO 111, 112 GENERAL ZOOLOGY (5,5) . . . . .	10
MATH 104 PLANE TRIGONOMETRY (3) OR HIGH SCHOOL TRIGONOMETRY EQUIVALENT . . . . .	3
GEOL 205 PHYSICAL GEOLOGY (5) OR GEOL 101 PHYSICAL GEOLOGY (5) . . . . .	5
GEOL 103 EARTH HISTORY (5) OR GEOL 208 GEOLOGY OF THE NORTHWEST (5) . . . . .	5
GEOL 220 MINERALOGY . . . . .	5
GEOL 225 IGNEOUS AND METAMORPHIC PETROLOGY . . . . .	5
GEOL 326 SEDIMENTARY PETROLOGY . . . . .	5
GEOL 330 GENERAL PALEONTOLOGY . . . . .	5
APPROVED UPPER-DIVISION GEOLOGY ELECTIVES OR APPROVED COURSES IN RELATED FIELDS . . . . .	10
	<hr/> 64

**Teaching Minor: Secondary School Emphasis**  
(19 credits required)

COURSES	CREDITS
205 PHYSICAL GEOLOGY (5) OR 101 PHYSICAL GEOLOGY (5) . . . . .	5
106 GEOLOGY IN WORLD AFFAIRS OR 220 MINERALOGY . . . . .	5
103 EARTH HISTORY . . . . .	5
411J GEOMORPHOLOGY (4) OR 208 GEOLOGY OF THE NORTHWEST (5) . . . . .	4-5
	<hr/> 19-20

## German (Germanic Languages and Literature)

(A grade-point average of 2.50 must be maintained in all German courses in the programs.)

**Teaching Major: Secondary School Emphasis**  
(66 credits required)

COURSES	CREDITS
201 BASIC SECOND-YEAR GERMAN . . . . .	5
202 INTERMEDIATE SECOND-YEAR GERMAN . . . . .	5
203 ADVANCED SECOND-YEAR READING . . . . .	3
207 ADVANCED SECOND-YEAR CONVERSATION . . . . .	2
301, 302, 303 GRAMMAR AND CONVERSATION (3,3,3) . . . . .	9
310, 311 INTRODUCTION TO THE CLASSICAL PERIOD (3,3) . . . . .	6
312 INTRODUCTION TO THE GERMAN NOVELLE . . . . .	3
401, 402, 403 GRAMMAR AND COMPOSITION (3,3,3) . . . . .	9
405 LINGUISTIC ANALYSIS OF GERMAN . . . . .	3
410, 411, 412 SURVEY OF MODERN GERMAN LITERATURE AND CULTURE (3,3,3) . . . . .	9
413, 414, 415 SURVEY OF OLDER GERMAN LITERATURE AND CULTURE (3,3,3) . . . . .	9
EDUC 330 THE TEACHING OF GERMAN . . . . .	3
	<hr/> 66

**Germanic Major: Elementary School Emphasis**

(39 credits required)

COURSES	CREDITS
201 BASIC SECOND-YEAR GERMAN . . . . .	5
202 INTERMEDIATE SECOND-YEAR GERMAN . . . . .	5
203 ADVANCED SECOND-YEAR READING . . . . .	3
207 ADVANCED SECOND-YEAR CONVERSATION . . . . .	2
301, 302, 303 GRAMMAR AND CONVERSATION (3,3,3) . . . . .	9
310, 311 INTRODUCTION TO THE CLASSICAL PERIOD (3,3) . . . . .	6
312 INTRODUCTION TO THE GERMAN NOVELLE . . . . .	3
405 LINGUISTIC ANALYSIS OF GERMAN . . . . .	3
EDUC 330 THE TEACHING OF GERMAN . . . . .	3
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	39

**Teaching Minor: Secondary School Emphasis**

(48 approved credits required)

COURSES	CREDITS
201 BASIC SECOND-YEAR GERMAN . . . . .	5
202 INTERMEDIATE SECOND-YEAR GERMAN . . . . .	5
203 ADVANCED SECOND-YEAR READING . . . . .	3
207 ADVANCED SECOND-YEAR CONVERSATION . . . . .	2
301, 302, 303 GRAMMAR AND CONVERSATION (3,3,3) . . . . .	9
310, 311 INTRODUCTION TO THE CLASSICAL PERIOD (3,3) . . . . .	6
312 INTRODUCTION TO THE GERMAN NOVELLE . . . . .	3
401, 402, 403 GRAMMAR AND COMPOSITION (3,3,3) . . . . .	9
405 LINGUISTIC ANALYSIS OF GERMAN . . . . .	3
EDUC 330 THE TEACHING OF GERMAN . . . . .	3
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	48

**Health Education**

(School of Physical and Health Education)

**Teaching Major: Secondary School Emphasis**

(66-72 approved credits required, and 22 credits in general foundation courses)

PROFESSIONAL COURSES	CREDITS
B STR 301 GENERAL ANATOMY . . . . .	4
CHEM 101 GENERAL CHEMISTRY . . . . .	5
CHEM 102 GENERAL AND ORGANIC CHEMISTRY . . . . .	5
H ED 291 PERSONAL AND GENERAL HYGIENE . . . . .	3
H ED 429 METHODS IN TEACHING FIRST AID AND SAFETY . . . . .	3
H ED 453 METHODS AND MATERIALS IN HEALTH TEACHING . . . . .	3
H ED 454 CURRICULUM DEVELOPMENT AND EVALUATION IN HEALTH EDUCATION . . . . .	2-3
H ED 465 THE SCHOOL ENVIRONMENTAL HEALTH PROGRAM . . . . .	3
MICRO 301 GENERAL MICROBIOLOGY (OR APPROVED SUBSTITUTE) . . . . .	5
PSYC 267 PREVENTIVE METHODS FOR MENTAL HEALTH (2) OR PRINCIPLES OF PERSONALITY DEVELOPMENT (2) OR MENTAL HYGIENE FOR TEACHERS AND ADMINISTRATORS (3) . . . . .	2-3
P MED 420 PRINCIPLES OF EPIDEMIOLOGY . . . . .	3
P MED 422 INTRODUCTION TO ENVIRONMENTAL HEALTH . . . . .	3
P MED 424 PUBLIC HEALTH PROGRAMS . . . . .	3
P MED 461 SCHOOL AND COMMUNITY HEALTH PROGRAMS . . . . .	5
SOC 453 SOCIAL FACTORS OF MARRIAGE (3) OR H EC 356 FAMILY RELATIONSHIPS (3) . . . . .	3
ZOOL 118, 118L SURVEY OF PHYSIOLOGY (5) AND ELEMENTARY PHYSIOLOGY LABORATORY (1) OR ZOOL 208 ELEMENTARY HUMAN PHYSIOLOGY (5) . . . . .	5-6
APPROVED ELECTIVES IN HEALTH EDUCATION OR RELATED FIELDS . . . . .	9-12
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	66-72

**GENERAL FOUNDATION COURSES****CREDITS**

BIOL 101-102 GENERAL BIOLOGY (5-5) . . . . .	10
H EC 300 NUTRITION . . . . .	2
PSYCH 100 GENERAL PSYCHOLOGY . . . . .	5
SOC 110 SURVEY OF SOCIOLOGY . . . . .	5
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	22

**Health Education Major: Elementary School Emphasis**

(45 approved credits required. Group requirements in science to be selected from the same courses as listed for the Teaching Major: Secondary School Emphasis. Selection of courses should be made with the guidance of a Health Education adviser in the School of Physical and Health Education.)

**Health Education Teaching Minor: Secondary School Emphasis**

(25-30 approved credits required)

COURSES	CREDITS
H ED 250 CONTEMPORARY HEALTH CONCEPTS . . . . .	2
H ED 291 PERSONAL AND GENERAL HYGIENE . . . . .	3
H ED 429 METHODS IN TEACHING FIRST AID AND SAFETY . . . . .	3
H ED 453 METHODS AND MATERIALS IN HEALTH TEACHING . . . . .	3
H EC 300 NUTRITION . . . . .	2
P MED 461 SCHOOL AND COMMUNITY HEALTH PROGRAMS . . . . .	5
APPROVED ELECTIVES . . . . .	7-12
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	25-30

**RECOMMENDED ELECTIVES**

(To be selected with the advice of Health Education adviser.)

H ED 451	WORKSHOP IN HEALTH EDUCATION FOR THE CLASSROOM TEACHER (2½)
H ED 454	CURRICULUM DEVELOPMENT AND EVALUATION IN HEALTH EDUCATION (2-3)
H ED 465	THE SCHOOL ENVIRONMENTAL HEALTH PROGRAM (3)
GENET 351	HUMAN GENETICS (3)
MICRO 301	GENERAL MICROBIOLOGY (5)
P MED 420	PRINCIPLES OF EPIDEMIOLOGY (3)
P MED 422	INTRODUCTION TO ENVIRONMENTAL HEALTH (3)
P MED 424	PUBLIC HEALTH PROGRAMS (3)
P MED 492	PROBLEMS IN INTERNATIONAL HEALTH (2)
PSYC 267	PREVENTIVE METHODS FOR MENTAL HEALTH (2) OR
PSYC 450	PRINCIPLES OF PERSONALITY DEVELOPMENT (2) OR
EDUC 408	MENTAL HYGIENE FOR TEACHERS AND ADMINISTRATORS (3)
SOC 453	SOCIAL FACTORS OF MARRIAGE (3) OR
H EC 356	FAMILY RELATIONSHIPS (3)

**History****Teaching Major: Secondary School Emphasis**

(52 approved credits required. A grade-point average of 2.50 is required in the history courses taken at the University of Washington.)

COURSES	CREDITS
101 MEDIEVAL EUROPEAN HISTORY (5) AND	
102 MODERN EUROPEAN HISTORY (5) OR	
SOC SCI 101 HISTORY OF CIVILIZATION: THE GREAT CULTURAL TRADITIONS (5) AND	



SOC SCI 102	HISTORY OF CIVILIZATION: THE WESTERN TRADITION IN WORLD CIVILIZATION (5) AND	
SOC SCI 103	HISTORY OF CIVILIZATION: THE CONTEMPORARY WORLD (5)	10-15
201, 202	ANCIENT HISTORY (5,5)	10
241	SURVEY OF THE HISTORY OF THE UNITED STATES	5
464	HISTORY OF WASHINGTON AND THE PACIFIC NORTHWEST	5
	APPROVED HISTORY ELECTIVES IN UPPER-DIVISION COURSES	15-20
EDUC 331	THE TEACHING OF HISTORY	2
		52

#### History Major: Elementary School Emphasis

(Requirements are same as for the History Teaching Major: Secondary School Emphasis.)

#### Teaching Minor: Secondary School Emphasis

(30 approved credits required. Requirements are same as for the History Teaching Major: Secondary School Emphasis, except that History 201, 202 is not required.)

#### Home Economics

##### \*Combined Teaching Major and Minor: Secondary School Emphasis

(62 approved credits and 32 credits in prerequisite and supporting courses)

COURSES	CREDITS
125 TEXTILES	3
134 CLOTHING	5
148 THE HOME, ITS EQUIPMENT, AND MANAGEMENT	3
216 FOOD PREPARATION AND MEAL MANAGEMENT	3
234 COSTUME DESIGN	3
307 NUTRITION	5
315 ADVANCED FOOD SELECTION AND PREPARATION	5
316 DEMONSTRATION TECHNIQUES	3
338 CLOTHING FOR THE FAMILY	3
347 HOME FURNISHING	5
348 HOME-MANAGEMENT HOUSE	3
354 FAMILY ECONOMICS AND FINANCES	5
356 FAMILY RELATIONSHIPS	3
457 CHILD NUTRITION AND CARE	3
APPROVED HOME ECONOMICS ELECTIVE AT 400 LEVEL	2
†EDUC 332 THE TEACHING OF HOME ECONOMICS	5
PSYCH 320 FIELD ANALYSIS OF THE BEHAVIOR OF YOUNG CHILDREN	3
	62

ART 109	DESIGN (3) (PREREQUISITE FOR HOME ECON. 234 AND 347) OR	
ART 129	APPRECIATION OF DESIGN (2)	2-3
CHEM 101	GENERAL CHEMISTRY (PREREQUISITE FOR CHEM 102)	5
CHEM 102	GENERAL AND ORGANIC CHEMISTRY (PREREQUISITE FOR HOME ECON 216 AND 307)	5

\*This is a composite program. The major may not be taken without completion of the minor. Completion of the Combined Teaching Major and Minor satisfies the major and minor degree requirements within the College of Education and these courses plus Education 445 fulfill Home Economics course requirements for a Vocational Certificate.

† 2 credits count as Education, and 3 credits count as Home Economics.

ECON 200	INTRODUCTION TO ECONOMICS (PREREQUISITE FOR HOME ECON 354)	5
MICRO 301	GENERAL MICROBIOLOGY	5
PSYCH 100	GENERAL PSYCHOLOGY (PREREQUISITE FOR PSYCH 306)	5
PSYCH 306	DEVELOPMENTAL PSYCHOLOGY (PREREQUISITE FOR PSYCH. 320)	5
ZOOL 118	SURVEY OF PHYSIOLOGY (5) OR	
ZOOL 208	ELEMENTARY HUMAN PHYSIOLOGY (5) (PREREQUISITE FOR HOME ECON 307)	5
		37-38

#### Home Economics Major: Elementary School Emphasis

(45 approved credits and prerequisite courses)

COURSES	CREDITS
*110 FOOD AND NUTRITION (5) OR	
216 FOOD PREPARATION AND MEAL MANAGEMENT (3)	5 OR 3
125 TEXTILES	3
134 CLOTHING	5
148 THE HOME, ITS EQUIPMENT, AND MANAGEMENT	3
240 HOME FURNISHING (3) OR	
347 HOME FURNISHING (5)	3 OR 5
*300 NUTRITION (2) OR	
307 NUTRITION (5)	2 OR 5
350 MANAGING FAMILY FINANCES (3) OR	
354 FAMILY ECONOMICS AND FINANCES (5)	3 OR 5
356 FAMILY RELATIONSHIPS	3
457 CHILD NUTRITION AND CARE	3
APPROVED HOME ECONOMICS ELECTIVES	8-17

#### PREREQUISITES

ART 109	DESIGN (3) (PREREQUISITE FOR HOME ECON. 347) OR	
ART 129	APPRECIATION OF DESIGN (2)	3 OR 2
CHEM 101	GENERAL CHEMISTRY (PREREQUISITE FOR CHEM 102)	5
CHEM 102	GENERAL AND ORGANIC CHEMISTRY (PREREQUISITE FOR HOME ECON 216 AND 307)	5
ECON 200	INTRODUCTION TO ECONOMICS (PREREQUISITE FOR HOME ECON 354)	5
ZOOL 118	SURVEY OF PHYSIOLOGY (5) OR	
ZOOL 208	ELEMENTARY HUMAN PHYSIOLOGY (5) (PREREQUISITE FOR HOME ECON 307)	5

\* Students cannot receive credit for both Home Economics 110 and 300, or 300 and 307.

#### Teaching Minor: Secondary School Emphasis

(32 approved credits in Home Economics and 22 credits in prerequisite courses)

COURSES	CREDITS
125 TEXTILES	3
134 CLOTHING	5
148 THE HOME, ITS EQUIPMENT, AND MANAGEMENT	3
216 FOOD PREPARATION AND MEAL MANAGEMENT	3
307 NUTRITION	5
347 HOME FURNISHING	5
354 FAMILY ECONOMICS AND FINANCES	5
356 FAMILY RELATIONSHIPS	3
	32

## PREREQUISITES

ART 109	DESIGN (3) (PREREQUISITE FOR HOME ECON. 347) OR	
ART 129	APPRECIATION OF DESIGN (2)	2-3
CHEM 101	GENERAL CHEMISTRY (PREREQUISITE FOR HOME ECON. 216)	5
CHEM 102	GENERAL AND ORGANIC CHEMISTRY (PREREQUISITE FOR HOME ECON. 307)	5
ECON 200	INTRODUCTION TO ECONOMICS (PREREQUISITE FOR HOME ECON. 354)	5
ZOOL 118	SURVEY OF PHYSIOLOGY (5) OR	
ZOOL 208	ELEMENTARY HUMAN PHYSIOLOGY (5) (PREREQUISITE FOR HOME ECON. 307)	5

22-23

## Industrial Education

### Teaching Major: Secondary School Emphasis

(54 approved credits required)

COURSES	CREDITS
EDUC 180, 181 INDUSTRIAL EDUCATION: SKETCHING AND TECHNICAL DRAWING (3,3)	6
EDUC 182 INDUSTRIAL EDUCATION: GENERAL SHOP	5
EDUC 280 INDUSTRIAL EDUCATION: FUNDAMENTALS OF WOODWORK	3
EDUC 281 INDUSTRIAL EDUCATION: GENERAL METALWORK	3
EDUC 380 INDUSTRIAL EDUCATION: TOOLS AND MATERIALS	2
EDUC 383-384 INDUSTRIAL EDUCATION: WOODWORKING TECHNOLOGY (3-2)	5
EDUC 386 INDUSTRIAL EDUCATION: HOME PLANNING	4
EDUC 388 SELECTION AND ORGANIZATION OF INDUSTRIAL EDUCATION SUBJECT MATTER	3
ME 201 METAL CASTING	1
ME 202 WELDING	1
ME 203 METAL MACHINING	1
ME 312 MACHINE TOOL FUNDAMENTALS	3
ART 253 DESIGN AND MATERIALS (INDUSTRIAL ARTS SECTION)	3
ARCH 105 THE HOUSE	2
APPROVED ELECTIVES	12
	54

### ALSO REQUIRED

EDUC 327	THE TEACHING OF TRADE AND INDUSTRIAL EDUCATION	3
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### Industrial Education Major: Elementary School Emphasis

(36 approved credits required)

COURSES	CREDITS
180 INDUSTRIAL EDUCATION: SKETCHING AND TECHNICAL DRAWING	3
182 INDUSTRIAL EDUCATION: GENERAL SHOP	5
280 INDUSTRIAL EDUCATION: FUNDAMENTALS OF WOODWORK	3
281 INDUSTRIAL EDUCATION: GENERAL METALWORK	3
383-384 INDUSTRIAL EDUCATION: WOODWORKING TECHNOLOGY (3-2)	5
389 INDUSTRIAL EDUCATION FOR ELEMENTARY TEACHERS	5
APPROVED ELECTIVES	12
	36

### Teaching Minor: Secondary School Emphasis

(26 approved credits required)

COURSES	CREDITS
EDUC 180 INDUSTRIAL EDUCATION: SKETCHING AND TECHNICAL DRAWING	3
EDUC 182 INDUSTRIAL EDUCATION: GENERAL SHOP	5
EDUC 280 INDUSTRIAL EDUCATION: FUNDAMENTALS OF WOODWORK	3

EDUC 281	INDUSTRIAL EDUCATION: GENERAL METALWORK	3
EDUC 327	THE TEACHING OF TRADE AND INDUSTRIAL EDUCATION	3
EDUC 388	SELECTION AND ORGANIZATION OF INDUSTRIAL ARTS SUBJECT MATTER	3
ME 201	METAL CASTING	1
ME 202	WELDING	1
ME 203	METAL MACHINING	1
ME 312	MACHINE TOOL FUNDAMENTALS	3
		26

## Journalism

### Teaching Major: Secondary School Emphasis

(43-49 approved credits required. All journalism courses must be approved by the curriculum adviser of the School of Communications.)

COURSES		CREDITS
JOUR 300	NEWS WRITING . . . . .	4
JOUR 301	COPY EDITING . . . . .	3
JOUR 318	REPORTING CONTEMPORARY AFFAIRS . . . . .	3
JOUR 375J	THE TEACHING OF JOURNALISM . . . . .	3
CMU 201	COMMUNICATIONS TODAY . . . . .	2
CMU 202	THE HISTORY OF THE PRESS IN AMERICA . . . . .	2
CMU 203	THE PRESS IN CONTEMPORARY AMERICA . . . . .	2
CMU 226	INTRODUCTION TO ADVERTISING . . . . .	3
CMU 310	INTRODUCTION TO MASS COMMUNICATIONS RESEARCH . . . . .	3

### ELECTIVE COURSES

CMU 302	THE ROLE OF THE MAGAZINE IN AMERICA (3)
CMU 312	COMMUNICATIONS THEORY (3)
CMU 320	LEGAL ASPECTS OF COMMUNICATIONS (5)
CMU 402	GOVERNMENT AND MASS COMMUNICATIONS (3)
CMU 406	SOCIAL CONTROL OF THE MASS MEDIA (3)
CMU 408, 409, 410	COMMUNICATION RESEARCH (3,3,3)
CMU 414	HISTORY OF MASS COMMUNICATIONS (3)
CMU 415	COMPARATIVE COMMUNICATION SYSTEMS (3)
CMU 443	THE SOCIAL FUNCTIONS OF ADVERTISING (2½)
CMU 474	THE EDUCATIONAL ROLE OF THE MASS MEDIA (2½)
CMU 480	PUBLIC OPINION AND PROPAGANDA (3)
JOUR 413	EDITORIAL WRITING, POLICIES, AND RESEARCH (3) . . . . . TO TOTAL 12-15
ADV 340	ADVERTISING PROCEDURES (3)
CMU 303	PUBLIC RELATIONS (3)
CMU 403	PROBLEMS IN PUBLIC RELATIONS (3)
JOUR 291	PHOTOGRAPHY (3)
JOUR 319	REPORTING PUBLIC AFFAIRS (3)
R-TV 270	ELEMENTS OF RADIO WRITING (3)
R-TV 376	RADIO AND TELEVISION NEWS WRITING (3)
	TO TOTAL . . . . . <u>6-9</u>
	42-48

### Journalism Major: Elementary School Emphasis

(The requirements are the same as those for the Teaching Major: Secondary School Emphasis.)

### Teaching Minor: Secondary School Emphasis

(25 approved credits required)

COURSES		CREDITS
JOUR 300	NEWS WRITING . . . . .	4
JOUR 301	COPY EDITING . . . . .	3
JOUR 318	REPORTING CONTEMPORARY AFFAIRS . . . . .	3
JOUR 375J	THE TEACHING OF JOURNALISM . . . . .	3
CMU 201	COMMUNICATIONS TODAY . . . . .	2
CMU 202	THE HISTORY OF THE PRESS IN AMERICA . . . . .	2
CMU 203	THE PRESS IN CONTEMPORARY AMERICA . . . . .	2
CMU 226	INTRODUCTION TO ADVERTISING . . . . .	3
CMU 310	INTRODUCTION TO MASS COMMUNICATIONS RESEARCH . . . . .	3
		<hr/> 25



## Latin (Classics)

### Teaching Major: Secondary School Emphasis

(36 approved credits required: 27 credits in upper-division Latin courses, and 9 credits chosen from courses in Greek, upper-division Latin, archaeology (Classical Archaeology 341J, 342J, 402J, 404J, 406), classics in English (Classics 210, 422, 426, 427, 428, 430, 435, 440), ancient history (Social Science 101, History 201, 202, 400, 401, 402, 403, 404, 405, 406), and the history of ancient philosophy (Philosophy 320).

### ELECTIVE COURSES

CLASSICAL ARCH 341J	GREEK ARCHAEOLOGY AND ART (2)
CLASSICAL ARCH 342J	ROMAN ARCHAEOLOGY AND ART (2)
CLASSICAL ARCH 402J	GREEK AND ROMAN POTTERY (3)
CLASSICAL ARCH 404J	GREEK AND ROMAN SCULPTURE (3)
CLASSICAL ARCH 406	GREEK ARCHITECTURE (3)
CLAS 210	GREEK AND ROMAN CLASSICS IN ENGLISH (5)
CLAS 422	GREEK HISTORIANS AND PHILOSOPHERS IN ENGLISH (3)
CLAS 426	GREEK AND ROMAN EPIC IN ENGLISH (3)
CLAS 427	GREEK AND ROMAN TRAGEDY IN ENGLISH (3)
CLAS 428	GREEK AND ROMAN COMEDY IN ENGLISH (3)
CLAS 430	GREEK AND ROMAN MYTHOLOGY (3)
CLAS 435	THE ANCIENT NOVEL (3)
CLAS 440	GREEK AND ROMAN CRITICS IN ENGLISH (3)
SOC SCI 101	HISTORY OF CIVILIZATION: THE GREAT CULTURAL TRADITIONS (5)
HIST 201, 202	ANCIENT HISTORY (5,5)
HIST 401	GREECE IN THE AGE OF PERICLES (3)
HIST 402	ALEXANDER THE GREAT AND THE HELLENISTIC AGE (3)
HIST 403	THE EARLY ROMAN REPUBLIC (3)
HIST 404	THE LATE ROMAN EMPIRE (3)
PHIL 320	HISTORY OF ANCIENT PHILOSOPHY (5)

### Latin Major: Elementary School Emphasis

(Requirements are the same as those for the Latin Teaching Major: Secondary School Emphasis.)

### Teaching Minor: Secondary School Emphasis

(18 approved credits required in recommended upper-division Latin courses.)

## Librarianship

### Teaching Minor: Secondary School Emphasis

(24 approved credits required)

COURSES	CREDITS
440 LIBRARIES AND SOCIETY . . . . .	3
441 BASIC LIBRARY MATERIALS . . . . .	3
442 BOOK SELECTION . . . . .	3
443 ORGANIZATION OF LIBRARY MATERIALS: THEORY AND PRACTICE .	3
451 CHILDREN'S LITERATURE I . . . . .	3
453 LITERATURE FOR YOUNG PEOPLE . . . . .	3
454 LIBRARY IN THE SCHOOL . . . . .	3
EDUC 455 INTRODUCTION TO LEARNING RESOURCES IN TEACHING . . . . .	3
	<hr/> 24

Elementary and secondary school librarians must have the following preparation, according to the *Recommended School Library Services and Standards*, January 1960, approved by the State Board of Education.

(1) For service in schools with enrollment up to 400, 18 credits;

(2) For service in schools with enrollment of 400 or more, one year of preparation in an ALA accredited library school.

A high school librarian's certificate is required of all librarians in accredited high schools. Every applicant must hold a teaching certificate.

Courses listed above meet:

(1) Recommendations for elementary, junior, and senior high school librarians in compliance with the *Recommended School Library Services and Standards*, and/or

(2) Standards for the high school librarian's certificate, and/or

(3) Requirements for the Librarianship Teaching Minor: Secondary School Emphasis, undergraduate teacher preparation.

A permission signature must be obtained in Room 133, Suzzallo Library.

## Mathematics

### Teaching Major: Secondary School Emphasis

(45 approved credits required beyond college algebra. Grades of C or higher and a grade-point average of at least 2.00 must be maintained in all mathematics courses.)

COURSES	CREDITS
124, 125, 126 CALCULUS WITH ANALYTIC GEOMETRY (5,5,5) . . . . .	15
224 INTERMEDIATE ANALYSIS . . . . .	3
391 ELEMENTARY PROBABILITY . . . . .	3
392 ELEMENTS OF STATISTICS . . . . .	3
411, 412, 413 LINEAR AND MODERN ALGEBRA (3,3,3) . . . . .	9
444, 445 FOUNDATIONS OF GEOMETRY (3,3) . . . . .	6
APPROVED MATHEMATICS ELECTIVES . . . . .	6
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Education 336 The Teaching of Secondary School Mathematics (3) is recommended for all Mathematics Teaching Majors.

### Mathematics Major: Elementary School Emphasis

(36 approved credits required beyond college algebra. Grades of C or higher and a grade-point average of at least 2.00 must be obtained in all mathematics courses.)

COURSES	CREDITS
124, 125, 126 CALCULUS WITH ANALYTIC GEOMETRY (5,5,5) . . . . .	15
224 INTERMEDIATE ANALYSIS . . . . .	3
391 ELEMENTARY PROBABILITY . . . . .	3
411, 412, 413 LINEAR AND MODERN ALGEBRA (3,3,3) . . . . .	9
445, 445 FOUNDATIONS OF GEOMETRY (3,3) . . . . .	6
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	36

#### Teaching Minor: Secondary School Emphasis

(24 approved credits required beyond college algebra. Grades of C or higher and a grade-point average of at least 2.00 must be obtained in all mathematics courses.)

COURSES	CREDITS
124, 125, 126 CALCULUS WITH ANALYTIC GEOMETRY (5,5,5) . . . . .	15
411, 412 LINEAR AND MODERN ALGEBRA (3,3) . . . . .	6
444 FOUNDATIONS OF GEOMETRY . . . . .	3
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	24

Education 337 The Teaching of Junior High School Mathematics (3) is recommended for all Mathematics Teaching Minors.

#### Music

(A grade-point average of 2.50 must be obtained in all music courses.)

#### Combined Teaching Major and Minor: Secondary School Emphasis (97 approved credits)

COURSES	CREDITS
101, 102, 103 FIRST-YEAR THEORY (2,2,2) . . . . .	6
114, 115, 116 SIGHT SINGING (1,1,1) . . . . .	3
201, 202, 203 SECOND-YEAR THEORY (3,3,3) . . . . .	9
207, 208, 209 MUSIC AFTER 1750 (2,2,2) . . . . .	6
307, 308 MUSIC BEFORE 1750 (2,3) . . . . .	5
321, 322, OR 353 MODAL COUNTERPOINT, TONAL COUNTER- POINT, ORCHESTRATION (3,2,3) . . . . .	6
344 ELEMENTARY SCHOOL MUSIC . . . . .	3
346J THE TEACHING OF SECONDARY SCHOOL MUSIC . . . . .	3
347 MUSIC IN THE UNITED STATES . . . . .	2
384 CONDUCTING (1,1,1) OR	
385 CONDUCTING (1,1,1) . . . . .	2 OR 3
474 THE CURRICULUM IN MUSIC EDUCATION . . . . .	2
476 THE GENERAL MUSIC CLASS . . . . .	2
MAJOR INSTRUMENT OR VOICE . . . . . TO TOTAL	24
MINOR INSTRUMENT OR VOICE . . . . .	12
MUSIC ENSEMBLE (MINIMUM OF ONE YEAR CHORAL ENSEMBLE REQUIRED) . . . . .	12
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	97

#### Music Major: Elementary School Emphasis (50 approved credits required)

COURSES	CREDITS
101, 102, 103 FIRST-YEAR THEORY (2,2,2) . . . . .	6
114, 115, 116 SIGHT SINGING (1,1,1) . . . . .	3
201, 202 SECOND-YEAR THEORY (3,3) . . . . .	6
207, 208, 209 MUSIC AFTER 1750 (2,2,2) . . . . .	6
344 ELEMENTARY SCHOOL MUSIC . . . . .	3
347 MUSIC IN THE UNITED STATES . . . . .	2
APPLIED MUSIC (INCLUDE NOT LESS THAN 3 CREDITS IN VOICE, NOR LESS THAN 3 CREDITS IN PIANO) . . . . . TO TOTAL	18
MUSIC ENSEMBLE . . . . .	6
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	50

#### Norwegian (Scandinavian Languages and Literature)

(A grade-point average of 2.50 must be maintained.)

#### Teaching Major: Elementary School Emphasis (36 credits required)

COURSES	CREDITS
NORW 220, 221, 222 INTRODUCTION TO NORWEGIAN LITERATURE (3,3,3) . . . . .	9
NORW 223, 224, 225 NORWEGIAN CONVERSATION AND COMPOSITION (2,2,2) . . . . .	6
NORW 300, 301, 302 MODERN NORWEGIAN LITERATURE (3,3,3) . . . . .	9
NORW 303, 304, 305 ADVANCED NORWEGIAN CONVERSATION AND COMPOSITION (2,2,2) . . . . .	6
NORW 490 SUPERVISED READING . . . . .	1
EDUC 344 THE TEACHING OF SCANDINAVIAN . . . . .	2
SCAND 455 INTRODUCTION TO SCANDINAVIAN LINGUISTICS . . . . .	3
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	36

#### Teaching Minor: Secondary School Emphasis (42 credits required)

NORW 220, 221, 222 INTRODUCTION TO NORWEGIAN LITERATURE (3,3,3) . . . . .	9
NORW 223, 224, 225 NORWEGIAN CONVERSATION AND COMPOSITION (2,2,2) . . . . .	6
NORW 300, 301, 302 MODERN NORWEGIAN LITERATURE (3,3,3) . . . . .	9
NORW 303, 304, 305 ADVANCED NORWEGIAN CONVERSATION AND COMPOSITION (2,2,2) . . . . .	6
NORW 450 HISTORY OF NORWEGIAN LITERATURE . . . . .	3
NORW 490 SUPERVISED READING . . . . .	4
SCAND 455 INTRODUCTION TO SCANDINAVIAN LINGUISTICS . . . . .	3
EDUC 344 THE TEACHING OF SCANDINAVIAN . . . . .	2
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	42

#### Physical Education for Men

#### Teaching Major: Secondary School Emphasis

(65 approved credits required in Physical Education, Health Education, and Recreation Education; and 35 credits required in specific related courses)

COURSES	CREDITS
H ED 291 PERSONAL AND GENERAL HYGIENE . . . . .	3
H ED 429 METHODS IN TEACHING FIRST AID AND SAFETY . . . . .	3
H ED 465 THE SCHOOL ENVIRONMENTAL HEALTH PROGRAM . . . . .	3
PE 164 SKILLS AND MATERIALS IN AQUATICS . . . . .	2
PE 165 SKILLS AND MATERIALS IN GYMNASTICS . . . . .	2
PE 166 SKILLS AND MATERIALS IN TEAM SPORTS . . . . .	2
PE 190 INTRODUCTION TO PHYSICAL AND HEALTH EDUCATION . . . . .	2
PE 265 SKILLS AND MATERIALS IN LOW-ORGANIZED GAMES . . . . .	2
PE 266 SKILLS AND MATERIALS IN INDIVIDUAL SPORTS . . . . .	2
PE 293 PHYSIOLOGY OF MUSCULAR EXERCISE . . . . .	3
PE 309 THE SCHOOL DANCE PROGRAM: SECONDARY . . . . .	2
PE 322 KINESIOLOGY . . . . .	3
PE 340 ADMINISTRATION OF INTRAMURAL SPORTS . . . . .	3
PE 345 PRINCIPLES OF PHYSICAL EDUCATION . . . . .	3
PE 358 METHODS OF TEACHING GYMNASTICS . . . . .	2
PE 361 METHODS OF TEACHING WRESTLING . . . . .	2
PE 363 METHODS OF TEACHING SPORTS . . . . .	2
PE 364 METHODS OF TEACHING AQUATICS . . . . .	2
PE 370 COACHING OF FOOTBALL (2) OR	
PE 371 COACHING OF BASKETBALL (2) OR	
PE 372 COACHING OF TRACK AND FIELD (2) OR	
PE 373 COACHING OF BASEBALL (2) . . . . . TO TOTAL	6
PE 447 TESTS AND MEASUREMENTS . . . . .	3
PE 450 THE SCHOOL PHYSICAL EDUCATION PROGRAM . . . . .	3



PE 493	PROBLEMS IN ATHLETICS . . . . .	3
R ED 294	INTRODUCTION TO RECREATION . . . . .	2
R ED 324	RECREATION PROGRAMS . . . . .	3
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		63

RELATED COURSES		CREDITS
B STR 301	GENERAL ANATOMY . . . . .	4
PSYCH 100	GENERAL PSYCHOLOGY . . . . .	5
SOC 110	SURVEY OF SOCIOLOGY . . . . .	5
SPCH 100	BASIC SPEECH IMPROVEMENT . . . . .	5
BIOL 101-102	GENERAL BIOLOGY (5-5) OR	
ZOOL 111, 112	GENERAL ZOOLOGY (5,5) . . . . .	10
ZOOL 118	SURVEY OF PHYSIOLOGY (5) AND	
ZOOL 118L	ELEMENTARY PHYSIOLOGY LABORATORY (1) . . . . .	6
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		35

#### Teaching Major: Elementary School Emphasis

(50 approved credits in Physical Education, Health Education, and Recreation Education)

COURSES		CREDITS
H ED 429	METHODS IN TEACHING FIRST AID AND SAFETY . . . . .	3
PE 164	SKILLS AND MATERIALS IN AQUATICS . . . . .	2
PE 165	SKILLS AND MATERIALS IN GYMNASTICS . . . . .	2
PE 166	SKILLS AND MATERIALS IN TEAM SPORTS . . . . .	2
PE 190	INTRODUCTION TO PHYSICAL AND HEALTH EDUCATION . . . . .	2
PE 264	SKILLS AND MATERIALS IN TRACK AND FIELD AND WEIGHT TRAINING . . . . .	2
PE 265	SKILLS AND MATERIALS IN LOW-ORGANIZED GAMES . . . . .	2
PE 266	SKILLS AND MATERIALS IN INDIVIDUAL SPORTS . . . . .	2
PE 293	PHYSIOLOGY OF MUSCULAR EXERCISE . . . . .	3
PE 309	THE SCHOOL DANCE PROGRAM: SECONDARY . . . . .	2
PE 322	KINESIOLOGY . . . . .	3
PE 340	ADMINISTRATION OF INTRAMURAL SPORTS . . . . .	3
PE 345	PRINCIPALS OF PHYSICAL EDUCATION . . . . .	3
PE 358	METHODS OF TEACHING GYMNASTICS . . . . .	2
PE 361	METHODS OF TEACHING WRESTLING (2) OR	
PE 364	METHODS OF TEACHING AQUATICS (2) . . . . .	2
PE 363	METHODS OF TEACHING SPORTS . . . . .	2
PE 370	COACHING OF FOOTBALL . . . . .	2
PE 371	COACHING OF BASKETBALL . . . . .	2
PE 450	THE SCHOOL PHYSICAL EDUCATION PROGRAM . . . . .	3
PE 493	PROBLEMS IN ATHLETICS . . . . .	3
R ED 324	RECREATION PROGRAMS . . . . .	3
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		50

#### Teaching Minor: Secondary School Emphasis

(27 approved credits required)

COURSES		CREDITS
PE 164	SKILLS AND MATERIALS IN AQUATICS . . . . .	2
PE 165	SKILLS AND MATERIALS IN GYMNASTICS . . . . .	2
PE 166	SKILLS AND MATERIALS IN TEAM SPORTS . . . . .	2
PE 264	SKILLS AND MATERIALS IN TRACK AND FIELD AND WEIGHT TRAINING . . . . .	2
PE 265	SKILLS AND MATERIALS IN LOW-ORGANIZED GAMES . . . . .	2
PE 266	SKILLS AND MATERIALS IN INDIVIDUAL SPORTS . . . . .	2
PE 345	PRINCIPALS OF PHYSICAL EDUCATION . . . . .	3
PE 358	METHODS OF TEACHING GYMNASTICS (2) OR	
PE 361	METHODS OF TEACHING WRESTLING (2) OR	
PE 363	METHODS OF TEACHING SPORTS (2) OR	
PE 364	METHODS OF TEACHING AQUATICS (2) . . . . .	2
PE 370	COACHING OF FOOTBALL (2) OR	
PE 371	COACHING OF BASKETBALL (2) OR	
PE 372	COACHING OF TRACK AND FIELD (2) OR	
PE 373	COACHING OF BASEBALL (2) . . . . .	2
PE 450	THE SCHOOL PHYSICAL EDUCATION PROGRAM . . . . .	3
ZOOL 118	SURVEY OF PHYSIOLOGY . . . . .	5
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		27

#### Physical Education for Women

##### Teaching Major: Secondary School Emphasis

(56-62 approved credits required in Physical Education, Health Education, and Recreation Education; 30 credits required in specific related courses.)

COURSES		CREDITS
H ED 291	PERSONAL AND GENERAL HYGIENE (3) AND H ED 453, METHODS AND MATERIALS IN HEALTH TEACHING (3) REQUIRED IF HEALTH EDUCATION MINOR IS NOT COMPLETED . . . . .	6
H ED 292	FIRST AID AND SAFETY (3) OR	
H ED 429	METHODS IN TEACHING FIRST AID AND SAFETY (3) . . . . .	3
DANCE 282	FUNDAMENTALS OF RHYTHM . . . . .	2
DANCE 283	CONTEMPORARY DANCE . . . . .	2
DANCE 377	METHODS IN PHYSICAL EDUCATION III OR	6 OR 7
PE 376	METHODS IN PHYSICAL EDUCATION II (7)	
PE 271	FIELD SPORTS . . . . .	2
PE 272	FUNDAMENTALS OF MOVEMENT . . . . .	2
PE 273	INDIVIDUAL SPORTS . . . . .	2
PE 280	INTRODUCTION TO PHYSICAL AND HEALTH EDUCATION AND RECREATIONAL LEADERSHIP . . . . .	2
PE 281	WOMEN'S GYMNASTICS . . . . .	2
PE 284	AQUATICS . . . . .	1
PE 293	PHYSIOLOGY OF MUSCULAR EXERCISE . . . . .	3
PE 304	OFFICIATING (2) OR	
PE 305-306	OFFICIATING (1-1) . . . . .	2
PE 322	KINESIOLOGY . . . . .	3
PE 345	PRINCIPLES OF PHYSICAL EDUCATION . . . . .	3
PE 374	THEORY AND EVALUATION OF MOTOR LEARNING AND PERFORMANCE . . . . .	5
PE 375	METHODS IN PHYSICAL EDUCATION I . . . . .	4
*PE 436	ADAPTED ACTIVITIES . . . . .	3
PE 450	THE SCHOOL PHYSICAL EDUCATION PROGRAM . . . . .	2
PE N466	COACHING (2 QUARTERS) . . . . .	0
PE 480	PRINCIPLES OF MOVEMENT . . . . .	3
R ED 344	ORGANIZATION AND ADMINISTRATION OF CAMP PROGRAMS . . . . .	3
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		61-62

RELATED COURSES		CREDITS
B STR 301	GENERAL ANATOMY . . . . .	4
CHEM 100	CHEMICAL SCIENCE (5) OR	
APPROVED HIGH SCHOOL EQUIVALENT (ONE YEAR OF HIGH SCHOOL CHEMISTRY) . . . . .		5
H ED 250	CONTEMPORARY HEALTH CONCEPTS . . . . .	2
H EC 300	NUTRITION . . . . .	2
PHYS 114	GENERAL PHYSICS (4) OR	
PHYS 110	GENERAL PHYSICS (3) . . . . .	3 OR 4
SOC 110	SURVEY OF SOCIOLOGY . . . . .	5
ZOOL 118	SURVEY OF PHYSIOLOGY (5) AND	
ZOOL 118L	ELEMENTARY PHYSIOLOGY LABORATORY (1) . . . . .	6
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		27-28

#### Teaching Major: Elementary School Emphasis

(55 approved credits required)

COURSES		CREDITS
DANCE 282	FUNDAMENTALS OF RHYTHM . . . . .	2
ZOOL 118	SURVEY OF PHYSIOLOGY (5) AND	
ZOOL 118L	ELEMENTARY PHYSIOLOGY LABORATORY (1) . . . . .	6
B STR 301	GENERAL ANATOMY . . . . .	4



EDUC 378	PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL . . . . .	3
H ED 250	CONTEMPORARY HEALTH CONCEPTS . . . . .	2
H ED 292	FIRST AID AND SAFETY (3) OR	
H ED 429	METHODS IN TEACHING FIRST AID AND SAFETY (3) . . . . .	3
*H ED 453	METHODS AND MATERIALS IN HEALTH TEACHING . . . . .	3
PE 271	FIELD SPORTS . . . . .	2
PE 272	FUNDAMENTALS OF MOVEMENT . . . . .	2
PE 280	INTRODUCTION TO PHYSICAL AND HEALTH EDUCATION AND RECREATIONAL LEADERSHIP . . . . .	2
PE 281	WOMEN'S GYMNASTICS . . . . .	2
PE 304	OFFICIATING (2) OR	
PE 305-306	OFFICIATING (1-1) . . . . .	2
PE 375	METHODS IN PHYSICAL EDUCATION I . . . . .	4
PE 480	PRINCIPLES OF MOVEMENT . . . . .	3
APPROVED ELECTIVES		15
		55

## SUGGESTED ELECTIVES

DANCE 251, 252, 253	INTERMEDIATE CONTEMPORARY DANCE TECHNIQUE (3,3,3)	
DANCE 256, 257, 258	INTERMEDIATE BALLET TECHNIQUE (3,3,3)	
DANCE 278	INTERMEDIATE FOLK DANCE (3)	
DANCE 283	CONTEMPORARY DANCE (2)	
DANCE 309	THE SCHOOL DANCE PROGRAM: SECONDARY (2)	
DANCE 310	TRADITIONAL DANCE FORMS (2½)	
DANCE 311	RHYTHMIC ACTIVITIES FOR SMALL CHILDREN (2)	
DANCE 351, 352, 353	ADVANCED BALLET AND CONTEMPORARY DANCE TECHNIQUES (5,5,5)	
DANCE 364	HISTORY OF DANCE (3)	
DANCE 355	DANCE COMPOSITION (2, MAX. 6)	
DANCE 377	METHODS IN PHYSICAL EDUCATION III (6)	
H ED 451	WORKSHOP IN HEALTH EDUCATION FOR THE CLASSROOM TEACHER (2½)	
H ED 454	CURRICULUM DEVELOPMENT AND EVALUATION IN HEALTH EDUCATION (2-3)	
PE 273	INDIVIDUAL SPORTS (2)	
PE 284	AQUATICS (1)	
PE 293	PHYSIOLOGY OF MUSCULAR EXERCISE (3)	
PE 304 OR 305-306	OFFICIATING (2, 1-1)	
PE 312	PHYSICAL FITNESS ACTIVITIES FOR CHILDREN (2½)	
PE 322	KINESIOLOGY (3)	
PE 376	METHODS IN PHYSICAL EDUCATION II (7) OR	
PE 295	FUNCTIONAL SWIMMING AND WATER SAFETY (2)	
PE 450	THE SCHOOL PHYSICAL EDUCATION PROGRAM (2)	
PE 498	SPECIAL STUDIES IN PHYSICAL EDUCATION (2-3, MAX. 6)	
R ED 344	ORGANIZATION AND ADMINISTRATION OF CAMP PROGRAMS (3)	
PHYS 114	GENERAL PHYSICS (4)	

\*May be deferred until fifth year.

**Teaching Minor: Secondary School Emphasis**  
(25 approved credits required)

COURSES		CREDITS
DANCE 282	FUNDAMENTALS OF RHYTHM OR APPROVED EQUIVALENTS . . . . .	2
H ED 292	FIRST AID AND SAFETY (3) OR	
H ED 429	METHODS IN TEACHING FIRST AID AND SAFETY (3) . . . . .	3
PE 271	FIELD SPORTS (2) AND	
PE 272	FUNDAMENTALS OF MOVEMENT (2) AND	
PE 273	INDIVIDUAL SPORTS (2) . . . . .	6
PE 280	INTRODUCTION TO PHYSICAL AND HEALTH EDUCATION AND RECREATIONAL LEADERSHIP . . . . .	2
PE 374	THEORY AND EVALUATION OF MOTOR LEARNING AND PERFORMANCE . . . . .	5
PE 375	METHODS IN PHYSICAL EDUCATION I . . . . .	4
APPROVED ELECTIVES	. . . . .	3
		<hr/> 25

## SUGGESTED ELECTIVES

DANCE 251, 252, 253	INTERMEDIATE CONTEMPORARY DANCE TECHNIQUE (3,3,3)	
DANCE 256, 257, 258	INTERMEDIATE BALLET TECHNIQUE (3,3,3)	
DANCE 278	INTERMEDIATE FOLK DANCE (3)	
DANCE 283	CONTEMPORARY DANCE (2)	
DANCE 310	TRADITIONAL DANCE FORMS (2½)	
DANCE 311	RHYTHMIC ACTIVITIES FOR SMALL CHILDREN (2)	
DANCE 351, 352, 353	ADVANCED BALLET AND CONTEMPORARY DANCE TECHNIQUES (5,5,5)	
DANCE 364	HISTORY OF DANCE (3)	
DANCE 355	DANCE COMPOSITION (2, MAX. 6)	
EDUC 340	THE TEACHING OF HEALTH AND PHYSICAL EDUCATION FOR WOMEN (2)	
PE 281	WOMEN'S GYMNASTICS (2) OR	
PE 284	AQUATICS (1)	
PE 293	PHYSIOLOGY OF MUSCULAR EXERCISE (3)	
PE 295	FUNCTIONAL SWIMMING AND WATER SAFETY (2)	
PE 304 OR 305-306	OFFICIATING (2, 1-1)	
PE 312	PHYSICAL FITNESS ACTIVITIES FOR CHILDREN (2½)	
PE 322	KINESIOLOGY (3)	
PE 376	METHODS IN PHYSICAL EDUCATION II (7)	
PE 436	ADAPTED ACTIVITIES (3)	
PE 450	THE SCHOOL PHYSICAL EDUCATION PROGRAM (2)	
PE 480	PRINCIPLES OF MOVEMENT (3)	

## Physics

**Teaching Major: Secondary School Emphasis**  
(51 approved credits required)

COURSES	CREDITS
121, 122, 123 GENERAL PHYSICS (4,4,4)	12
131, 132, 133 GENERAL PHYSICS LABORATORY (1,1,1)	3
221, 222 MECHANICS (3,3)	6
225, 226 ELECTRIC CIRCUITS (4,4)	8
320 INTRODUCTION TO MODERN PHYSICS	3
323 INTRODUCTION TO NUCLEAR PHYSICS	3
325, 326, 327 ELECTRICITY AND MAGNETISM (3,3,4)	10
371, 372 PROPERTIES OF MATTER (3,3)	6
	51

**Physics Major: Elementary School Emphasis**

(Requirements are the same as for the Teaching Major: Secondary School Emphasis.)

**Physics Minor: Secondary School Emphasis**  
(22 approved credits required)

COURSES	CREDITS
121, 122, 123 GENERAL PHYSICS (4,4,4)	12
131, 132, 133 GENERAL PHYSICS LABORATORY (1,1,1)	3
225 ELECTRIC CIRCUITS	4
320 INTRODUCTION TO MODERN PHYSICS	3
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## Political Science

**Teaching Major: Secondary School Emphasis**  
(50 approved credits required)

COURSES	CREDITS
201 MODERN GOVERNMENT . . . . .	5
202 AMERICAN GOVERNMENT AND POLITICS . . . . .	5
BROAD FIELDS:	
(1) POLITICAL THEORY AND PUBLIC LAW (MINIMUM 10 CREDITS)	
(2) GOVERNMENT, POLITICS, AND PUBLIC ADMINISTRATION (MINIMUM 10 CREDITS)	
(3) COMPARATIVE GOVERNMENT AND INTERNATIONAL RELATIONS (MINIMUM 10 CREDITS) . . . . .	TO TOTAL 40



The Department of Political Science maintains a current list of approved courses for the three broad fields. Useful courses for teachers in Washington State are:

- 360 THE AMERICAN CONSTITUTIONAL SYSTEM (3)  
376 STATE AND REGIONAL GOVERNMENT AND ADMINISTRATION (5)

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The Department of Political Science strongly recommends that a student who intends to teach in senior high school elect a minor in history in addition to his major in political science; and that a student who intends to teach in junior high school elect a minor in geography and take History 241 in addition to his major in political science.

#### Political Science Major: Elementary School Emphasis

(Requirements are the same as for the Teaching Major: Secondary School Emphasis.)

#### Teaching Minor: Secondary School Emphasis

(30 approved credits required)

COURSES	CREDITS
201 MODERN GOVERNMENT . . . . .	5
202 AMERICAN GOVERNMENT AND POLITICS . . . . .	5
*BROAD FIELDS	
(1) POLITICAL THEORY AND PUBLIC LAW . . . . . TO TOTAL	5
(2) GOVERNMENT, POLITICS, AND PUBLIC ADMINISTRATION . . . . . TO TOTAL	5
(3) COMPARATIVE GOVERNMENT AND INTERNATIONAL RELATIONS . . . . . TO TOTAL	5
APPROVED UPPER-DIVISION POLITICAL SCIENCE ELECTIVES . . . . .	5
	30

\*The Department of Political Science maintains a current list of approved courses for the three broad fields.

### Psychology

#### Teaching Major: Secondary School Emphasis

(50 approved credits required; 40 credits in psychology and 10 credits in natural sciences chosen from chemistry, physics, or zoology. In addition, one calculus course is required [Mathematics 124, 130, 134, or 157]. Completion of Psychology 100 or 190, 191, and 301, with grades of A or B; and an approved general course record are required for admission to the Department. Transfer students must complete a minimum of 15 credits in psychology and have the appropriate mathematics and science background. Transfer students holding a bachelor's degree with a major in psychology from another accredited institution must have attained a minimum of 2.50 grade-point average in major work or have met requirements for transfer students as stated

here. A cumulative grade-point average of 2.50 is required in all courses counted for major credit.)

#### COURSES

#### CREDITS

100 GENERAL PSYCHOLOGY, OR	
190 INTRODUCTION TO THE SCIENTIFIC ANALYSIS OF BEHAVIOR, OR APPROVED EQUIVALENT . . . . .	5
191 LABORATORY IN THE SCIENTIFIC ANALYSIS OF BEHAVIOR . . . . .	5
301 STATISTICAL METHODS . . . . .	5
APPROVED PSYCHOLOGY ELECTIVES . . . . .	25
APPROVED SCIENCE ELECTIVES IN CHEMISTRY, PHYSICS, OR ZOOLOGY COURSES (BEYOND THE NATURAL SCIENCES DISTRIBUTION REQUIREMENTS) . . . . .	10
	50

Proposed elective or equivalent credits in the major must be approved by the departmental adviser *prior* to registration. *Early* consultation with the departmental adviser concerning major or minor is urged.

#### Psychology Major: Elementary School Emphasis

(Requirements are the same as those for the Psychology Teaching Major: Secondary School Emphasis.)

#### Teaching Minor: Secondary School Emphasis

(30 approved credits required. Transfer students must complete a minimum of 15 credits in psychology in this Department. A cumulative grade-point average of 2.50 is required in psychology courses.)

#### COURSES

#### CREDITS

100 GENERAL PSYCHOLOGY (5) OR	
190 INTRODUCTION TO THE SCIENTIFIC ANALYSIS OF BEHAVIOR (5) . . . . .	5
191 LABORATORY IN THE SCIENTIFIC ANALYSIS OF BEHAVIOR . . . . .	5
301 STATISTICAL METHODS . . . . .	5
APPROVED PSYCHOLOGY ELECTIVES . . . . .	15
	30

Proposed elective credits in psychology must be approved by the departmental adviser *prior* to registration. *Early* consultation with the departmental adviser concerning major or minor is urged.

### Russian

#### (Far Eastern and Slavic Languages and Literature)

#### Teaching Major: Secondary School Emphasis

(A minimum of 52 approved credits including the following courses):

#### COURSES

#### CREDITS

RUSS 310 ACCELERATED RUSSIAN EF (10) OR	
RUSS 300, 305 RUSSIAN E (5), RUSSIAN F (5) . . . . .	10
RUSS 311, 312, 313 INTERMEDIATE RUSSIAN A,B,C (5,5,5) . . . . .	15
RUSS 411, 412, 413 ADVANCED CONVERSATION AND COMPOSITION A,B,C (5,5,5) . . . . .	15
EDUC 341 THE TEACHING OF RUSSIAN . . . . .	2
COURSES CHOSEN FROM ELECTIVES FOR BACKGROUND IN RUSSIAN STUDIES (SEE LIST OF ELECTIVES BELOW)	
MINIMUM OF . . . . .	10

52

## ELECTIVES FOR BACKGROUND IN RUSSIAN STUDIES

FAR E 110 OR 310	THE FAR EAST IN THE MODERN WORLD (5)
FAR E 333J	THE SOVIET UNION (5)
FAR E 421J	KIEVAN AND MUSCOVITE RUSSIA, 850-1700 (5)
FAR E 422J	IMPERIAL RUSSIA, 1700-1900 (5)
FAR E 423J	TWENTIETH-CENTURY RUSSIA (5)
FAR E 424J	MODERN RUSSIAN INTELLECTUAL HISTORY (5)
LING 400	SURVEY OF LINGUISTIC METHOD AND THEORY (3)
POL S 441J	POLITICAL INSTITUTIONS OF THE SOVIET UNION (5)
RUSS 320	RUSSIAN LITERATURE IN ENGLISH (5)
RUSS 421	CONTEMPORARY RUSSIAN LITERATURE IN ENGLISH (5)
RUSS 422	RUSSIAN PLAYS IN ENGLISH (5)
RUSS 426	THE RUSSIAN NOVEL IN ENGLISH (5)
RUSS 427	THE RUSSIAN NOVEL IN ENGLISH (5)
RUSS 451, 452, 453	STRUCTURE OF RUSSIAN (3,3,3)
RUSS 455	HISTORY OF RUSSIAN STANDARD LANGUAGE (5)
RUSS 461, 462	INTRODUCTION TO RUSSIAN LITERATURE (3,3)
SLAV 450	INTRODUCTION TO SLAVIC PHILOLOGY (3)

### Teaching Major: Elementary School Emphasis

(Requirements are the same as the Russian Minor: Secondary School Emphasis.)

### Teaching Minor: Secondary School Emphasis

(A minimum of 33 approved credits including the following courses):

COURSES	CREDITS
RUSS 310 ACCELERATED RUSSIAN EF (10) OR	
RUSS 300, 305 RUSSIAN E (5), RUSSIAN F (5)	10
RUSS 311, 312, 313 INTERMEDIATE RUSSIAN A,B,C (5,5,5)	15
EDUC 341 THE TEACHING OF RUSSIAN	2
COURSES CHOSEN FROM ELECTIVES FOR BACKGROUND IN RUSSIAN STUDIES (SEE LIST OF ELECTIVES ABOVE)	
MINIMUM OF	6
	<hr/> 33

## Sociology

### Teaching Major: Secondary School Emphasis

(50 approved credits in sociology required; a cumulative 2.30 grade-point average is also required.)

COURSES	CREDITS
110 SURVEY OF SOCIOLOGY (5) OR	
310 GENERAL SOCIOLOGY (5)	5
223 SOCIAL STATISTICS	5
230 INTRODUCTION TO HUMAN ECOLOGY (5) OR	
331 POPULATION PROBLEMS (5) OR	
430 HUMAN ECOLOGY (5)	5
240 GROUP BEHAVIOR	5
450 CONTEMPORARY AMERICAN INSTITUTIONS (5) OR	
352 THE FAMILY (5)	5
APPROVED SOCIOLOGY ELECTIVES, CHOSEN AFTER CONSULTATION REGARDING THE STUDENT'S SPECIAL FIELD OF INTEREST	25
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### Sociology Major: Elementary School Emphasis

(Requirements are the same as for the Teaching Major: Secondary School Emphasis.)

### Teaching Minor: Secondary School Emphasis

(27 approved credits in sociology required)

## COURSES

## CREDITS

110 SURVEY OF SOCIOLOGY (5) OR	
310 GENERAL SOCIOLOGY (5)	5
352 THE FAMILY (5) OR	
331 POPULATION PROBLEMS (5) OR	
430 HUMAN ECOLOGY (5)	5

APPROVED SOCIOLOGY ELECTIVES CHOSEN AFTER CONSULTATION REGARDING THE STUDENT'S SPECIAL FIELD OF INTEREST	17
	<hr/> 27

## Spanish (Romance Languages and Literature)

### Teaching Major: Secondary School Emphasis

(45 approved credits required; proficiency in oral and written Spanish, knowledge of Hispanic literature and culture, and training in the application of modern principles, materials, and methods of foreign-language teaching. The candidate will be required to take certain tests to demonstrate his acquisition of the language skills; satisfaction of the remainder of the requirements is to be certified by an adviser in the Department of Romance Languages and Literature. The candidate's program of study, supervised by a Department adviser, should normally include the courses listed below.)

COURSES	CREDITS
101-102, 103 ELEMENTARY (5-5,5) OR APPROVED EQUIVALENT	15
201, 202, 203 INTERMEDIATE (5,5,5) OR APPROVED EQUIVALENT	15
301, 302 ADVANCED SYNTAX AND COMPOSITION (3,3)	6
303 SPANISH STYLISTICS	3
304 SURVEY OF SPANISH LITERATURE: 1140-1498 (3)	
305 SURVEY OF SPANISH LITERATURE: 1498-1681 (3)	
306 SURVEY OF SPANISH LITERATURE: 1681 TO THE PRESENT (3)	9
308 SPANISH LITERATURE OF THE GOLDEN AGE (3) OR	
309 CONTEMPORARY SPANISH LITERATURE (3) OR	
310 INTRODUCTION TO SPANISH AMERICAN LITERATURE (3)	3
327 ADVANCED CONVERSATION (2, MAX. 8) OR	
330 CONVERSATIONAL SPANISH (2½ OR 4, MAX. 8) OR	
430 CONVERSATIONAL SPANISH (2½ OR 4, MAX. 8)	TO TOTAL 6
SPAN 409 ADVANCED PHONETICS	3
ROM 401 INTRODUCTION TO ROMANCE LINGUISTICS	3
APPROVED ELECTIVES IN ROMANCE LANGUAGES AND LITERATURE COURSES NUMBERED ABOVE 400	9
EDUC 343S THE TEACHING OF SPANISH: SECONDARY EMPHASIS	3
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Credit may be arranged for study abroad, preferably during the junior year, subject to the regulations governing transfer credit and provided the student's plan is approved in advance by the Registrar's Office and by the departments in which he is studying. Summer study abroad is encouraged.

### Teaching Major: Elementary School Emphasis

(Requirements are the same as for the Teaching Major: Secondary School Emphasis.)

### Teaching Minor: Secondary School Emphasis

(Requirements are the same as for the Teaching Major: Secondary School Emphasis, with one exception—electives in Romance Languages and Literature courses numbered above 400 are not required of the candidate for the Spanish Teaching Minor.)



## Speech

### Teaching Major: Secondary School Emphasis

(56 approved credits required. In the fifth year, the student must elect an additional 15 credits of upper-division courses approved by the Department of Speech, including Speech 400 Backgrounds in Speech (3), if not already taken.)

COURSES	CREDITS
100 BASIC SPEECH IMPROVEMENT . . . . .	5
110 VOICE AND ARTICULATION IMPROVEMENT . . . . .	2
140 ORAL INTERPRETATION . . . . .	5
220 INTRODUCTION TO PUBLIC SPEAKING . . . . .	5
230 ESSENTIALS OF ARGUMENT . . . . .	5
235 PARLIAMANTARY PROCEDURE . . . . .	3
310 SPEECH SCIENCE . . . . .	5
332 PRINCIPLES OF GROUP DISCUSSION . . . . .	5
335 METHODS OF DEBATE . . . . .	3
370 SPEECH CORRECTION . . . . .	5
EDUC 342 THE TEACHING OF SPEECH . . . . .	3
DRAMA 325 PLAY PRODUCTION (STAGECRAFT) . . . . .	5
DRAMA 326 PLAY PRODUCTION (ACTING AND DIRECTING) . . . . .	5
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	56

Teacher candidates with a major in Speech will normally be advised to elect English as their first minor. Other recommended minors include social studies, drama, or a modern foreign language. Such major-minor combinations are proposed on the basis of most probable teaching assignment combinations in the secondary schools of Washington State.

### Speech Major: Elementary School Emphasis

(40 approved credits required)

COURSES	CREDITS
100 BASIC SPEECH IMPROVEMENT . . . . .	5
110, 111 VOICE AND ARTICULATION IMPROVEMENT (2,2) . . . . .	4
140 ORAL INTERPRETATION . . . . .	5
220 INTRODUCTION TO PUBLIC SPEAKING . . . . .	5
332 PRINCIPLES OF GROUP DISCUSSION . . . . .	5
359 SPEECH IN THE CLASSROOM . . . . .	3
370 SPEECH CORRECTION . . . . .	5
APPROVED SPEECH ELECTIVES, WHICH MAY INCLUDE DRAMA 338, CREATIVE DRAMATICS (3), AND LIBRARIANSHIP 452 STORYTELLING (3) . . . . .	8
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	40

### Speech Minor: Secondary School Emphasis

(30 approved credits required)

COURSES	CREDITS
100 BASIC SPEECH IMPROVEMENT . . . . .	5
110 VOICE AND ARTICULATION IMPROVEMENT (2) . . . . .	2
or	
111 VOICE AND ARTICULATION IMPROVEMENT (2) . . . . .	2
140 ORAL INTERPRETATION . . . . .	5
220 INTRODUCTION TO PUBLIC SPEAKING . . . . .	5
332 PRINCIPLES OF GROUP DISCUSSION . . . . .	5
359 SPEECH IN THE CLASSROOM (3) OR	
370 SPEECH CORRECTION . . . . .	5
EDUC 342 THE TEACHING OF SPEECH . . . . .	3
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	30

### Speech and Hearing Therapy Major: Elementary School Emphasis

(62–66 credits, including the following:)

COURSES	CREDITS
311 ANATOMY OF THE SPEECH MECHANISM . . . . .	5
312 GENERAL PHONETICS . . . . .	5
370 SPEECH CORRECTION . . . . .	5
371 SPEECH CORRECTION . . . . .	5
373 DIAGNOSTIC METHODS IN SPEECH CORRECTION . . . . .	5
475 STUTTERING . . . . .	3
476 LANGUAGE DEVELOPMENT OF THE CHILD . . . . .	3
478 INTERVIEW TECHNIQUES FOR SPEECH AND HEARING REHABILITATION . . . . .	3
480 INTRODUCTION TO AUDIOLOGY . . . . .	5
481 PRINCIPLES AND METHODS OF AURAL REHABILITATION . . . . .	5
485 MEDICAL BACKGROUND FOR AUDIOLOGY . . . . .	2
487 AUDIOMETRY . . . . .	3
374 CLINICAL PRACTICE IN SPEECH CORRECTION (1-5, MAX. 15) AND	
484 CLINICAL PRACTICE IN AURAL REHABILITATION (1-5, MAX. 15)	
MINIMUM OF 3 CREDITS IN EITHER . . . . . TO TOTAL	7

(Two courses elected from the following:)

140 ORAL INTERPRETATION (5)
220 INTRODUCTION TO PUBLIC SPEAKING (5)
230 ESSENTIALS OF ARGUMENT (5)
332 PRINCIPLES OF GROUP DISCUSSION (5)
359 SPEECH IN THE CLASSROOM (3)
400 BACKGROUNDS IN SPEECH (3)

### Swedish (Scandinavian Languages and Literature)

(A grade-point average of 2.50 must be maintained.)

### Teaching Major: Elementary School Emphasis

(36 credits required)

SWED 220, 221, 222 INTRODUCTION TO SWEDISH LITERATURE (3,3,3) . . . . .	9
SWED 223, 224, 225 SWEDISH CONVERSATION AND COMPOSITION (2,2,2) . . . . .	6
SWED 300, 301, 302 MODERN SWEDISH LITERATURE (2,2,2) . . . . .	6
SWED 303, 304, 305 ADVANCED CONVERSATIONAL SWEDISH (2,2,2) . . . . .	6
SWED 306, 307, 308 ADVANCED SWEDISH COMPOSITION (1,1,1) . . . . .	3
SCAND 455 INTRODUCTION TO SCANDINAVIAN LINGUISTICS . . . . .	3
EDUC 344 THE TEACHING OF SCANDINAVIAN . . . . .	2
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	36

### Teaching Minor: Secondary School Emphasis

(42 credits required)

SWED 220, 221, 222 INTRODUCTION TO SWEDISH LITERATURE (3,3,3) . . . . .	9
SWED 223, 224, 225 SWEDISH CONVERSATION AND COMPOSITION (2,2,2) . . . . .	6
SWED 300, 301, 302 MODERN SWEDISH LITERATURE (2,2,2) . . . . .	6
SWED 303, 304, 305 ADVANCED CONVERSATIONAL SWEDISH (2,2,2) . . . . .	6
SWED 306, 307, 308 ADVANCED SWEDISH COMPOSITION (1,1,1) . . . . .	3
SWED 490 SUPERVISED READING . . . . .	7
SCAND 455 INTRODUCTION TO SCANDINAVIAN LINGUISTICS . . . . .	3
EDUC 344 THE TEACHING OF SCANDINAVIAN . . . . .	2
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	42



## THE STANDARD CERTIFICATE

The Standard Certificate is issued by the State Department of Public Instruction upon recommendation from an approved institution of higher learning in the state of Washington. The requirements of the College of Education, University of Washington, combined with the requirements of the State Board of Education for the Standard Certificate are as follows:

### Basic Provisions, General

(1) Possession of a valid Provisional Certificate; (2) at least two years of successful teaching on the Provisional Certificate or equivalent, at the elementary and/or secondary level(s); (3) completion of 45 quarter credits of approved course work beyond the Provisional Certificate requirement including completion of deferred courses from the Provisional Certificate pattern and any appropriate suggestions from the field. Such work must represent study in both professional and academic fields.

### Specific Requirements, University of Washington College of Education

#### SECONDARY EMPHASIS

A minimum of 3 credits must be selected from one of the following areas: (a) curriculum development, (b) guidance and counseling, (c) special education.

#### ELEMENTARY EMPHASIS

Students shall complete or have completed 15 credits beyond minimum degree requirements in the College of Education in the two basic fields of knowledge outside the major (humanities, social sciences, natural sciences).

### Specific Requirements, State Board of Education

1. At least 50 per cent of the 45 quarter credits in the fifth year must be upper-division and/or graduate courses.

2. A maximum of 12 quarter credits may be taken by correspondence and/or extension in the fifth year provided no transfer work from other institutions is included.

3. A minimum of 22½ quarter credits approved by the attesting institution must be completed in *residence* at one institution. These credits may be earned in the thirteenth, fourteenth, or fifteenth quarters.

4. A maximum of 30 quarter credits in excess of degree requirements may be taken before or during the first year of teaching.

5. A minimum of 15 quarter credits must be taken after one year of successful teaching experience.

6. A college-level course in Washington State history must be completed or an examination must be passed in the office of the County School Superintendent (first Saturday in March).

7. A grade of C or higher must be attained in all course work required for the fifth year.

Students are reminded that a petition for the Standard Certificate should be filed in the College of Education Advisory Office when the conversion program is started.

## GRADUATE PROGRAMS

### Graduate Program Adviser

Gordon C. Lee  
210 Miller Hall

### Graduate Information Office

Claire F. Jones  
210 Miller Hall

The Department of Education provides, by means of its graduate programs, for the continuing education of teachers and other specialists in various phases of education, for the preparation of school and college administrators, and for the scholarly study of the educational process itself—its history, philosophy, and organization, and the sociological and psychological foundations of its operation. In addition to the "fifth" or post-baccalaureate year required by the state of Washington for the standard teaching credential which may be part of a *bona fide* graduate program, certain of the special



professional certificates for school personnel, requiring graduate study, may be earned through the College of Education.

Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section as well as the general departmental requirements listed below. After admission to Graduate School, certain steps must be successfully completed before a student is accepted as a prospective doctoral candidate. The Department of Education normally requires prospective candidates for advanced degrees to present at least 20 credits in background courses in education. A minimum of one year of successful teaching or administrative experience is required before the completion of a program leading to a master's degree; two years of successful teaching or administrative experience are normally required for admission to a program leading to a doctoral degree.

#### GRADUATE DEGREE PROGRAMS

The basic graduate programs offered by the College of Education lead to one of four advanced degrees: Master of Arts, Master of Education, Doctor of Education, and Doctor of Philosophy.

Within the programs leading to the four degrees named above, the following fields and specializations are available with the exceptions noted: curriculum and instruction, educational administration, educational psychology and psychological services, higher education (doctoral level only), history-philosophy-sociology of education (sociology of education, master's level only), and special education (master's level only).

Students entering these programs will be governed by the requirements outlined below.

##### Master of Arts

The requirements are: Completion of an approved program of a minimum of 36 quarter credits of graduate work (exclusive of prerequisites) to consist of at least 27 quarter credits in courses in a field of concentration in education, including related course work in and outside of education, and 9 quarter credits in *Thesis*; completion of an acceptable thesis; demonstration of a reading knowledge of one language other than English; and a written final examination.

##### Master of Education

The requirements are: Completion of an approved program of a minimum of 45 quarter credits of graduate

work (exclusive of prerequisites) consisting of at least 24 quarter credits in a field of concentration in education, at least 12 quarter credits in related courses in and outside of education, and 9 quarter credits in *Thesis* or such special assignment as research seminar or field study; and a written final examination.

##### Doctor of Philosophy

The requirements are: Completion of an approved program of a minimum of 90 quarter credits of graduate work beyond the master's degree (exclusive of prerequisites) focusing upon an area of specialization consisting of at least 36 quarter credits in a field of concentration in education and approximately 12 quarter credits in supporting courses in a field other than education; approximately 12 quarter credits in the techniques of scholarly research; 30 quarter credits in *Dissertation*; demonstration of a reading knowledge of two languages other than English; a General Examination, written and oral; an oral Final Examination after the dissertation has been satisfactorily completed.

##### Doctor of Education

The requirements are: Completion of an approved program of a minimum of 96 quarter credits of graduate work beyond the master's degree (exclusive of prerequisites) focusing upon an area of specialization consisting of at least 24 quarter credits in a field of concentration in education; approximately 20 credits in related courses in and outside of education; approximately 10 credits in an internship or field experience relevant to the area of concentration; approximately 12 quarter credits in the techniques of scholarly research; 30 quarter credits in *Dissertation*; a General Examination, written and oral; and an oral Final Examination after the dissertation has been satisfactorily completed.

For further details, students should check with the Graduate Program Advisers, their faculty supervisors, or the Graduate Information Office, 210 Miller Hall.

## ADMINISTRATORS' CREDENTIALS

The revised requirements for administrators' credentials were adopted by the State Board of Education March 24, 1956, and became effective June 1, 1957. All applications are to be made to the State Superintendent of Public Instruction, Olympia, Washington.

## **I. Provisional Principal's Credential**

(Elementary, Secondary, and General)

*A.* Applications for the Provisional Principal's Credential may be filed by students with full graduate standing in the Graduate School after one year of successful teaching and prior to completion of requirements, preferably before the applicant has begun study for the credential.

*B.* A total of 54 quarter credits beyond the bachelor's degree in an approved institution is the required minimum. Of these 54 credits, 24 must be in an approved program, which will make a maximum contribution to the individual's responsibilities as a principal.

*C.* At least 9 credits of the 54 quarter credits must have been earned *after* completion of the Standard Certificate. These 9 quarter credits shall be in courses in administration, curriculum, and supervision on the elementary and/or secondary level. These 9 credits must be earned in residence at the University of Washington.

*D.* A total of 12 credits toward the 24 may be transferred from an approved institution. Not more than 6 of the 24 credits may be earned by extension and no credits earned in correspondence study may be applied. The combination of transfer and extension work may not exceed 12 credits.

*E.* Laboratory and internship type experiences shall be a part of the program. These shall take the form of supervised administration experiences in school situations.

*F.* Proof of three years of successful teaching experience on the appropriate level or levels is one of the requirements for a Provisional Principal's Credential.

*G.* The credential is dependent upon proof that the applicant possesses the qualities of leadership necessary for school administration and an evaluation of the applicant's success in positions already held.

*H.* After admission to graduate standing in the Graduate School, an official program plan must be arranged in consultation with a faculty supervisor in Educational Administration.

*I.* The provisional Principal's Credential is valid for not more than four years of administrative experience

in elementary schools of six or more teachers or in accredited junior, senior, and four-year or six-year high schools.

## **II. Standard Principal's Credential**

(Elementary, Secondary, and General)

*A.* Applications for the Standard Principal's Credential may be filed during the applicant's second year of experience as a principal and prior to completion of requirements.

*B.* After completion of the Provisional Principal's Credential, 12 credits in residence at the University of Washington must be earned for a Standard Principal's Credential. These credits shall be in approved courses in administration, supervision, and curriculum on the elementary and/or secondary level.

*C.* A master's degree is required for the Standard Principal's Credential. This degree may be completed in the College of Education or in an academic department.

*D.* Three years of successful teaching experience (two years of which must be as a full-time classroom teacher), and three years of experience as a principal on the appropriate level or levels are requirements for a Standard Principal's Credential.

*E.* The credential is dependent upon proof that the applicant possesses the qualities of leadership necessary for school administration and an evaluation of the applicant's success in positions already held.

*F.* An official program plan must be arranged in consultation with a faculty supervisor in Educational Administration.

*G.* The Standard Principal's Credential is valid as long as the holder's teaching certificate is valid.

## **III. Provisional Superintendent's Credential**

*A.* Applications for the Provisional Superintendent's Credential may be filed after the applicant has completed preparation for a Standard Principal's Credential and prior to completion of requirements.

*B.* After completion of the Standard Principal's Credential, 12 credits in residence at the University of Washington must be earned for a Provisional Super-



intendent's Credential. These credits shall be in approved courses in administration, supervision, and curriculum on the elementary and/or secondary level.

*C.* A master's or higher degree is required for the Provisional Superintendent's Credential. This degree may be completed in an academic department or in the College of Education.

*D.* Candidates with experience as principals at one level only are to have laboratory experience at the opposite level. These experiences are to be planned with the candidate, the teacher-education institution, and school administrators.

*E.* Three years of successful teaching experience (two years of which must be as a full-time classroom teacher), and four years of administrative experience on the appropriate level or levels are requirements for a Provisional Superintendent's Credential.

*F.* The credential is dependent upon proof that the applicant possesses the qualities of leadership necessary for school administration and an evaluation of the applicant's success in positions already held.

*G.* An official program plan must be arranged in consultation with a faculty supervisor in Educational Administration.

*H.* The Provisional Superintendent's Credential is valid for three years of administrative experience.

#### **IV. Standard Superintendent's Credential**

*A.* Applications for the Standard Superintendent's Credential may be filed by the candidate after one year's service as a superintendent, and prior to completion of requirements.

*B.* After completion of the Provisional Superintendent's Credential, 12 credits in residence at the University of Washington must be earned for a Standard Superintendent's Credential. These credits shall be in approved courses in the areas of administration, supervision, and curriculum.

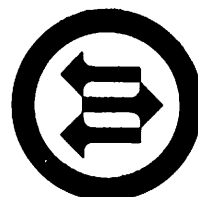
*C.* Three years of successful superintendent's experience are required for a Standard Superintendent's Credential.

*D.* An official program must be completed by all candidates with a faculty supervisor in Educational Administration.

*E.* The Standard Superintendent's Credential is valid as long as the holder's teaching certificate is valid.







## ENGINEERING

### Dean

Charles H. Norris  
206 Guggenheim Hall

### Associate Deans

W. Ryland Hill (on leave)  
206 Guggenheim Hall

H. Myron Swarm (acting)  
206 Guggenheim Hall

### Assistant Dean

Endrik Noges (acting)  
206 Guggenheim Hall

### Executive Committee

Charles H. Norris, Chairman, A. L. Babb, R. J. H. Bollard, S. W. Chapman, A. V. Eastman, V. B. Hammer, R. G. Hennes, A. Hertzberg, W. Ryland Hill (on leave), E. W. Jordahn (*ex officio*), C. J. Kippenhan, R. W. Moulton, Endrik Noges, D. A. Pifer, H. Myron Swarm (acting)

Twentieth-century technology is dependent on cooperative teamwork among engineers, scientists, and engineering technicians. Engineers use the principles of science and of engineering to create things that people

need or want. Bridges, highways, ships, planes, rockets, power transmission lines, and the machinery to build them—these and more are the concern of the engineer. He must be competent to understand and use methods of science; he must apply ingenuity to devise a product or process both useful and economical; he must assume professional responsibility for the safety and well-being of people affected by his works.

The scientist discovers new principles. A truly qualified scientist usually must have a college education extending past the four-year bachelor degree to the Doctor of Philosophy degree. The engineer with the bachelor degree is more immediately useful to industry for many technical positions. However, engineers who plan to engage in research, in college teaching, or in creative design on a high professional level now need graduate study leading to master and doctoral degrees. Students with academic aptitudes should seriously consider at least a fifth year of specialization.

Assisting the engineer and the scientist is the engineering technician. His work is practical and applied, requiring approximately two years of post-high school training in a technical institute or a junior college. He works closely with the engineer to test and develop models, and to put engineering designs into production.

The College offers educational programs in the various fields of engineering with five main aims: (1) to provide a strong undergraduate engineering education leading to a bachelor's degree and enabling some students immediately to enter the engineering profession; (2) to provide a fundamental scientific and technical foundation for graduate studies; (3) to provide a stimulating program of graduate studies and research for students who have the potential to pursue such programs successfully; (4) to permit the outstanding student to realize his full capabilities; and (5) to encourage each student to read, study, and progress professionally on his own.

Although engineering education is directed primarily toward providing the scientific and technical foundation required for the profession, each curriculum includes courses in the humanities and social studies to broaden the student's knowledge, increase his sense of responsibility, and help him live more effectively as an individual engineer and citizen.

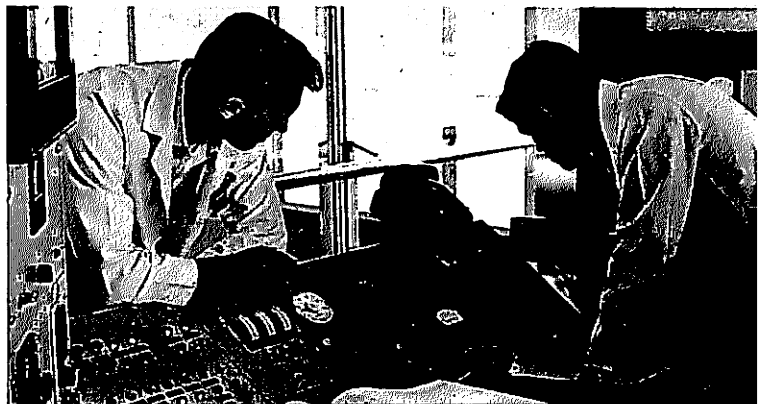
In recognition of the responsibility of the University for the development of knowledge and the training of research personnel, the College has active graduate programs in all engineering degree departments. The College has also developed an expanded research program at every level in these departments. Not only does this research advance engineering knowledge, but it is an integral part of the educational experience needed to qualify men for research and development positions, or for careers in engineering teaching.

The College of Engineering has been a major unit of the University since 1899, with the first engineering degree awarded in mining engineering in 1900. Progressively, degrees in civil engineering (1901), electrical engineering (1902), mechanical engineering (1906), chemical engineering (1907), aeronautical engineering (1929), and nuclear engineering (1955) were added. The College, participating in the technological development of the Northwest, has shared the University's rapid growth, with a present faculty of 180 members. Last year, 2,400 undergraduates and 750 graduate students were enrolled in engineering curricula.

### **College Facilities and Services**

The teaching and research activities of the College of Engineering occupy eleven major campus buildings and portions of others. All except the Hydraulics Laboratory are grouped around the Engineering Quadrangle. These buildings, most of them relatively new, contain the office, classroom, and administrative facilities of

the College and also house the numerous research and teaching laboratories. A central Engineering Library serves the College, which together with the nearby Chemistry and Chemical Engineering Library and the Mathematics and Physics Library provides outstanding collections of books and periodicals of interest to engineers. The Research Computer Laboratory of the University is also located within the College of Engineering complex, thus making it particularly convenient for many engineering studies.



Facilities of particular interest include a large wind tunnel, a 100-kilowatt nuclear reactor, a 44-acre antenna site, a microwave laboratory, a large structural testing laboratory, an extensive hydraulics laboratory, and a laboratory for heat transfer studies. Greatly expanded laboratory facilities for Ceramics and Metallurgy have recently been completed.

A new laboratory and classroom building for Chemical Engineering was completed just prior to the 1966 academic year. Future plans include modern and expanded quarters for the Engineering Library, new administrative offices, and a substantial increase in laboratory space for Aeronautics and Astronautics.

The University of Washington assumed the administration of the school formerly known as the General Electric School of Nuclear Engineering at Richland, Washington, on July 1, 1958. This facility is now operated as the Center for Graduate Study at Hanford. This transfer of administration was made to enhance the opportunities for continuing graduate and upper-division study available to employees of the Atomic Energy Commission and companies in the area near Richland. In addition to the above, this facility provides further opportunities for research to graduate students enrolled on the Seattle campus who desire to take advantage of them.



## Office of Engineering Research

### Director

Charles H. Norris  
206 Guggenheim Hall

### Assistant Director

Erik W. Jordahn  
314B Guggenheim Hall

The *Office of Engineering Research*, formerly called the Engineering Experiment Station, performs a three-fold function:

1. It stimulates, promotes, and coordinates investigations and research in all fields of engineering.
2. It publishes results of significant research achievements.
3. It provides opportunities through graduate research assistantships for engineering students to extend their professional education while pursuing a course of study leading to the master's or doctoral degree.

The functioning of the Office of Engineering Research is guided by an Engineering Research Board consisting of the Dean of the College of Engineering as chairman, the assistant director, and the chairmen of the academic departments. All research is carried on in the departments of the College under the supervision of departmental faculties.

The Office offers a number of research assistantships to highly qualified graduate students who are assigned to the academic departments. Current research findings, as well as listings of sponsored projects, appear in the quarterly journal, *The Trend in Engineering*, which has a circulation of 4,000, including 150 foreign institutions.

## Student Activities

The *Engineering Student Council* is made up of representatives elected from student organizations in the departments of the College. Tau Beta Pi, the honorary fraternity also has a representative on the Council, which supervises various student activities.

## Honorary and Professional Societies

All the great professional engineering societies, such as the American Society of Civil Engineers, the Institute of Electrical and Electronic Engineers, and the American Society of Mechanical Engineers, have student chapters on the campus, and every engineering student is encouraged to join the chapter that represents his

field of interest. The College also has a student chapter of the Society of Women Engineers.

Honor societies open to engineering students are *Tau Beta Pi* and *Sigma Xi*. Students who have maintained high scholarship and are of commendable character may be elected to membership in Tau Beta Pi in their junior or senior year. Election to Tau Beta Pi constitutes one of the highest honors an undergraduate engineering student can receive.

## Financial Aids

The College offers financial assistance to undergraduates through industrial scholarships and limited loan funds. The *Handbook of Scholarships* available from the Office of Financial Aids, 333 Student Union Building, or the departmental advising offices, lists available scholarships. Qualified graduate students may obtain financial assistance through industrial and governmental fellowships, National Science Foundation, National Aeronautics and Space Administration, and Public Health Service traineeships, research assistantships, or teaching assistantships. Students seeking such aid should apply at the office of their major department.



## UNDERGRADUATE PROGRAMS

(Advisers are listed under the individual departments.)

Curricula in the College of Engineering are accredited by the Engineers' Council for Professional Development, the principal accrediting agency of the engineering profession in the United States. All courses of study are designed to provide an understanding of the physical sciences; a fundamental background for the conception, design, construction, operation, and improvement of structures and machines, of processes and projects; and an educational foundation in the humanities and the social sciences.

### **Admission as Freshmen**

Admission to the University as described in the *Undergraduate Education* section establishes that the student is eligible for admission to the College of Engineering. However, a student intending to pursue an engineering career should choose his high school elective to provide the background essential to engineering studies. Intermediate algebra, trigonometry, physics, and chemistry are prerequisites for the first-year courses in Engineering. Those who fail to include these subjects in high school must study equivalent courses at the University in addition to the normal required program. This may extend the time needed for a degree. The College also recommends electing a fourth year of mathematics and senior composition when possible.

### **Admission with Advanced Standing**

A qualified student in good standing at an accredited institution may apply for admission with advanced standing. Such an applicant is expected to have the same high school preparation as the student who enters as a freshman, and to have a college grade-point average which meets the standards herein specified.

With fewer than 45 acceptable credits, an applicant must present a grade-point average of 2.50 in high school work and a 2.30 cumulative average in all college work.

With 45 or more acceptable credits, an applicant is expected to present a cumulative and last-term grade-point average of at least 2.30. See also the section on *Transfer Credit*.

### **Mathematics Placement Tests**

For information concerning the qualifying mathematics tests in the Pre-College Testing Program, see *Undergraduate Education* section.

### **Programs of Study**

The engineering student enrolls for his first year in the Department of General Engineering, where he is assigned to a member of the faculty who advises him on his educational objectives and his program of study. This first-year curriculum, administered for the other departments of the college by the Department of General Engineering, provides courses in basic engi-

neering and science subjects as well as an orientation course designed to familiarize the student with University activities, the various fields of engineering, and the opportunities open to the engineering graduate. At the beginning of the sophomore year, regular students enter the curriculum of the department in which they have decided to major.

All undergraduate engineering students are required to take an integrated sequence of courses in the humanities and social sciences. These courses, offered by the Department of Humanistic-Social Studies, are designed to include a general, nontechnical education as an integral part of the engineer's professional training.

Four-year curricula leading to bachelor degrees are offered in the Departments of Aeronautics and Astronautics, Chemical, Civil, Electrical, and Mechanical Engineering, and in the School of Mineral Engineering through the Divisions of Ceramic, Metallurgical, and Mining Engineering.

In addition to the four-year curricula, the College offers a course of study in industrial engineering for which a second bachelor degree is awarded at the end of five years; the first four years comprise the standard four-year curriculum of any branch of engineering in which the College grants a bachelor degree, while the fifth is made up of courses in industrial management and related subjects.

### **Graduation Requirements**

Students working toward bachelor degrees in engineering must meet certain general requirements of the University and the College as well as the particular course requirements of their major department. Course requirements for each degree are described in the curricular announcements of the departments.

For graduation, the College of Engineering requires completion of one of the prescribed engineering curricula, including the required quarters of physical education activity. This requirement supersedes the minimum credit requirement of the University (180 academic credits plus 3 physical education activity credits). No more than 9 quarter credits in advanced ROTC courses may be counted toward graduation. Grades earned at other institutions may not be used to raise the grade-point average at the University of Washington.



## Honors Program

### Chairman

W. Ryland Hill (on leave)  
206 Guggenheim Hall

Walter E. Rogers (acting)  
304 Electrical Engineering Building

The honors program of the College of Engineering provides an opportunity for the gifted undergraduate engineering student to develop to his fullest extent.

The objectives of the honors program are achieved through the provision of special honors sections in the engineering and supporting curricula, by permitting greater program flexibility to suit special needs, by the development of ingenuity and a research attitude in special honors projects, and by participation in seminars and honors colloquia available on a campus-wide basis.

Although the designation of honors students is not made until the end of the freshman year, the program actually starts at college entrance. The taking of honors sections in mathematics or entrance into the college mathematics sequence at a higher level than normal because of advanced high school preparation, will serve as the basis of the honors work to follow. However, the honors program should also attract those students who display outstanding scholarship during the freshman year even though their progress may not have been accelerated in high school or in college honors courses. Of importance in the selection of honors students at the end of the freshman year will be advanced standing in mathematics, inclusion of honors courses in mathematics, and outstanding academic performance.

An entering student interested in the honors program should consult with an adviser in the Department of General Engineering to plan a program that will best fit his abilities and high school preparation.

A student may drop from the honors program into regular status at any time. Conversely, a student may enter the honors program later than normal if he can demonstrate the necessary ability and background. He should consult his departmental honors adviser and present to the college honors chairman supporting letters from one or more professors familiar with his work.

Honors students successfully completing a program including a substantial number of honors courses are graduated "With College Honors in Engineering."

## GRADUATE PROGRAMS

(Graduate Program Advisers are listed under individual departments.)

Students who intend to work toward advanced degrees must fulfill the admission requirements of the Graduate School and of the department in which they expect to major. Acceptance will also depend upon the availability of the faculty and facilities for the program desired.

### Departmental Graduate Programs

Graduate study leading to a Master of Science degree with departmental designation is available in the Departments of Aeronautics and Astronautics, Chemical, Civil, Electrical, Mechanical, and Nuclear Engineering, and in the School of Mineral Engineering through the Divisions of Ceramic, Metallurgical, and Mining Engineering.

The degree of Master of Science in Engineering (without departmental designation) is offered to qualified advanced students whose undergraduate majors have been in departments different from those in which they are working toward master's degrees, and to students who are doing graduate work in several engineering departments with the approval of advisers in their major departments.

The degrees of Master of Aeronautics and Astronautics and Master of Electrical Engineering are offered to students who satisfactorily complete an approved two-year program of graduate work in these departments.

Graduate study leading to the Doctor of Philosophy degree is available in aeronautics and astronautics, in chemical, civil, electrical, mechanical, and nuclear engineering, in ceramics, and in metallurgy, and through the interdisciplinary program of engineering mechanics.

Graduate students must satisfy the requirements for an advanced degree which are in force at the time the degree is to be awarded. No foreign language is required for any master's degree awarded by the College of Engineering.

### Interdepartmental Program

#### Engineering Mechanics

An interdepartmental program in Engineering Mechanics is offered through the cooperation of the Departments of Aeronautics and Astronautics, Civil Engineering, and Mechanical Engineering. Work in this field can lead to the Master of Science in Engineering and the Doctor of Philosophy degree. See Engineering Mechanics, *College of Engineering* section.



## GENERAL ENGINEERING

### Chairman

Vernon B. Hammer  
111 General Engineering Building

### Professors

Herbert Boehmer, Robert Q. Brown (emeritus), Clarence E. Douglass, Vernon B. Hammer, Thomas M. Rowlands (emeritus), Frank M. Warner (emeritus), E. Roscoe Wilcox (emeritus)

### Associate Professors

Daniel E. Alexander, Frank G. Bartlett, W. Burnett Bonow, Walter L. Dunn, Albert L. Hoag, Dorland H. Konichak, Thomas W. Macartney, Donald C. McNeese, Rowland E. Messer, Robert W. Seabloom

### Assistant Professors

William S. Chalk, James D. Collins, Keith C. Crandall, Geoffrey K. Douthwaite, Philip A. Jacobsen, George A. Nelson, Mahlon O. Ness, Charles C. Redeker, Martin Wolff

### Instructor

David Rogers

### Lecturers

Richard W. Seed, Wells Thompson

During the first year, the Department of General Engineering offers several unique advantages for introduction and examination of engineering as a career.

In the first quarter, a course is offered in the analysis and solution of engineering problems, and further engineering experience is provided during this year in a series of integrated engineering graphics and mechanics courses. Classes in the engineering graphics and problems courses are on a "lecture-laboratory" basis,

meeting for two hours, three times a week. This allows the instructor to introduce a subject, initiate a class discussion, then spend the remainder of the period working with the various members of the class as individual problems arise. These courses, together with the normal mathematics, chemistry, and communication subjects, give the student the opportunity to assess his interest and ability to pursue engineering.

Every freshman takes an orientation course to learn about the various fields of engineering—the academic requirements as well as the present and future opportunities in the field. These presentations are from men actively engaged in the various fields and consist of talks, films, question sessions, and open-house tours.

The student is assigned an adviser who is informed of his previous academic background. Consultation with him on matters of program planning is required and his advice in other academic and some personal matters is available. In addition, other members of the staff representing all fields of engineering are available for consultation. A staff of professional counselors is also available at the University Counseling Center.

## CURRICULUM IN GENERAL ENGINEERING

### First Year

FIRST QUARTER		CREDITS
GE 100	ORIENTATION . . . . .	1
GE 104	GRAPHICS . . . . .	3
GE 111	PROBLEMS . . . . .	3
CHEM 140	GENERAL . . . . .	3
MATH 105	COLLEGE ALGEBRA . . . . .	5
		<hr/> 15

\*PE ACTIVITY . . . . .

SECOND QUARTER		CREDITS
GE 105	GRAPHICS . . . . .	3
GE 115	DIGITAL COMPUTING . . . . .	2
CHEM 150	GENERAL . . . . .	3
CHEM 151	GEN. CHEM. LAB. . . . .	2
MATH 124	CALC. WITH ANALYTIC GEOMETRY . . . . .	5
		<hr/> 15

\*PE ACTIVITY . . . . .

THIRD QUARTER		CREDITS
GE 112	STATICS . . . . .	3
CHEM. 160	GENERAL . . . . .	3
MATH 125	CALC. WITH ANALYTIC GEOMETRY . . . . .	5
PHYSICS 121	GENERAL . . . . .	4
		<hr/> 15

\*PE ACTIVITY . . . . .

### Technical Electives

GE 107	APPLIED DESCRIPTIVE GEOMETRY
GE 121	PLANE SURVEYING AND MEASUREMENTS (REQUIRED FOR MINING ENGINEERING)
GE 351	INVENTIONS AND PATENTS
GE 390	COMPUTER APPLICATIONS IN ENGINEERING PROBLEMS

\* See *Undergraduate Education* section for Physical Education Activity requirement.

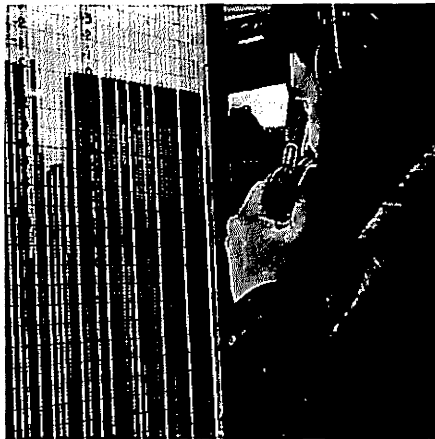


**Exceptions are as follows:**

Students without high school chemistry will take Chemistry 100, (Chemical Science), followed by Chemistry 140, 150, 151, 160.

Students are required to demonstrate proficiency in mathematics by passing qualifying tests. Those who are unable to pass a test in algebra will adjust their program of studies to allow for a refresher course.

At the beginning of the sophomore year, regular students enter the curriculum of the department in which they have decided to major.



## AERONAUTICS AND ASTRONAUTICS

**Chairman**

R. J. H. Bollard  
207 Guggenheim Hall

**Professors**

R. J. H. Bollard, Ellis H. Dill, Fred S. Eastman, Victor M. Ganzer, Abraham Hertzberg, Harold C. Martin, Robert E. Street

**Associate Professors**

Harlow G. Ahlstrom, Ian M. Fyfe, Robert G. Joppa, Jirair K. Kevorkian, Timothy F. O'Brien

**Assistant Professors**

M. E. Fourney, Keith A. Holsapple, R. Reid Parmerter, William H. Rae, Jr.

**Visiting Faculty**

Theodore C. Nark, Carl E. Pearson

The departmental programs are directed to the education of men and women seeking professional careers in the engineering, research, and development activities associated with the exploration of space and the creation of water and airborne vehicles. The complexity of the associated technologies and their rapid change requires these programs to provide a firm basis in the basic and engineering sciences upon which fields of chosen specialization can be built with relative ease and confidence during studies in the Department and throughout a professional career.

A study of the programs illustrates the emphasis given to the engineering sciences with application to gas and solid mechanics, dynamics, vibrations, and systems theory in areas of professional interest such as aerodynamics, structural analysis, aeroelasticity, astronautics, propulsion, flight mechanics, and systems analysis. These programs are characterized by the liberal content of free electives allowing concentration on the sciences on one hand and the development of professional skills on the other. The majority of students choosing a program between these extremes find themselves well prepared for successful careers.

The timeliness of the program content is assured by faculty research and consulting association with industrial and government organizations and an extensive program of visiting lecturers who participate in colloquia, seminars, and as visiting professors for longer term appointments.

### Undergraduate Programs

The curriculum for the Bachelor of Science in Aeronautics and Astronautics for the first year is administered by the Department of General Engineering. An honors program is offered under the advisement of Harold C. Martin, 315C Guggenheim Hall.

### CURRICULUM IN AERONAUTICS AND ASTRONAUTICS

#### Second Year

FIRST QUARTER		CREDITS
ECON 211	GENERAL . . . . .	3
HSS 265	TECH. OF COMMUN. . . . .	3
MATH 126	CALC. WITH ANALYTICAL GEOMETRY . . . . .	5
PHYSICS 122	GENERAL . . . . .	4
		<hr/> 15

SECOND QUARTER		CREDITS
CE 291	DYNAMICS . . . . .	3
MATH 224	INTERMED. ANAL. . . . .	3
MTL E 250	MT'LS. SCIENCE . . . . .	4
HSS 270	REPORT WRITING . . . . .	2
PHYSICS 123	GENERAL . . . . .	4
		<hr/> 16



THIRD QUARTER		CREDITS
AA 200	INTRODUCTION . . . . .	2
CE 292	MECH. OF MT'LS. I . . . . .	3
ME 320	THERMODYNAMICS I . . . . .	4
HSS 331	ORIG. WEST. CULT. INST. . . . .	3
MATH 238	DIFF. EQUATIONS . . . . .	3
		<hr/> 15

### Third Year

FIRST QUARTER		CREDITS
AA 300	AERODYNAMICS . . . . .	3
AA N320-	JUNIOR LAB . . . . .	0-
AA 330	STRUCT. ANAL. . . . .	3
EE 303	ELEMENTS OF EE . . . . .	5
HSS 332	DEV. WEST. CULT. INST. . . . .	3
		<hr/> 14

SECOND QUARTER		CREDITS
AA 301	AERODYNAMICS . . . . .	3
AA -N321-	JUNIOR LAB. . . . .	0-
AA 331	STRUCT. ANAL. . . . .	3
EE 400	VACUUM TUBES AND ELECTRONICS . . . . .	5
HSS 333	CONTEMP. POL. AND SOCIAL PROBLEMS . . . . .	3
		<hr/> 14

THIRD QUARTER		CREDITS
AA 302	AERODYNAMICS . . . . .	3
AA -322	JUNIOR LAB . . . . .	3-
AA 332	STRUCT. ANAL. . . . .	3
ME 340	ENGR. MT'LS . . . . .	3
PHYSICS 320	MODERN . . . . .	3
H REL 365	HUM. BEHAVIOR IN ORGANIZATIONS . . . . .	3
		<hr/> 18

### Fourth Year

FIRST QUARTER		CREDITS
AA N390-	SEMINAR . . . . .	0-
HSS 491	LIT. HERITAGE WEST. WORLD I . . . . .	3
TECHNICAL ELECTIVES . . . . .		12
		<hr/> 15

SECOND QUARTER		CREDITS
AA -N391-	SEMINAR . . . . .	0-
HSS 492	LIT. HERITAGE WEST. WORLD II . . . . .	3
TECHNICAL ELECTIVES . . . . .		12
		<hr/> 15

THIRD QUARTER		CREDITS
AA -392	SEMINAR . . . . .	1-
HSS 493	LIT. HERITAGE WEST. WORLD III . . . . .	3
TECHNICAL ELECTIVES . . . . .		12
		<hr/> 16

At least 27 credits of technical electives will be selected from the following list of courses. It is expected that three one-year sequences will be followed in the chosen areas of specialization. The remaining required 9 credits may be selected from course offerings within the Univer-

sity in appropriate related fields. Senior programs should be planned with the assistance of a faculty adviser and will meet with the adviser's approval.

### Technical Electives

MATHEMATICS	MATH 324, 325, 427, 428, 429, 438 AA 470
THEORETICAL AERODYNAMICS	AA 400, 401, 402
STRUCTURES	AA 430, 431, 432, 441
DYNAMICS	AA 440, 450, 451, 480, 481
DESIGN	AA 410, 411, 412
PROPULSION	AA 460, 461, 462
LABORATORY	AA 420, 421, 422, 425
AUTOMATIC CONTROL	EE 235, 479, 493

### Graduate Programs

#### Graduate Program Adviser

E. H. Dill  
315B Guggenheim Hall

Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section.

#### Master of Science in Aeronautics and Astronautics

Students who have earned a bachelor's degree in engineering, physics, or mathematics are eligible for admission. Prospective candidates must complete an approved program of study. This program is tailored to the needs and interests of each student, but must possess breadth, through study of a variety of subjects, and depth through extensive study of a chosen field of specialization.

The program may either consist of 39 credits of course work, or 30 credits of course work and a minimum of 9 credits for thesis. The following courses are suggested to provide the required breadth and are usually taken by all students: 504, 532, 550, 567, 568, 569, 575. Depth is obtained through a choice of electives from among the courses available in this department or in other departments. A minimum of three quarters of full-time study after admission to the Graduate School is required. No foreign language is required.

#### Master of Aeronautics and Astronautics

This degree is intended to provide more extensive course work than is normally included in the degree programs for the Master of Science in Aeronautics and Astronautics. A minimum of two years of study after admission to the Graduate School and a thesis are required.



The student must complete an approved program consisting of 78 credits including thesis research. No foreign language is required.

#### Doctor of Philosophy

The doctoral program consists of lectures, seminars, discussions, and independent study enabling the student to master his field and to demonstrate his ability to make original contributions. The formal steps toward the degree are listed in the *Graduate Study* section of this Catalog. In addition to those requirements, the student is expected to be in continuous full-time residence for one academic year after advancement to candidacy.

Admission to the Graduate School does not imply admission to the Ph.D. program. Admission to the Ph.D. program is based upon the performance in the first year of graduate study. Students who have achieved a 3.50 grade-point average will be admitted to the doctoral program. In other cases, admission will be determined by the Department based on evidence of superior ability, achievement, and motivation for advanced study and research.

## CHEMICAL ENGINEERING

#### Chairman

Ralph W. Moulton  
105 Benson Hall

#### Professors

Albert L. Babb, Morton M. David, Howard S. Gardner, Lennart N. Johanson, Joseph L. McCarthy, Ralph W. Moulton, Kyosti V. Sarkanen, Charles A. Sleicher, Jr.

#### Associate Professors

Kermit L. Garlid, William J. Heideger

#### Assistant Professors

John C. Berg, Norman F. Sather

Today's rapidly changing technology offers many challenges in chemical engineering. Emphasis is placed on the development and application of processes and equipment in which matter is treated to induce a change in state (or phase), energy content, or chemical composition. Chemistry and physics are the underlying sciences of chemical engineering, mathematics is its quantitative language, and economics and human relations are its guides in practice.



The chemical engineering graduate of today must cope with new and complex technologies that until but a few years ago existed only in the minds of men with vision and imagination. For this reason and many others, today's undergraduate is treated to a less descriptive and a less industry-oriented approach to education than was so ten to fifteen years ago. The emphasis now is toward a more fundamental treatment with a good foundation in mathematics, physics, and chemistry. Such a sound, fundamental background coupled with practical engineering training is needed to prepare the graduate for work in the wide diversity of problems and variety of careers offered to the chemical engineer of today.

### Undergraduate Programs

#### Adviser

Ralph W. Moulton  
105 Benson Hall

The curriculum for the Bachelor of Science in Chemical Engineering for the first year is administered by the Department of General Engineering.

The honors adviser is William J. Heideger, 363 Benson Hall.

### CURRICULUM IN CHEMICAL ENGINEERING

#### Second Year

FIRST QUARTER		CREDITS
CHEM 335	ORGANIC . . . . .	3
CHEM 345	ORGANIC LAB. . . . .	2
CHEM 170	QUAL. ANAL. . . . .	3
MATH 126	CALC. WITH ANALYTIC GEOMETRY . . . . .	5
PHYSICS 122	GENERAL . . . . .	4
		<hr/> 17

SECOND QUARTER		CREDITS
CH E 200	INTRODUCTION . . . . .	3
CHEM 336	ORGANIC . . . . .	3
ENGL 101	COMPOSITION . . . . .	3
MATH 224	INTERM. ANAL. . . . .	3
PHYSICS 123	GENERAL . . . . .	4
		16

THIRD QUARTER		CREDITS
CH E 210	MATERIAL & ENERGY BALANCES . . . . .	4
CE 291	DYNAMICS . . . . .	3
CHEM 337	ORGANIC . . . . .	3
ENGL 102	COMPOSITION . . . . .	3
MATH 238	DIFFERENTIAL EQUATIONS . . . . .	3
		16

### Third Year

FIRST QUARTER		CREDITS
CH E 325	THERMODYNAMICS . . . . .	3
EE 303	ELEMENTS OF E.E. . . . .	5
HSS	ELECTIVES . . . . .	5
CHEM 455	PHYSICAL . . . . .	3
		16

SECOND QUARTER		CREDITS
CH E 326	THERMODYNAMICS AND KINETICS . . . . .	4
HSS	ELECTIVES . . . . .	5
CHEM 456	PHYSICAL . . . . .	4
PHYSICS 320	MODERN . . . . .	3
		16

THIRD QUARTER		CREDITS
CH E 330	TRANSPORT PROCESS PRINCIPLES . . . . .	4
HSS	ELECTIVES . . . . .	5
CHEM 457	PHYSICAL . . . . .	3
CHEM 458	PHYSICAL CHEM. LAB. . . . .	4
		16

### Fourth Year

FIRST QUARTER		CREDITS
CH E 435	HEAT AND MASS TRANSFER . . . . .	3
CH E 436	CHEM. ENGR. LAB. I . . . . .	4
HSS	ELECTIVES . . . . .	5
TECHNICAL	ELECTIVES . . . . .	3
		15

SECOND QUARTER		CREDITS
CH E 437	CHEM. ENGR. LAB. II . . . . .	2
CH E 485	PROCESS DESIGN PRINCIPLES II . . . . .	2
TECHNICAL	ELECTIVES . . . . .	6
HSS	ELECTIVES . . . . .	5
		15

THIRD QUARTER		CREDITS
CH E 486	PROCESS DESIGN . . . . .	4
TECHNICAL	ELECTIVES . . . . .	6
HSS	ELECTIVES . . . . .	5
		15

### ELECTIVE CHEMICAL ENGINEERING COURSES

438	CHEMICAL ENGINEERING LABORATORY III
440	FLUID MECHANICS
450	HEAT TRANSFER
460	MASS TRANSFER
465	REACTOR DESIGN
470	CHEMISTRY OF WOOD
471	PULP AND PAPER TECHNOLOGY
472	PULP AND PAPER LABORATORY
480	PROCESS DYNAMICS AND CONTROL
481	PROCESS OPTIMIZATION
499	UNDERGRADUATE RESEARCH

### Graduate Programs

#### Graduate Program Adviser

Ralph W. Moulton  
105 Benson Hall

The Department of Chemical Engineering offers courses leading to the degrees of Master of Science in Chemical Engineering, Master of Science in Engineering, and Doctor of Philosophy. Students who intend to work toward advanced degrees must apply for admission to and meet the requirements of the Graduate School. Prospective candidates for the degrees of Master of Science in Chemical Engineering and Doctor of Philosophy are required to take four qualifying examinations prior to initial registration for graduate study. These examinations are designed to assess the student's knowledge and understanding of material normally contained in an undergraduate program with a major in chemical engineering, and their results are used to aid the faculty in advising the student on registration. They are usually given during the week preceding the opening of Autumn Quarter. Special arrangements will be made for students entering at other times.

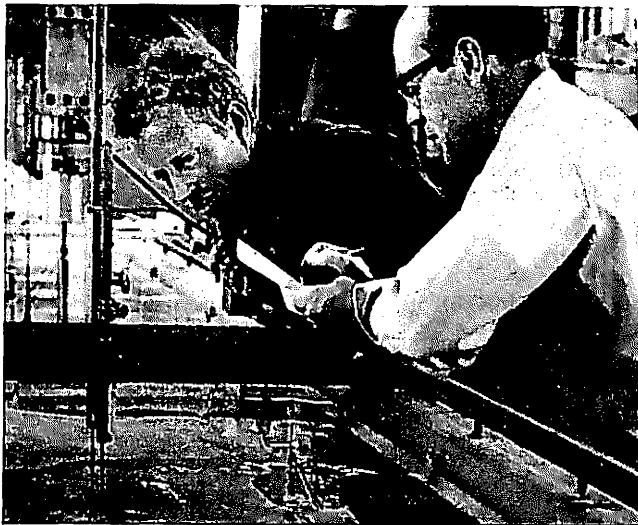
#### Master of Science in Chemical Engineering

The requirements for this degree are a minimum of 39 credits, of which 30 credits are in formal course work and 9 in thesis. The course work is usually divided in the ratio of about two to one between Chemical Engineering and other departments. At least half of these courses must be numbered 500 or above.

#### Doctor of Philosophy

In addition to the general requirements of the Graduate School, students who wish to work toward the Ph.D. degree must pass a preliminary examination. This examination is normally taken after three quarters of satisfactory graduate study. It is designed to assess the student's comprehension of both undergraduate and graduate material and especially his ability to apply fundamental concepts to new and varied situations.

More detailed information on degree requirements is available from the Graduate Program Adviser.



## CIVIL ENGINEERING

### Chairman

Robert G. Hennes  
201 More Hall

### Professors

Richard H. Bogan, Thomas H. Campbell, Jack R. Clanton, Martin I. Ekse, F. Burt Farquharson (emeritus), Charles W. Harris (emeritus), Billy J. Hartz, Robert G. Hennes, Edgar M. Horwood, Alan H. Mattock, Harold K. Moritz (emeritus), Charles H. Norris, Fred H. Rhodes, Jr., August T. Rossano, Jr., Sergius I. Sergev, Robert O. Sylvester, Richard G. Tyler (emeritus), Robert B. Van Horn (emeritus), Desi D. Vasarhelyi, Harold E. Wessman

### Associate Professors

Dale A. Carlson, Harry H. Chenoweth, Hiram M. Chittenden (emeritus), J. E. Colcord, Jr., Joseph C. Kent, Richard H. Meese, William M. Miller, Holger P. Mittem, Ronald E. Nece, Carl A. Rambow, Eugene P. Richey, Roy B. Sawhill, Howard S. Strausser, Jr., Sandor A. Veres

### Assistant Professors

Robert J. Charlson, Russell F. Christman, Roger J. Evans, Jack I. Nicholls, Ray T. Oglesby, Mehmet A. Sherif

### Lecturers

Halvard W. Birkeland, William L. Clark

Civil engineering is the branch of the engineering profession primarily responsible for the engineering of physical facilities for the public. The civil engineer is part of the team that plans, designs, and constructs highway and road systems, air terminals, port and river developments, water supply and waste disposal systems. In the planning and design phases, he works with professionals from such disciplines as architecture, urban planning, business and industrial management, economics, and various social sciences. He may also work as a member of the firm or organization that constructs and maintains these facilities.

To prepare the civil engineer for his professional role, the undergraduate curriculum includes a fundamental base of mathematics, physics, and chemistry supplemented by courses in solid mechanics, constructional materials, fluid mechanics, thermodynamics, elements of electrical engineering, and geology. The standard Humanistic-Social Studies program of the College of Engineering is incorporated in the curriculum. A strong core of courses in civil engineering planning, analysis, and design starts in the sophomore year with Civil Engineering 201 (Civil Engineering Projects I), and extends throughout the remainder of the four-year program.

The departmental honors adviser is B. J. Hartz, 313 More Hall.

An extensive graduate program is also offered.

### Undergraduate Programs

#### Adviser

Jack R. Clanton  
201 More Hall

The curriculum for the Bachelor of Science in Civil Engineering for the first year is administered by the Department of General Engineering.

### CURRICULUM IN CIVIL ENGINEERING

The fourth-year program calls for 12 credits of appropriate elective courses, 6 credits ordinarily being in civil engineering courses. Civil engineering electives in the field of hydraulics are 441, 445, 447, 448; in engineering mechanics, 494; in materials, 467; in structures, 481, 482, 485; in sanitary, 455, 456, 457, 458, 459; in transportation, 410, 415, 417, 419, 424. Students planning to take a degree in industrial engineering should elect Accounting 210 (Fundamentals of Accounting).

Students may also elect graduate courses for which they have the proper prerequisites, subject to the approval of their adviser, the course instructor, and the Dean of the Graduate School. They may also wish to select as electives courses in fields related to civil engineering, subject to the approval of their adviser.

#### Second Year

FIRST QUARTER		CREDITS
CE 201	CIV. ENGR. PROJECTS I . . . . .	2
CE 292	MECH. OF MT'LS. I . . . . .	3
HSS 265	TECH. OF COMMUN. . . . .	3
MATH 126	CALC. WITH ANALYTIC GEOMETRY . . . . .	5
PHYSICS 122	GENERAL . . . . .	4
		<hr/> 17

SECOND QUARTER		CREDITS
CE 202	CIV. ENGR. PROJECTS II . . . . .	3
CE 293	MECH. OF MT'LS. II . . . . .	3
GEOL 310	FOR ENGINEERS . . . . .	4
PHYSICS 123	GENERAL . . . . .	4
MATH 224	INTERMED. ANAL. . . . .	3
		<hr/> 17

THIRD QUARTER		CREDITS
CE 216	GEOMETRONICS . . . . .	4
CE 291	DYNAMICS . . . . .	3
HSS 270	REPORT WRITING . . . . .	2
MTL E 250	MT'LS. SCIENCE . . . . .	4
ME 215	STATISTICAL METHODS . . . . .	3
		<hr/> 16

#### Third Year

FIRST QUARTER		CREDITS
CE 363	CONSTRUCTIONAL MATERIALS I . . . . .	3
CE 380	BASIC STRUCT. ENGR. . . . .	2
EE 303	ELEMENTS OF EE . . . . .	5
HSS 331	ORIG. WEST. CULT. INST. . . . .	3
ME 323	THERMODYNAMICS . . . . .	4
		<hr/> 17

SECOND QUARTER		CREDITS
CE 320	TRANSPORTATION ENGR. I . . . . .	4
CE 342	FLUID MECHANICS I . . . . .	4
CE 364	CONSTRUCTIONAL MATERIALS II . . . . .	3
CE 381	STRUCT. ANALYSIS I . . . . .	3
HSS 332	DEV. WEST. CULT. INST. . . . .	3
		<hr/> 17

THIRD QUARTER		CREDITS
CE 345	FLUID MECHANICS II . . . . .	3
CE 350	SANITARY ENGR. I . . . . .	3
CE 366	SOIL MECHANICS I . . . . .	3
CE 382	STRUCT. ANALYSIS II . . . . .	3
HSS 333	CONTEMP. POL. AND SOC. PROBLEMS . . . . .	3
		<hr/> 15

#### Fourth Year

FIRST QUARTER		CREDITS
CE 446	HYDR. ENGR. . . . .	3
CE 451	SANITARY ENGR. II . . . . .	5
CE 483	STRUCT. DESIGN I . . . . .	3
ECON 211	GENERAL . . . . .	3
HSS 491	LIT. HERITAGE WEST. WORLD I . . . . .	3
		<hr/> 17

SECOND QUARTER		CREDITS
CE 421	TRANSPORTATION ENGR. II. . . . .	3
CE 484	STRUCT. DESIGN II . . . . .	3
ELECTIVES . . . . .		6
HSS 492	LIT. HERITAGE WEST. WORLD II . . . . .	3
		<hr/> 15

THIRD QUARTER		CREDITS
ELECTIVES . . . . .		6
HSS 493	LIT. HERITAGE WEST. WORLD III . . . . .	3
B LAW 307	BUSINESS LAW FOR ENGINEERS . . . . .	3
H REL 365	HUM. BEHAVIOR IN ORGANIZATIONS . . . . .	3
		<hr/> 15

#### Graduate Programs

##### Graduate Program Adviser

Sergius I. Sergev  
201 More Hall

The Department of Civil Engineering offers courses leading to the degrees of Master of Science in Engineering, Master of Science in Civil Engineering, and Doctor of Philosophy.

##### Master of Science in Civil Engineering

Graduate work leading to this degree is offered in the fields of hydraulic engineering, sanitary engineering, soil mechanics, engineering mechanics, structural engineering, and transportation (highway) engineering. The requirements are: a minimum of 39 credits, of which 30 credits must be in formal course work and 9 in thesis.

##### Doctor of Philosophy

Prospective candidates for this degree must complete an approved program of studies and a research program which makes a definite contribution to knowledge. This research program may be in one of the following areas: hydraulics and fluid mechanics, sanitary engineering, soil mechanics, engineering mechanics, structural engineering, or transportation engineering.



## ELECTRICAL ENGINEERING

### Chairman

Austin V. Eastman  
211 Electrical Engineering Building

### Professors

F. Robert Bergseth, John L. Bjorkstam, Robert N. Clark, Lyall B. Cochran, Austin V. Eastman, Arthur E. Harrison, W. Ryland Hill, Jr. (on leave), G. Lisle Hoard (emeritus), Akira Ishimaru, David L. Johnson, Laurel J. Lewis, Edgar A. Loew (emeritus), Donald K. Reynolds, Walter E. Rogers, George S. Smith (emeritus), H. Myron Swarm

### Associate Professors

Robert W. Albrecht, Betsy Ancker-Johnson, Hellmut Golde, Edward C. Guilford, Chih-Chi Hsu, Dean W. Lytle, Endrik Noges, Irene C. Peden, Floyd D. Robbins

### Assistant Professors

Frank J. Alexandro, Jr., Graham L. Duff, Jay H. Harris, Alistair D. C. Holden, Peter O. Lauritzen, Robert E. Lindsay, Peter R. Metz, Robert B. Pinter, Rubens A. Sigelmann, Sinclair S. Yee

### Lecturer

William E. Creedon

Electrical Engineering is the utilization of the physical properties of charged particles in service to mankind. Ordinarily, the electrical engineer produces a device or several devices which are interconnected to form a system, the whole performing a useful task. Examples of such systems are: An electrical power generation and distribution system for supplying electrical energy to

homes and factories, a communications system for transmitting information between a space vehicle and the earth, and an electronic computing system used to process data for science and industry. The talents of the electrical engineer are also used in fields other than engineering, such as medicine and physics, where electronic instrumentation is essential.

Because the electron is one of the basic particles of matter, the electrical engineering student receives a thorough grounding in physics and chemistry. Mathematics, the language of modern engineering analysis, is also essential to his education. The basic engineering subjects which all electrical engineering undergraduates study are: mechanics, graphics, computer programming, thermodynamics, electric circuits, electromagnetic fields and waves, electronics, and electromechanical energy conversion and control. Undergraduate elective courses, intended to prepare the student for professional practice or for graduate studies, are offered in several special fields such as electromagnetics, automatic control systems, microwave devices and propagation, solid-state electronics, computer science, power system analysis, advanced circuit theory, communication theory, and advanced electronic circuits. Advanced work in all of these subjects is offered at the graduate level. The engineer also requires a sound training in the humanities to prepare him to accept the social responsibilities which modern professional engineering work thrusts upon him.

Undergraduate training prepares the engineer to take responsibility not only in the design and development of electronic and electromechanical systems but also in other less technical work such as management or sales. Because of the phenomenal rate with which new electrical discoveries are developed into engineering tools, today's electrical engineering graduate must continue his studies after he is employed in order to keep abreast of developments in this rapidly changing field. For this reason his training at the University emphasizes those fundamental principles which are long lasting. He is also given an opportunity to work on research assignments.

### Undergraduate Programs

#### Adviser

William E. Creedon  
205 Electrical Engineering Building

The curriculum for the Bachelor of Science in Electrical Engineering for the first year is administered by the Department of General Engineering.

All students are encouraged to substitute other humanities and social science courses for the Humanistic-Social Studies for Engineers courses listed in the curriculum, if such substitution seems to more effectively meet the student's interests. Approval by the undergraduate adviser is required.

Electives are not restricted except that they must be so selected as to further the student's objectives. This can best be determined through consultation with a faculty adviser. All electives must be approved by the curriculum counselor, 213 Electrical Engineering Building, or a faculty adviser before they may be used to satisfy degree requirements.

Students who plan to study for a Master of Science degree should, with the guidance of a faculty counselor, plan a coordinated program for their fourth and fifth years (senior and graduate). A limited number of substitutions for normally required courses may be made, and course sequences may be rearranged to more effectively achieve desired objectives. Information concerning coordinated programs may be obtained from the department registration office during the junior year.

Students planning to take a degree in industrial engineering should elect Accounting 210 (Fundamentals of Accounting).

The honors adviser is Hellmut Golde, 201 Electrical Engineering Building.

## CURRICULUM IN ELECTRICAL ENGINEERING

### Second Year

FIRST QUARTER		CREDITS
EE 231	INTR. LINEAR SYS. I . . . . .	5
HSS 265	TECH. OF COMMUN. . . . .	3
MATH 126	CALC. WITH ANALYTIC GEOMETRY . . . . .	5
PHYSICS 122	GENERAL . . . . .	4
		17

SECOND QUARTER		CREDITS
EE 233	INTR. LINEAR SYS. II . . . . .	4
EE 234	ELEC. ENGR. LAB. I . . . . .	1
CE 291	DYNAMICS . . . . .	3
MATH 224	INTERMED. ANAL. . . . .	3
PHYSICS 123	GENERAL . . . . .	4
		15

THIRD QUARTER		CREDITS
EE 235	INTR. LINEAR SYS. III . . . . .	4
EE 236	ELEC. ENGR. LAB. II . . . . .	1
CE 292	MECH. OF MT'LS. I . . . . .	3
HSS 270	REPORT WRITING . . . . .	2
MTL E 250	MT'LS. SCIENCE . . . . .	4
MATH 238	DIFF EQUATIONS . . . . .	3
		17

### Third Year

FIRST QUARTER		CREDITS
EE 311	INTR. LINEAR SYS. IV . . . . .	4
EE 312	ELEC. ENGR. LAB. III . . . . .	1
EE 321	ELECTROMAG. FLDS. AND WAVES I . . . . .	4
EE 322	ELECTROMAG. FLDS. AND WAVES LAB. I . . . . .	1
HSS 331	ORIG. WEST. CULT. INST. . . . .	3
PHYSICS 320	MODERN . . . . .	3
		16

SECOND QUARTER		CREDITS
EE 323	ELECTROMAG. FLDS. AND WAVES II . . . . .	4
EE 324	ELECTROMAG. FLDS. AND WAVES LAB. II . . . . .	1
EE 361	PHYS. ELECTRONICS . . . . .	4
CE 342	FLUID MECHANICS I . . . . .	4
HSS 332	DEV. WEST. CULT. INST. . . . .	3
		16

THIRD QUARTER		CREDITS
EE 325	ELECTROMAG. FLDS. AND WAVES III . . . . .	4
EE 326	ELECTROMAG. FLDS. AND WAVES LAB. III . . . . .	1
EE 363	ELECTRONIC DEVICES AND CIRCUITS . . . . .	4
EE 364	ELECTRONICS LAB. I . . . . .	1
HSS 333	CONTEMP. POL. AND SOC. PROBLEMS . . . . .	3
ECON 211	GENERAL . . . . .	3
		16

### Fourth Year

FIRST QUARTER		CREDITS
EE 343	INTR. ELECTROMECH. ENERGY CONV. . . . .	5
EE 365	ELECTRONIC CIRCUITS . . . . .	4
EE 366	ELECTRONICS LAB. II . . . . .	1
HSS 491	LIT. HERITAGE WEST. WORLD I . . . . .	3
H REL 365	HUM. BEHAVIOR IN ORGANIZATIONS . . . . .	3
		16

SECOND QUARTER		CREDITS
HSS 492	LIT. HERITAGE WEST. WORLD II . . . . .	3
ME 325	THERMODYNAMICS . . . . .	4
ME 469	INTR. TO ADV. DYNAMICS . . . . .	3
*ELECTIVES	. . . . .	6
		16

THIRD QUARTER		CREDITS
HSS 493	LIT. HERITAGE WEST. WORLD III . . . . .	3
ME 426	THERMODYNAMICS . . . . .	4
*ELECTIVES	. . . . .	10
		17

\*Students planning to do graduate work are urged to include, as electives, Electrical Engineering 441 and one or more of the following: Electrical Engineering 445, 451, 469, 479, 485.

## Graduate Programs

### Graduate Program Adviser

F. Robert Bergseth  
207 Electrical Engineering Building

Students who intend to work toward advanced degrees must apply for admission to the Graduate School



and meet the requirements outlined in the *Graduate Study* section. Mathematics through at least one quarter of differential equations is a prerequisite to all graduate work.

Students who received their undergraduate training at other institutions are expected to have substantially the same training as that given to students at this University. In case of deficiencies, students may be required to take certain undergraduate courses in addition to the normal graduate program.

#### **Master of Science in Electrical Engineering**

A total of 45 credits of which 36 are in course work and a suitable thesis for 9 credits are required for this degree. Course work should be divided between electrical engineering and supporting courses in other fields in the ratio of approximately two to one. Electrical engineering courses must be chosen from those numbered 500 or above, with the following exception: On the approval of the student's Supervisory Committee, not more than two of the following senior elective courses, 441, 445, 451, 469, 479, 485, may be applied to this degree. University of Washington graduates are expected to include 441 and one of the others in their undergraduate programs.

#### **Master of Electrical Engineering**

This is a more advanced degree than that of Master of Science in Electrical Engineering. A total of 72 credits of course work and a more extensive thesis are required. Other requirements are similar to those for the Master of Science in Electrical Engineering degree. Certain physics courses may be used in partial satisfaction of the major requirements.

#### **Doctor of Philosophy**

This is primarily a research degree. It is not conferred as a result of course work, no matter how faithfully nor how long it is pursued. The granting of the degree in this department is based essentially on general proficiency and distinctive attainments in electrical engineering, particularly on the demonstrated ability to pursue independent research. Evidence of research investigation is the production of a doctoral dissertation which makes a definite contribution to knowledge and is presented with a satisfactory degree of literary skill. In addition to the general requirements of the Graduate School (see the *Graduate Study* section) this De-

partment selects prospective candidates for the doctor's degree from outstanding students at the master's level by means of a series of examinations given each year in the Winter Quarter.

## **HUMANISTIC-SOCIAL STUDIES FOR ENGINEERS**

#### **Chairman**

Stuart W. Chapman  
316 Guggenheim Hall

#### **Professors**

Stuart W. Chapman, Dell R. Skeels

#### **Associate Professors**

David C. Botting, Jr., Eugene C. Elliott, Jay A. Higbee, John R. Rustad, James W. Souther

#### **Assistant Professors**

Jack T. Leahy, Louis P. Trimble, Myron L. White

#### **Instructor**

Raymond W. Mise

#### **Lecturer**

Wesley L. Hunner

The Department of Humanistic-Social Studies offers courses designed to give engineering students a general, nontechnical education as an integral part of their professional training. All of these courses, except 302, are normally required in all engineering curricula. Students who wish to take courses in the humanities and social sciences other than those offered by the Department should consult their engineering advisers.

The Department's aim is to help its students to understand the growth of the society in which they live; to recognize and analyze critically some of the problems of that society; to think logically and express themselves lucidly; to appreciate great works of literature; and to develop social and philosophical concepts which will help them lead effective lives as professional men, citizens, and individuals. To this end the Department



offers an integrated program of study which begins in the sophomore year and continues through the senior year.

Certain nontechnical courses offered in other colleges of the University are required or are elective in the various engineering curricula: Human Relations in Business and Industry 365 (Human Behavior in Organizations), and Economics 211 (General Economics).



## INDUSTRIAL ENGINEERING

Industrial Engineering is concerned with the design, improvement, and installation of integrated systems of men, materials, and equipment; drawing upon specialized knowledge and skill in the mathematical, physical, and social sciences, together with the principles and methods of engineering analysis and design, to specify, predict, and evaluate the results to be obtained from such systems.

The Industrial Engineering curriculum consists of a regular four-year course of study in any engineering department that offers a full curriculum, supplemented by a fifth year devoted to study in industrial management, accounting, quality control, and related subjects.

Students who plan to enter the Industrial Engineering curriculum should take Accounting 210 (Fundamentals of Accounting) as an elective subject for the first bachelor's degree. Those who fail to do so will need to take Accounting 210 as a prerequisite to the accounting courses listed below during their fifth year. This will require completion of Accounting 311 (Cost Accounting) in extension study or in residence during the fourth quarter.

Students in Unclassified-5 status working toward a Bachelor of Science in Industrial Engineering as a second bachelor's degree will be placed under the administration of the Mechanical Engineering Department and advised by the Industrial Engineering advisers listed below. Other students who combine the Industrial Engineering program with their regular bachelor degree studies will continue to register in their major departments. However, they should obtain curriculum counseling from the Industrial Engineering advisers.

### Undergraduate Programs

#### Advisers

Berl W. Owens  
206 Mechanical Engineering Building

Albert B. Drui  
210 Mechanical Engineering Building

The second Bachelor of Science in Industrial Engineering degree is granted when 45 credits in the curriculum outlined below are successfully completed. In case of schedule difficulties, substitutions may be made for Mechanical Engineering 410, 411, or 419. A minimum of 15 credits from the College of Engineering is required.

#### CURRICULUM IN INDUSTRIAL ENGINEERING

FIRST QUARTER		CREDITS
ME 415	STAT. QUAL. CONTROL . . . . .	3
ME 417	METH. ANAL. . . . .	3
ACCTG 220	FUNDAMENTALS . . . . .	3
TECHNICAL ELECTIVES . . . . .		6
		<hr/> 15

SECOND QUARTER		CREDITS
ME 410	ENGR. ADMIN. . . . .	3
ME 411	ENGR. ECON. . . . .	3
ACCTG 230	BASIC ACCTG. ANAL. . . . .	3
TECHNICAL ELECTIVES . . . . .		6
		<hr/> 15

THIRD QUARTER		CREDITS
ME 419	IND. FACILITIES DESIGN . . . . .	3
ACCTG 311	COST ACCTG. . . . .	3
FIN 320	MONEY, FIN. INST. AND INCOME . . . . .	4
TECHNICAL ELECTIVES . . . . .		5
		<hr/> 15

#### Recommended Electives

##### PRODUCTION TECHNOLOGY AREA

EE 433	TRANSISTOR CIRCUIT ENGINEERING . . . . .	3
EE 479	FUND. OF AUTOMATIC CONTROL . . . . .	4
ME 201	METAL CASTING . . . . .	1
ME 202	WELDING . . . . .	1
ME 203	METAL MACHINING . . . . .	1
ME 305	PRODUCTION TOOLING . . . . .	1
ME 306	PRODUCTION TECHNIQUES . . . . .	1



ME 307	PRODUCTION PLANNING . . . . .	1
ME 414	INDUSTRIAL SAFETY . . . . .	2
ME 420	ENGINEERING RELIABILITY . . . . .	3
ME 441	AUTOMATIC CONTROL . . . . .	3
ME 464	THEORY OF WELDING . . . . .	3
ME 465	WELDING DESIGN . . . . .	3

#### WORK MEASUREMENT AND CONTROL AREA

CE 405	CRITICAL PATH METHODS OF PROJECT SCHEDULING . . . . .	3
ME 420	ENGINEERING RELIABILITY . . . . .	3
ME 441	AUTOMATIC CONTROL . . . . .	3
PERS 301	INDUSTRIAL RELATIONS . . . . .	3
PERS 345	PERSONNEL METHODS AND THEORY I . . . . .	3
POL & AD 440	ORGANIZATION THEORY . . . . .	3
PROD 443	PRODUCTION AND INVENT. CONTROL . . . . .	3
PROD 460	MANUFACTURING ADMINISTRATION . . . . .	5

#### OPERATIONS RESEARCH AREA

BUS STAT 401	ADVANCED BUSINESS STATISTICS . . . . .	4
BUS STAT 450	OPERATIONS RESEARCH TECHNIQUES I . . . . .	3
BUS STAT 451	OPERATIONS RESEARCH TECHNIQUES II . . . . .	3
BUS STAT 460	MULTIVARIATE ANALYSIS FOR BUSINESS . . . . .	3
FIN 350	BUSINESS FINANCE . . . . .	4
POL & AD 480	BUSINESS SIMULATION . . . . .	5
MKT 301	MKT. TRANSP. AND INTERNAT'L BUS.: AN INTE- GRATIVE ANALYSIS . . . . .	5

## MECHANICAL ENGINEERING

#### Chairman

Charles J. Kippenhan  
142 Mechanical Engineering Building

#### Professors

Peter L. Balise, Jr., Morris E. Childs, Emmett E. Day, Joseph C. Firey, Charles J. Kippenhan, Albert S. Kobayashi, Dean E. McFeron, Harry J. McIntyre (emeritus), Bryan T. McMinn (emeritus), Blake D. Mills, Jr., James B. Morrison, Gilbert S. Schaller (emeritus), Paul J. Waibler

#### Associate Professors

John R. Bodoia, Richard W. Crain, Sr., Creighton A. Depew, Ashley F. Emery, Kurt R. Galle, Michael Guidon III, Richard E. Holt, William C. Kielling, Howard C. Merchant, William B. Nordquist, Berl W. Owens, Norman H. Roberts (acting), Robert E. Sherrer, Raymond Taggart

#### Assistant Professors

Jay W. Anderson, James D. Chalupnik, Richard C. Corlett, Albert B. Drui, Paul W. Ford, Colin J. Sandwith, Kenneth V. Saunders, Jan Wolak

#### Lecturer

Oscar M. Browne, Jr.



The program in mechanical engineering is aimed at providing the fundamental knowledge required to begin a career in professional engineering, and in particular in the analysis, design, manufacture, and production of apparatus, devices, and machines. Throughout the program of study, courses in manufacturing methods and design parallel those in analysis and the humanities.

In the early program, the basic physical sciences and mathematics are included as precursors of the engineering sciences. The latter include mechanics, thermodynamics, fluid mechanics, heat transfer, electrical circuits, and electronics. In the design sequence, mechanisms, machine components, and dynamics of machines are required. In the senior year, the program is flexible and one of several areas of particular interest can be pursued by the individual student.

The philosophy of the entire program is not only to equip the student with the basic tools of analysis, but also to direct his attention and interest to the exciting art of synthesis, toward the culmination of a final, manufacturable design, at an optimum criteria of strength, function, and economic feasibility—the dominant function of an engineer.

## Undergraduate Programs

### Advisers

Michael Guidon III, James B. Morrison, William B. Nordquist  
141 Mechanical Engineering Building

The curriculum for the Bachelor of Science for the first year is administered by the Department of General Engineering.

The departmental honors adviser is James B. Morrison, 203 Mechanical Engineering Building.

### CURRICULUM IN MECHANICAL ENGINEERING

#### Second Year

FIRST QUARTER		CREDITS
ME 201	METAL CASTING . . . . .	1
ME 263	MECHANICAL SYSTEMS . . . . .	3
HSS 265	TECH. OF COMMUN. . . . .	3
MATH 126	CALC. WITH ANALYTIC GEOMETRY . . . . .	5
PHYSICS 122	GENERAL . . . . .	4
		16

SECOND QUARTER		CREDITS
ME 202	WELDING . . . . .	1
ME 215	STAT. METHODS IN ENGR. . . . .	3
ME 222	INTRODUCTORY MECHANICAL ENGR. LAB. . . . .	1
CE 291	DYNAMICS . . . . .	3
HSS 270	REPORT WRITING . . . . .	2
MATH 224	INTERMED. ANAL. . . . .	3
PHYSICS 123	GENERAL . . . . .	4
		17

THIRD QUARTER		CREDITS
ME 203	METAL MACHINING . . . . .	1
ME 260	MECHANISM . . . . .	3
CE 292	MECH. OF MT'LS. . . . .	3
HSS 331	ORIG. WEST CULT. INST. . . . .	3
MTL E 250	MTL'S. SCIENCE . . . . .	4
		14

#### Third Year

FIRST QUARTER		CREDITS
ME 305	PRODUCTION TOOLING . . . . .	1
ME 320	THERMODYNAMICS I . . . . .	4
ME 340	ENGINEERING MATERIALS . . . . .	3
CE 293	MECH. OF MT'LS. . . . .	3
HSS 332	DEV. WEST. CULT. INST. . . . .	3
MATH 238	DIFF. EQUATIONS . . . . .	3
		17

SECOND QUARTER		CREDITS
ME 306	PRODUCTION TECHNIQUES . . . . .	1
ME 321	THERMODYNAMICS II . . . . .	4
ME 361	MACHINE DESIGN . . . . .	3
ME 367	DYNAMICS OF MACHINES . . . . .	3
ECON 211	GENERAL . . . . .	3
HSS 333	CONTEMP. POL. AND SOC. PROBLEMS . . . . .	3
		17

THIRD QUARTER		CREDITS
ME 307	PRODUCTION PLANNING . . . . .	1
ME 330	EXPER. THERMODYNAMICS . . . . .	4
ME 362	MACHINE DESIGN . . . . .	3
EE 303	ELEMENTS OF EE . . . . .	5
HSS 491	LIT. HERITAGE WEST. WORLD I . . . . .	3
		16

#### Fourth Year

FIRST QUARTER		CREDITS
ME 430	INTRO. TO HEAT TRANSFER . . . . .	4
CE 342	FLUID MECHANICS I . . . . .	4
EE 305	ELECT. MACHINERY <i>or</i> . . . . .	
EE 400	VACUUM TUBES AND ELECTRONICS . . . . .	5
HSS 492	LIT. HERITAGE WEST. WORLD II . . . . .	3
		16

SECOND QUARTER		CREDITS
ME 434	ADV. MECHANICAL ENGINEERING LAB. . . . .	3
ME 468	MACHINE DESIGN . . . . .	3
H REL 365	HUM. BEHAVIOR IN ORGANIZATIONS . . . . .	3
HSS 493	LIT. HERITAGE WEST. WORLD III . . . . .	3
TECHNICAL ELECTIVE . . . . .		3
		15

THIRD QUARTER		CREDITS
TECHNICAL ELECTIVES . . . . .		6
ELECTIVES . . . . .		9
		15

## Graduate Programs

### Graduate Program Adviser

Blake D. Mills, Jr.  
314 Mechanical Engineering Building

Students who intend to work toward degrees must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section.

### Master of Science in Mechanical Engineering

Although options are not designated, graduate offerings in mechanical engineering are so arranged that prospective candidates for the master's degree who are interested in the special fields of heat power, heat transfer, gas dynamics, instrumentation and control, stress analysis, advanced engineering materials, and design will find well-integrated programs available. Subject to the approval of the student's committee, work beyond bachelor requirements in physics, mathematics, aeronautics and astronautics, and civil, and electrical engineering is permitted, and sometimes required. This degree requires a 9-credit thesis and a minimum of 30 credits of approved course work, including seminar courses N518-N519-520.

### Doctor of Philosophy

Students working for this degree must complete an approved program of studies and a research program which makes a definite contribution to knowledge.



## MINERAL ENGINEERING

### Director

Drury A. Pifer  
211 Roberts Hall

### Professors

Donald L. Anderson, Frederick B. Brien, Joseph Daniels (emeritus), James I. Mueller, Drury A. Pifer, Douglas H. Polonis

### Associate Professors

Barry D. Lichter, O. J. Whittemore

### Assistant Professors

Thomas F. Archbold, Robert J. Campbell, Jr., Henk I. Dawson, Thomas G. Stoebe, William D. Scott, Gerald W. Toop, Jerry E. Turnbaugh

### Lecturer

Wolf G. Bauer

The School of Mineral Engineering is concerned with the engineering aspects of the minerals industry. Through the Divisions of Ceramic, Metallurgical, and Mining Engineering, the School offers courses leading to the degrees of Bachelor of Science in Mining Engineering (with options in mineral engineering and geological engineering); Bachelor of Science in Metallurgical Engineering; Bachelor of Science in Ceramic Engineering; Master of Science in Engineering, Master of Science in Mining, Metallurgical, or Ceramic Engineering; Master of Science in Ceramics or Metallurgy; and Doctor of Philosophy in the fields of metallurgy and ceramics.

The honors adviser is Thomas F. Archbold, 241 Roberts Hall Addition.

## MATERIALS ENGINEERING

Courses in materials engineering are offered jointly by the several degree-granting divisions of the School of Mineral Engineering. These courses are part of a core which constitutes the base in materials science upon which the specific branches are founded.

## CERAMIC ENGINEERING

Ceramic engineering is concerned principally with the development, production, evaluation, and understanding of ceramic materials or products and includes those activities generally associated with engineering, includ-

ing economic considerations. The ceramic engineer deals with problems of ceramic materials and high temperature technologies and is concerned with manufacturing facilities, production processes, feasibility studies, administration, research, and development.

Ceramic engineering graduates are employed by a wide range of industries including those whose primary product is a ceramic material, plus manufacturers in the chemical, electrical and electronic, automotive, metallurgical, nuclear, and aerospace industries. There



are few major industries that are not employers of ceramic engineers. In addition, ceramic engineers serve in government laboratories, defense installations, universities, and industrial laboratories. They are inherently involved with all engineering fields.

## Undergraduate Programs

### Adviser

James I. Mueller  
301 Roberts Hall

The curriculum for the Bachelor of Science in Ceramic Engineering for the first year is administered by the Department of General Engineering. Students who decide to transfer into Ceramic Engineering may complete the chemistry requirements by rearranging the required curriculum in consultation with the director of the School of Mineral Engineering.

As part of their course, students should have ceramic industrial experience during the summer vacation following their sophomore and junior years and must participate in scheduled field excursions. Technical electives are courses in the College of Engineering and science courses in the College of Arts and Sciences.

## CURRICULUM IN CERAMIC ENGINEERING

### Second Year

FIRST QUARTER		CREDITS
CER E 201	INTRODUCTION . . . . .	1
MTL E 250	MT'L'S. SCIENCE . . . . .	4
HSS 265	TECH. OF COMMUN. . . . .	3
MATH 126	CALC. WITH ANALYTIC GEOMETRY . . . . .	5
PHYSICS 122	GENERAL . . . . .	4
		17

SECOND QUARTER		CREDITS
CER E 202	RAW MATERIALS . . . . .	3
ME 203	METAL MACHINING . . . . .	1
HSS 270	REPORT WRITING . . . . .	2
CHEM 350	PHYSICAL . . . . .	3
MATH 224	INTERMED. ANAL. . . . .	3
PHYSICS 123	GENERAL . . . . .	4
		16

THIRD QUARTER		CREDITS
CER E 203	MEASUREMENTS . . . . .	3
HSS 302	TECH. WRITING . . . . .	3
CHEM 170	QUAL. ANAL. . . . .	3
CHEM 351	PHYSICAL . . . . .	3
MATH 238	DIFF. EQUATIONS . . . . .	3
		15

### Third Year

FIRST QUARTER		CREDITS
CER E N307	EXCURSION . . . . .	0
CER E 312	STRUCTURE AND RHEOLOGY . . . . .	5
MTL E 351	MINERAL PROCESSING I . . . . .	4
MET E 322	MET. THERMODYNAMICS I . . . . .	3
HSS 331	ORIG. WEST. CULT. INST. . . . .	3
		15

SECOND QUARTER		CREDITS
CER E 301	CERAMIC PROCESSING I . . . . .	3
CER E 314	EQUILIBRIA I . . . . .	3
CER E 322	MICROSCOPY OF CERAMICS . . . . .	3
EE 303	ELEMENTS OF EE . . . . .	5
ECON 211	GENERAL . . . . .	3
		17

THIRD QUARTER		CREDITS
CER E 302	CERAMIC PROCESSING II . . . . .	3
CER E 315	VITREOUS STATE . . . . .	4
HSS 332	DEV. WEST. CULT. INST. . . . .	3
CE 292	MECH. OF MTL'S I . . . . .	3
PHYSICS 320	MODERN . . . . .	3
		16

### Fourth Year

FIRST QUARTER		CREDITS
CER E 401	CERAMIC PROCESS ANAL. . . . .	3
CER E 441	UNDERGRAD. SEMINAR . . . . .	1
CER E 499	SPECIAL PROJECTS . . . . .	1
HSS 491	LIT. HERITAGE WEST. WORLD I . . . . .	3
MTL E 412	X-RAY DIFFRACTION . . . . .	3
ELECTIVES . . . . .		6
		17

SECOND QUARTER		CREDITS
CER E 402	EQUIP. AND PLANT DESIGN . . . . .	2
CER E 421	CER. BODIES LAB. . . . .	3
CER E 441	UNDERGRAD. SEMINAR . . . . .	1
CER E 499	SPECIAL PROJECTS . . . . .	2
HSS 333	CONTEMP. PROBLEMS . . . . .	3
HSS 492	LIT. HERITAGE WEST. WORLD II . . . . .	3
ELECTIVES . . . . .		3
		17

THIRD QUARTER		CREDITS
CER E 403	EQUIP. AND PLANT DESIGN . . . . .	2
CER E 441	UNDERGRAD. SEMINAR . . . . .	1
CER E 470	REFRACTORIES . . . . .	3
CER E 499	SPECIAL PROJECTS . . . . .	2
HSS 493	LIT. HERITAGE WEST. WORLD III . . . . .	3
H REL 365	HUM. BEHAVIOR IN ORGANIZATIONS . . . . .	3
ELECTIVES . . . . .		3
		17

## Graduate Programs

### Graduate Program Adviser

James I. Mueller  
301 Roberts Hall

Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section.

### Master of Science in Ceramic Engineering

A total of 45 credits of which 36 credits are in course work, a suitable thesis for 9 credits, and a comprehensive oral examination complete the requirements for this degree.



Students may select courses and research in accordance with their special interests and objectives. Graduate work is largely concerned with advanced physical sciences as applied to ceramics; however, courses may also be selected which prepare for plant operation and management. Graduates of accredited ceramic engineering curricula and graduates of other accredited engineering curricula who complete the basic undergraduate courses in ceramic engineering and in science may work for this degree.

#### **Master of Science in Ceramics**

Students with undergraduate majors in science, particularly chemistry or physics, may work for this degree after completing basic undergraduate courses in ceramics. The same academic and thesis program is required for this degree as is described under Master of Science in Ceramic Engineering.

#### **Doctor of Philosophy**

Students who have completed at least one year of satisfactory graduate study may request an examination to determine their eligibility for work leading toward the doctorate. Accepted students must complete an approved program of studies and a research program which makes a definite contribution to the knowledge of the field.



## **METALLURGICAL ENGINEERING**

The curriculum in metallurgical engineering is centered on the fundamentals underlying the properties and behavior of engineering materials with emphasis on metals and alloys. The early part of the program includes a thorough grounding in the basic and engineering sciences such as mathematics, physics, physical chemistry, and engineering mechanics. Subsequent studies are oriented toward the materials sciences. In

this work, emphasis is placed on atomic, molecular, and crystalline structure, the physical properties of solids, thermodynamic properties of materials, transport phenomena, reactions, and mechanical behavior. Problems in the preparation, properties, and applications of metals and alloys are considered in light of scientific and engineering principles.

The curriculum provides a liberal degree of senior-year electives arranged through discussions with faculty advisers. Technical electives emphasize specific areas in metallurgy such as electrical and electronic properties, nuclear materials, mechanical metallurgy, chemical metallurgy, and minerals processing. By the selection of appropriate courses a student may orient his program toward careers in development research and production in industry, basic research, teaching, management, or sales. Opportunities are available in the senior year for a limited number of students to undertake senior projects which involve participation in current research projects in the division.

Metallurgical engineering graduates are employed by every industry that uses metals to fabricate and produce its products. These include all aspects of manufacturing; the aero-space, nuclear, and electrical industries; metal refining and alloy production; and a broad spectrum of research laboratories. Although the Division's curriculum is science-oriented, emphasis is placed as well on the general intellectual development of the individual, the cultivation of imagination which leads to originality in industrial and engineering progress, and the character building necessary to fit the student for the responsibilities he must assume as a metallurgical engineer.

### **Undergraduate Programs**

#### **Adviser**

Thomas F. Archbold  
241 Roberts Addition

The curriculum for the first year is administered by the Department of General Engineering. Those students who transfer into metallurgical engineering may complete the requirements by rearranging the curriculum in consultation with the director of the School of Mineral Engineering. Students must participate in field excursions as part of the course content.

In the fourth year, students may choose electives in physical metallurgy, chemical metallurgy, or mineral proc-

essing. Electives in labor relations, business administration, mechanical engineering, and economics are recommended for students interested in plant operation and administration.

## CURRICULUM IN METALLURGICAL ENGINEERING

### Second Year

FIRST QUARTER		CREDITS
MTL E 250	MTL'S SCIENCE . . . . .	4
CHEM 170	QUAL. ANAL. . . . .	3
MATH 126	CALC. WITH ANALYTIC GEOMETRY . . . . .	5
PHYSICS 122	GENERAL . . . . .	4
		<hr/> 16

SECOND QUARTER		CREDITS
ME 201	METAL CASTING . . . . .	1
MET E 203	CHEM. MET.: INTRO. . . . .	2
HSS 265	TECH. OF COMMUN. . . . .	3
CHEM 350	PHYSICAL . . . . .	3
MATH 224	INTERMED. ANAL. . . . .	3
PHYSICS 123	GENERAL . . . . .	4
		<hr/> 16

THIRD QUARTER		CREDITS
MET E 204	CHEM. METALLURGY I . . . . .	3
MET E 224	INTRO. MET. LAB. . . . .	2
CE 291	DYNAMICS . . . . .	3
CHEM 351	PHYSICAL . . . . .	3
HSS 270	ENGINEERING REPORT WRITING . . . . .	2
MATH 238	DIFF. EQUATIONS . . . . .	3
		<hr/> 16

### Third Year

FIRST QUARTER		CREDITS
MET E 322	MET. THERMODYNAMICS I . . . . .	3
MET E 361	STRUCT. OF SOLIDS . . . . .	4
CE 292	MECH. OF MT'LS. . . . .	3
MTL E 351	MINERAL PROCESSING I . . . . .	4
HSS 331	ORIG. WEST. CULT. INST. . . . .	3
		<hr/> 17

SECOND QUARTER		CREDITS
MET E 324	CHEM. MET. LAB. . . . .	1
MET E 362	PROP. OF SOLIDS . . . . .	4
EE 303	ELEMENTS OF EE . . . . .	5
HSS 332	DEV. WEST. CULT. INST. . . . .	3
PHYSICS 320	MODERN . . . . .	3
		<hr/> 16

THIRD QUARTER		CREDITS
MET E 306	EXCURSION . . . . .	1
MET E 321	CHEM. METALLURGY II . . . . .	2
MET E 363	REACT. IN SOLIDS . . . . .	4
CH E 330	TRANSPORT PROC. PRIN. . . . .	4
HSS 333	CONTEMP. POL. AND SOC. PROBLEMS . . . . .	3
ECON 211	GENERAL . . . . .	3
		<hr/> 17

### Fourth Year

FIRST QUARTER		CREDITS
MET E 424	EXPERMNTL TECH . . . . .	2
MET E 468	UNDERGRAD. SEMINAR . . . . .	1
MTL E 412	X-RAY DIFFRACTION . . . . .	3
CHEM 455	PHYSICAL . . . . .	3
HSS 491	LIT. HERITAGE WEST. WORLD I . . . . .	3
TECHNICAL ELECTIVES . . . . .		5
		<hr/> 17

SECOND QUARTER		CREDITS
MET E 421	MET. THERMODYNAMICS II . . . . .	4
MET E 468	UNDERGRAD. SEMINAR . . . . .	1
HSS 492	LIT. HERITAGE WEST. WORLD II . . . . .	3
TECHNICAL ELECTIVES . . . . .		9
		<hr/> 17

THIRD QUARTER		CREDITS
MET E 306	EXCURSION . . . . .	1
MET E 468	UNDERGRAD. SEMINAR . . . . .	1
HSS 493	LIT. HERITAGE WEST. WORLD III . . . . .	3
TECHNICAL ELECTIVES . . . . .		6
ELECTIVES . . . . .		6
		<hr/> 17

In the senior year, students majoring in physical metallurgy may choose technical electives from Metallurgical Engineering 460, 461, 464, 466; chemical metallurgy majors must elect 471 (Hydrometallurgy).

### MINERAL PROCESSING ENGINEERING OPTION

Students electing this option will, in the third year, substitute Materials Engineering 352 (Mineral Processing II) and Metallurgical Engineering 471 for 324 and 363.

### Fourth Year

FIRST QUARTER		CREDITS
MET E 470	FLOTATION . . . . .	3
MTL E 412	X-RAY DIFFRACTION . . . . .	3
HSS 491	LIT. HERITAGE WEST. WORLD I . . . . .	3
GEOL 423	OPTICAL MINERALOGY . . . . .	5
ELECTIVES . . . . .		3
		<hr/> 17

SECOND QUARTER		CREDITS
MIN E 465	OPAQUE MINERALS MICROSCOPY . . . . .	2
MIN E 481	MINERAL INDUST. ECON. . . . .	2
MET E 499	SPECIAL PROJECTS . . . . .	3
HSS 492	LIT. HERITAGE WEST. WORLD II . . . . .	3
H REL 365	HUM. BEHAVIOR IN ORGANIZATIONS . . . . .	3
ELECTIVES . . . . .		3
		<hr/> 16

THIRD QUARTER		CREDITS
MIN E 306	EXCURSION . . . . .	1
MIN E 499	SPECIAL PROJECTS . . . . .	2
MET E 472	MINERAL PROCESSING PRACTICES . . . . .	2
MET E 473	MINERAL PROCESS PLANT DESIGN . . . . .	2
MET E 415	STAT. QUAL. CONTROL . . . . .	2
HSS 493	LIT. HERITAGE WEST. WORLD III . . . . .	3
ELECTIVES . . . . .		3
		<hr/> 16



## Graduate Programs

### Graduate Program Adviser

Douglas H. Polonis  
328 Roberts Hall

Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section.

### Master of Science in Metallurgical Engineering

A total of 45 credits of which 36 credits are in course work, a suitable thesis for 9 credits, and a comprehensive oral examination complete the requirements for this degree. Prospective candidates may select courses in accordance with their special interests and objectives. Graduate work is largely concerned with advanced materials science as applied to physical metallurgy, extractive metallurgy, or mineral processing. However, courses may also be selected which prepare for plant operation and management. Graduates of accredited metallurgical engineering curricula and graduates of other engineering curricula who complete the basic undergraduate courses in metallurgical engineering may work for this degree.

### Master of Science in Metallurgy

Students with undergraduate majors in science, particularly physics or chemistry, may work for this degree after completing basic undergraduate courses in metallurgy or equivalent.

### Doctor of Philosophy

Students who have completed one year of graduate work may request an examination to determine whether or not the faculty will advise proceeding to the Ph.D. General Examination. A critical examination of the applicant's record, recommendations, and proposed course of study will be pertinent to this decision. The language requirement will be satisfied by passing the scheduled examinations in any two of either German, French, or Russian. In addition to course work, a student will be expected to study independently for examination on a list of subjects prepared by his Supervisory Committee. General Examinations will be taken at the end of the second year or during the third year of residence. The General Examinations will be sufficiently comprehensive to demonstrate the student's ability to deal with broad aspects of materials science, as well as his specialized subject area. Each Candidate will present a written dissertation based on his research program which makes an original and independent contribution to knowledge. Proficiency in basic re-

search is of paramount importance and the research will be conducted in the University laboratories. The Final Examination will consist of the student's oral defense of his dissertation.

## MINING ENGINEERING

Mining engineering requires the application of the fundamentals from other branches of engineering as well as those peculiar to the industry. The unique nature of engineering in the mineral industries is characterized by a knowledge of minerals, their geologic environment, methods for their exploitation and recovery, and of the technical and economic factors controlling the industry. In the curriculum, the basic and engineering-sciences common to all engineering are complemented by the addition of geologic science.

Mining Engineering is concerned with the economic evaluation of mineral deposits, and the application of engineering principles to mine operations. These include the application of rock mechanics to support and design of underground openings and to the breaking of ore, the design of systems for breaking, loading, and transporting large tonnages, and the control of environment in underground mines. Industrial relations, organization planning, personnel management, cost control, financial provisions, and marketing of mineral products are essential activities of the mine engineer in management.



## Undergraduate Programs

### Adviser

Donald L. Anderson  
223 Roberts Hall

The curriculum for the Bachelor of Science in Mining Engineering for the first year is administered by the



Department of General Engineering. The mining engineering curriculum options provide for basic preparation in exploration geology, mine engineering and production, and mineral preparation and concentration. A pre-professional training program, conducted in cooperation with the major mines in the Northwest, provides essential industrial and geologic field experience.

*Geologic engineering* involves the search for and evaluation of ore deposits and other engineering applications of geology. The geologic engineering curriculum is supplemented by senior-year study of a mineral deposit in the field.

*Mineral preparation engineering* deals with the recovery of valuable minerals from raw ores by processes of beneficiation or concentration. The mineral preparation option is supported by complete experimental facilities in the Milnor Roberts Hall laboratories.

All students make an annual field study trip to a major mining district. These activities supplement classwork and develop a realistic view of the minerals industry. Courses in labor relations, business administration, and economics are recommended to students interested in mine administration.

## CURRICULUM IN MINING ENGINEERING

### Second Year

FIRST QUARTER		CREDITS
HSS 265	TECH. OF COMMUN. . . . .	3
GEOL 220	MINERALOGY . . . . .	5
MATH 126	CALC. WITH ANALYTIC GEOMETRY . . . . .	5
PHYSICS 121	GENERAL . . . . .	4
		17

SECOND QUARTER		CREDITS
MIN E 221	EXPLOSIVES AND ROCK DRILLING . . . . .	2
HSS 270	REPORT WRITING . . . . .	2
GEOL 225	IGNEOUS AND METAMORPHIC PETROL . . . . .	5
MATH 224	INTERMED. ANAL. . . . .	3
PHYSICS 122	GENERAL . . . . .	4
		16

THIRD QUARTER		CREDITS
MIN E 330	MINE SURVEYING . . . . .	3
CE 291	DYNAMICS . . . . .	3
MTL E 250	MT'LS. SCIENCE . . . . .	4
MATH 238	DIFF. EQUATIONS . . . . .	3
PHYSICS 123	GENERAL . . . . .	4
		17

### Third Year

FIRST QUARTER		CREDITS
MIN E 322	PRINCIPLES OF MINE PROD. . . . .	4
MTL E 351	MINERAL PROCESS. I. . . . .	4
EE 303	ELEMENTS OF EE . . . . .	5
HSS 331	ORIG. WEST. CULT. INST. . . . .	3
		16

SECOND QUARTER		CREDITS
ME 415	STAT. QUAL. CONTROL . . . . .	3
CE 292	MECH. OF MT'LS. I . . . . .	3
HSS 332	DEV. WEST. CULT. INST. . . . .	3
GEOL 340	STRUCTURAL GEOLOGY . . . . .	5
H REL 365	HUM. BEHAVIOR IN ORGANIZATIONS . . . . .	3
		17

THIRD QUARTER		CREDITS
MIN E 306	EXCURSION . . . . .	1
GEOL 487	ORE DEPOSITS . . . . .	4
MTL E 352	MINERAL PROCESS. II . . . . .	2
CE 293	MECH. OF MAT'LS. II . . . . .	3
HSS 333	CONTEMP. POL. AND SOCIAL PROBLEMS . . . . .	3
ECON 211	GENERAL . . . . .	3
		16

### Fourth Year

FIRST QUARTER		CREDITS
MIN E 425	ROCK MECHANICS . . . . .	2
MIN E 433	MINE VENTILATION . . . . .	3
HSS 491	LIT. HERITAGE WEST. WORLD I . . . . .	3
ME 325	THERMODYNAMICS . . . . .	4
ELECTIVES . . . . .		3
		15

SECOND QUARTER		CREDITS
MIN E 325	MINERAL LAND VALUATION . . . . .	2
ME 417	METHODS ANAL. . . . .	3
MIN E 481	MINERAL INDUST. ECON. . . . .	3
HSS 492	LIT. HERITAGE WEST. WORLD II . . . . .	3
ELECTIVES . . . . .		5
		16

THIRD QUARTER		CREDITS
MIN E 426	EXPLORATION . . . . .	3
MIN E 432	MINE PLANT DESIGN . . . . .	5
HSS 493	LIT. HERITAGE WEST. WORLD III . . . . .	3
CE 342	FLUID MECHANICS I . . . . .	4
ELECTIVES . . . . .		3
		18

## GEOLOGICAL ENGINEERING OPTION

### Fourth Year

FIRST QUARTER		CREDITS
MIN E 425	ROCK MECHANICS . . . . .	2
HSS 491	LIT. HERITAGE WEST. WORLD I . . . . .	3
GEOL 423	OPTICAL MINERALOGY . . . . .	4
ME 325	THERMODYNAMICS . . . . .	4
ELECTIVES . . . . .		3
		17

SECOND QUARTER		CREDITS
MIN E 325	MINERAL LAND VALUATION . . . . .	2
MIN E 481	MINERAL INDUST. ECON. . . . .	3
HSS 492	LIT. HERITAGE WEST. WORLD II . . . . .	3
GEOL 424	PETROG. AND PETROL. OF IGNEOUS ROCKS . . . . .	5
CE 342	FLUID MECHANICS I . . . . .	4
		17

THIRD QUARTER		CREDITS
MIN E 426	EXPLORATION . . . . .	3
MIN E 427	EXPLORATION GEOPHYSICS . . . . .	3
HSS 493	LIT. HERITAGE WEST. WORLD III . . . . .	3
GEOL 425	PETROG. AND PETROL. OF METAMORPHIC ROCKS . . . . .	5
ELECTIVES . . . . .		3
		17

**MINERAL PROCESSING ENGINEERING OPTION****Third Year**

FIRST QUARTER		CREDITS
MIN E 322	PRODUCTION PRINCIPLES . . . . .	4
MTL E 351	MINERAL PROCESS. I . . . . .	4
EE 303	ELEMENTS OF EE . . . . .	5
HSS 331	ORIG. WEST. CULT. INST. . . . .	3
		16

SECOND QUARTER		CREDITS
CE 292	MECH. OF MT'LS. II . . . . .	3
ME 415	STAT. QUAL. CONTROL . . . . .	3
MET E 203	CHEMICAL METALLURGY . . . . .	2
HSS 332	DEV. WEST. CULT. INST. . . . .	3
CHEM 350	PHYSICAL . . . . .	3
ECON 211	GENERAL . . . . .	3
		17

THIRD QUARTER		CREDITS
MIN E 306	EXCURSION . . . . .	1
MTL E 352	MINERAL PROCESS. II . . . . .	2
CE 342	FLUID MECHANICS I . . . . .	4
HSS 333	CONTEMP. POL. AND SOC. PROBLEMS . . . . .	3
CHEM 351	PHYSICAL . . . . .	3
MET E 204	PRIN. OF CHEM. MET. I . . . . .	3
		16

**Fourth Year**

FIRST QUARTER		CREDITS
MET E 470	FLOTATION . . . . .	3
HSS 491	LIT. HERITAGE WEST. WORLD I . . . . .	3
MTL E 412	X-RAY DIFFRACTION . . . . .	3
GEOL 423	OPTICAL MINERALOGY . . . . .	5
ELECTIVES . . . . .		3
		17

SECOND QUARTER		CREDITS
MIN E 465	OPAQUE MINERALS MICROSCOPY . . . . .	2
MIN E 481	MINERAL INDUST. ECON. . . . .	3
MET E 472	MINERAL PROCESS PRACTICES . . . . .	2
ME 325	THERMODYNAMICS . . . . .	4
HSS 492	LIT. HERITAGE WEST. WORLD II . . . . .	3
ELECTIVES . . . . .		3
		17

THIRD QUARTER		CREDITS
MIN E 306	EXCURSION . . . . .	1
MET E 471	HYDROMETALLURGY . . . . .	4
MET E 473	PLANT DESIGN . . . . .	2
HSS 493	LIT. HERITAGE WEST. WORLD III . . . . .	3
ELECTIVES . . . . .		6
		17

**Graduate Programs****Graduate Program Adviser**

Drury A. Pifer  
211 Roberts Hall

Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section.

**Master of Science in Mining Engineering**

The requirements for this degree are a minimum of 45 credits, of which 36 must be in formal course work and 9 in thesis. A nonthesis program may be followed with permission of the Director and substitution of approved courses. Prospective candidates for the degree may elect work in mining, geology, or mineral processing in accordance with their special interests. Special study in the fields of labor relations and management is available. The student may select courses in preparation for exploration and development, operation and management, engineering, or mining geology. Graduate studies in mineral processing cover the fields of metallic and nonmetallic minerals and coal, with special work on advanced theory and practice. Graduates of accredited mining engineering curricula and graduates of other accredited engineering curricula who complete the basic undergraduate courses in mining engineering and geology may be accepted in this program.

**NUCLEAR ENGINEERING****Chairman and Graduate Program Adviser**

Albert L. Babb  
303 Benson Hall

**Professors**

Albert L. Babb

**Associate Professors**

Robert W. Albrecht, Kermit L. Garlid

**Assistant Professors**

Salvador B. Layno (acting), Norman J. McCormick,  
Gene L. Woodruff

**Research Associate Professor**

Eugene D. Clayton

**Research Assistant Professor**

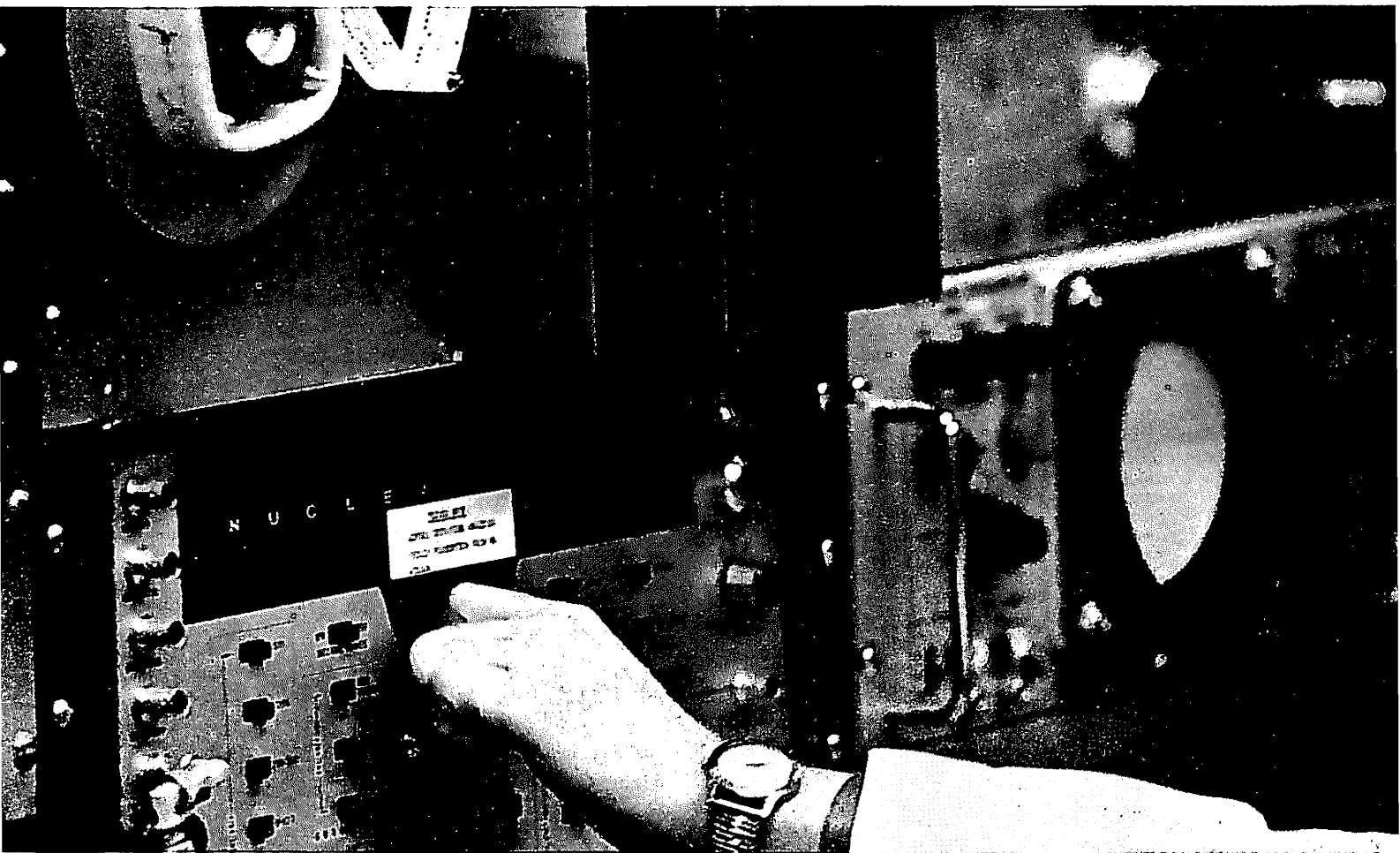
Lars Grimsrud

**Visiting Associate Professor**

John C. Fox

**Senior Nuclear Engineer**

William E. Wilson, Jr.



#### **Associated Faculty**

Richard H. Bogan (Civil Engineering), Dean E. McFeron (Mechanical Engineering), Ralph W. Moulton (Chemical Engineering), Douglas H. Polonis (Mineral Engineering)

The nuclear engineering program, while administered by the Department of Nuclear Engineering, draws on, and is in close relation to, the faculty in the Departments of Chemical, Civil, Electrical, and Mechanical Engineering, and the Division of Metallurgical Engineering.

Nuclear engineering is directly concerned with the release, control, and utilization of all forms of energy from nuclear sources. This discipline did not exist until about fifteen years ago when concerted effort was directed toward the use of nuclear energy for central station power, propulsion of naval vessels, outer space exploration, and the production of radioisotopes for industrial, medical, and agricultural uses.

The successful engineering of nuclear energy projects involves the use of skills and specialties in many areas such as heat transfer, metallurgy, stress analysis, automation and control, corrosion, thermoelectricity, thermionics, and chemical processing. The presence of nuclear reactions together with severe environmental conditions complicates otherwise conventional engineering problems. Thus, one purpose of the program is to encourage students to become proficient in related areas. In addition, a special three-quarter sequence of courses (484, 485, and 486) is offered for students in engineering or science programs who wish to obtain an orientation toward the nuclear energy field, with a minimum of prerequisite courses.

#### **Master of Science in Engineering, Major: Nuclear Engineering**

Students entering the master's program should have completed in their undergraduate programs the following courses or their equivalents: Mathematics 238



(Elements of Differential Equations) and 224 (Intermediate Analysis); Physics 320 (Introduction to Modern Physics); Physics 323 (Introduction to Nuclear Physics); Materials Engineering 250 (Fundamentals of Materials Science); Mechanical Engineering 430 (Introduction to Heat Transfer) or Chemical Engineering 330 (Transport Process Principles); Nuclear Engineering 484 (Introduction to Nuclear Engineering); Nuclear Engineering 485 (Nuclear Instruments). In case of deficiencies, students may be required to take the necessary undergraduate courses in addition to the normal graduate program.

A total of 36 credits of course work and a thesis equivalent to 9 credits of course work are required. The course work is usually divided in the ratio of two to one between nuclear engineering courses and selected courses from other departments. All programs of study must be approved by the Graduate Program Adviser and will normally include 500, 501, 505, 506, 510, 512, N521, N522, and 523. At least 9 credits of advanced mathematics and physics are required.

Students who enter the program with a Bachelor of Science degree in Nuclear Engineering may substitute advanced courses for certain first-year requirements.

Minor electives in a student's program may be chosen from such fields of study as: control systems and servomechanisms; electronics; chemical separation processes; numerical analysis; heat transfer; materials engineering; sanitary engineering.

### Doctor of Philosophy

The program of study should include preparation equivalent to the courses 444, 500, 501, 505, 506, 510, 512, 550, 551, 556, 560, 570; Physics 461, 462, 463; Mathematics 427, 428, 429; and two years of seminar. Additional courses should be taken to meet requirements for specialization in one of the following categories:

#### 1. Nuclear Analysis of Nuclear Reactors

For students with a strong background and aptitude in physics and mathematics. Courses include: Mathematics 527, 528, 529; Physics 513, 517, 518, 519.

#### 2. Engineering Analysis of Nuclear Reactor Systems

For students with a mechanical engineering background and interest. Courses include: Mechanical Engineering 521, 522, 530, 531, 532, 534, 541, 564, 565; plus supporting courses in mathematics.

#### 3. Nuclear Engineering Materials

For students with a background and interest in metallurgy or ceramics. Courses include: 444, 445; Materials Engineering 512, 513; Metallurgical Engineering 541, 542, 543, 566; or alternate courses in Ceramic Engineering such as 511, 512, 513.

#### 4. Nuclear-Chemical Processes

For students with a background and interest in chemistry and chemical engineering. Courses include: Chemical Engineering 525, 530, 531, 560, 561, 588J; Chemistry 418.

#### 5. Radiolotope Usage and Environmental Control

For students with a background and interest in sanitary engineering. Courses include: 559; Civil Engineering 550, 551, 552, 560, 561, 562; Chemical Engineering 530; Chemistry 418.

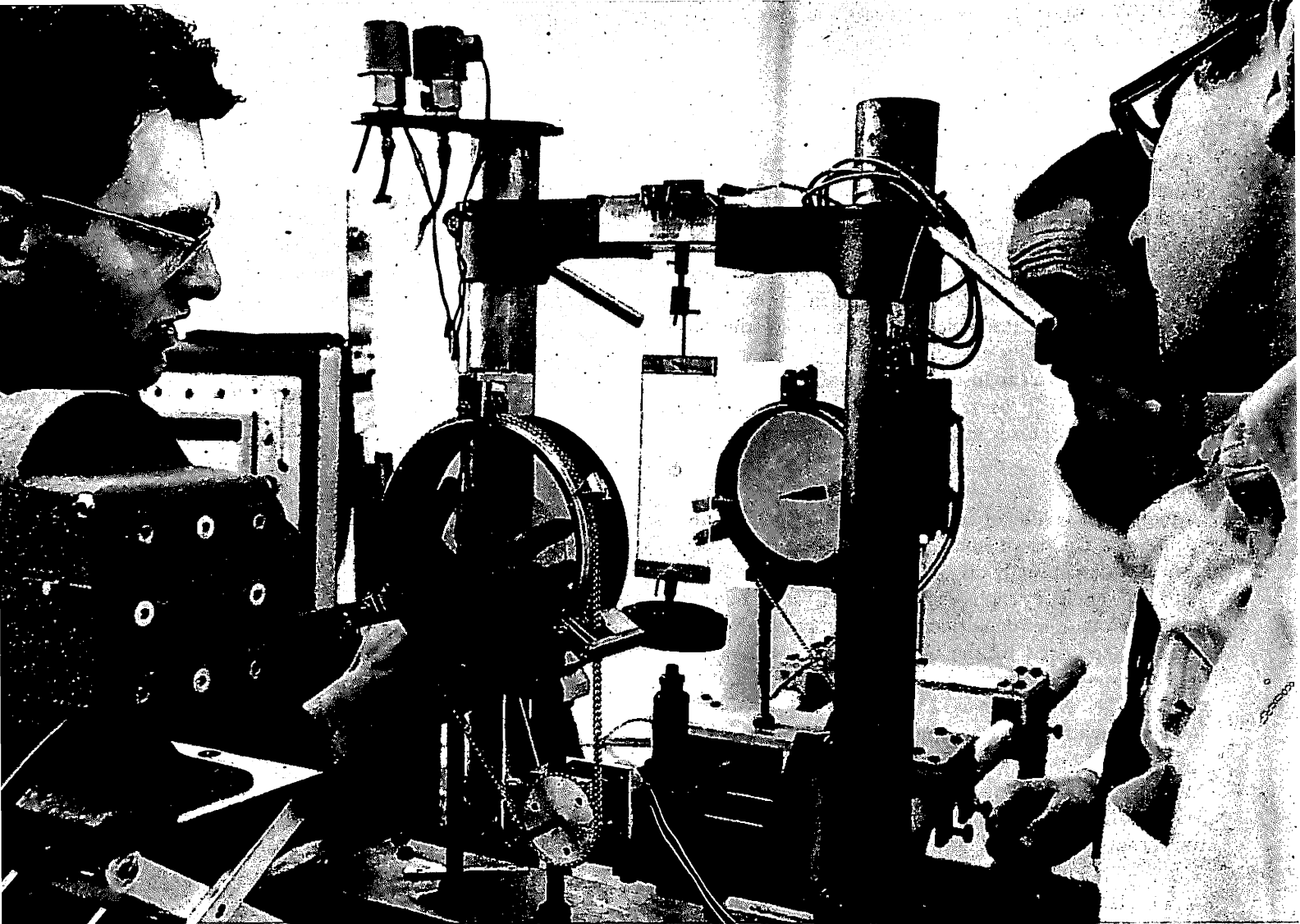
#### 6. Nuclear Reactor System Dynamics

For students with a background and interest in electrical engineering. Courses include: Electrical Engineering 505, 510, 545, 582, 583, 584, 585; plus supporting courses in mathematics.

Aspirants to the degree of Doctor of Philosophy must pass, successively, a written and oral qualifying examination, a General Examination for admission to candidacy, and a Final Examination. The qualifying examination may be taken after 30 credits of graduate work have been successfully completed or during the second year of regular graduate study. The qualifying examination is given once at the beginning of each Autumn and Spring Quarter. It is designed to assess the student's understanding of the basic scientific and engineering concepts upon which his doctoral work will be based. The subject material includes undergraduate fundamentals in mathematics, physics, and the engineering sciences as well as the material in the first year of graduate work in nuclear engineering.

In the Oral General Examination the student is examined on topics related to his field of specialization in nuclear engineering and the area in which he plans to do his dissertation research. A student is not permitted to take the General Examination until he has been accepted by a member of the faculty as a research student. A student should take the General Examination as soon as possible after passing the qualifying examination, usually within one year. Passing the General Examination constitutes admission to candidacy for the Ph.D.

A prospective candidate for the degree is expected to conduct an original and independent investigation in



one of the fields of nuclear engineering. The results of this research, which must yield a significant contribution to knowledge, are submitted as a dissertation. In his Final Examination, the student presents and defends these results orally.

## INTERDEPARTMENTAL PROGRAM

### ENGINEERING MECHANICS

**Chairman of Committee**

Billy J. Hartz, Department of Civil Engineering  
313 More Hall

An interdepartmental graduate program in engineering mechanics leading to the degrees of Master of Science in Engineering and Doctor of Philosophy is offered. The student will normally enroll in either the Departments of Aeronautics and Astronautics, Civil Engineering, or in Mechanical Engineering.

Engineering mechanics is an important link between new developments in the physical sciences, in mathematics, and in engineering. The field covers such topics as the mechanics of solids and fluids, dynamics, behavior of materials, and experimental mechanics.

Students entering this program should have completed an undergraduate degree in a field such as aeronautical, civil, or mechanical engineering, physics, engineering physics, mathematics, or an equivalent. The course program is planned through consultation with an adviser to fit the student's interests and background. The student's program will ordinarily include continuing study in mathematics and the engineering sciences (solid mechanics, fluid mechanics, thermodynamics, dynamics), and must satisfy the basic requirements of the department in which he is enrolled.

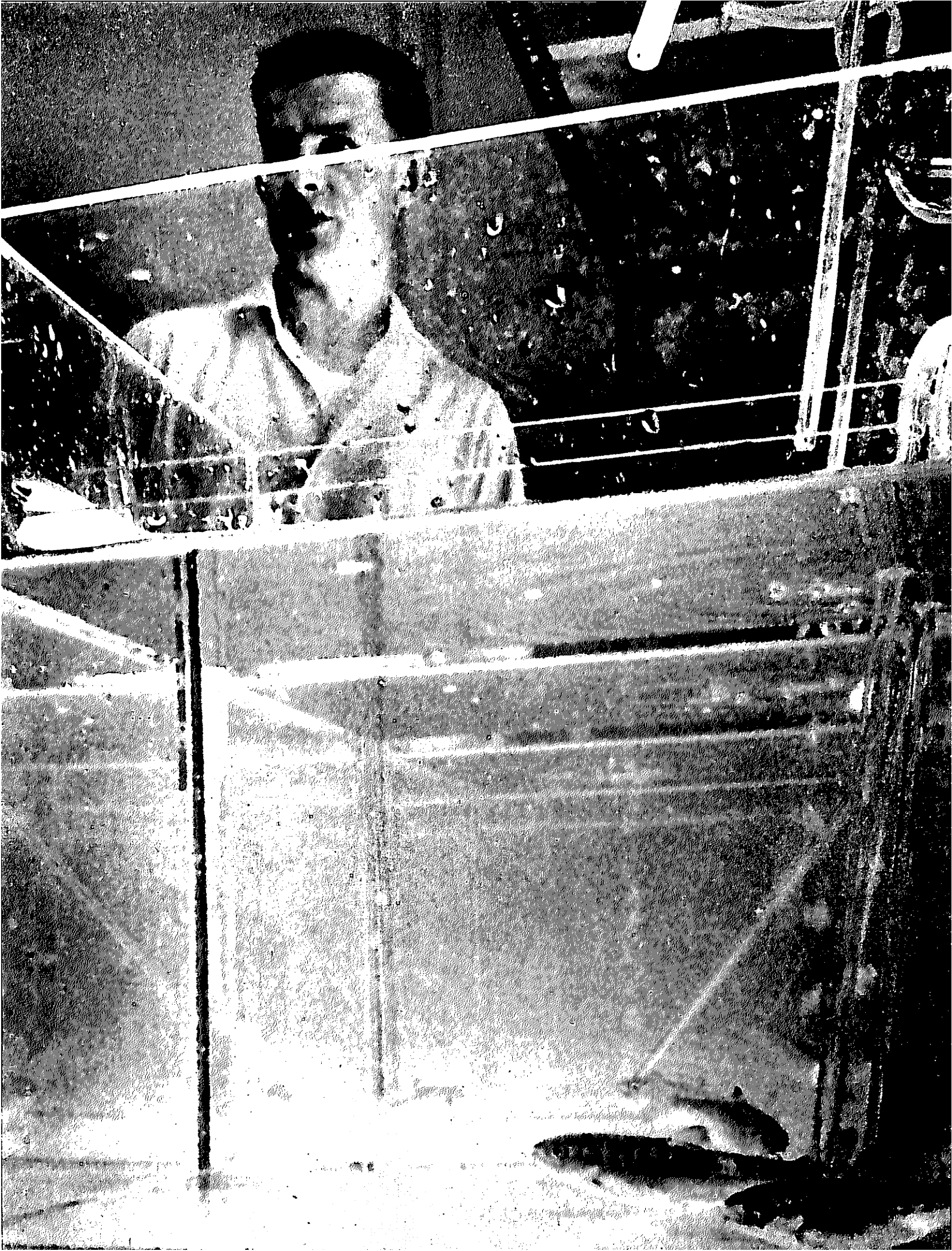
The engineering science courses for this program are normally selected from available courses offered by the Departments of Aeronautics and Astronautics, Civil

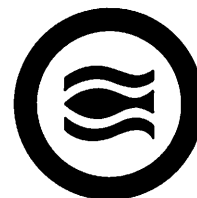


Engineering, and Mechanical Engineering in the following areas: (1) Mechanics of Continua and Thermodynamics: general theory of continuous media, thermodynamics, heat transfer, electro- and thermodynamics of a continuum; (2) Mechanics of Solids: theory of elasticity, theory of plasticity, viscoelasticity, thermoelasticity, properties of solids, fracture mechanics, experimental stress analysis; (3) Mechanics of Fluids:

fluid mechanics, hydrodynamics, aerodynamics, gasdynamics, hydrodynamic waves; (4) Dynamics and Wave Propagation: advanced dynamics, nonlinear dynamics, space dynamics, vibration theory, random vibrations, wave propagation; (5) Structural Mechanics: theory of plates and shells, dynamics of structures, elastic stability, matrix theory of structures, variational and energy methods.







## FISHERIES

### **Dean**

**Richard Van Cleve**  
204 Fisheries Center

### **Associate Dean**

**Donald E. Bevan**  
214 Fisheries Center

### **Professors**

**Milo C. Bell, Allan C. DeLacy, Lauren R. Donaldson, Paul E. Fields, John Liston, James E. Lynch (emeritus), William F. Royce, Allyn H. Seymour, Albert K. Sparks, Arthur D. Welander**

### **Associate Professors**

**Donald E. Bevan, Robert L. Burgner, Alexander M. Dollar, Ole A. Mathisen, Gerald J. Paulik, Ernest O. Salo**

### **Assistant Professors**

**George M. Pigott, Lynwood S. Smith**

### **Lecturer**

**F. Heward Bell**

### **Research Faculty**

**Clarence D. Becker, Kenneth K. Chew, Max Katz, Jack R. Matches, Frieda Taub**

In a hungry world, contemporary man turns more and more to the living resources of the waters. He farms the seas, lakes, and rivers as he has farmed the land: breeding his stock, harvesting his crops, using science and knowledge to develop and preserve an increasingly important food supply.

Until recently, conservation and cultivation of fish have been of minor importance, but the population growth combined with rapid depletion of fisheries stocks has focused attention on a worldwide problem. The College of Fisheries is concerned, through both its faculty and students, with the investigation of possible ways to use well known stocks of fish more effectively, how to make better use of all waters to produce more food from living organisms, how to culture aquatic plants and animals more effectively.

In the United States, a decreasing work week and increasing leisure have meant an even further demand on fisheries. Recreational fishing is rapidly becoming a major factor in the need for increased production, and for the well trained management biologist. To meet this need, the College has broadened its base of training to include, in the undergraduate curricula, a much greater emphasis on fisheries administration.



Founded in 1919, the College of Fisheries has been intimately associated with the development and conservation of the fisheries of the northeastern Pacific Ocean.

The College attempts, always, to deal with whole problems rather than with isolated technical questions, an approach which involves many phases of biology with particular emphasis on the quantitative aspects. Full attention is given to political, social, legal, and economic problems associated with the use of resources. Although fishery problems of the Northwest are emphasized, they are examined as case histories, with many features applicable to problems of harvesting aquatic resources throughout the world, and as a result many foreign students register in the College.

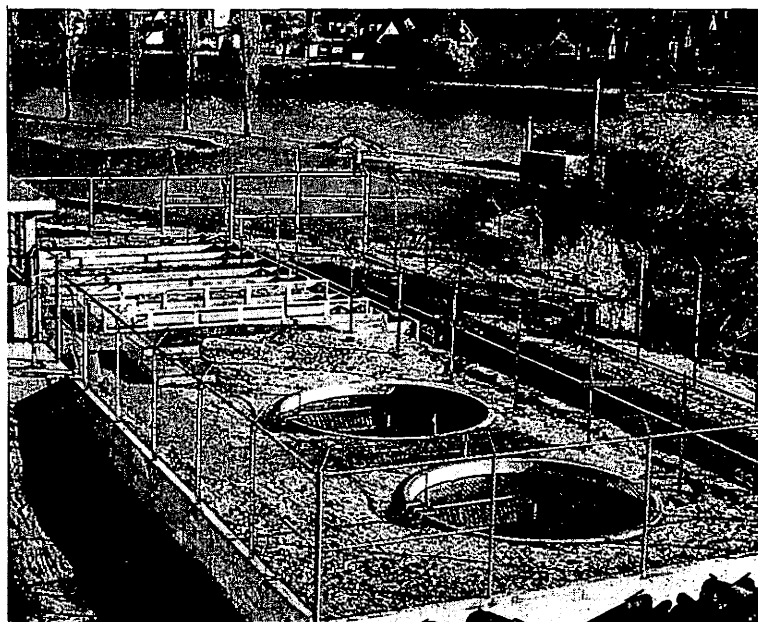
Since commercial fishing is so closely related to the food industry, the College maintains a Food Science Division to prepare food scientists for careers in both industry and government. Both the graduate and undergraduate programs emphasize the role of the basic physical and biological sciences in the solution of problems which have resulted from the recent technological revolution in the food industry.

Although the Food Science program concentrates on general principles applicable to a wide range of food products, the extensive research program is largely concerned with marine and freshwater products of the Pacific Northwest. The program attracts many out-of-state and foreign students, particularly at the graduate level.

The College of Fisheries offers courses leading to the degrees of Bachelor of Science in Fisheries, Bachelor of Science with a major in Fisheries, Bachelor of Science with a major in Food Science, Master of Science, and Doctor of Philosophy.

The College programs are designed to provide both the scientific training and the professional competency necessary for graduates to satisfy the various needs of their chosen fields. A Bachelor of Science in Fisheries is granted to students successfully completing a prescribed curriculum. Two options are offered: fishery biology and fishery management and administration. A Bachelor of Science with a major in fisheries is granted to students successfully completing an elective curriculum including at least 36 fisheries credits. A Bachelor of Science with a major in food science is granted to

students successfully completing a specified core curriculum and appropriate electives. Further specialization within these areas may be undertaken in graduate studies as preparation for careers in teaching and research. In addition, training programs at the graduate level are offered in shellfish sanitation and biological aspects of water pollution.



### College Facilities and Services

The College of Fisheries combines laboratory and classroom study with practical experience to offer the student the maximum preparation for a career in fisheries.

The College is located in the Fisheries Center, which was built in 1949 on the edge of the Lake Washington Ship Canal. The Ship Canal connects the large, freshwater body of Lake Washington with the salt water of Puget Sound.

The Center houses classrooms, laboratories, and general facilities, as well as several research organizations. Also, the Center contains a branch library of research materials in fisheries, food science, and oceanography. With more than twenty thousand bound volumes and forty thousand pamphlets, the library currently receives more than nine hundred serial publications. All the major abstract journals in the subject fields are also



available, as are indexes to government research reports. Further material needed for research work is obtained from other library collections on the campus or by inter-library loan.

The collection of fishes maintained by the College for research and teaching purposes contains over three hundred thousand cataloged specimens. These are mainly North Pacific marine fishes and northwestern freshwater fishes. However, the collection also includes extensive material from the Philippine Islands and the South Pacific, as well as representative collections from other parts of the world.

To provide practical experience and to accommodate part of the research program, the College has concrete fish ponds, connected to the Lake Washington Ship Canal by a fish ladder. Inside the Fisheries Center, an experimental fish hatchery provides facilities for students to study the life cycle of the Pacific salmon and of other freshwater fishes. A salt water aquarium is also maintained by the College. Cold or warm recirculated sea water may be supplied to a battery of aquaria as well as to a unique 2,000 gallon annular tank.

Other laboratories provide for the study of the physiology and behavior of fish. These include a separate room containing troughs and tanks in which water temperature may be maintained at various levels. Physiological facilities include equipment for surgical procedures and biochemical analysis of body fluids from both freshwater and marine fish.

Equipment for the study of the effects of pollutants upon fish is housed in a room where the temperature can be maintained at any level between 50° and 75° F. This laboratory is supplied with water from several different sources and is used for both class demonstrations and research.

The College of Fisheries and the Fisheries Research Institute maintain an extensive library of computer programs for processing biological data. Included in this collection of programming materials are a number of simulation compiler programs that enable students to use the IBM 7094 computer for study of the structure and dynamic behavior of biological systems. Students have access to a Burroughs B5500, an IBM 360-50 and 7094 direct coupled system, and peripheral data processing equipment of the Pacific Northwest Research Computer Laboratory at the University of Washington.

A 67-foot, diesel-powered boat, with cabin laboratory, is operated by the College. The vessel, the "Commando," is used for instruction and research in Lake Washington, Puget Sound, and the North Pacific Ocean. It is capable of trawling to a depth of 1,000 fathoms, and is equipped for other types of fishing carried on in the North Pacific, as well as for handling a wide variety of experimental gear. There are facilities for marine microbiological studies and for technological investigations at sea on the M.V. "Commando." These include freezing and other refrigeration equipment and a small laboratory unit. Periodic training cruises introduce students to shipboard operations, including the use of various types of sampling equipment and acquaintance with a diversity of marine habitats.

The headquarters of one of the Pacific Coast's largest fishing fleets is located within two miles of the campus. Puget Sound, besides serving as a base for the world-famous salmon and halibut fisheries, has extensive bottom fish, commercial oyster, clam, crab, and shrimp operations. Sports fishing, particularly for trout, is available in the Northwest's many lakes and streams. Full advantage is taken of the proximity of these natural resources in research and teaching. A College of Fisheries field station at Big Beef Creek on Hood Canal provides additional opportunities for class field studies and research in stream and estuarine ecology. The stream contains established runs of chum and coho salmon, and of steelhead trout.

Food Science facilities include separate, well-equipped laboratories for food microbiology, food biochemistry, and food analysis. The food-processing and food-engineering laboratory complex is composed of several separate facilities containing equipment for teaching and experimental work in thermal processing (including canning), drying, smoking, and freezing foods. A particularly wide variety of low-temperature equipment and cold rooms is available.

A unique feature of the Food Science laboratories is the Cobalt-60 research food irradiator (Mark II). This radiation unit contains a source of about 30,000 curies strength. Food or other materials to be irradiated are loaded into metal containers which are moved mechanically into proximity to the source. Operational safety is ensured by a water shield. The containers are designed to provide for temperature and atmosphere control during irradiation.

Facilities for graduate studies in nutrition, including experimental work with vertebrates and invertebrates,

are provided in the Food Science Division. Laboratory and shipboard facilities, including simulated sea-bed equipment, pressure bomb incubators, deep-sea sampling equipment, etc., are maintained in the Food Science Division for graduate studies in the field of Marine Microbiology.

#### **Fisheries Club**

The students of the College of Fisheries formed the Fisheries Club in 1922. Since its beginning, the Club has been the center of extracurricular social and educational activities for the College students.

Meetings are held monthly, usually with prominent speakers from the various fields of the fishing industry. Frequently motion pictures are shown which deal with fisheries all over the world. In the past years the students have organized the Open House of the College of Fisheries. In addition the Club has its annual salmon bake and other social gatherings. The Club has aided in procuring summer employment for many College of Fisheries students.

#### **Related Activities**

Offices are maintained in the Fisheries Center by the Washington State Department of Fisheries and the Washington State Department of Game. The Laboratory of Radiation Biology, a national center for research in aquatic radiobiology supported by the Atomic Energy Commission, also has its quarters in the Fisheries Center.

In the city of Seattle are offices and laboratories of the U.S. Fish and Wildlife Service, and the headquarters of the International Pacific Halibut Commission is located on the campus.

The Friday Harbor Laboratories on San Juan Island, about eighty miles north of Seattle, are under the administration of the Graduate School and provide unique opportunities for teaching and research in the marine sciences. During the summer, courses in algology, marine zoology, fisheries, oceanography, and meteorology are offered for advanced undergraduate and graduate students.

The College of Fisheries is actively engaged in water resource management activities, with the faculty participating in interdisciplinary programs. The College is represented on the joint scientific committee of the State of Washington Water Research Center.

### **The Fisheries Research Institute**

#### **Staff**

Rollin D. Andrews, Clarence D. Becker, Donald E. Bevan, Robert L. Burgner, Kenneth K. Chew, Michael B. Dell, Allan C. Hartt, Orra E. Kerns, Jr., Ole A. Mathisen, Denny M. Miller, Remedios W. Moore, Kenneth Roberson, Donald E. Rogers, William F. Royce, Ernest O. Salo, Lynwood S. Smith, Albert K. Sparks, Richard W. Tyler

The Fisheries Research Institute is a research branch of the College of Fisheries. The College's larger grants and contracts in the field of fishery biology are handled by the Institute under the direction of both teaching and research faculty. Employment on contracts and grants is given first to graduate or undergraduate students, and many students are working toward their graduate degrees on major fishery problems which are being supported by contracts or grants.

The Institute was established in 1947 under the sponsorship of the Alaska Salmon Industry, Inc., and the research on salmon has continued and expanded under various industry, state, and federal contracts. Currently the principal salmon studies are: (1) population dynamics and ecology of lakes producing sockeye salmon; (2) migrations and abundance of salmon on the high seas; (3) blood parasites of Northwest fishes; (4) ecology of nursery areas in pink and chum salmon streams; (5) regulation for optimum yield; and (6) ecology of Puget Sound salmon stocks under natural and altered environmental conditions in fresh water and estuaries. Much of this work on salmon is important to the United States section of the International North Pacific Fisheries Commission, and members of the Institute staff participate in the meetings of the Commission.

Research on problems other than salmon has been expanding rapidly. Current projects include several studies on oysters, ecology of paralytic shellfish toxicity, studies of parasites of fish, and simulation of watershed management.

The Institute maintains headquarters on the University campus and semipermanent field stations at five locations in Alaska. The campus headquarters and the Big Beef station are used for work in Washington. A large amount of field and laboratory equipment is available together with an extensive collection of fishery records from the Pacific Northwest and Alaska. Provision is made to conduct research on fishery problems in collaboration with other colleges and departments of the



University, especially with Engineering, Economics, Law, and Oceanography.

The motor vessel "Malka," 38 feet long, is used for inshore oceanographic and biological work in Washington and Alaska. She is equipped with a small laboratory and winches for handling specialized fishing or sampling gear.

The 32-foot "Iliamna" and 30-foot "Kakhonak" are stationed on Lake Iliamna, the largest lake in Alaska and a major producer of sockeye salmon in North America. They are equipped for studies of limnology and of the fish population.

### **Admission as Freshmen**

In addition to the University requirements for entrance from high school, intermediate algebra and trigonometry are prerequisites for the first courses in mathematics included in all College of Fisheries curricula. Students who plan to enter this College can, and preferably should, complete these courses in addition to elementary algebra and plane geometry which normally are the two units of college preparatory mathematics. Without this additional preparation, students will probably find it necessary to spend an extra quarter at the University in completing work for the baccalaureate degree. It is recommended also that students study chemistry, physics, and if possible, biology while in high school.

Because an appropriate choice of high school electives serves to strengthen a student's preparation, the University will give this part of a student's record the same careful attention it gives to other aspects of his qualifications.

### **Advising**

After notification of admission, and before registration, new students should visit or write to the College of Fisheries for help in planning their course programs. Academic and other counseling of fisheries students is given by faculty advisers in the College of Fisheries.

### **Admission with Advanced Standing**

A qualified student in good standing at an accredited institution may apply for admission with advanced standing. Such an applicant is expected to have the same high school preparation as the student who enters as a freshman, and to have a college grade-point average which meets the standard specified for the University. Students who plan to complete their first two years of college work at a junior college should consult their advisers concerning junior college courses

which are acceptable to the College of Fisheries. These courses are listed in the booklet *University of Washington Community College Transfer Programs*. The latest issue should be consulted.

### **Admission to the Graduate Program**

Basic requirements for admission to the graduate program in the College of Fisheries are a bachelor's degree from an institution of recognized standing, a grade-point average of 3.00 in the junior and senior years of college work, approval of the College of Fisheries, and approval of the Graduate School. Students entering the graduate program in either Fishery Biology or Food Science must have completed the equivalent of an undergraduate major in Fisheries or Food Science or have completed an undergraduate program acceptable to the College of Fisheries.

### **Financial Aids**

The College offers financial assistance to undergraduates and graduates through industrial and private scholarships. The *Handbook of Scholarships*, available from the Office of Financial Aids, 333 Student Union Building, or the departmental advising offices, lists available scholarships. Qualified graduate students may obtain financial assistance through governmental fellowships, National Science Foundation, National Aeronautics and Space Administration, and Public Health Service traineeships, research assistantships, or teaching assistantships. Students seeking such aid should apply at the office of their major department.

### **Employment**

The College of Fisheries assists its students to obtain summer employment and also helps them to secure permanent employment when they graduate. A number of Research Assistantships associated with grant and contract research are available for graduate students in the College. Both summer and part-time employment during the scholastic year are frequently available with the research organizations which are associated with the College of Fisheries on or near the campus and elsewhere in the Northwest. The Fisheries Research Institute normally hires students for summer work in the field and usually has several part-time positions available during the school year. Similar work is available in the Washington State Department of Game, Washington State Department of Fisheries, the U.S. Fish and Wildlife Service, the International Pacific Halibut Commission, Laboratory of Radiation Biology, Oregon Fish Commission, the International Pacific Salmon Fisheries Commission, and the Alaska Department of Fisheries.

These jobs may be located within the state of Washington but frequently take the students to Alaska or elsewhere in the United States. These agencies normally interview students at the College of Fisheries during the Winter Quarter for the purpose of choosing both permanent employees and employees for temporary summer work. Fisheries students are encouraged to seek summer work in the field to gain valuable experience in both fishery biology and fisheries or food technology.

The specific fishery orientation of the College program is supported by a unique combination of subject interests among the faculty, and a wide range of equipment and physical facilities. These factors, together with the active research program, put graduate students in a very favorable position to pursue programs leading to advanced degrees.

In addition to the opportunities for graduate work at the College of Fisheries, the international fishery commissions, federal government, and state fishery and water research agencies have staffs working in laboratories on or near the campus. Many of the senior research members of the cooperating laboratories and a number from industry are lecturers in the College. Graduate students, besides finding financial support in such laboratories, may, under special arrangements, carry out research which upon approval may be used to satisfy the thesis requirements for the advanced degree.

### **Undergraduate Programs**

Students working toward bachelor degrees must qualify for admission to the University and the College. Students who do not include two units of foreign language in their college preparatory program will be required to achieve equivalent competence in a foreign language as a graduation requirement. This requirement may be fulfilled by successful completion in the University of 10 credits of a foreign language or by passing an appropriate placement examination.

### **GRADUATION REQUIREMENTS**

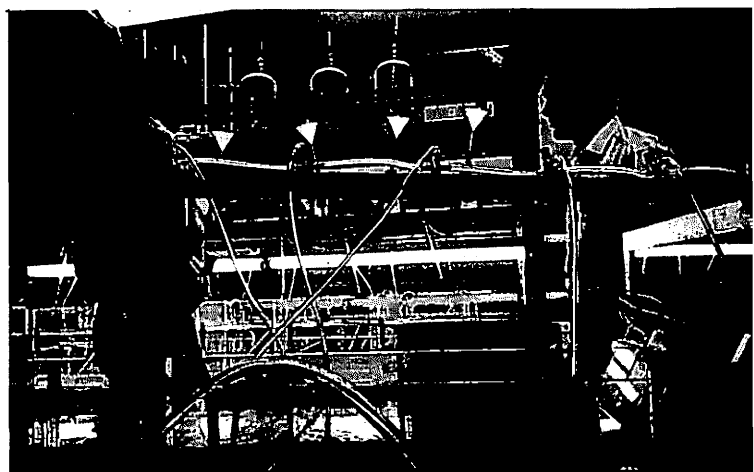
Students should apply for bachelor degrees during the first quarter of the senior year. If not more than ten years have elapsed since the date of a student's entry into the College, he may choose to graduate under the requirements set out in either the bulletin published most recently prior to the date of his entry, or that published prior to his anticipated date of graduation; provided that when, in the opinion of the faculty of the College, substantial changes have been made in the cur-

riculum since the student's entry, the student's choice shall be subject to the approval of the faculty or dean.

Disapproval of the student's choice shall be faculty action and subject to the procedures of the Faculty Code. All responsibility for fulfilling graduation requirements shall rest with the student concerned.

The University credit requirement for graduation is 180 academic credits and the required quarters of physical education activity. The College of Fisheries requires that 9 credits or the equivalent in English 101, 102, and 103 (Composition) be included in the total. At least 60 of the 180 credits must be in upper-division courses, those numbered 300 and above. A total of at least 36 credits in fisheries and food science is required. For graduation, students must have a cumulative average of 2.00 (C) in fisheries and food science courses and an over-all average of 2.00 (C) in all courses. Advanced ROTC courses do not count as upper-division credit, and no more than 18 credits in advanced ROTC courses may be counted toward graduation.

Students who transfer from other institutions to the College of Fisheries are normally required to earn at least 10 credits in their major subject in this College.



## **FISHERY BIOLOGY**

**Adviser**

A. C. DeLacy  
248 Fisheries Center

### **BACHELOR OF SCIENCE IN FISHERIES**

A student may major in fishery science or fishery management and administration. He must take the courses required for all options and complete the required courses for his selected option.



#### Required Courses for Fishery Options A and B

Biology 210, 211, 212 (Introductory Biology) or Zoology 111, 112 (General Zoology); Chemistry 140, 141, 150, 151 (General Chemistry and General Chemistry Laboratory); English 101, 102, 103 (Composition); Fisheries 101, 240, 311, 314, 401, 456, 457, 495 (4 credits); Mathematics 105 (College Algebra), 281 (Elements of Statistical Method)

#### Option A: Fishery Science

##### ADDITIONAL REQUIRED COURSES

Chemistry 160 (General Chemistry), 170 (Qualitative Analysis), 231, 232 (Organic Chemistry); Fisheries (9 credits); Humanities (10 credits); Mathematics 124 (Calculus with Analytic Geometry), 382, 383 (Statistical Inference in Applied Research); Social Sciences (10 credits)

##### RECOMMENDED COURSES (Selection of 36 credits is required)

Biochemistry 405, 406 (Introduction to Biochemistry), 440, 441, 442 (Biochemistry); Biology 472 (Ecology), 472L (Ecology Laboratory), 473 (Limnology), 473L (Limnology Laboratory); Botany 113 (Elementary Plant Classification); Chemistry 221 (Quantitative Analysis), 241, 242, (Organic Chemistry Laboratory), 335, 336, 337 (Organic Chemistry), 345, 346, 347 (Organic Chemistry Laboratory); Economics 435 (Natural Resource Utilization and Public Policy); Genetics 451 (Genetics); Geology 101 or 205 (Physical Geology); Mathematics 125, 126 (Calculus with Analytic Geometry), 302, 303 (Elementary Linear Algebra), 391 (Elementary Probability), 392 (Elements of Statistics), 393 (Analysis of Variance); Oceanography 203 (Introduction to Oceanography), 401 (General Physical Oceanography I), 433 (Biological Oceanography: Organisms and Processes), 435 (Biological Oceanography: Quantitative Aspects); Philosophy 120 (Introduction to Logic); Physics 114, 115, 116 (General Physics), 117, 118, 119 (General Physics Laboratory); Zoology 330 (Natural History of Marine Invertebrates), 400 (General Physiology), 400L (General Physiology Laboratory), 409 (Ethology), 433, 434 (Invertebrate Zoology), 435 (Parasitology), 453-454 (Comparative Anatomy of Chordates), 456 (Developmental Biology)

#### Option B: Fishery Management and Administration

##### ADDITIONAL REQUIRED COURSES

Chemistry 102 (General and Organic Chemistry); Communications 303 (Public Relations); Economics 211 (General Economics), 435 (Natural Resource Utilization and Public Policy), English 271, 272 (Expository Writing); Fisheries 379, 380, 405 or 406, 425,

451, 452, 460; Mathematics 157 (Elements of Calculus); Speech 220 (Introduction to Public Speaking), 320 (Public Speaking)

##### RECOMMENDED COURSES (Selection of 15 credits is required)

Biology 472 (Ecology), 472L (Ecology Laboratory), 473 (Limnology), 473L (Limnology Laboratory); Botany 113 (Elementary Plant Classification); Chemistry 160 (General Chemistry), 170 (Qualitative Analysis), 221 (Quantitative Analysis); Forestry 350 (Wildlife Management); Geology 101 or 205 (Physical Geology); Mathematics 382, 383 (Statistical Inference in Applied Research); Oceanography 203 (Introduction to Oceanography); Political Science 470 (Introduction to Public Administration), 471 (Administrative Management), 472 (Introduction to Administrative Law)

#### BACHELOR OF SCIENCE

An elective curriculum is available for students desiring a Bachelor of Science with a major in fisheries. The student must complete 36 credits in fisheries and sufficient electives to meet University graduation requirements. This degree is specifically intended for students desiring a strong minor (minimum of 30 credits) in a related field. The choice of electives is subject to approval by the College.

Prospective students are invited to inquire about additional areas of emphasis in which undergraduate preparation may be made. Such areas include behavior, biometrics, economics, and water pollution. Study in some of these topics can be undertaken only at the graduate level.

#### FOOD SCIENCE

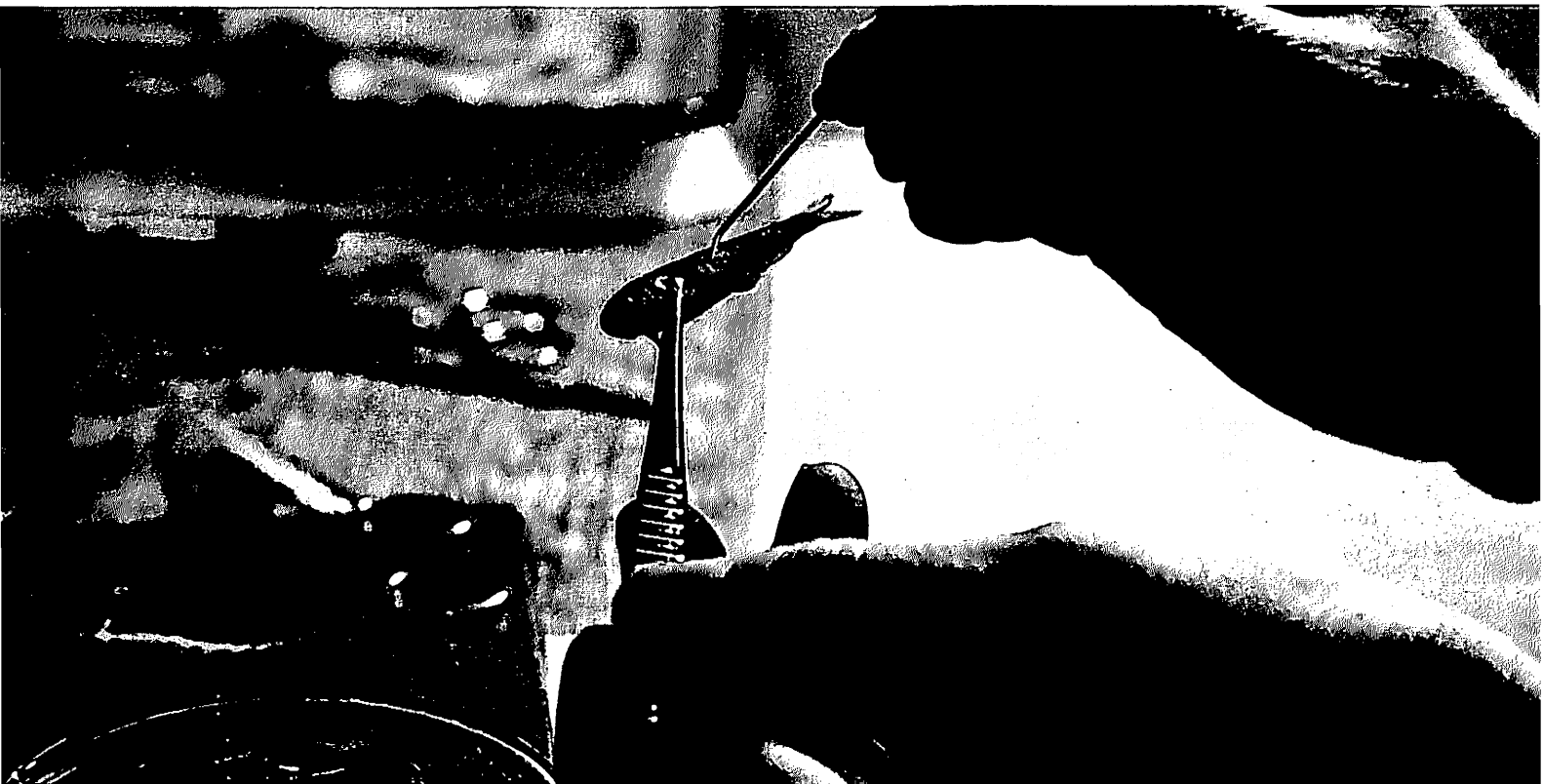
##### Adviser

John Liston  
221 Fisheries Center

##### BACHELOR OF SCIENCE

The food science program provides a curriculum leading to a Bachelor of Science degree with a major in Food Science. It is recommended that the entering student will have completed mathematics to include advanced algebra and trigonometry, and laboratory science to include chemistry and physics.

The student should complete the required courses listed below together with sufficient electives to meet University graduation requirements. At least 10 credits in



humanities or social sciences and 10 credits in biological sciences should be included.

Students intending to proceed to graduate study should take the more advanced series of courses in physics, biochemistry, and organic chemistry and should elect 15 credits of a foreign language.

#### REQUIRED COURSES

Biochemistry 405, 406 (Introduction to Biochemistry), and 408 (Introduction to Biochemistry Laboratory) or 440\*, 441\*, 442\* (Biochemistry), and 444\* (Biochemistry Laboratory); Chemistry 140, 150, 160 (General Chemistry), 151 (General Chemistry Laboratory), 170 (Qualitative Analysis), 221 (Quantitative Analysis), either 231, 232 (Organic Chemistry) and 241, 242 (Organic Chemistry Laboratory) or 335\*, 336\*, 337\* (Organic Chemistry) and 345\*, 346\*, 347\* (Organic Chemistry Laboratory), 350 (Elementary Physical Chemistry); English 101, 102, 103 (Composition); Fisheries 380, 495; Food Science 481, 482, 483, 484, 485, 487, 498; Mathematics 105 (College Algebra), 124 (Calculus with Analytic Geometry), 281 (Elements of Statistical Method); Microbiology 301 (General Microbiology) or 400 (Fundamentals of Bacteriology); Physics 110, 111, 112 (General Physics) or 114\*, 115\*,

116\* (General Physics) and 117\*, 118\*, 119\* (General Physics Laboratory), Preventive Medicine 440 (Water and Waste Sanitation), 441 (Milk and Food Sanitation)

#### RECOMMENDED COURSES

Accounting 210 (Fundamentals of Accounting); Biology 210, 211, 212 (Introductory Biology); Botany 111 (Elementary Botany), 112 (The Plant Kingdom), 461 (Yeasts and Molds); Chemistry 141 (General Chemistry Laboratory), 426 (Instrumental Analysis); Fisheries 101, 406; Food Science 490 (Space Biology: Sealed Life-Support Systems); General Engineering 111 (Engineering Problems); Home Economics 300, 307 (Nutrition); Marketing 301 (Marketing, Transportation, and International Business: An Integrative Analysis); Mathematics 114 (Elementary Computer Programming), 125, 126 (Calculus with Analytic Geometry), 374 (Principles of Digital Computers and Coding), 382, 383 (Statistical Inference in Applied Research); Microbiology 430 (Microbial Metabolism); Philosophy 120 (Introduction to Logic), 460 (Introduction to the Philosophy of Science); Production 301 (Principles of Operations Management); Zoology 111, 112 (General Zoology)

\* Students intending to proceed to graduate study are advised to take these courses.

**Graduate Programs**

**Graduate Program Adviser**

**Richard Van Cleve**

**204 Fisheries Center**

For further information, see the *Graduate Study* section of this Catalog.

Graduate students specializing in each option of the College of Fisheries are required to take a minor or a minimum number of supporting courses in other selected departments of the University. The nature and number of such courses are determined by the student's Supervisory Committee. All graduate students must complete 6 credits (three quarters) in Fisheries 520.

**MASTER OF SCIENCE**

Students must have the degree of Bachelor of Science in biological or physical science or fisheries or food

science or their equivalent. At least one year of approved study, with the completion of a research project, leads to the master's degree.

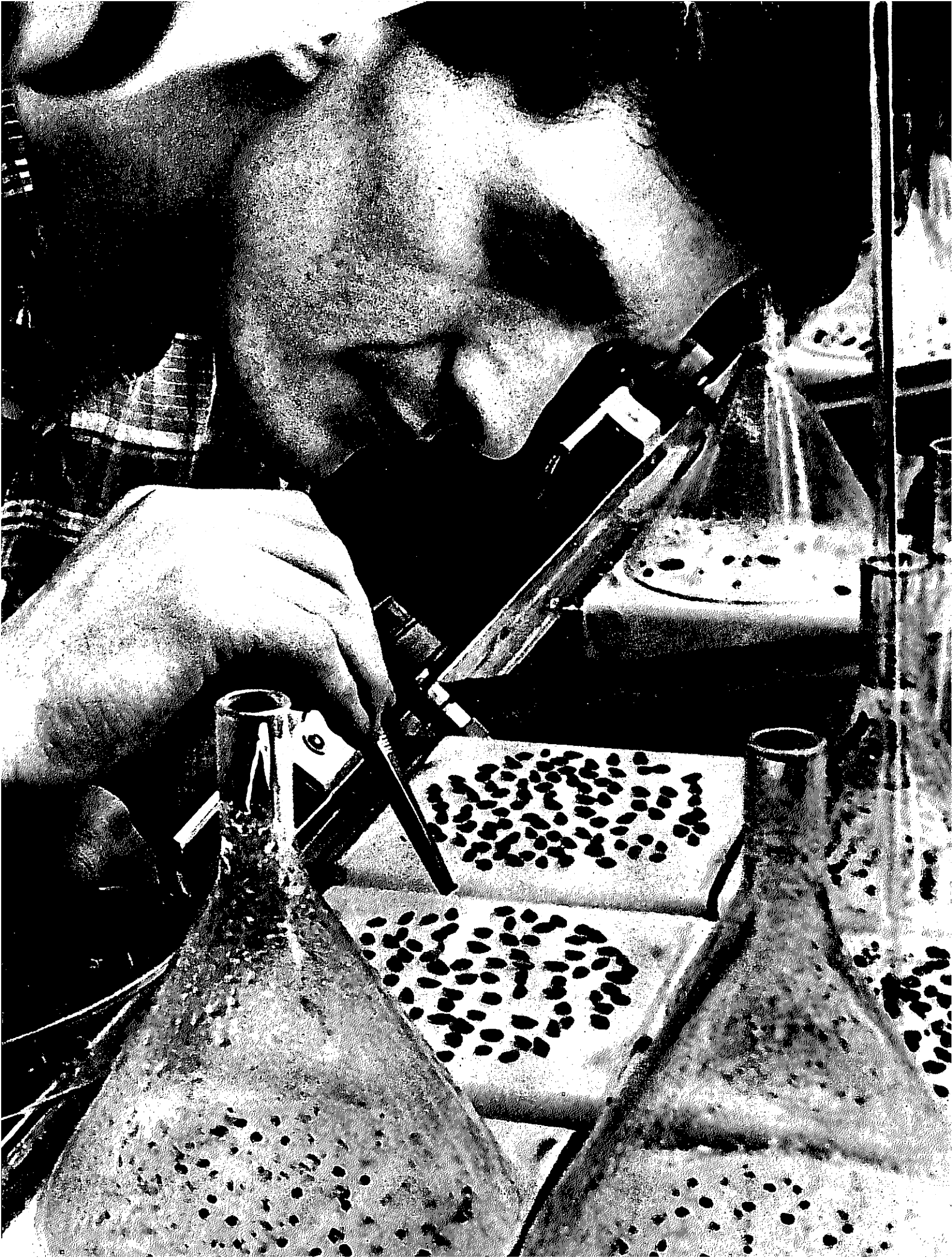
A total of not less than 36 credits in course work and thesis must be presented. The student must present a certificate of proficiency in one foreign language.

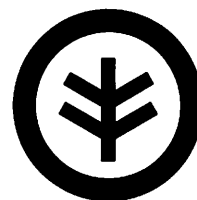
**DOCTOR OF PHILOSOPHY**

Students must complete at least three years of graduate study including a dissertation. Credits earned for a master's degree may be applied toward the doctor's degree.

The student must present a certificate of proficiency in two foreign languages (one in addition to the Master of Science requirement).







# FORESTRY

## **Dean**

James S. Bethel  
206 Anderson Hall

## **Associate Deans**

Stanley P. Gessel, David R. M. Scott

## **Professors**

James S. Bethel, C. Frank Brockman, Charles H. Driver, Harvey D. Erickson, Howard S. Gardner, Stanley P. Gessel, Bror L. Grondal (emeritus), Benjamin A. Jayne, Gordon D. Marckworth (emeritus), J. Kenneth Pearce, James C. H. Robertson, K. V. Sarkanen, Walter H. Schaeffer, David R. M. Scott, George Stenzel, David P. Thomas

## **Associate Professors**

G. Graham Allan, Benjamin S. Bryant, Barney Dowlle, Leo J. Fritschen, Lawrence Leney, Fiorenzo C. Ugolini

## **Assistant Professors**

Dale W. Cole, Herman J. Heikkinen, Bjorn F. Hrutfiord, Reinhard F. Stettler, Kenneth J. Turnbull, Thomas R. Waggener

## **Lecturers**

Victor B. Scheffer, Theodore N. Stoats

Forestry is concerned with all aspects of human use of forest land. This includes an understanding of the biological principles that govern the dynamics of forest organisms as individuals and as communities; knowledge of how these communities can be measured and how they respond to and act on their physical environment; familiarity with the sciences and technologies of utilizing all forest values and products in an ever-increasing array; and a consideration of the several public and private ownership objectives, together with appropriate management techniques.

Founded in 1907, when forestry education in the United States was in its infancy, the University's College of Forestry has evolved to provide instruction in this substantial array of science, social science, and humanistic knowledge, both as applied in the several professional areas in forestry and as subjects for advanced study and research. Located centrally in one of the world's most important forest regions, there are unique opportunities at Washington to integrate into the instructional program on all levels the nearby public and private forest land, extensive and diverse industrial facilities, numerous research centers, and the regional corps of practitioners and research workers.

The College of Forestry emphasizes in its curricula a thorough and appropriate academic preparation during

the first two years, followed by one of several professional upper-division programs, dependent on the individual student's inclination. In all curricula there are elective possibilities. Opportunities for independent study and research are available for gifted students. Because of the modest size of the undergraduate enrollment in forestry, there exists, in classroom and laboratory, an atmosphere of close association between students and faculty members. At the same time the diversity of educational experiences and the superior facilities found only in a large university are also available to forestry students at the University of Washington.

The College of Forestry is accredited by the Society of American Foresters. It offers curricula leading to the degrees of Bachelor of Science in Forestry and, through the Graduate School, to the Master of Forestry, Master of Science in Forestry, and Doctor of Philosophy.

### **College Facilities and Services**

The College occupies a complex of three buildings: Alfred H. Anderson Hall, the Hugo Winkenwerder Forest Sciences Laboratory, and the Forest Products Laboratory.

*Alfred H. Anderson Hall*, the gift of Mrs. Agnes H. Anderson in honor of her husband, a pioneer lumberman and civic leader in the state of Washington, has been the center of the College since 1925. It contains administrative offices, faculty offices, undergraduate classrooms and laboratories, the library, and the herbarium.

The library, a branch of the University's Henry Suzallo Library, consists of more than 15,000 bound volumes and 30,000 pamphlets, reports, and monographs. It also has an excellent collection of approximately 1,200 periodicals and many indexes to current literature in forestry and supporting sciences. Under the nationwide Farmington Plan sponsored by the Special Library Association, the forest library has assumed responsibility for collecting all foreign material published in the fields of forestry and pulp and paper technology, providing unusual opportunity for academic research.

The herbarium supplements forestry students' field work in dendrology. The collection contains representative plant material from all parts of the United States and includes dried mounted specimens of shrubs, hardwood

trees, and conifers. Fruit specimens and a complete cone collection of American conifers are maintained apart from the mounted collection. Another herbarium, complete in range plants, is maintained by the Botany Department and is available to forestry students.

The *Hugo Winkenwerder Forest Sciences Laboratory*, named after the distinguished Dean of the College from 1912 to 1945, was completed in 1964. It houses the offices of the Institute of Forest Products, faculty offices, seminar rooms, an undergraduate teaching laboratory, and 12 research laboratories for graduate students and faculty. These laboratories are equipped with the analytical and optical instruments required for research in soil chemistry and physics, tree nutrition and physiology, forest ecology, genetics, forest entomology, wood anatomy, and wood chemistry. Supporting facilities such as preparation, cold storage, and stock rooms, are contained in the basement of the building.

The Institute of Forest Products has both research and information roles within the College of Forestry. In research, the Institute serves to provide a focus for selected faculty-graduate student research through specific research programs. These are intended to bring College as well as University capabilities to bear on problems of particular concern to forestry within the state.

The Institute is also dedicated to making research information available to the practicing forester and to the state's forest industries. It accomplishes this by a series of publications and a continuing education program. The latter includes seminars on specific research topics, as well as meetings designed to review all current information in selected areas.

The *Forest Products Laboratory* is equipped to conduct advanced studies of wood and wood products. Sections of the Laboratory are devoted to instruction and research in timber physics, woodworking, wood gluing, wood preservation, kiln drying, photo-micrography, advanced wood technology, fiber and particle board, and pulp and paper technology. Testing machines, presses, machine tools, chemical apparatus, kilns, and mensuration devices permit intensive experiments with wood. Dry kilns for research and instruction in wood seasoning are situated adjacent to the Forest Products Laboratory. They are equipped with modern instrumentation for controlling the variables involved in the drying of wood over a wide range of conditions.



Several land holdings play a major role in the College's dual function of instruction and research.

The *University Arboretum* is a 200-acre park planted with trees and shrubs from all over the world. The diversified topography of the Arboretum together with the mild climate of the Puget Sound region permit the growth of a greater number of species and varieties than is possible in almost any other area of the northern temperate zone. The Arboretum is a ten-minute walk from the campus.

The *Charles Lathrop Pack Demonstration Forest*, an enlargement and development of an original gift from the Charles Lathrop Pack Forestry Trust, is a tract of more than twenty-three hundred acres. It extends along both sides of the Mount Rainier National Park highway at La Grande, Washington, 65 miles from the University. Pack Forest is an excellent terrestrial ecology area and a general natural science research laboratory. The Forest also serves as a demonstration area for advanced forest practices. An extensive arboretum area was established in the 1930's and has been constantly added to. Forest growth research plots have been maintained on the forest since 1928. Recent major research expansion has been in forest ecology, forest soils, tree physiology, genetics, and pathology. Field laboratory facilities are available here.

Complete facilities for classwork and living accommodations are available to students and faculty-in-residence working at the Pack Forest.

The *Lee Memorial Forest* is a young forest in Snohomish County, near Maltby, about twenty-two miles from the University. The 158-acre property was deeded to the College of Forestry in the early 1930's by Mr. and Mrs. George O. Lee in memory of Mr. Lee's parents, Mr. and Mrs. O. H. Lee, Snohomish County pioneers. An experimental and demonstration area, the Lee Memorial Forest is used for teaching and research in mensuration, silviculture, ecology, and forest soils. The accessibility, stocking, age, and site of the Lee Memorial Forest make it exceptionally valuable for studies and demonstrations of forestry practices applicable in Western Washington.

The *Winnifred Denney Moore Memorial Forest* was a gift to the College of Forestry from Dr. Raymond C. Moore, professor of geology at the University of Kansas. The 450-acre tract is situated in the eastern Cas-

cade Mountains, about twenty miles northwest of Cle Elum, in the Boulder Creek area of the Wenatchee National Forest. The tract is forested with ponderosa and lodge-pole pine, spruce, and fir. It is especially useful for ecological studies in eastern Cascade timber types and land management studies applicable to the high altitude sections of Eastern Washington.

The College of Forestry, in cooperation with the Water Department of the City of Seattle, maintains a research station in the Cedar River Watershed for studies in forest hydrology and mineral cycling in the forest ecosystem.

The *Forest Club* is the service and social organization for forestry students. Membership is open to everyone matriculated in the College. The Club holds a variety of meetings and social events during the academic year. Members also participate in a number of service programs.

*Xi Sigma Pi*, the national forest honorary fraternity, was founded at the University of Washington in 1908. Election to membership is recognition of outstanding academic achievement and professional promise.

The *Washington Foresters Alumni Association* is composed of graduates of the College. An annual meeting and seminar and a periodic newsletter keep alumni and College in close contact with mutual benefit.

### Scholarships and Financial Aids

Scholarships and awards specifically for students in the College of Forestry are included in the handbook listing the current awards, available in the Office of the Dean of Students.

### Employment

The College of Forestry faculty helps forestry students to obtain summer employment while in the University and permanent employment upon graduation. Summer work is usually available through the several federal and state public agencies or the numerous private companies in the wood-using industry of the region. Many of these agencies and companies send representatives to the College during Winter Quarter to interview prospective employees. All students are encouraged to seek summer employment, because such work offers an excellent opportunity for practical experience as well as financial help.



## Undergraduate Programs

Associate Dean

David R. M. Scott  
218 Anderson Hall

In addition to meeting the admission requirements for all undergraduate students to the University, students planning to enter the College of Forestry should have completed the following: Algebra III (intermediate) and a course in trigonometry. It is recommended that students also complete at least one unit of biological science and one unit of physical science while in high school. Students who enter the College with a thorough academic preparation will have the least problems in successfully completing one of the programs and receiving the Bachelor of Science in Forestry degree in the shortest possible time.

Because an appropriate choice of high school electives serves to strengthen a student's preparation, the University will give this part of his record the same careful attention it gives to other aspects of his qualifications.

### Bachelor of Science in Forestry

The College of Forestry offers opportunities for undergraduate education in the various fields of forestry through the medium of the six undergraduate curricula and the Honors Program. Students whose interest is in the forest and forest land management will major in the curricula in *forest sciences*, *forest management*, or *logging engineering*. The *forest sciences* curriculum provides opportunities for study in depth in the biological and social sciences related to forestry. It is commonly elected by students wishing to prepare for grad-

uate work and later specialization. The *forest management* curriculum emphasizes the role of applied biology and social sciences in the management of forest properties. The *logging engineering* curriculum deals with the engineering aspects of the management of forest property.

Students primarily concerned with those areas of forestry that deal with wood, its properties, and its use in commerce and industry find opportunities for study in the curricula in *wood science and technology*. The *wood and fiber sciences* curriculum deals with the structure, properties, and behavior of wood from both the biological and physical sciences viewpoint. It is commonly elected by students wishing to prepare for specialization through further graduate study. The *wood technology* curriculum is concerned with the application of the wood sciences to the physical and mechanical processing of wood. The *pulp and paper technology* curriculum emphasizes the varied principles underlying the chemical and mechanical production of pulp and the manufacture of paper.

It should be noted that, while the College of Forestry does not have the career-oriented curricula sometimes described, its resources are adequate and its curricula flexible enough to enable the student to develop a course of study in any of the usual fields related to the forestry resource. For example, the election of appropriate optional courses within the framework of the *forest sciences* curriculum will allow a student to emphasize the *recreational use of forest land*, a subject long established at the College. Similarly, it is possible to utilize electives in a *watershed management* option or in a *forest wildlife management* option.

Students in all curricula must meet certain general requirements of the University and the College as well as the particular curriculum requirements which are described below. General requirements for the bachelor's degree include physical education, scholarship and minimum credits, and senior-year residence.

### Honors Program

The Honors Program in the College of Forestry provides opportunity for the gifted student in any of the six curricula to develop his special abilities to the fullest extent. Privileges enjoyed by honors students include the opportunity for accelerated self-study programs; flexibility in selecting interdisciplinary course programs; an excellent possibility of receiving financial assistance; special personal contact with individual faculty members; and the chance to gain experience in research.



Each honors student will be assigned a committee of two faculty members to advise and guide him in his studies.

A student may be granted an honors status at an early stage of his study on the basis of performance in high school, in college placement examinations, and other pertinent information, or later on the basis of having demonstrated the necessary academic ability at the university level. Maintenance of a minimum grade-point average of 3.00 is mandatory for all honors students.

During his junior and senior years, the honors student is required to complete a special research project or independent literature study and to present his findings in the form of an honors senior thesis.

Participation in the Honors Program is of particular value to students contemplating graduate studies towards an advanced degree.

#### Curricula

Students entering the College of Forestry select one of the six curricula.

All eligible students are encouraged to start the Chemistry 140, 150 sequence, although it is not required in certain curricula.

Students contemplating graduate work are also urged to take a suitable modern language.

The three curricula in the Forest Sciences and Management Group, namely forest management, logging engineering, and forest sciences, have a substantial common core; hence a decision as to a specific major among these three can be delayed until the second year. Students interested in the Wood Science and Technology Group, i.e., wood technology, pulp and paper technology, or wood and fiber sciences, are urged to choose the field of their specialization as soon as possible upon entering the College of Forestry.

Curricula of the various fields of specialization are as follows:

#### Forest Sciences and Management Group

##### FOREST MANAGEMENT CURRICULUM

(Lower-Division Course Requirements)

*Mathematics:* 105, 124, 281; *Sciences:* Chemistry 101, 102, Physics 114 and 117, 115 and 118. Botany 111, 112, Zoology 112, Geology 205; *Humanities-Social Sciences:* English 101, 102, 103, Economics 200, Po-

litical Science 202; *Professional Courses Other Than Forestry:* Accounting 210, General Engineering 121; *Forestry:* 101, 102, 103, 204

(Upper-Division Course Requirements)

*Forestry:* 306, 310, 320, 321, 322, 331, 340, 341, 360, 361, 374, 430, 435, 456, 460, 461, 462, 465, 466, 467, 468, 469, plus electives for a total of 190 credits.

##### LOGGING ENGINEERING CURRICULUM

(Lower-Division Course Requirements)

*Mathematics:* 105, 124, 281; *Sciences:* Chemistry 101, 102, Physics 114 and 117, 115 and 118, Botany 111, 112, Geology 205; *Humanities-Social Sciences:* English 101, 102, Economics 200, Political Science 202, Speech 327, Humanistic-Social Studies 270; *Professional Courses Other Than Forestry:* Accounting 210, General Engineering 104, 121; *Forestry:* 101, 102, 103, 204.

(Upper-Division Course Requirements)

*Forestry:* 306, 310, 320, 321, 322, 340, 360, 361, 374, 404, 430, 440, 441, 442, 443, 446, 447, 448, 449, 460, 461; *Professional Courses Other Than Forestry:* Civil Engineering 310, 417, plus electives for a total of 192 credits.

##### FOREST SCIENCES CURRICULUM

(Lower-Division Course Requirements)

*Mathematics:* 105, 124, 281; *Sciences:* Chemistry 140, 150, 151, 231, Physics 114 and 117, 115 and 118, 116 and 119, Botany 111, 112, Zoology 112, Geology 205; *Humanities-Social Sciences:* English 101, 102, 103, Economics 200; *Forestry:* 101, 102, 103, 204

(Upper-Division Course Requirements)

*Forestry:* 306, 310, 320, 321, 322, 331, 340, 360, 361, 374, 435, 460, 461, 462; *Electives:* Mathematics or Physical Sciences—15 credits, Biological Sciences—20 credits, Humanities-Social Sciences—15 credits, plus electives for a total of 193 credits.

#### Wood Science and Technology Group

##### WOOD TECHNOLOGY CURRICULUM

(Lower-Division Course Requirements)

*Mathematics:* 105, 124, 281; *Sciences:* Chemistry 101, 102, 150, 151, Physics 114 and 117, 115 and 118, 116 and 119, Botany 111, 112; *Humanities-Social Sciences:* English 101, 102, 103, Economics 200, Political Science 202; *Professional Courses Other Than Forestry:* General Engineering 104; *Forestry:* 101, 102, 103, 204

### (Upper-Division Course Requirements)

*Forestry:* 306, 321, 374, 375, 380, 403, 404, 405, 407, 461, 470, 472, 473, 475, 476, 477, 482, 484, 485, plus electives for a total of 180 credits.\*

### WOOD AND FIBER SCIENCES CURRICULUM

#### (Lower-Division Course Requirements)

*Mathematics:* 105, 124, 125, 126, 281; *Sciences:* Chemistry 140, 150, 151, 160, 170, Physics 121, 122, 123, Botany 111, 112; *Humanities-Social Sciences:* English 101, 102, Economics 211; *Professional Courses Other Than Forestry:* General Engineering 104; *Forestry:* 101, 102, 103, 204

#### (Upper-Division Course Requirements)

*Forestry:* 306, 401†, 402†, 403, 404†, 405, 407; *Sciences:* Chemistry 231 and 241, 232, 350, 351, plus 30 credits of science or professional electives and additional electives for a total of 180 credits.‡

### PULP AND PAPER TECHNOLOGY CURRICULUM

#### (Lower-Division Course Requirements)

*Mathematics:* 105, 124, 125, 126, 224, 238; *Sciences:* Chemistry 140, 150, 151, 160, 170, 221, Physics 121, 122, 123, Botany 111, 112; *Humanities-Social Sciences:* English 101, 102, Economics 211; *Professional Courses Other Than Forestry:* General Engineering 104, 115; *Forestry:* 101, 102, 103

#### (Upper-Division Course Requirements)

*Forestry:* 306, 401, 402, 407, 408, 409, 476, 477, 481, 483, 486, 488; *Sciences:* Chemistry 231 and 241, 232, 350, 351; *Professional Courses Other Than Forestry:* Chemical Engineering 210, 325, 330, 435, 437; Mechanical Engineering 415, plus electives for a total of 185 credits.‡

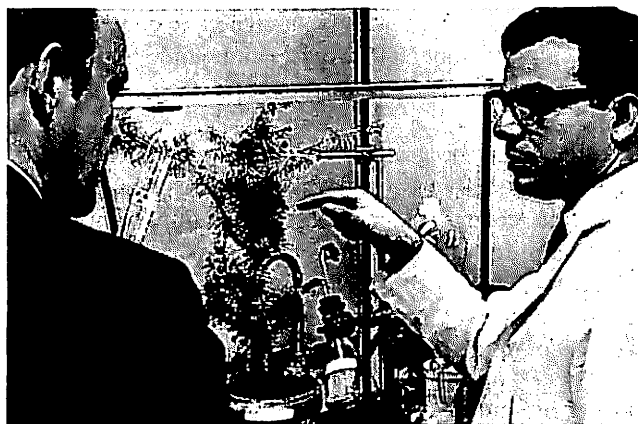
### Graduate Programs

#### Graduate Program Adviser

Stanley P. Gessel  
206 Anderson Hall

Graduate programs in forestry are designed to accommodate a wide range of educational objectives. It is possible either to concentrate upon advanced professional training or to intensify appropriate science or social science education, as these disciplines are related to forestry in special or underlying roles.

In forest biology, graduate study and research are offered in wood anatomy and morphology, genetics of



forest tree development, forest tree physiology, tree nutrition, the ecology of forest tree species and communities, forest soils, forest meteorology, forest influences, forest entomology, forest pathology, forest biometry, forest hydrology, and silviculture.

Included in forestry physical sciences are wood physics, chemical and mechanical properties of wood, wood-moisture relations, wood technology, pulp and paper technology, plywood, adhesives, synthetic boards, milling, forest photogrammetry, and forest engineering.

Forest management graduate education includes the economics of forest land management and forest products industry, the recreational use of wildlands, forest fire protection, forest policy, mensuration, watershed management, logging planning, cost analysis, and transportation.

#### Admission

Students who intend to work toward an advanced degree must apply for admission to the Graduate School and meet the requirements set forth by the Graduate School and the College of Forestry. Programs are offered leading to the Master of Forestry, Master of Science in Forestry, and Doctor of Philosophy degrees.

Basic requirements for admission to the Graduate School are a bachelor's degree from an institution of recognized standing, a grade-point average of 3.00 in the junior and senior years of college work, approval of the Graduate School, and approval of the department in which the work is to be taken. For complete information, see the *Graduate Study* section.

In addition to requesting admission forms from the University Admissions Office, admission forms also





should be obtained from the Dean, College of Forestry. These provide supplementary information required by the College of Forestry

#### **Master of Forestry**

The Master of Forestry is a professional degree, and professional forestry education to a baccalaureate level is a prerequisite for this program. Course work may be either in forestry or in appropriate science or social science. A thesis is required, but a foreign language is not.

#### **Master of Science in Forestry**

The Master of Science in Forestry is a non-professional degree and may be preceded by a baccalaureate either in forestry or in another discipline, although graduates with degrees in areas other than forestry normally require an additional year of course work to remedy forestry deficiencies. Course work includes an appropriate selection of forestry courses and a minor in a

science or social science comprising at least one-third of the total course credits. A thesis is required, but a foreign language is not.

#### **Doctor of Philosophy**

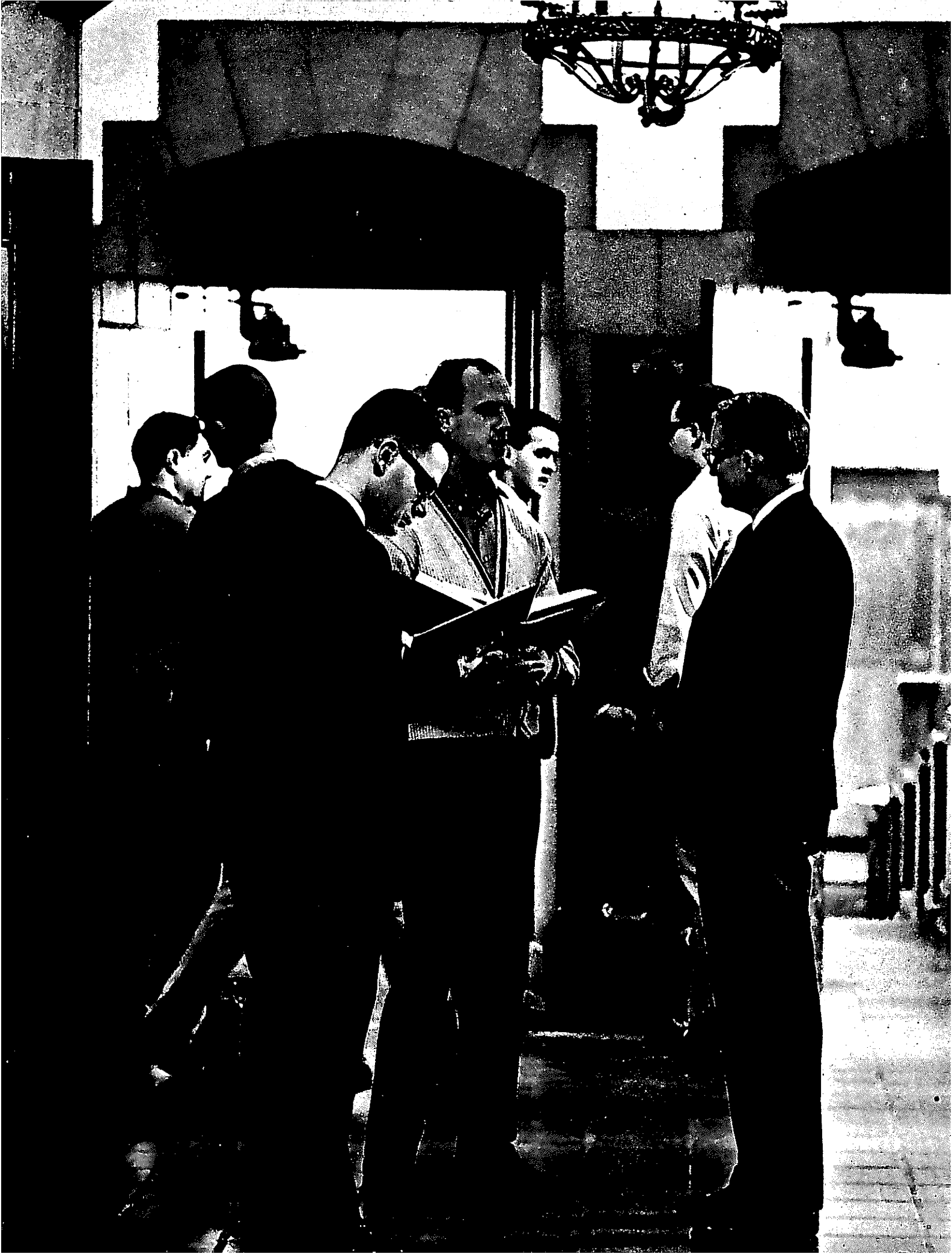
The Doctor of Philosophy degree may be preceded by baccalaureate education in forestry or in another discipline. The program of course work is designed around an appropriate selection of forestry and related science or social science courses with a view to successful preparation for the General Examination in forestry and the research and dissertation that are required for the degree. Additional requirements are listed in the *Graduate Study* section.

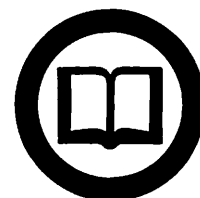
\* A minimum of 11 credits of approved electives must be taken in humanities and/or social sciences.

† Requirements for a degree may be satisfied by Forestry 404 (4 credits) or Forestry 401-, 402 (8 credits).

‡ A minimum of 18 credits of approved electives must be taken in humanities and/or social sciences.







LAW

**Dean**

Lehan K. Tunks  
207 Condon Hall

**Associate Dean**

William R. Andersen  
203 Condon Hall

**Professors**

Charles E. Corker, Richard Cosway, Harry M. Cross, Robert L. Fletcher, Marian G. Gallagher, Alfred Harsch, Howard A. Heffron, Dan F. Henderson, Robert S. Hunt, Ralph W. Johnson, Ernst Levy (emeritus), Robert Meisenholder, Arval Morris, Rudolph H. Nottelmann (emeritus), Cornelius J. Peck, John W. Richards (on leave), Luvern V. Rieke, Warren L. Shattuck, Julius Stone, Robert L. Taylor, Philip A. Trautman, Lehan K. Tunks

**Associate Professors**

William R. Andersen, James E. Beaver, Philip R. Bilancia, Robert W. Hallgring, Richard O. Kummert

**Assistant Professors**

George P. Fletcher, Roland L. Hjorth, John M. Junker, Roy L. Prosterman, Marjorie D. Rombauer

**Instructors**

Virginia B. Lyness, Beverly P. Rosenow

The program of the School of Law is designed to help students develop an understanding of law, the processes by which it operates, and the social, economic, and political context in which it functions. Without in any way ignoring technical legal knowledge, the School of Law recognizes that legal education must be broadly based for its recipients to contribute effectively to shaping society's goals and developing the means of achieving these goals.

Graduates of the School of Law are prepared to practice law anywhere in the United States and other common-law countries. The curriculum and methods of instruction are designed to develop the student's highest potential, both in school and thereafter. Persons with a legal education, by virtue of their developed abilities to analyze and comprehend, are able to succeed in many careers not directly connected to law practice.

Students are encouraged to rely on their own initiative and to develop their own powers of perception. Classroom discussion in which students participate fully is one means used to assist in the development of such powers. Independent research projects, either in the context of a seminar or under the supervision of an individual faculty member, are emphasized for the same purpose.

The law is not, and cannot be, static, and the man who is "learned in the law" is the man who has developed the ability to find sound solutions to new problems by adapting and using, rather than merely echoing, the teachings of the past.

### **The School of Law**

Established at the University in 1899, the School of Law is housed in Condon Hall, named for John T. Condon, organizer and first Dean of the School. A member of the Association of American Law Schools, the School is approved by the Council of the Section of Legal Education and Admissions to the Bar of the American Bar Association.

### **School Facilities and Services**

#### **Program in the Law of Asian Countries**

In 1962 the School established its program in the Law of Asian Countries. Supported by funds from the Ford Foundation, the program places its initial research emphasis on the legal aspects of foreign investments, licensing, and trade, beginning with Japan and extending eventually to other Asian countries such as the Philippines, India, Malaysia, and China.

Courses are offered on various aspects of the legal problems likely to be encountered in dealing with Asian affairs. The research and teaching programs are designed to develop materials not presently available to western legal scholarship and to meet the growing demand for lawyers and scholars trained in this area.

#### **Law Librarianship Program**

The Law School provides facilities and instruction for lawyer candidates for the Master of Law Librarianship degree, or for other students of the Graduate School of Librarianship who elect specialized training in law librarianship. This program is described in the Announcement of the School of Librarianship.

#### **Law Library**

The Law School Library contains more than 170,000 volumes; included are decisions of all English and American courts of last resort, and the reported decisions of all lower courts in the United States. Extensive collections of English, American, and colonial statutes are available, as well as copies of all legal periodicals published in English.

In addition, the Library has one of the finest collections of Japanese law materials in the United States, other

substantial Asian collections which are being rapidly augmented by use of new funds obtained from the Ford Foundation, a growing collection of Russian materials, and most of the titles indexed in the *Index to Foreign Legal Periodicals*.

### **Undergraduate Education**

The School of Law does not prescribe a definite undergraduate curriculum for its applicants. The wide range of lawyers' tasks and the difference in offerings from school to school preclude such an approach. With the assistance of his college or university adviser, a student should follow his own intellectual interests in developing his undergraduate program. However, there are certain goals which every student thinking of law school should keep before him in planning his college program. He should strive to acquire the ability to read, write, and speak the English language well; to gain a critical understanding of values and human institutions, political, economic, and social; and to understand and develop in himself creative power in thinking. Not only memory, but also accomplishment in understanding; not just knowing, but knowing why and how, should be the objectives. A more complete statement is available from the School of Law on request.

College advisers will help students decide how best to accomplish these ends. The School of Law faculty will be glad to assist in program planning.

### **Accounting Requirement**

Familiarity with basic accounting principles and methods is a prerequisite of some law school courses beyond the first-year level. This requirement may be satisfied by either of the following:

(a) Prior to entrance into law school, by completion for college credit with a grade of C or better of a course or courses covering the general principles of accounting.

(b) After entrance into law school, by completion prior to commencing the fifth quarter, for credit applicable toward the LL.B. degree, of a course emphasizing statistical and accounting fundamentals of particular significance for lawyers. The course in Accounting and Statistics for Lawyers offered by this law school is such a course.

### **Student Activities**

The *Student Bar Association* was organized to promote useful activities among the students in the School of



Law; to foster a professional outlook on the part of such students; to promote and bring about contacts and cooperation between members of the association and members of the School of Law faculty; to foster a close relationship between members of the association and members of the Law School faculty; and to carry on and promote activities for the best interest of its members, the faculty, and the School. The association sponsors an annual School banquet for members of the judiciary, the bar, the faculty, the student body and their spouses and guests. Throughout the year, it sponsors other social functions, engages speakers to appear before the law student body, engages in intramural recreational activities, publishes a newspaper, conducts the School's moot court competition, and aids in the operation of the Legal Aid program.

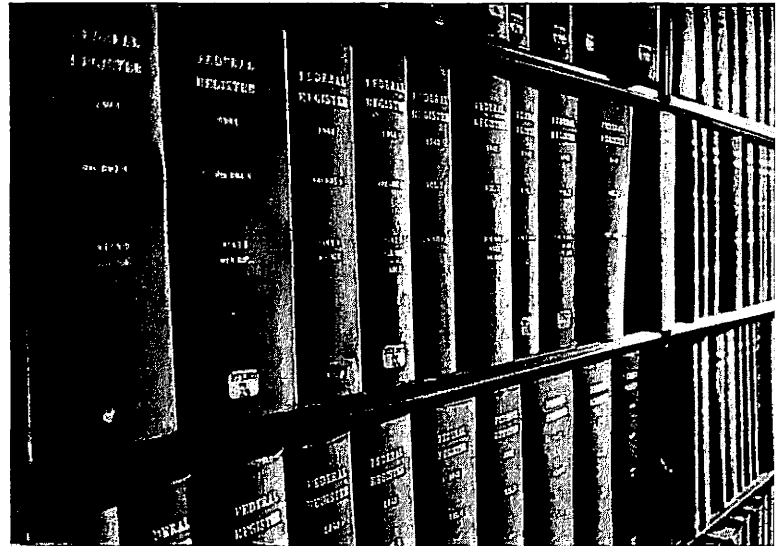
Every student enrolled in the School of Law is a member of this association. The elective officers—president, vice president, secretary, and treasurer, together with two elected representatives from each class—make up the executive board.

The Student Bar Association is affiliated with the American Law Student Association, which is sponsored by the American Bar Association.

The *Legal Aid Bureau* in Seattle, in cooperation with the Seattle-King County Bar Association and under the supervision of a faculty adviser, offers the opportunity of assignment to regular weekly office hours to students of demonstrated ability in the second- and third-year classes. The services of the Bureau are available to persons who are unable to afford the services of an attorney. Students are given the fullest responsibility consistent with their experience and ability. They interview clients to determine the nature of their problems; after consulting with the Bureau director or the faculty adviser, they dispose of those cases which require only advice; they conduct negotiations for settlements with opposing parties or their attorneys; and they prepare cases for litigation under the supervision of the Bureau director or one of a panel of volunteer attorneys, with whom they appear in court. The experience thus acquired is of considerable assistance to the young attorney embarking on his professional career.

Participation in the *Voluntary Defender Program* is limited to students in the second and third years who have completed the course in Criminal Law. The function of the participants is to assist attorneys who have been appointed by the Superior Court of the State of

Washington to defend persons charged with a crime who are unable to afford legal representation. The students assist the attorneys by investigating, doing research, and performing any other services required to prepare the case for trial. Participation in this program not only gives the student invaluable experience, but also gives the attorney additional assistance to ensure that every defendant in a criminal proceeding gets a fair trial and is adequately represented by counsel.



An extensive *moot court competition* is conducted by the Student Bar Association with the assistance and cooperation of the faculty. Competing students research assigned problems, prepare appropriate briefs, and present oral argument before courts composed of judges, lawyers, and faculty members.

Each student is required to compete in one round during his first year in conjunction with the course in Legal Research and Writing. During the second year, the Student Bar Association conducts a voluntary competition. Successive rounds determine the moot court finalists who present their arguments before judges of the Supreme Court of Washington. Those who prevail represent the School in the National Competition during their third year. Prizes donated by law book publishers are awarded to the four finalists.

A team from the School of Law also participates annually in the unique International Moot Court Competition with a team from the Faculty of Law of the University of British Columbia.

The *Order of the Coif* is a national honorary legal society with a chapter at the University. The order encourages scholarship and the advancement of the ethical standards of the legal profession. Membership is restricted to students who have demonstrated outstanding scholarship, and who are within the upper 10 per cent of the graduating class.

The *University of Washington Law Review* is the School's legal periodical. It is published by a student board consisting of approximately thirty select second- and third-year students under the direction of six student editorial officers and with assistance from the law faculty. The *Review* serves as a medium of expression for legal scholars and is devoted particularly to the interpretation, advancement, and harmonious development of the law. It contains scholarly articles by judges, lawyers, teachers, and authorities in related business and professional fields. Surveys and discussions, based on thorough research by student members of the board, of important court decisions and topics of concern and interest to members of the profession are included.

The possibility of gaining admission to the *Law Review* staff provides students with an additional incentive to strive for high standards of performance during their first year in law school. In most cases, admission to the *Law Review* staff is based upon the student's performance during his first year. Only a very limited number of students are admitted on the basis of their high scholastic performance during their second year.

A place on the student editorial board is an invaluable experience for professional life and should be one of the goals of every law student. It provides opportunities to develop skill in research and expression beyond those available in normal classwork activity. As a member of the *Law Review* staff, the student will gain his first experience in solving both administrative and peculiarly legal problems through organized cooperative effort. *Law Review* membership affords a means by which the student can make a real contribution to the legal profession during his years at law school.

Three law fraternities are represented at the School of Law: Story Senate of *Delta Theta Phi*, Dunbar Chapter of *Phi Alpha Delta*, and Ballinger Inn of *Phi Delta Phi International*. Composed of and governed by law students, these fraternities serve to promote and develop comradeship, loyalty to the School and to the law, and an understanding of, and devotion to, the finest traditions of the legal profession.

## **Scholarships, Loans, Prizes, and Awards**

Scholarship awards are made possible by the generosity of many people. Some students would be unable to attend the School of Law were it not for scholarship and loan assistance; others, despite the fact that law study is a full-time occupation, would be forced to divert their attention from such study in order to earn money to put themselves through school. While in the case of scholarships, and even some loans, there is no legal obligation to do so, it is expected and urged that recipients of such funds, after graduation and when financially able to do so, will restore the funds to the School of Law so that an increasing number of other students may enjoy the same advantage.

## **Beginning Students**

**General:** Students whose prior academic performance and economic need justify it may receive scholarship or combination scholarship-loan assistance. Application forms may be obtained from the School of Law and requests should be submitted by March 1 of the year in which the student intends to enter.

**Asian Law Program:** Special stipends are available to assist (for three years) LL.B. degree candidates who are qualified by reason of language competence to undertake a concentration in the studies of Asian Law offered at the School. Holders of such stipends are, of course, required to maintain acceptable academic standing in all their work.

## **Students in Residence**

Applications for most grants and loans are considered by the Committee on Scholarships in July, at which time the Committee can inform itself of the applicant's academic performance during the preceding academic year. Potential applicants may obtain necessary forms at the Dean's Office and should inquire there at an early date concerning presently available funds, possible additional funds, or changes in deadline dates.

Loan funds are also available for which applications should similarly be made. Frequently, it is advisable to grant a particular student a combination of scholarship and loan assistance.

Additional loan funds are provided by National Defense Student Loans administered by the University. Applications should be directed to the Director of Student Financial Aids, University of Washington, 3939 University Way, Seattle, Washington 98105, as soon after April 1 of the appropriate year as possible.



In addition, numerous substantial prizes and awards are available for superior academic achievement in the School of Law.

### Graduate Placement

The School maintains a placement service to assist students in finding legal positions upon graduation, and provides assistance to alumni who are seeking new associations. It also aids students in finding legal positions for the summer months. While the securing of employment remains the ultimate responsibility of the individual, the experience of the recent past indicates that virtually all graduates can be suitably placed. Career seminars are conducted periodically at the Law School to inform students of the broad opportunities available to those with a legal education.

## ADMISSION

### When Students May Enter

Beginning students may enter the School of Law only in the Autumn Quarter, and are required to be present, as stated in their letter of acceptance, a few days earlier than the time set for upper-class students.

### Requirements for Admission to First-Year Class

Applicants for admission must present a baccalaureate degree from an approved college or university, except that applicants presenting three years of satisfactory undergraduate credit may be admitted if they meet other admission standards and present exceptional additional qualifications by virtue of background or experience. In addition, students who enrolled in a combined-degree program\* prior to September, 1964, may be admitted after the satisfactory completion of three years of undergraduate work. A combined-degree student must present a record demonstrating such superior abilities as to justify acceleration of his program of academic and professional education.

Normally, students at the School of Law attend full time and complete their studies in nine quarters. Well-qualified, mature students, however, are permitted to take a reduced load and extend their studies beyond the normal nine quarters. (For a description of the extended [part-time] program, see page 270.

**Law School Admission Test:** Each applicant for admission to the first-year class must take the Law School Admission Test administered by the Educational Testing Service, Princeton, New Jersey. A \$12 fee is charged by the Testing Service. The test is given an-

nually in February, April, August, and November in numerous locations in the United States and throughout the world. For detailed information, the applicant should write directly to the Educational Testing Service. It is recommended that the test be taken during the academic year preceding the one for which admission is sought, preferably in February or before, and not later than April.

**Other Elements:** In recent years, the number of applications for admission to the first-year class has by far exceeded the number of places available. In determining which applications to accept, the score received on the Law School Admission Test is but one of many elements considered by the Admissions Council. All other aspects of the applicant's background are taken into account, with great emphasis being placed on the undergraduate record presented. A letter of admission constitutes a judgment by the Admission Council that the applicant has the capacity and motivation to pursue the study of law successfully. In most instances, the Council's judgment has proved sound.

### Procedure to Be Followed

The applicant must request:

- (1) A formal application blank from the University of Washington, School of Law, Seattle, Washington 98105. The application should be filed early in the final year of undergraduate study and under no circumstances later than May 1, of the year for which admission is sought.
- (2) The registrar of each college he has attended to send two official transcripts *directly* to the School of Law. However, students applying for admission who last attended, or are attending, the University of Washington need have only one complete transcript forwarded directly to the School of Law. All records become a part of the official file. They will not be returned or duplicated.

A student expecting a baccalaureate degree in June may have his application considered prior to receiving his degree. Such a student should submit, along with his application, one transcript of his college work through the first seven semesters or ten quarters. After completing his college work, the student must complete his application by sending the required number of transcripts of *all* of his college work.

\*Combined-degree program as used here includes only those undertaken at a school operating under an agreement with the University of Washington School of Law concerning such programs.

(3) The Educational Testing Service, preferably on his test application, to send his test score to the School of Law.

Upon receiving a letter of acceptance, an applicant must submit two permanent passport-size facial photographs (approximately 2" x 2"). The photographs should be submitted prior to registration.

Applicants for admission whose collegiate education has taken place in countries in which English is not the usual spoken language may be required to submit evidence of competence in English. On occasion, the Test of English as a Foreign Language administered by TOEFL, 1755 Massachusetts Avenue, Washington, D.C. 20036, will be employed. Such candidates should make their own arrangements with TOEFL, preferably advising the School of Law of their action by sending carbons.

#### **Admission with Advanced Standing**

A transfer student may be eligible for admission if he has completed work at a school approved by the Association of American Law Schools, if he is in good standing at the time of his withdrawal (evidenced by a letter from the Dean of the school from which he is transferring), and if he meets the current admission requirements for beginning students at this School. At the discretion of the Dean, credit may be granted for course work taken at another law school. No credit will be granted, however, for courses in which grades are below the average required for graduation at the school from which the student wishes to transfer.

Transfer applications normally will be accepted only if the applicant's record demonstrates that he is capable of doing substantially above average law school work. Where an applicant has completed more than one year of law study, advanced standing will be permitted only in exceptional cases.

The applicant for admission as a transfer student should comply with procedure required for admission to the first-year class, and in addition, forward a letter stating why he desires to transfer to this School.

#### **Readmission after Withdrawal**

**First-year students:** First-year students who withdraw during the academic year are not eligible as a matter of right to return to school. Such students must compete for a place in the class with other applicants in the year they wish to return. In passing upon an application for readmission, the reason for the withdrawal and the quality of work done prior to withdrawal will be considered.

**Second- and third-year students:** If a second- or third-year student not subject to dismissal withdraws from school, he is eligible as a matter of right to return, if he does so within twenty-four months of his withdrawal. His readmission thereafter is at the discretion of the Admissions Council.

**All students:** Any student in good standing required to withdraw because of a military obligation is entitled to return upon the completion of his military service.

## **PROGRAM OF STUDY**

### **The LL.B. Degree**

The Bachelor of Laws degree (LL.B.) is conferred upon a student who has met the residence requirements as described below and has received credit for at least 135 quarter hours of course work satisfactory to the School of Law, including all required courses and at least one seminar offered by the School.

A student who started his work at the School of Law prior to September, 1964, and has earned at least 90 quarter hours of School of Law credit by the end of the Summer Quarter, 1965, is eligible for a Bachelor of Laws degree if he has met the residence requirements and has received credit for at least 132 quarter hours of satisfactory course work.

A student may earn up to 10 quarter hours of credit towards his Bachelor of Laws degree with course work taken in other units of the University. Approval will be granted at the discretion of the Dean's office upon a showing that such course work will contribute significantly to the student's legal education. School of Law credit will be granted only for courses in which the student receives a grade of C or better, and normally only graduate-level courses will be approved for such credit. Grades received in courses taken elsewhere will not be used in computing a student's grade-point average at the School except that if a failing grade is received, the student will be given a 44-E and the grade will be used in computing his School of Law average.

### **Scholastic Requirements**

The grading system of the School of Law is as follows: 85-100=A; 77-84=B; 68-76=C; 60-67=D; 0-59=E.

A grade of 60 or higher is a passing grade. A grade below 60 results in the loss of credit for the course. First-year students must achieve an average of 68 or over for the academic year (Autumn, Winter, and Spring



Quarters) to remain eligible to continue. Second- and third-year students are subject to dismissal if their cumulative average drops below 68 or if their average for the academic year drops below 66. For purposes of eligibility and dismissal of upper-class students, averages are calculated at the end of the Spring Quarter, and the academic year includes Summer, Autumn, Winter, and Spring Quarters. If an upper-class student does not attend during the Summer Quarter, the other three quarters will constitute the academic year.

**Re-examination in required courses:** All required courses must be taken as a condition precedent to graduation. A student not subject to dismissal who fails a required course may arrange for re-examination the next time the course is regularly taught. If the student receives a passing grade upon re-examination, he receives credit for the course, but his cumulative average is not affected. If the student fails the course on re-examination, the grade received is counted in his cumulative average and he is subject to dismissal if that average, including the re-examination grade, falls below 68. A failing re-examination grade is counted in determining the academic-year average of the student for the year in which he takes the re-examination.

**Residence requirements:** To be eligible for a degree, a student must complete at least nine quarters of study in residence. A quarter of residence credit is given for each quarter during which a student successfully completes at least 12 credits of work. In unusual cases, two quarters, in each of which a student earns less than 12 credits, may be combined to produce a quarter of residence credit. Except for Summer Quarter courses, however, quarters of less than 12 credits cannot be combined to produce a quarter of residence credit unless the student successfully completes at least 7 credits of work in each of the quarters. (Students in the extended [part-time] program must either satisfy the regular nine quarter residence requirement or must successfully complete at least 7 credits of work in each of 15 quarters.) In no case can more than two quarters of work be combined to produce a quarter-of-residence credit.

A law student is making normal progress toward his LL.B. degree so long as his work in each academic year, plus Summer Quarter, is equal to at least one-third of the total credits required for graduation. A full-time student in the School of Law is one who is registered for a minimum of 12 credits per quarter. To complete his work in nine quarters, however, a student must average 15 credits per quarter. No student may register for more than 16 credits per quarter without the ap-

proval of the Dean's office. Such permission will be granted only to students whose records demonstrate the capacity to assume the extra load.

Additional information concerning scholastic and other regulations is available at the Dean's office.

### **Honor Code**

An Honor Code to which all students are subject is administered by the Student Bar Association. A statement concerning it is available at the Association office in Condon Hall and is distributed to law students prior to registration.

### **Change of Registration**

**Adding courses:** A student who desires to enroll in a course in which he has not been previously enrolled must complete the change of registration and add the course within the first five school days of the quarter in which the course is first offered. The consent of the instructor teaching the course must first be obtained.

**Withdrawing from courses:** A student may withdraw from a course without permission only during the first five weeks of the quarter. Withdrawal from courses which continue for more than one quarter can be made without permission only during the first five weeks of the first quarter. Withdrawal after the passing of the five weeks is possible only with the consent of the Dean and the instructor. Such withdrawal shall be permitted only in unusual, exceptional, and unforeseeable circumstances. The Dean and the instructor in the course shall determine what constitutes such circumstances.

**Adding and withdrawing during summer:** With the exception of different time periods, the change of registration rules apply to courses given during the summer. Because the Summer Quarter is divided into two terms, the time period for changes is reduced to three days for adding courses and two weeks for withdrawing.

### **Withdrawal From School**

Withdrawal from school is a formal process. Information concerning the necessary procedures is available at the Dean's office. Failure to follow the prescribed rules will result in the receipt of grades of 44-W in all courses in which the student is enrolled. (On the right to re-admission after withdrawal, see the rule stated on page 268.



### **Auditors**

1. Students are not permitted to attend classes in which they are not registered for credit unless permission to attend the particular course has been obtained from the instructor and from the Dean's office. The instructor may prescribe the terms of the permission. The permission to audit and its terms shall be filed by the student with the Dean's office on a form available there.
2. A student who has obtained permission to audit a course will not be given permission to change to credit registration during the quarter.
3. A student who has obtained permission to audit a course will not be permitted to register for the same course for credit at some later date except for good cause shown and with the permission of the instructor.

### **Time Demands of Study**

If at all possible, students should not plan to do outside work during the academic year. School of Law studies demand all of a student's time and energy. Students who find it financially necessary to take on outside work are required to report that fact and the amount of such work to the Dean's office. Such reports will be required periodically. For students carrying a full academic schedule, outside work may not exceed ten hours a week.

### **Extended Program (Part-Time)**

Students are urged to attend the School of Law on a full-time basis and financial aid is provided whenever possible to assist them in doing this. Persons who meet the entrance standards, however, who are forced by circumstances to maintain employment while attending the School of Law, may take partial loads over a period which may extend through four calendar years and fifteen quarters. Individual arrangements are made in these cases in an attempt to balance the requirements of a sound legal education with a continuation of employment. No student is permitted to be enrolled for less than 7 credits each quarter.

### **Accelerated Program**

It is possible for a student to accelerate the date of his graduation by completing successfully a full program of study during the summers between his first and second, and second and third years in the School of Law. For example, under this program a student who enters the School of Law in the Autumn Quarter of 1966 will be able to graduate in December, 1968, and thus be educationally eligible for an examination to be admitted to practice as early as January, 1969.

### **Joint Programs**

Individual programs can be developed for students interested in following a dual program leading to an LL.B. and a graduate degree in some other discipline.

### **Summer Quarter**

The School of Law offers a limited number of courses during Summer Quarter for its own students who are qualified and who desire to accelerate, or who desire to take additional subject-matter, and for students from other law schools who have completed at least one year of study and who wish to do additional work for credit in their respective schools.

The Summer Quarter courses also afford opportunity for further study by practicing lawyers who desire systematic instruction in specialized areas of expanding significance.

Students with advanced standing who wish to transfer to this law school as degree candidates and who desire to begin their study in the Summer Quarter must comply with the admission procedures set forth above.

### **Postgraduate Program**

*Degrees in Asian Law:* In the Autumn of 1967, the School of Law will institute a postgraduate program in the law of Asian countries, with initial emphasis on the law of Japan and China. The program, assisted with funds from the Ford Foundation, will be open to graduates of law schools in the English speaking world who have competence in either Japanese or Chinese. Graduates of law schools in other countries who have a competence in English and either Japanese or Chinese are also eligible. To qualify, students must additionally present an academic record demonstrating the ability to succeed in postgraduate work. Fellowship assistance will be made available to qualified applicants. It is contemplated that authorization will be received to grant the Master of Comparative Law (M.C.L.), the Master of Laws (LL.M.), and the Doctor of Philosophy Ph.D.) degrees in the field of Asian Law. Interested students should write to Director, Asian Law Program, University of Washington School of Law, Seattle, Washington 98105.

## **CURRICULUM**

The first year of law study is composed of a program of required courses. Except for Law 569 (Professional Responsibility), the second- and third-year programs



are entirely elective. The following program will be in effect through 1966-67. Revisions are in prospect, however, and changes in future years can be expected. Summer Quarter offerings will be announced during the Winter Quarter. A listing may be obtained from the School of Law at that time.

### First-Year Program

First-year classes in law schools throughout the country traditionally have tended to be large. At several schools classes with from 70 to 170 students have not been uncommon. Since World War II, an effort has been made to reverse this trend, and many law schools, including the University of Washington's, have attempted to accomplish this reversal by introducing the techniques of analysis, writing, and research in first-year courses.

While this program at the University of Washington School of Law has shown its value and is to be continued, the faculty of the School of Law has decided that more should be done to individualize first-year instruction. To this end, the three basic year-long, first-year courses—Contracts, Property I, and Torts—have been divided into three sections. In each course, one section will be large and two will have from 23 to 25 students. Each first-year student will be assigned to one of the small sections. In this way, the School of Law hopes to combine the very real resource advantage of a fairly large school with the equally real advantage offered by small classes. The large sections will be handled in traditional fashion. The small sections provide opportunities for more individual expression by the student, for a more intimate teacher-student relationship, for additional testing of students, writing by them, and for something more closely related to graduate school instruction than has been possible in first-year courses in the past.

The following program is contemplated for 1966-67.

#### First Year

400	CONTRACTS (3-3-2)	Corker, Rieke, Shattuck
410	CIVIL PROCEDURE (0-3-2)	Beaver, Meisenholder
415	PROCESSES (2-2-0)	Tunks
416	LEGAL RESEARCH AND ANALYSIS (1-1-1)	Gallagher, Lyness, Rombauer, Rosenow
420	CRIMINAL LAW AND PROCEDURE (4-2-0)	Heffron, Junker
430	PROPERTY I (3-3-2)	Bilancia, Cross, Prosterman
440	TORTS (2-2-4)	G. Fletcher, Heffron, Peck
441	LAND USE PLANNING (0-0-3)	Hunt, Johnson, Trautman

#### Second and Third Year Electives

500	ADMINISTRATIVE LAW IV (4-0-0)	Peck
501	ADMINISTRATIVE LAW III (0-3-0)	Andersen
503	AGENCY AND PARTNERSHIP (0-0-3)	Taylor

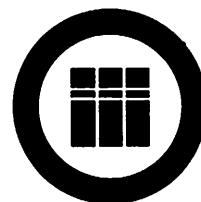
505	CORPORATIONS V (5-0-0)	Kummert
506	CORPORATIONS IV (0-0-4)	Henderson
507	BUSINESS PLANNING (0-3-3)	Kummert
508	SECURITIES REGULATION (0-3-0)	Hunt
515	COMMERCIAL TRANSACTIONS VII (3-4-0)	Taylor
516	COMMERCIAL TRANSACTIONS V (0-2-3)	Corker
520	CONSTITUTIONAL LAW VIII (4-4-0)	Morris
521	LEGAL ACCOUNTING AND STATISTICS (3-0-0)	Kummert
522	CONSTITUTIONAL LAW VI (0-3-3)	Fletcher, R.
523	INTERNATIONAL CONFLICT RESOLUTION (0-3-0)	Stone
525	EQUITABLE REMEDIES IV (4)*	
526	EQUITABLE REMEDIES III (0-0-3)	Rombauer
527	COPYRIGHT AND PATENT LAW (0-0-3)	Fletcher, G.
528	LAW AND SOCIETY (0-0-3)	Stone
530	FEDERAL INCOME TAXATION (3-2-0)	Hjorth
531	SURVEY OF TAXATION (0-3-3)	Harsch
535	PROPERTY II A (4-4-0)	Fletcher, R.
535	PROPERTY II B (0-4-4)	Hallgring
544	CONFLICT OF LAWS III (0-0-3)	Trautman
546	LEGAL HISTORY (3-0-0)	Beaver
550	ADMIRALTY (3-0-0)	Henderson
551	COMMUNITY PROPERTY (0-3-0)	Cross
552	COMPARATIVE LAW (0-3-0)	Fletcher, G.
553	CONFLICT OF LAWS V (5-0-0)	Trautman
555	CREDITORS' RIGHTS (4-0-0)	Corker
556	CRIMINAL PROCEDURE (0-0-3)	Junker
558	DEATH AND GIFT TAXATION (3-0-0)	Hallgring
559	DOMESTIC RELATIONS (0-0-3)	Rieke
561	EVIDENCE (3-3-0)	Meisenholder
563	GOVERNMENT REGULATION OF BUSINESS (2-3-0)	Rieke
564	INSURANCE (3-0-0)	Taylor
565	INTERNATIONAL TRANSACTIONS (0-3-0)	Prosterman
566	JURISPRUDENCE (3-0-0)	Morris
567	LABOR LAW (0-3-0)	Peck
568	LABOR RELATIONS (0-0-3)	Peck
569	PROFESSIONAL RESPONSIBILITY (0-0-1)	Hunt
570	LEGISLATION (3-0-0)	Harsch
571	LOCAL GOVERNMENT LAW (0-3-0)	Trautman
573	PROPERTY SECURITY (0-0-5)	Shattuck
574	NATURAL RESOURCES (3-0-0)	Johnson
575	PROBATE PRACTICE (2-0-0)	Fletcher, R.
577	STATE AND LOCAL TAXES (0-0-3)	Harsch
579	SURETYSHIP (0-2-0)	Shattuck
580	TRIAL AND APPELLATE PRACTICE (0-3-2)	Trautman
581	TRUST ADMINISTRATION (2-0-0)	Hallgring
585	PROBLEMS IN EVIDENCE (4-0-0)	Beaver
586	PUBLIC INTERNATIONAL LAW (3)*	
590	CORPORATE INCOME TAX (0-0-3)	Hjorth
593	SOCIAL LEGISLATION (3)*	
594	TRANSNATIONAL TAX (0-0-3)	Hjorth
595	INTRODUCTION TO JAPANESE LAW (0-3-0)	Henderson
599	INTRODUCTION TO CHINESE LAW (0-0-3)	Bilancia
600	RESEARCH PROBLEMS IN LAW (1-5)	Staff
610	LAW REVIEW (1-4, max. 4)	Kummert, Trautman

#### Seminars

524	HUMAN LAW AND HUMAN JUSTICE SEMINAR (0-3-0)	Stone
529	INTERNATIONAL LAW SEMINAR (0-0-3)	Stone
532	TAX FRAUD SEMINAR (3)*	Heffron
533	CRIMINAL LAW REVISION SEMINAR (0-0-3)	Junker
534	INSURANCE SEMINAR (0-2-1)	Taylor
536	BUSINESS PLANNING SEMINAR (0-2-1)	Kummert
537	CRIMINAL PROCEDURE SEMINAR (0-2-1)	Junker
538	EVIDENCE SEMINAR (0-2-1)	Beaver
539	OCEAN RESOURCES SEMINAR (2-1-0)	Johnson
549	JAPANESE LAW SEMINAR (1-1-1)	Henderson
560	ESTATE PLANNING SEMINAR (0-2-1)	Hallgring
562	FEDERAL JURISDICTION SEMINAR (3-0-0)	Meisenholder
572	URBAN PLANNING SEMINAR (2-1-0)	Hunt
578	CIVIL LIBERTIES SEMINAR (0-0-3)	Morris
587	NATURAL RESOURCES SEMINAR (0-2-2)	Johnson
588	LAND USE SEMINAR (0-2-1)	Hunt
589	COMMON MARKET SEMINAR (2-2-0)	Hjorth
591	PUBLIC FINANCE SEMINAR (2-1-0)	Harsch
592	REGULATED INDUSTRIES SEMINAR (4)*	
597	COMMERCIAL CODE SEMINAR (3)*	

\* Not offered 1966-67.





# LIBRARIANSHIP

**Director**

Irving Lieberman  
133 Library

**Associate Director**

L. Dorothy Bevis  
133 Library

**Graduate Program Adviser**

Irving Lieberman  
133 Library

**Professors**

Harry C. Bauer, L. Dorothy Bevis, Marian G. Gallagher (Professor of Law; Law Librarian), Irving Lieberman

**Associate Professors**

Eleanor E. Ahlers, Perry D. Morrison, Marion E. Peterson, Mabel A. Turner

**Assistant Professors**

Mae M. Benne, Benjamin F. Page

**Lecturers**

Phoebe M. Harris, Don D. Wiley

A library is a storehouse for the collective mind of man—a legacy of his ideas, thoughts, and knowledge. But it is much more than merely a collection of books. Because it is organized, classified, and cataloged it is the great instrument of inquiry, a source of learning tapped by both the student and his teacher.

One of thirty-eight schools accredited by the American Library Association, the School prepares students for professional positions in all types of libraries. Programs offered lead to the degrees of Master of Librarianship and Master of Law Librarianship. The School of Librarianship is a member of the Association of American Library Schools.

The basic professional curriculum is organized around a group of studies designed to provide a sound foundation in principles and methods, and is required of all students pursuing a graduate degree in librarianship. In addition, the student elects courses which will prepare him for a special field of library service, such as those designed for children and young people's work, school library work, and law librarianship. Other programs may be designed in accordance with the individual needs of the student which might include his choice of type of library and his undergraduate subject major—art, economics, music, political science, sociology, the natural and physical sciences.



### Admission

The approval of both the Graduate School and the School of Librarianship is necessary for admission to the graduate program, which may be entered in either Summer or Autumn Quarter. The deadline for submission of applications and complete credentials for Autumn Quarter is July 15, and for Summer Quarter, May 15.

Students from countries where English is a foreign language require at least two years to complete the program as full-time students and may enter only in the Autumn Quarter. The deadline for submission of applications and complete credentials for foreign students is during February.

Since Autumn Quarter, 1965, four prerequisite courses have been required of all students before entrance to the graduate program. These are: Librarianship 440 (Libraries and Society), 441 (Basic Library Materials), 442 (Book Selection), and 443 (Organization of Library Materials: Theory and Practice). The four prerequisite courses carry 3 quarter credits each, or a total of 12 credits. The courses are designed to form a basic

foundation for graduate work to follow and also to serve as terminal library courses for students not seeking the graduate library degree. *These 12 quarter credits are in addition to the required 45 quarter credits for the Master of Librarianship degree.*

In order to facilitate entrance procedures, students may apply for and be accepted by the Graduate School and the School of Librarianship although they are deficient in modern foreign language or the four prerequisites mentioned above. These deficiencies *must be removed* before the student will be allowed to register for 500-level course work.

Librarianship courses offered by other colleges and universities accredited by the Northwest Association of Secondary and Higher Schools will be articulated with the graduate program of the School of Librarianship. A student admitted from another accredited institution will be granted up to 12 quarter credits for courses completed, *without a reduction in the required 45 quarter credits for the Master of Librarianship degree.* Transcripts of individual students will be evaluated at the time of admission, and prior to the date of registration and enrollment.



The new curriculum of the School of Librarianship includes not only the prerequisites but also new arrangements and material in the areas of reference and technical services. Additional courses will be offered in the ensuing years giving emphasis in the areas of services and materials for children and youth, newer instructional materials and media, information science, archival management, and advanced subject bibliography such as medicine, science, engineering, etc. Many of these new courses will be available to librarians as in-service education.

The entrance requirement of a modern foreign language (foreign students may not use national language or English) may be met either by passing the Graduate School Foreign Language Examination or by submitting *one academic year*, at the college level, of a modern foreign language.

### **Summer Program**

The full program for the Master of Librarianship degree is available to Summer Quarter students. The prerequisite courses, as well as both required and elective courses in the graduate program, are offered every summer. Course offerings vary from year to year, but are planned to enable students to complete requirements for the degree by attendance during summers only.

### **Law Librarianship**

Applicants for entrance to the Law Librarianship program must hold a Bachelor of Laws degree from an accredited American law school, and applications must be approved by the Dean of the University of Washington School of Law. Since specialized Law Librarianship courses are not offered in the Summer Quarter, the Master of Law Librarianship degree must be completed in the consecutive quarters of the regular academic year. Prerequisite courses are, however, offered in the Summer Quarter.

### **Library Facilities**

The School of Librarianship is in the south wing of the Henry Suzzallo Library. The professional materials of librarianship, including an outstanding collection of children's books and a high school library collection, are a part of the Henry Suzzallo Library. These materials are supplemented by the Library's central and departmental research libraries containing more than one million volumes. In addition, the School of Librarianship has the William E. Henry collection of rare books. Students have access to the facilities of the Pacific Northwest Bibliographic Center and the University's Audio-Visual Services. The Seattle Public Library and the King County Public Library are also available for student use.

The art of healing is as old as man. In today's world, the health sciences are, literally, a phenomenon. Research probes closer and closer to the heart of the life puzzle, and of disease; it enlarges the limits of life, gives insight to the disturbed. All aspects of the physical and mental well-being of man are the intimate concern of the healer and of the schools which teach him.

The Division of Health Sciences at the University of Washington was founded in 1945, when the new Schools of Dentistry and Medicine were joined with the already existing School of Nursing and the College of Pharmacy.

The University has offered instruction in nursing since 1917. The School of Nursing has offered programs leading to bachelor's and advanced degrees since 1931. The College of Pharmacy, founded in 1894, established a four-year curriculum in 1904 leading to a bachelor's degree, and in 1957 established a five-year curriculum. The College now offers both bachelor's and advanced degrees.

The present Health Sciences Division, which includes the University Hospital, coordinates development, research, and teaching activities to strengthen and reinforce the work of each independently organized unit.

The Health Sciences Building was occupied in 1949, and overlooks the Portage Bay Yacht Basin between Lake Washington and Lake Union. The building complex houses administrative units, research units, and classrooms of the three schools, library and auditorium,

and clinical facilities of the School of Dentistry. The College of Pharmacy is located outside the complex in Bagley Hall.

The second unit of the University Hospital, completed in 1959, is a 320-bed unit. It includes inpatient and outpatient facilities, classrooms, laboratories, X-ray facilities, an emergency department, a physical medicine and rehabilitation unit, premature nursery, etc. The unit is contiguous to the first unit of the Hospital, completed in 1954, which houses the office and research areas of the eight clinical departments of the School of Medicine.

The Samuels Research Wing, opened in 1960, houses additional laboratories of the clinical departments. Closely integrated units for cancer research, a regional primate center, and a biochemistry-genetics wing (extensions of the original building complex) give the University one of the finest health sciences centers in the United States. New facilities for preventive medicine-environmental research and an all-University center for mental retardation and child development, soon to be constructed, will provide added dimension for existing programs.

#### **Facilities and Services**

The Health Sciences Library serves the Schools of Medicine, Dentistry, Nursing, and the College of Pharmacy. Used by many researchers in other sections of the University, the Library has nearly 100,000 carefully



## HEALTH SCIENCES

selected volumes, and subscribes to more than 2,000 periodicals. Included in the facilities are ten glass-paneled, soundproofed rooms for reading, study, and conferences, as well as space for microfilm and micro-card readers and special study groups. In addition, the resources of the main University Library, and the interlibrary loan service, can make available all the medical resources of the country.

Clinical teaching programs of the Schools of Medicine, Dentistry, Nursing, and the College of Pharmacy are conducted not only in the University Hospital, but also in hospitals affiliated with the individual schools.

In conducting the undergraduate and graduate clinical teaching programs, the School of Nursing utilizes the facilities of 21 hospitals and public health agencies. Other community facilities are used as necessary to provide selected learning experiences for students.

Many aspects of the clinical teaching program in Medicine are centered at King County Hospital in both Harborview Division and in the Chronic Disease and Convalescent Division. Offices, laboratories, and classrooms at the hospital accommodate many of the activities of the clinical departments. Faculty members with full-time status, including chairmen of clinical departments, are appointed in teaching and service capacities at these hospitals.

The United States Veterans Administration Hospital in Seattle is closely integrated with other teaching facilities of the Division. The Veterans Administration operates

this hospital as a "Dean's Committee Hospital," with the cooperation of Seattle physicians and the Health Sciences faculty.

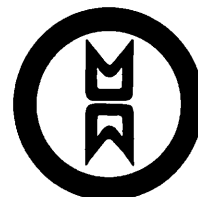
The Children's Orthopedic Hospital and Medical Center, the United States Public Health Service Hospital, and Firland Sanatorium also are affiliated with the Division. Children's Orthopedic has excellent facilities in all branches of pediatrics. Some medical students are assigned to the U.S.P.H.S. Hospital for their clerkships. Firland Sanatorium offers unusually fine opportunities for the study and treatment of tuberculosis, and at the University of Washington Child Health Center students have the opportunity to study the phenomena of normal growth and development of infants and children. The Center is sponsored jointly by the Departments of Pediatrics, Preventive Medicine, and Psychiatry.

The state mental hospitals are affiliated in the elective externship training program for fourth-year medical students, and include Western State Hospital at Fort Steilacoom, Eastern State Hospital at Medical Lake, and Northern State Hospital at Sedro-Woolley.

Since the School of Medicine stresses the importance of a solid foundation in general medicine, additional affiliations with qualified hospitals throughout the state are planned for use in both undergraduate and graduate training programs. The ultimate goal of the Division of Health Sciences is a continuous educational program for undergraduate and graduate training in all of its professional schools.







# DENTISTRY

## **Dean**

Maurice J. Hickey  
C301 Health Sciences Building

## **Associate Dean**

Alton W. Moore  
B374 Health Sciences Building

## **Assistant Dean**

Thompson M. Lewis  
B322 Health Sciences Building

## **Professors**

Berton E. Anderson, Oscar E. Beder, Maurice J. Hickey, David B. Law, Alton W. Moore, Kenneth N. Morrison, Alfred O. Ogilvie, Saul Schluger, Leo M. Sreebny, Gerald D. Stibbs

## **Associate Professors**

Charles L. Bolender, Charles I. Degering, Jan Diepenheim, Martha H. Fales, John D. Gehrig, Jean E. Hodson, F. Lloyd Jacobson, Patricia J. Keller, Thompson M. Lewis, Benjamin C. Moffett, Jr., Richard A. Riedel, Russell Ross, Irving B. Stern, Arnold Tamarin, Myron E. Warnick, Walter A. Wykhuis

## **Research Associate Professor**

Robert E. Guild

## **Assistant Professors**

Neil Basaraba, B. E. Braden, George A. Drennan, James R. Easley, Edward C. Funk, Herbert P. Gordon, James D. Haberman, Paul J. Heins, James R. Hooley, Eugene Natkin, Patricia M. Wagner, Ralph A. Yuodelis

## **Instructors**

Emile Azar, Ann Dinius, Gaither B. Everett, George G. Ghosn, Donald G. Gronas, Lennard A. Hendrickson, James L. Lord, Dean L. Pope, James L. Quessenberry, Murray R. Robinovitch, James C. Steiner, Joan S. Voris, Norma J. Wells

## **Research Assistant Professor**

Jay D. Decker

In the School of Dentistry the student learns fundamental principles significant to the entire body of dental knowledge, and is expected to acquire habits of reasoning and critical judgment enabling him to implement that knowledge. To the School of Dentistry, the future development of the student is as critical as his professional training, and the program of instruction is designed to equip him, as a practicing dentist, with the knowledge and qualities necessary for solving problems of dental health and disease.

The Dental School expects its students to learn the fundamentals of the basic health sciences, to master certain clinical skills, and to acquire a thorough understanding of professional and ethical principles. The four-year program encompasses these objectives.

The School of Dentistry is approved by the Council on Dental Education of the American Dental Association and is a member of the American Association of Dental Schools. It is a participating member of the Western Interstate Commission for Higher Education.

The School of Dentistry offers a four-year program of courses leading to the degree of Doctor of Dental Surgery (D.D.S.); programs leading to the Master of Science in Dentistry for students in the Graduate School; and courses for practicing dentists.

The four-year curriculum for the D.D.S. degree includes study in two main areas: Basic Sciences and Clinical Dental Sciences. Instruction in the basic sciences is provided by the Departments of Biological Structure (formerly Anatomy), Biochemistry, Microbiology, Pathology, Pharmacology, Physiology and Biophysics, and Preventive Medicine of the Health Sciences Division. In the clinical dental sciences the Departments of Dental Science and Literature, Dental Materials, Fixed Partial Dentures, Operative Dentistry, Oral Diagnosis and Treatment Planning, Oral Biology (formerly Oral Pathology), Oral Surgery, Orthodontics, Periodontics and Endodontics, Pedodontics, and Prosthodontics provide instruction in the fields of general dental practice and dental specialization.

As an integral part of the School of Dentistry, the Department of Dental Hygiene has the same basic objectives, and offers courses of instruction leading to a Bachelor of Science degree with a major in Dental Hygiene.

### Admission

The Council on Dental Education of the American Dental Association has specified these minimum requirements for admission to an approved school of dentistry:

"... the successful completion of two full academic years of work in an accredited college of liberal arts and science. . . . The college course must include at least a year's credit in English, in biology, in physics, and in inorganic chemistry, and a half-year's credit in organic chemistry. All courses in science should include both class and laboratory instruction. . . ."

The Committee on Admissions of the School of Dentistry requires the following courses given at the University of Washington. Students taking predental work at other institutions may compare these courses with those given in their schools by consulting the *Description of Courses* section of this Catalog.

COURSES	CREDITS
ENGL 101, 102, 103 (COMPOSITION) . . . . .	9
CHEM 140, 150 AND 151, 160 AND 170 (GENERAL AND QUALITATIVE ANALYSIS) . . . . .	14
CHEM 231, 232, 241, 242 (ORGANIC) . . . . .	10
PHYS 114, 115, 116, 117, 118, 119 (GENERAL AND LAB) . . . . .	15
ZOOL 111, 112 (GENERAL) . . . . .	10
ZOOL 456 (DEVELOPMENTAL BIOLOGY) . . . . .	5
or ZOOL 453-454 (COMPARATIVE ANATOMY OF CHORDATES) . . . . .	10

The Committee on Admissions recommends that predental students choose electives with the aim of broadening their background in human relationships and understanding. Laboratory drawing, sculpture, American literature, modern literature, music appreciation, speech, anthropology, economics, philosophy, psychology, and sociology are suggested, but students should survey the courses offered in their respective schools for other possible electives. Applicants from the University of Washington must have satisfied the physical education activities requirement.

Students presenting evidence of scholastic attainment over the required minimum generally have the advantage at the time of selection.

### Application Procedure

Applications and all credentials should be sent to the Committee on Admissions, Office of Admissions, University of Washington School of Dentistry. The final date on which applications for entrance in Autumn Quarter may be submitted is February 1. Prior to that date, each applicant must submit the following:

1. Formal application for admission on the form furnished by the School of Dentistry.
2. Two official transcripts from *each* college attended (one copy if attending the University of Washington) sent directly from the registrars of the institutions where preprofessional training was taken to the Committee on Admissions. Transcripts should show (a) a complete college record, with grades and credits; (b) subjects the applicant is taking or will take to complete his preprofessional training before entering the School of Dentistry (if this information is not shown on the transcript the applicant must forward a separate schedule). It is the applicant's responsibility to see that



transcripts are forwarded to the Office of Admissions at the end of each quarter or semester.

3. One official transcript from high school attended. (University of Washington students excepted.)

4. At least four letters of recommendation, two of which must contain personal evaluation by science instructors (one letter if forwarded by the preprofessional committee of the school), and two from business or professional persons. The School of Dentistry does not provide a form for recommendations.

5. Physician's statement of physical examination taken within the last twelve months.

#### **Processing of Applications**

The Committee on Admissions examines the credentials and bases its decision on the objective evaluation of these factors: preprofessional training, evidences of scholarship, residence of the applicant, dental aptitude test rating, and personal evaluation of the student by predental instructors and members of the Committee on Admissions.

Washington participates in the student exchange program of the Western Interstate Commission for Higher Education, under which legal residents of certain Western states which do not have dental schools may pay the tuition and fees charged to legal residents of Washington rather than the higher nonresident rate. These states are Alaska, Arizona, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, and Wyoming. To be eligible for this program, the student must be certified by his home state. State eligibility requirements vary, and the number of students who can be included in the program each year depends on appropriations by the legislature of each state. A student interested in this program must apply to the certifying officer in his home state, whose address may be obtained by writing to the Western Interstate Commission for Higher Education, Fleming Law Building, Boulder, Colorado.

#### **Dental Aptitude Test**

All predental students who apply for admission to the School of Dentistry are required to take the dental aptitude test given under the auspices of the Council on Dental Education of the American Dental Association. This test is given in October, January, and April, at the University of Washington and other schools throughout the country. Full information about the test is sent to all applicants for admission. It is advantageous for the applicant to participate in an early aptitude testing session.

#### **Personal Interview**

After all material pertinent to the application has been received and reviewed, the candidate may be requested to appear for a personal interview. When an interview is required the applicant will generally participate in a special aptitude test conducted by the Committee on Admissions of the School of Dentistry.

#### **Notification of Acceptance or Rejection**

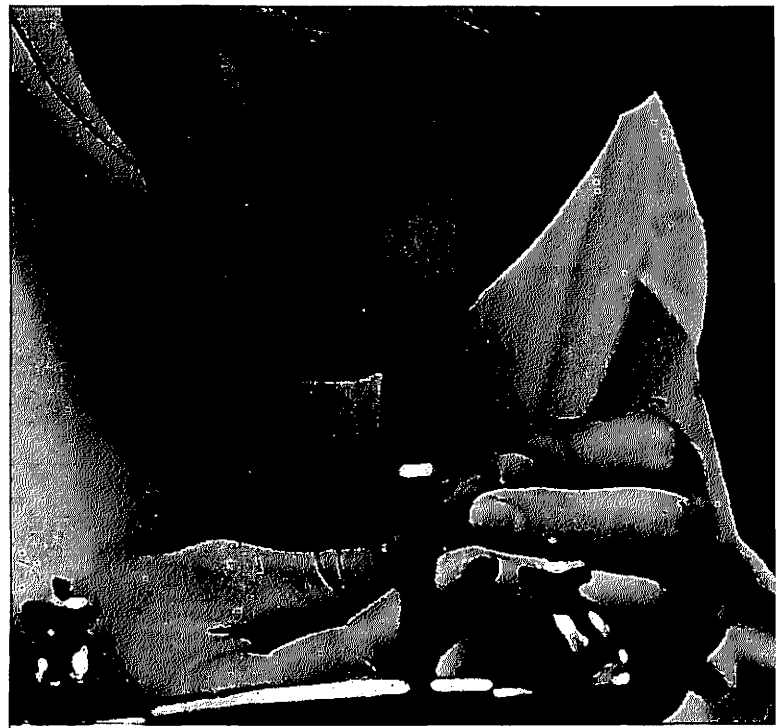
All candidates are given written notice of the acceptance or rejection of their applications as soon as possible after the Committee on Admissions has reached a decision. Applicants generally are informed of the Committee's decision sometime prior to June 30.

#### **Honor Code**

All students accepted by the School of Dentistry will be expected to indicate their willingness to participate in the School's Honor Code.

#### **Acceptance of Appointment**

When a candidate has been notified that he is accepted in the School of Dentistry, he must deposit \$50.00 with the Comptroller of the University. This deposit is applied to the first quarter's tuition. It is refundable only in cases of withdrawal for bona fide illness, failure to complete basic predental requirements, induction into military service, or failure to pass the physical examination required of all students at the time of registration.



# **FIRST YEAR SCHEDULE**

Autumn Quarter						
HOURS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	
AM	BIOL. STR. 328 (GROSS ANATOMY) GROSS ANATOMY LABORATORY	DENT. SCI. AND LIT. 131 (DENT. MATERIALS) DENT. MATERIALS LABORATORY	BIOL. STR. 328 GROSS ANATOMY LABORATORY	DENT. SCI. AND LIT. 131 DENT. MATERIALS LABORATORY	OPERATIVE DENTISTRY 132 (ORAL ANATOMY) ORAL ANATOMY LABORATORY	
PM	OPERATIVE DENTISTRY 132 ORAL ANATOMY LABORATORY	BIOL. STR. 330 (MICROSCOPIC ANATOMY) MICROSCOPIC ANATOMY LABORATORY	BIOL. STR. 330 MICROSCOPIC ANATOMY LABORATORY	BIOL. STR. 328 GROSS ANATOMY LABORATORY	FREE	
Winter Quarter						
AM	BIOCHEMISTRY 405 (INTRO. TO BIOCHEMISTRY I)  FREE	DENT. SCI. AND LIT. 100 (ORIENTATION)  ORAL PATHOLOGY 131 (ORAL HISTOLOGY AND EMBRYOLOGY) ORAL HISTOLOGY AND EMBRYOLOGY LAB.	BIOCHEMISTRY 405  FREE	FREE  ORAL PATHOLOGY 131  ORAL HISTOLOGY AND EMBRYOLOGY LAB.	BIOCHEMISTRY 405  FREE	
PM	PHYSIOLOGY AND BIOPHYSICS 405 (HUMAN PHYSIOLOGY) PHYSIOLOGY LECTURE	OPERATIVE DENTISTRY 133 (ORAL ANATOMY)	PHYSIOLOGY AND BIOPHYSICS 405  PHYSIOLOGY LABORATORY	PHYSIOLOGY AND BIOPHYSICS 405  PHYSIOLOGY LABORATORY	BIOL. STR. 331 (NEUROANATOMY) NEUROANATOMY LABORATORY	
Spring Quarter						
AM	BIOCHEMISTRY 406 (INTRO. TO BIOCHEMISTRY II) PROSTHODONTICS 131 (COMPLETE DENTURE TECHNIC) PROSTHODONTICS LABORATORY	BIOCHEMISTRY 407 (DENT. STUDENTS' LAB.)  BIOCHEMISTRY LABORATORY	BIOCHEMISTRY 406  FREE OPERATIVE DENTISTRY 134 (ORAL ANATOMY) ORAL ANATOMY LABORATORY	BIOCHEMISTRY 407  BIOCHEMISTRY LABORATORY	BIOCHEMISTRY 406  OPERATIVE DENTISTRY 134  ORAL ANATOMY LABORATORY	
PM	OPERATIVE DENTISTRY 131 (ELEM. OP. DENT. TECHNIC) OPERATIVE TECHNIC LABORATORY	PROSTHODONTICS 131 (COMPLETE DENTURE TECHNIC) PROSTHODONTICS TECHNIC LABORATORY	OPERATIVE DENTISTRY 131  OPERATIVE TECHNIC LABORATORY	PROSTHODONTICS 131  PROSTHODONTICS TECHNIC LABORATORY	PROSTHODONTICS TECHNIC LABORATORY	

# **THIRD YEAR SCHEDULE**

Autumn Quarter						
HOURS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	
AM	PROSTHODONTICS 300 (COMPLETE DENTURE PROSTHO.)  PEDODONTICS 300	ORAL SURGERY 300 (EXODONTIA)  PERIODONTICS 300	OPERATIVE DENTISTRY 300  ENDODONTICS 304	O.D.T.P.* 300  FIXED PARTIAL DENTURES 300	FREE  PERIODONTICS 300	
PM	CLINIC CLINIC	CLINIC CLINIC	CLINIC CLINIC	CLINIC CLINIC	CLINIC CLINIC	
Winter Quarter						
AM	PROSTHODONTICS 301 (COMPLETE DENTURE PROSTHO.)  O.D.T.P.* 301	PROSTHODONTICS 303 (REMOV. PART. DENT. PROSTHO.)  FREE	OPERATIVE DENTISTRY 301  PEDODONTICS 301	FIXED PARTIAL DENTURES 301  ORAL SURGERY 301 (EXODONTIA)	ORAL SURGERY 303 (GENERAL ANESTHESIA) PERIODONTICS 301	
PM	CLINIC CLINIC	CLINIC CLINIC	CLINIC CLINIC	CLINIC CLINIC	CLINIC CLINIC	
Spring Quarter						
AM	PROSTHODONTICS 302 (COMPLETE DENTURE PROSTHO.)  ORTHODONTICS 300	PROSTHODONTICS 304 (REMOV. PART. DENT. PROSTHO.)  DENT. SCI. AND LIT. 302 (TECH. COMPOSITION)	OPERATIVE DENTISTRY 302  FIXED PARTIAL DENTURES 302 (F.P.D. TECHNIC)	DENT. SCI. AND LIT. N300 (DENTAL MEDICINE)  ORAL SURGERY 302 (EXODONTIA)	DENT. SCI. AND LIT. 302  DENT. SCI. AND LIT. N301 (DENTAL MEDICINE)	
PM	CLINIC CLINIC	ORAL BIOLOGY 331 (ORAL PATHOLOGY) ORAL PATHOLOGY LABORATORY	CLINIC  ORAL SURGERY 331 (ORAL SURGERY LABORATORY)	ORAL BIOLOGY 331  ORAL BIOLOGY LABORATORY	CLINIC	

\*Oral Diagnosis and Treatment Planning

**SECOND YEAR SCHEDULE****Autumn Quarter**

HOURS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
AM	PATHOLOGY 440- (GENERAL) MICROBIOLOGY 235 (MICRO. FOR DENT. STUDENTS)	OPERATIVE DENTISTRY 231 (DENT. TECHNIC)	MICROBIOLOGY 235	OPERATIVE DENTISTRY 231	PATHOLOGY 440- MICROBIOLOGY 235
	MICROBIOLOGY LABORATORY	OPERATIVE TECHNIC LABORATORY	MICROBIOLOGY LABORATORY	OPERATIVE TECHNIC LABORATORY	MICROBIOLOGY LABORATORY
PM	FIXED PARTIAL DENTURES 231 (F.P.D. TECHNIC) FIXED PARTIAL DENTURES LABORATORY	PROSTHODONTICS 231 (REMOV. PART. DENT. TECHNIC) PROSTHODONTICS TECHNIC LABORATORY	PATHOLOGY 440-  FREE	PATHOLOGY -444- (GENERAL)	FIXED PARTIAL DENTURES 231  FIXED PARTIAL DENTURES LABORATORY

**Winter Quarter**

AM	PROSTHODONTICS 232 (REMOVE PART. DENT. TECHNIC) PROSTHODONTICS LABORATORY	OPERATIVE DENTISTRY 232 (DENT. TECHNIC)  OPERATIVE TECHNIC LABORATORY	PROSTHODONTICS 232  PROSTHODONTICS LABORATORY	OPERATIVE DENTISTRY 232  OPERATIVE TECHNIC LABORATORY	DENT. SCI. AND LIT. 200 (DENTAL HISTORY)  O.D.T.P.* 216 (ORAL ROENTGENOLOGY) PERIODONTICS 200 (INTRO. TO PERIODONTICS) PEDODONTICS 201 (PREVENTIVE DENT.)
PM	FIXED PARTIAL DENTURES 232 (F.P.D. TECHNIC)  FIXED PARTIAL DENTURES LABORATORY	PROSTHODONTICS 232	FREE	PEDODONTICS 200 PATHOLOGY -445 (SYSTEMIC)  PATHOLOGY LABORATORY	FIXED PARTIAL DENTURES 232  FIXED PARTIAL DENTURES LABORATORY

**Spring Quarter**

AM	PHARMACOLOGY 234 (GEN. PHARMACOLOGY) ORAL SURGERY 200 (LOCAL ANESTHESIA) ENDODONTICS 201 (INTRODUCTION) O.D.T.P.* 217, O.S.† 200, PERIODONTICS 231 (ORAL ROENTGENOLOGY), (LOCAL ANESTHESIA), (PERIODONTIC TECHNIC)	OPERATIVE DENTISTRY 233 (DENT. TECHNIC)	PEDODONTICS 216	OPERATIVE DENTISTRY 233	ENDODONTICS 232 (ENDODONTIC TECHNIC)
PM	FIXED PARTIAL DENTURES 233 F.P.D. TECHNIC FIXED PARTIAL DENTURES LABORATORY	O.D.T.P.* 217, O.S.† 200, PERIODONTICS 231	PHARMACOLOGY LABORATORY	PHARMACOLOGY 234  O.D.T.P.* 217, O.S.† 200, PERIODONTICS 231	FIXED PARTIAL DENTURES 233  FIXED PARTIAL DENTURES LABORATORY

**FOURTH YEAR SCHEDULE****Autumn Quarter**

HOURS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
AM	ORAL SURGERY 400	ORTHODONTICS 400	DENT. SCI. AND LIT. 403 (JURISPRUDENCE)	DENT. SCI. AND LIT. 431 (DENTAL ETHICS AND OFFICE MANAGEMENT)	O.D.T.P.* 400
	PERIODONTICS 401	FIXED PARTIAL DENTURES 400	OPERATIVE DENTISTRY 400		PROSTHODONTICS 400 (ADV. COMPLETE DENT. PROSTHO.)
PM	CLINIC	CLINIC	CLINIC	CLINIC	CLINIC

**Winter Quarter**

AM	ORAL SURGERY 401	FIXED PARTIAL DENTURES 401	O.D.T.P.* 401	PROSTHODONTICS 402 (ADV. REMOV. PART. DENT. PROSTHO.)	DENT. SCI. AND LIT. 432 (DENT. ETHICS AND OFFICE MANAGEMENT)
	DENT. SCI. AND LIT. 401 (APPLIED DENT. SCIENCE)	ORAL SURGERY 403 (MAXILLOFACIAL SURG.)	OPERATIVE DENT. 401	DENT. SCI. AND LIT. 401	ORTHODONTICS 401
PM	CLINIC CLINIC	CLINIC CLINIC	CLINIC CLINIC	CLINIC CLINIC	CLINIC CLINIC

**Spring Quarter**

AM	PERIODONTICS 401	O.D.T.P.* 402	ORAL SURGERY 404 (MAXILLOFACIAL SURG.)	CONJOINT (DENT.) 402 (APPLIED THERAPEUTICS AND PRESCRIBING)	PROSTHODONTICS 401 (ADV. COMPLETE DENT. PROSTHO.) PEDODONTICS 400 (PEDO. & PUB. HEALTH DENT.)
	DENT. SCI. AND LIT. 433 (DENTAL ETHICS AND OFFICE MANAGEMENT)	ORAL SURGERY 402	OPERATIVE DENT. 402		
PM	CLINIC CLINIC	CLINIC CLINIC	CLINIC CLINIC	CLINIC CLINIC	CLINIC CLINIC

\*Oral Diagnosis and Treatment Planning

†Oral Surgery

## Promotion

At the end of each academic year the Executive Committee of the School of Dentistry evaluates the accomplishments of the student during the year and determines his fitness for promotion. When promotion is not recommended, the student is subject to dismissal from the School. The School of Dentistry reserves the right to dismiss any student from the School for any reason it deems sufficient. Scholastic standing is not the only requirement for promotion. Students are advanced only when their general attitude, scholastic progress, and personal attributes are considered satisfactory.

## Awards and Honors

**Mosby Book Awards.** The Mosby Company provides awards for five senior theses representing the most significant contribution to dental literature. These awards are \$30.00 certificates entitling the students to any one Mosby volume.

**The American Society of Dentistry for Children.** This award is presented by the Department of Pedodontics to a senior dental student who has shown outstanding interest and achievement in clinical pedodontics. The award consists of a certificate of merit, a one-year membership in the American Society of Dentistry for Children, and a one-year subscription to the *Journal of Dentistry for Children*.

**The American Academy of Periodontology Award.** For exceptional interest and ability in the field of periodontics, the American Academy of Periodontology awards one senior student a one-year subscription to the *Journal of Periodontology*.

**The American Academy of Dental Medicine Award.** A certificate of merit is presented to the senior student demonstrating unusual ability in this phase of dentistry.

**Department of Prosthodontics Award.** A one-year subscription to the *Journal of Prosthetic Dentistry* and a plaque is presented to a senior student for academic and clinical excellence in prosthodontics.

**Washington State Dental Association Award.** This certificate is presented to the senior student who has demonstrated character and leadership, together with high scholastic achievement during the four-year dental course.

**American Academy of Gold Foil Operators.** A certificate is presented each year to the senior student demonstrating greatest skill in gold foil performance.

**The Alpha Omega Scholarship Award.** This plaque is presented to the senior student with the highest scholastic average for his four years of dental studies.

**Washington State Dental Hygienists' Association Award.** A plaque and a one-year complimentary membership to the Washington State Dental Hygienists' Association is presented to the senior dental hygiene student whose activities have been outstanding, and who shows promise of those qualities of leadership necessary for the advancement of the profession.

**Omicron Kappa Upsilon** is the national dental honorary society, founded in 1914. **Sigma Sigma** Chapter at the University of Washington was chartered in the spring of 1950 when the first class in Dentistry was graduated. Each year the Chapter elects to membership 12 per cent of the graduating class in dentistry. These students have distinguished themselves in scholarship and character and possess potential qualities for future professional growth and attainments.

**Sigma Phi Alpha** is the national dental hygiene honor society, founded in 1958. **Sigma** Chapter at the University of Washington elects to membership each year 10 per cent of the graduating class in dental hygiene. These students have distinguished themselves in scholarship and character and possess outstanding qualities for future professional growth.

**Dennis P. Duskin Inspirational Award.** Winner is selected by a majority of the Senior Class. The award is given to that senior who has shown outstanding character and personality throughout his dental education.

## Fellowships

### Student Part-Time Research Fellowships

Awards in the amount of \$900 are available to a limited number of undergraduate dental students who are interested in undertaking research. The research may be on a part-time basis during the academic year or full time during the Summer Quarter. The grants are made upon the recommendation of the department heads concerned and the Dean. Funds for this purpose are provided on an annual basis by the Division of Research Grants, National Institutes of Health, and the United States Department of Public Health.

Information concerning other scholarships and fellowships for University students may be obtained from the Office of the Dean of Students.

### Research Grants

Grants-in-aid for research and special projects in the School of Dentistry totaling approximately \$156,000



have been received during the past year. About \$151,000 was received from government agencies and private sources, and some \$5,000 from the state of Washington under Initiative 171.

### Financial Aid to Students

Students enrolled in the School of Dentistry may obtain financial aid through a variety of loan funds. These funds are administered by the Student Loan Committee of the School of Dentistry and by the Director of Financial Aids of the University.

Loan fund information is summarized in a folder available in the offices of the Dean, the Associate Dean, and the Chairman of the Student Loan Committee. Students who wish to obtain financial aid are asked to discuss their need with a member of the Loan Committee.

### Fees

	<i>Resident</i>	<i>Nonresident</i>
Per Quarter Throughout the Academic Year . . . .	\$190.00	\$365.00

Summer Quarter (Graduate Students Only) . . . .	174.00	174.00
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Depending upon the coursework, additional charges (payable at the School of Dentistry) may be assessed for microscope rental, \$7.00; dental engine rental, \$3.50; and laboratory case rental, \$2.50.

## DEPARTMENTAL PROGRAMS

The School of Dentistry offers courses leading to the degrees of Doctor of Dental Surgery (D.D.S.), Bachelor of Science, Master of Science in Dentistry, as well as Certificates in Orthodontics, Pedodontics, Periodontics, Endodontics, and Restorative Dentistry.

### Degrees

#### Doctor of Dental Surgery

Upon completion of the four-year curriculum of the School of Dentistry, the D.D.S. degree is awarded to candidates who have (1) given evidence of good moral character; (2) completed the last two years of dental training as regularly matriculated students in the School of Dentistry; (3) satisfactorily completed all the required work with a grade-point average of at least 2.00; (4) fulfilled all special requirements; and (5) discharged all indebtedness to the University.

Work leading to the following degrees is also offered in the School of Dentistry.

#### Bachelor of Science

The curriculum leading to this degree is given by the Department of Dental Hygiene.

#### Master of Science in Dentistry

Work leading to this degree is available in the Graduate School.

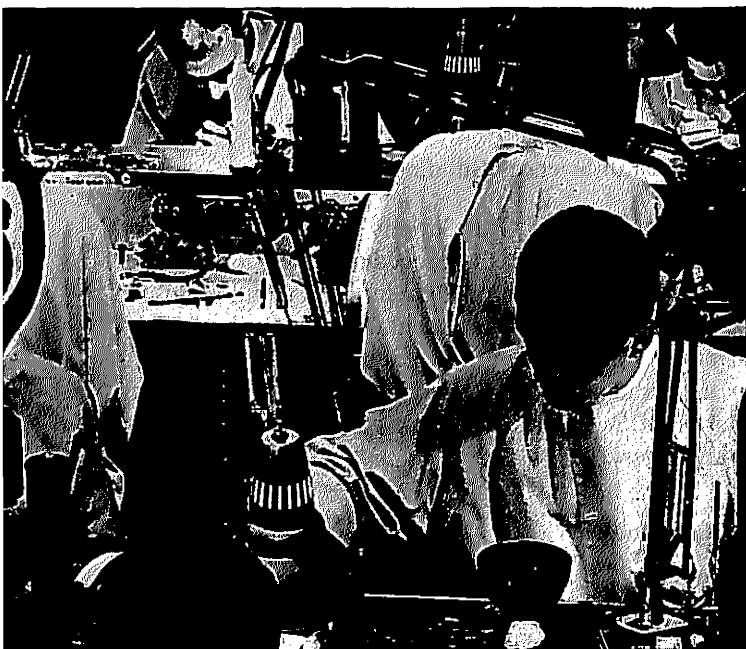
#### Certificates in Clinical Divisions of Dentistry

Programs are not administered by the Graduate School; no thesis is required.

The School also provides professional training in the areas of basic science, for which the Bachelor of Science degree may be awarded by the College of Arts and Sciences, upon completion of the requirements for a major and approval of the department concerned.

### Licensure

Admission to the practice of dentistry in any state is conditional upon the candidate's meeting the requirements of the State Board of Dental Examiners. In the state of Washington, admission to practice is dependent upon the candidate having a D.D.S. or a D.M.D. degree and passing the examination conducted semi-annually by the State Board of Dental Examiners. The basic science examination may be waived if the candi-





date presents credentials showing he successfully passed Part I of the National Board Dental Examination.

Further information about licensure requirements and time of examinations may be obtained from the State Department of Licenses, Professional Division, Olympia, Washington.

## **PROGRAMS IN CLINICAL DENTAL SCIENCES**

Please find Basic Sciences in Dentistry listed in the *School of Medicine* section of this Catalog under Departments of Biochemistry, Biological Structure, Microbiology, Pathology, Pharmacology, Physiology and Biophysics.

### **Dental Science and Literature**

#### **Chairman**

Alton W. Moore  
B374 Health Sciences Building

The Department of Dental Science and Literature teaches the fundamentals of the dental profession, such as legal problems, ethics, office management, and scientific writing.

### **Fixed Partial Dentures**

#### **Chairman**

K. N. Morrison  
A407 Health Sciences Building

The teaching in this Department is directed toward the maintenance or attainment of oral health through the fixed replacement of missing teeth, the restoration of badly involved teeth, or by the correction of occlusal discrepancies through restoration, that are not amenable to orthodontic treatment.

### **Operative Dentistry**

#### **Chairman**

Gerald D. Stibbs  
B404 Health Sciences Building

Operative Dentistry is primarily concerned with maintaining the natural dentition in good health. It has to do with preventing the ravages of dental caries and with restoring to health and function carious and mutilated teeth with various restorative materials and means.

In addition to the courses for undergraduate dental students, the Department of Operative Dentistry offers, through the restorative dentistry graduate program, a specialization for students in the Graduate School working toward the degree of Master of Science in Dentistry.

### **Oral Diagnosis and Treatment Planning**

#### **Chairman**

Frederic L. Jacobson  
B309 Health Sciences Building

The Department of Oral Diagnosis and Treatment Planning provides training in diagnostic techniques, such as interrogation, examination, and X ray. The student learns to correlate information gained in the various departments and to plan both ideal and practical treatment for the patient.

### **Oral Biology**

#### **Chairman**

Leo M. Sreëbny  
B122 Health Sciences Building

Oral Biology is that division of general pathology which is concerned with the understanding of the cause and mechanism of diseases of the oral cavity and associated structures. In addition to the courses for undergraduate dental students, the Department of Oral Biology offers graduate study for students in the Graduate School working toward the degree of Master of Science in Dentistry with a specialization in oral biology.

### **Oral Surgery**

#### **Chairman**

John D. Gehrig  
B348 Health Sciences Building

The Department of Oral Surgery provides training and clinical experience in the procedures used for all types of operations in the oral cavity. In addition to the courses for undergraduate dental students, the Department of Oral Surgery offers graduate study for students in the Graduate School working toward the degree of Master of Science in Dentistry with a specialization in oral surgery.

### **Orthodontics**

#### **Chairman**

Richard A. Riedel  
B374 Health Sciences Building



The objective of orthodontics is the prevention and correction of malocclusion of the teeth. In addition to the courses for undergraduate dental students, the Department of Orthodontics offers graduate study for students in the Graduate School working toward the degree of Master of Science in Dentistry with a specialization in orthodontics.

### **Pedodontics**

#### **Chairman**

David B. Law

B343 Health Sciences Building

The objective of the Department of Pedodontics is to provide the student with a broad understanding of the growth and development of the child and the principles of preventive dentistry plus a working knowledge of the skills necessary for the maintenance of optimal dental health. In addition to the courses for undergraduate dental students, the Department of Pedodontics offers graduate study for students in the Graduate School interested in working toward the degree of Master of Science in Dentistry with a specialization in pedodontics.

### **Periodontics and Endodontics**

#### **Chairman**

Saul Schluger

B410 Health Sciences Building

In this Department, students are taught the basic knowledge and technics necessary in diagnosing and treating diseases of the supporting structures and pulp of the teeth. In addition to the courses for undergraduate dental students, the Department of Periodontics and Endodontics offers graduate study for students in the Graduate School working toward the degree of Master of Science in Dentistry with a specialization in periodontics or in endodontics.

### **Prosthodontics**

#### **Chairman**

Charles L. Bolender

C402 Health Sciences Building

The Department of Prosthodontics provides instruction in the fabrication and maintenance of removable complete and partial dentures. In addition to the courses for undergraduate dental students, the Department of Prosthodontics offers, through the restorative dentistry

graduate program, a specialization for students in the Graduate School working toward the degree of Master of Science in Dentistry.

### **Maxillofacial Prosthesis Clinic**

#### **Director**

Oscar E. Beder

B134 Health Sciences Building

This clinic is a service clinic available to the public and all departments of the University for treatment falling in the maxillofacial field of prosthodontics. Treatment usually consists of constructing and fitting planned remedial and restorative appliances for losses or defects in the oral or facial regions. Expedient prosthodontic appliances are fabricated for losses and defects of other body areas and for adjunctive therapy of patients. Assistance is also rendered in developing special devices used for research and teaching by various departments.

### **Prosthodontic Laboratory**

#### **Chief Technician**

Bernard Langdon

#### **Technician**

Melvin Witters

This laboratory furnishes prosthodontic technician services to undergraduate students of the Department of Prosthodontics and for the Department's maxillofacial section. The laboratory furnishes its services to other departments of the School and to graduate students, when requested.

### **Conjoint Courses**

Conjoint courses are offered cooperatively by departments in the School of Dentistry. They are designed to integrate clinical training in two or more fields.

### **Dental Hygiene**

#### **Director**

Martha H. Fales

B214B Health Sciences Building

The curriculum offers a professional program leading to a baccalaureate degree which emphasizes the liberal arts and the sciences and prepares the student for a career in Dental Hygiene.

The Bachelor of Science degree with a major in Dental Hygiene requires two academic years of predental hygiene courses followed by two additional years of enrollment in the Dental Hygiene program. This basic curriculum provides a background in the educational, communicative, and clinical skills necessary for professional practice. The program is approved by the Council on Dental Education of the American Dental Association.

The dental hygiene student learns and practices a future role as a member of the dental health team. The student learns to provide clinical and educational services that include the oral prophylaxis (cleaning and polishing of teeth), the taking and processing of dental radiographic surveys, the application of fluoride solutions for prevention of dental caries, and the teaching of dental health facts to children and adults. The program is planned to give the student the wide range of professional experience available in a health sciences center.

The dental hygiene student is encouraged to develop habits, interests, and attitudes favorable to continued professional growth.

Dental hygiene students are eligible to apply for scholarships offered through the Office of the Dean of Students. In addition, the American Dental Hygienists' Association administers four national scholarships for students enrolled in dental hygiene programs. Current scholarship information is available from the Department of Dental Hygiene.

### Basic Curriculum in Predental Hygiene

The basic curriculum is open to applicants who meet the requirements of this Catalog as outlined in the *College of Arts and Sciences* section and who complete 90 credits scheduled to include courses listed below plus the required quarters of physical education activities.

COURSES		CREDITS
ENGL 101, 102, 103	ENGLISH COMPOSITION . . . . .	9
BIOL 101-102, OR ZOOL 111-112	. . . . .	10
CHEM 101	GENERAL AND INORGANIC CHEMISTRY . . . . .	5
CHEM 102	ORGANIC CHEMISTRY . . . . .	5
PSYCH 100	GENERAL PSYCHOLOGY . . . . .	5
SOC 110	SURVEY OF SOCIOLOGY . . . . .	5
SPCH 100	BASIC SPEECH IMPROVEMENT . . . . .	5
AUTHORIZED SUBSTITUTES TO MEET DISTRIBUTION REQUIREMENT OF THE COLLEGE OF ARTS AND SCIENCES OR THE DEPARTMENT OF DENTAL HYGIENE . . . . .		46
PHYSICAL EDUCATION ACTIVITY . . . . .		3

Students taking their preprofessional training at the University of Washington follow the two-year predental hygiene program offered in the College of Arts and Sciences (see the *College of Arts and Sciences* section). Students in other institutions should consult *Description of Courses* section of this Catalog, compare the above listed courses with those given in their schools and seek the advice of the Director of Admissions for course equivalents. It is recommended that students who anticipate transferring to the University of Washington request an evaluation of their credits earned during their first year of study. This may be accomplished by writing directly to the Department of Dental Hygiene.

### Application Procedure

One class of dental hygiene students is admitted each spring. On or before April 1 each applicant must submit the following:

1. Formal application on the form provided by the Department of Dental Hygiene, School of Dentistry.
2. Official transcripts of high school and college records. Transcripts must be sent directly to the Department of Dental Hygiene, School of Dentistry, from the registrar's office of each institution in which predental hygiene education was obtained.
3. A written list of subjects which the applicant is taking or will take to complete the requirements.
4. At least two letters of recommendation from business or professional persons.

Additional transcripts must be provided by the applicant to show courses completed during each subsequent quarter following application.

### Processing of Applications

#### Evaluation of Credentials

The Committee on Dental Hygiene Admissions reviews the credentials and bases its decision on the objective evaluation of preprofessional education, scholastic records, residence of the applicant, dental hygiene aptitude, and personal characteristics of the applicant.

#### Personal Interview

Eligible applicants are interviewed by the Committee on Dental Hygiene Admissions. The interview is held at the School of Dentistry, and the applicant is notified of the date and time.

**Notification of Acceptance or Rejection**

Candidates are given written notice of acceptance or rejection of their application as soon as possible after the Committee on Admissions has completed the necessary interviews.

**Tuition And Charges**

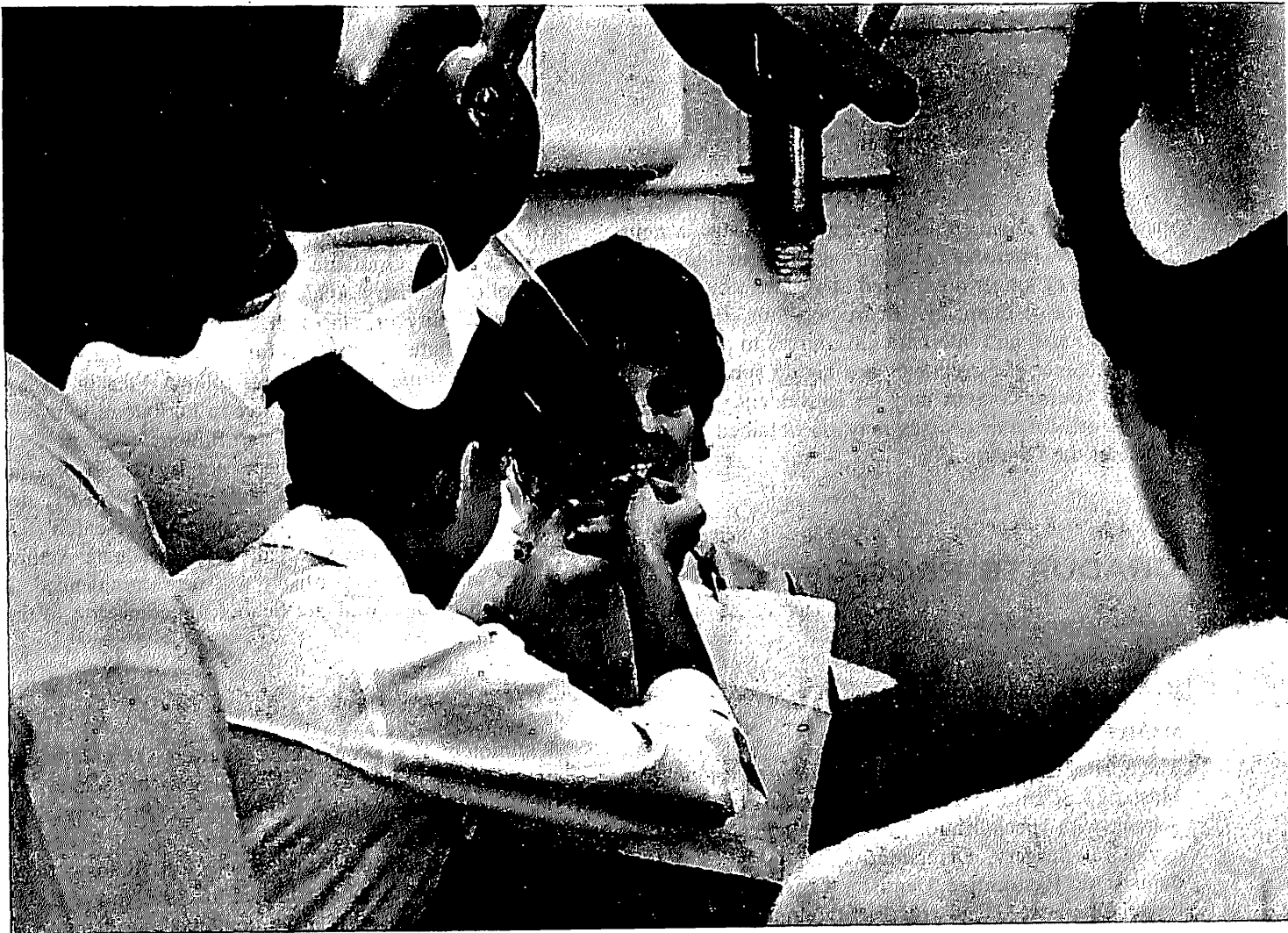
Students in the dental hygiene curriculum pay the regular tuition of the School of Dentistry. Expenses for uniforms, instruments, and other equipment are additional to the tuition fee.

**Basic Curriculum for Major in Dental Hygiene**

This program includes specific courses in the Schools of Dentistry and Medicine and the Colleges of Pharmacy

and of Arts and Sciences. The student takes in sequence all the courses offered for undergraduates in the Department of Dental Hygiene and the following additional courses: Conjoint (Medical), 316, 317-318 (Introductory Anatomy and Physiology); Education 309 (Introduction to Educational Psychology); Education 305 (Adolescence and Youth); Home Economics 319 (Family Nutrition); Microbiology 301 (General Microbiology); Pathology 310 (General Pathology); Pedodontics 200 (Preventive Dentistry); Pharmacy 352 (Pharmacy and Therapeutics); Psychiatry 450, 451 (Principles of Personality Development); and Preventive Medicine 323 (Introduction to Public Health Principles and Practices).

A total of 180 academic credits is required for graduation.



## **Curriculum for Certificate Dental Hygienists**

This program provides dental hygienists with the opportunity to broaden their previous education with courses in liberal arts, humanities, and basic sciences so that they may go on to graduate study or occupy positions in administration, teaching, or public health. The requirement for graduation in this curriculum is a total of 180 academic credits.

Students must fulfill the requirements of the preprofessional program and the basic curriculum. They must have a total of 36 credits in dental hygiene, plus a minimum of 10 taken with this Department. When teaching in dental hygiene is the chosen goal, additional courses in the College of Education are selected.

## **CONTINUING DENTAL EDUCATION**

### **Director**

Thompson M. Lewis  
B322 Health Sciences Building

To provide for the ever-expanding developments in method and related subject matter in dentistry, a number of short, intensive courses ranging from one day to two weeks or longer are offered at various times in each special area of dentistry. Instructors are chosen from local, national, and international sources to provide this service. Since these courses are highly specialized, no specific course content may be conveniently listed. A list of forthcoming courses may be obtained from the Office of the Director.

## **GRADUATE PROGRAMS**

### **Graduate Program Adviser**

Saul Schluger  
B327 Health Science Building

### **MASTER OF SCIENCE IN DENTISTRY**

The School of Dentistry offers course work leading to a Master of Science in Dentistry degree in the Graduate School, with specializations in Endodontics, Oral Biology, Oral Surgery, Orthodontics, Pedodontics, Periodontics, or Restorative Dentistry (Fixed Partial Dentures, Operative Dentistry, Prosthodontics).

## **Application Procedure**

Applications are received and processed throughout the school year from applicants desiring to work for a Master of Science in Dentistry degree with a specialization in any one of the fields previously listed. Applications for admission to the graduate dental curriculum, with all necessary credentials, must be submitted on or before December 1 for consideration for entrance in the following Autumn Quarter. This applies to all new students seeking admission to graduate study in dentistry. It is imperative that applicants observe this deadline in order to ensure prompt attention to credentials and replies to correspondence.

## **Admission**

An applicant may be admitted to the Graduate School for work leading to a Master of Science in Dentistry degree provided he meets the admission requirements of the University of Washington Graduate School, and provided he is a graduate of a school of dentistry approved by the Council on Dental Education of the American Dental Association, or of a university dental school, located outside of the North American continent, whose curriculum and admission requirements are similar to those of the University of Washington School of Dentistry.

An applicant's acceptance as a student must be approved by the Graduate Admissions Committee of the School of Dentistry. This approval will be based upon the availability of places in the various classes. The capacity number of students for each specialization commencing Autumn Quarter is as follows: ten in Orthodontics, two in Pedodontics, five in Periodontics, two in Endodontics and two in Oral Biology, one in Oral Surgery, and varying numbers, not to exceed two, in each of the three phases of Restorative Dentistry, depending upon availability of teaching and research staff members. Applicants selected by the Graduate Admissions Committee in Dentistry will be recommended to the Dean of the Graduate School for admission to the Graduate School.

## **Residence**

A minimum of six consecutive quarters (18 months) of residence is required for the Master of Science in Dentistry degree with specialization in Orthodontics or Pedodontics; eight quarters (24 months) in Endodontics; 12 quarters (36 months) in Oral Biology; three quarters (9 months) of residence for Oral Surgery, plus two-year hospital residency, combined academic and



hospital work. In Restorative Dentistry, the student determines his specialization (Operative Dentistry, Fixed Partial Dentures, or Prosthodontics) by the electives he selects. Six quarters (18 months) of residence is required for Fixed Partial Dentures or Prosthodontics, and five quarters (15 months) for Operative Dentistry. No foreign language is required. New students for graduate training in Periodontics will be accepted on the basis of a dual program consisting of certificate (residency) training in the clinical discipline progressing parallel to graduate study in a basic science field selected by the student. Such students must be admitted to the Graduate School and meet the requirements for the master's or doctor's degree in the basic science field.

### Programs of Study

The programs are planned to prepare students to think independently, to evaluate their own services and the literature of the programs, and to develop their clinical operative skills to a level to permit the successful practice of their chosen specialty. Emphasis is placed on the basic principles of diagnosis and treatment, which comprise one of the clinician's most valuable assets. The seminar method of teaching is generally used. The purpose of the programs is not only to train students in the art of their respective specialties, but also to encourage basic science research in the specialties on a graduate level in possible preparation for academic careers or for research. The research may be undertaken in the field of specialization or in cooperation with other departments. The opportunity for collaborative research is excellent because of the close proximity of the other colleges and departments in the University.

### Class Schedules

The graduate programs of the School of Dentistry operate on the quarter system of the University. There are three 11-week quarters in the academic school year. In order for the graduate dental programs to be continuous, the Summer Quarter has also been made an 11-week quarter, or equivalent in length to the other quarters in the school year.

## POSTDOCTORAL TRAINING

Requirements for admission to the postdoctoral training programs of study for certificates in the various major clinical fields are similar to those for admission to



graduate study for the master's degree. The postdoctoral student is required, during six consecutive quarters of residence, to maintain the same academic standards as the graduate student. These programs are not administered by the Graduate School and no thesis is required. The course content may vary somewhat from the graduate program. This will depend upon the department in which the course is taken.

Following the successful completion of the prescribed courses during the required residency, a Certificate in Orthodontics, Pedodontics, Periodontics, Endodontics, or Restorative Dentistry will be granted to the postdoctoral student by the School of Dentistry. The fees each quarter are the same as for graduate training and the residency requirements remain the same. For further information, address: Director of Graduate Dental Education, University of Washington School of Dentistry, Seattle, Washington 98105.







# MEDICINE

## Dean

John R. Hogness  
C304 Health Sciences Building

## Associate Deans

William O. Robertson  
August G. Swanson  
Lowell E. White, Jr.

## Assistant Dean

John N. Lein

The healer of the sick has always played an important and essential role in every society whether he be medicine man who professes to cure by charms and fetishes, shaman in sole communication with gods, demons, and influential ancestral spirits, or the modern physician who bases his ministrations on scientific knowledge developed in the laboratory. He is a peculiarly influential member of his community because of the faith placed in his esoteric knowledge by the sick and the well, and their trust in the efficacy of his medicine and in his deep personal concern for their welfare.

In the past the physician's function was largely to cure disease, to alleviate its effects, and to comfort. Increasingly,

the prevention of disease and the preservation of health is occupying the attention of the profession. Most physicians will continue to have as their main responsibility the care of the sick, but many will devote their talents to public health, preventive medicine, and research.

The extension of knowledge is essential to the advance of medicine. The physician takes active part in the search for knowledge in university, government, and private laboratories. He also serves an important function in applying to medicine advances made in the physical, chemical, biological, and social sciences. He is the catalyst in translating theoretical knowledge to practical developments in diagnostic techniques, drug therapy, and surgical procedures.

It is the obligation of the profession to pass on medical knowledge to the next generation. A certain number of physicians enter the academic field as teachers and administrators for this purpose. They continue to practice medicine in the hospitals attached to universities as part of the essential tutorial system of medical education, the intimate relationship of student and physician in the practice of their art and science.

It is necessary to increase significantly each year the number of medical graduates, not only to care for the



sick of a rapidly expanding population but also to fill the continually developing positions in public health, preventive medicine, industry, and research.

The School of Medicine prepares the individual for service in many fields: from the practice of medicine to the complex problems of public health in a modern world, from the study of human emotion to research in the chemical processes of life itself.

Diversified professional opportunities unequaled by any other profession require persons whose ultimate goals may be the practice of medicine, teaching, or research in all of the basic health sciences or clinical areas of medicine, public health, radiation biology, or hospital administration, to mention only a few. Individuals with a wide variety of backgrounds can find both challenge and satisfaction in the field of medicine.

The fundamental objective of undergraduate medical education is to provide a solid foundation for the student's future development by giving the student the opportunity to learn the basic principles applicable to the whole body of medical knowledge, by instilling in him habits of reasoned and critical judgment of evidence and experience, and by developing his ability to use these principles wisely in solving problems of health and disease.

The School of Medicine provides an opportunity for the student to achieve five mutually interdependent objectives: (1) basic professional knowledge, (2) good habits of self education and of accuracy and thoroughness, (3) basic clinical and social skills, (4) sound attitudes, and (5) an understanding of professional and ethical principles.

A special word should be mentioned about the development of "sound attitudes." The attitude of continuing education—the idea that the physician must remain a student throughout his life, is stressed. Establishing respect for scientific investigation and its importance in advancement of medical knowledge is a major factor in developing this attitude and in making the graduate a well educated and trained physician.

Even though emphasis is placed on the scientific aspects of the practice of medicine, of equal importance is the development of such qualities as humaneness, kindness, sympathy, and warm patient-doctor relationships. In addition, every effort is made to develop the attitude of humility in the student, the awareness of the limitations of any one physician, the necessity to seek help when it is needed without loss of personal integrity or self-respect.

Given incentive and opportunity to learn, and guidance toward the grasp of principles, with the problems of health and disease as a frame of reference, the student can build the necessary foundation for his career in medicine, be it practice (general or limited), teaching, research, or administration. The student should develop into a responsible professional person, and be able to gain and maintain the confidence and trust of his patients, the respect of those with whom he works, and the support of the community in which he lives.

Bachelor of Science degree programs are offered in Medical Technology, in Physical Therapy, and in Occupational Therapy.

In accordance with the general requirements of the Graduate School, the School of Medicine as an integral part of the Division of Health Sciences offers programs leading to the degrees of Master of Science and Doctor of Philosophy in the Departments of Biological Structure, Biochemistry, Microbiology, Pathology, Pharmacology, and Physiology and Biophysics. In the Departments of Physical Medicine and Rehabilitation and of Surgery, programs leading to the degree of Master of Science are offered. The Department of Preventive Medicine offers a program leading to the degree of Master of Science in Preventive Medicine. The combined Doctor of Medicine-Master of Science program is described elsewhere in this Catalog. The student who intends to work toward one of these degrees should confer with the Graduate Program Adviser of the department in which he intends to pursue his graduate study.

The four-year curriculum for an M.D. degree includes studies in three main areas: Basic Health Sciences, Conjoint Courses, and Clinical Sciences. In the Basic Health Sciences, the Departments of Biological Structure, Biochemistry, Microbiology, Pathology, Pharmacology, Physiology and Biophysics, and Preventive Medicine offer courses for medical, dental, nursing, and pharmacy students and for students in other University curricula. Conjoint Courses, sponsored jointly by various departments, are designed to integrate teaching in different medical fields. In the Clinical Sciences, the Departments of Anesthesiology, Medicine, Neurological Surgery, Obstetrics and Gynecology, Ophthalmology, Orthopedics, Otolaryngology, Pediatrics, Physical Medicine and Rehabilitation, Psychiatry, Radiology, Surgery, and Urology provide clinical study in the fields of medical specialization and in general medical practice.

The School of Medicine is approved by the Association of American Medical Colleges and the Council on



Medical Education and Hospitals of the American Medical Association. It participates in the student exchange program of the Western Interstate Commission for Higher Education, under which legal residents of certain Western states which do not have medical schools may pay the tuition and fees charged to legal residents of Washington rather than the higher nonresident rate. These states are Alaska, Arizona, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming. To be eligible for this program, the student must be certified by his home state. State eligibility requirements vary, and the number of students who can be included in the program each year depends on appropriations by the legislatures. A student interested in this program must apply to the certifying officer in his home state, whose address may be obtained by writing to the Western Interstate Commission for Higher Education, Fleming Law Building, Boulder, Colorado.

### Admission to the University and to the School

The faculty of the School of Medicine believes that the appropriate level of scholarly achievement and preparation for medicine can best be developed in a liberal arts program with the emphasis on a major area of interest selected by the student in any field sufficiently demanding in scholastic discipline. A "pre-med course" with no further aim than admission to medical school is not recommended. The faculty believes that competence for the study of medicine can best be demonstrated by developing a depth of understanding in a major field. Therefore, a degree program of four years duration is preferred. In exceptional circumstances, consideration will be given to applicants who may qualify at the end of three years of college work.

Before admission each applicant must have completed the minimum requirements listed below and must have demonstrated his proficiency in these subjects by obtaining a grade-point average of 2.50 or better. In addition to the following credits, proficiency in English and basic mathematics is expected of every applicant. Applicants from the University of Washington must have satisfied lower-division physical and health education requirements.

	Quarter Credits	Semester Credits
BIOLOGY . . . . .	12	8
CHEMISTRY . . . . .	18	12
PHYSICS . . . . .	12	8

In recognition of the diverse opportunities afforded the graduate of medicine, the specified requirements are purposely kept to a minimum. In this manner each

student has the opportunity to pursue, as his major field of study, any area of special interest to him—the physical sciences, biological sciences, or humanities—and still acquire the intellectual skills necessary to the regular medical curriculum. In general, college courses which constitute part of the medical curriculum are not encouraged. Throughout the medical program, elective time as well as time for research and theses affords the student an opportunity to apply the knowledge and concepts acquired in his major field to the appropriate areas of medicine.

### Application Procedure

Applications and all credentials should be sent to the Admissions Committee. Because the Committee begins examining applications a year ahead of the time of entrance, *early application is advisable*. Applications will be accepted beginning April 1, and should be returned before October 1. Applications received after January 1 will not be given consideration for the following academic year. An application fee of \$5.00 is required of all applicants who are not residents of the state of Washington. On or before January 1, each applicant must submit the following:

1. Formal application for admission on the form furnished by the School of Medicine.
2. Official transcript of previous college record (sent directly from the registrars of the institutions where preprofessional training was taken to the Admissions Committee) showing the complete college record, with grades and credits. Each applicant is required to include a list of the courses he is taking and plans to take to complete his preprofessional study before entering the School of Medicine.
3. Names, addresses, and departments of three science and two nonscience instructors to whom recommendation forms may be sent. (University of Washington premedical students should consult the Premedical Adviser about recommendations.)
4. The score received in the Medical College Admission Test. Arrangements for this test may be made with the premedical adviser at the institution where premedical training is being taken. Medical aptitude tests are customarily given in May and October of each year. The student is advised to take the test in May if at all possible. When the student takes the test, he should request that his scores be sent directly to the Admissions Committee. Further information on this test may be

obtained by writing to The Psychological Corporation, 304 East 45th Street, New York, New York 10017.

5. Three copies of a short autobiography.

Primary consideration is given to applications from residents of Washington and from students certified by the Western Interstate Commission for Higher Education. A certain number of out-of-state applicants are accepted each year, with preference to qualified applicants from neighboring states and territories where no medical school exists. Applicants from states outside the Pacific Northwest are accepted only when they present exceptional academic records.

It is the policy of this school not to accept for admission students who have failed in other medical schools or who have been dismissed from them.

All applicants are given consideration on the same basis regardless of race, color, sex, religion, or parental occupation.

Students taking their premedical undergraduate work at the University of Washington customarily enroll in the College of Arts and Sciences and consult the premedical adviser, B10 Padelford Hall, for help in planning their programs.

Information concerning admission to the curriculum in Physical Therapy and in Occupational Therapy is included under the Department of Physical Medicine and Rehabilitation, and in Medical Technology under the Department of Pathology.

#### Transfer Students

Transfer students are accepted into the second- and third-year classes only when vacancies occur, and only if they are in good standing at the school in which they are already enrolled. When vacancies do occur, applicants from two-year medical schools are given preference. Transfer students are not accepted in the fourth year. Transfer applications for the second or third years should be filed no later than March 1. No fee is charged for transfer students. Applicants for entrance to the second- or third-year class must submit the following:

1. Formal application for admission on the form furnished by the School of Medicine.
2. Official transcripts of premedical and medical training (sent directly from the registrars of the institutions where the training was taken to the Admissions Committee).

3. The score received in the Medical College Admission Test.

4. A letter from the dean of the medical school indicating the student's status and relative standing in his class.

5. Three copies of a short autobiography.

Students applying for transfer from nonaccredited medical schools, in addition to the usual application, are required to pass qualifying examinations in the basic health sciences, *i.e.*, biological structure, biochemistry, microbiology, pathology, pharmacology, and physiology and biophysics. These qualifying examinations may be offered by the departments involved at a regularly scheduled time once a year. The Candidate may offer successful completion of Part I examinations of the National Board of Medical Examiners in lieu of the departmental examinations. Permission to take these examinations is obtained through the School of Medicine. Accredited schools are listed in the educational number of the *Journal of the American Medical Association*.

#### Processing of Applications

*Evaluation of Credentials.* The Admissions Committee examines each applicant's credentials and bases its decisions on the objective evaluation of these factors: preprofessional training, evidences of scholarship, place of residence, Medical College Admission Test rating, and personal evaluation of the student by premedical instructors in their letters of recommendation.

*Personal Interview.* If an examination of the credentials shows them to be satisfactory and within the competitive group, the applicant may be requested to appear for a personal interview by the Admissions Committee. At the time of interview the applicant is requested to submit two unmounted photographs (2 by 3 inches). A personal interview will not be requested if the credentials are not satisfactory. Applicants who are in school a considerable distance from Seattle may request that their interviews be held at some more convenient location; out-of-state interviews are arranged by the Committee.

*Notification of Acceptance or Rejection.* All candidates are given written notification of the acceptance or rejection of their applications as soon as possible after the Admissions Committee has reached a decision. Acknowledgment of notification of acceptance should be made in writing by the successful applicant within a reasonable length of time.



**Acceptance of Appointment.** Within several weeks after a candidate has accepted the position offered to him in the School of Medicine, the Comptroller of the University will request a deposit of \$50.00. This deposit is applied to the first quarter's tuition. If the student wishes to withdraw, the deposit is refundable for any reason before January 15. After January 15, it is refundable only in case of withdrawal for bona fide illness, failure to complete basic premedical requirements, induction into military service, or failure to pass the physical examination required of all students at the time of the first registration.

#### **Fees, Extra Service Charges, and Rentals**

All fees, extra service charges, and rentals are payable in United States dollars at the time of registration. The University reserves the right to change any of its fees and charges without notice.

#### **FEES FOR STUDENTS OF MEDICINE, PHYSICAL THERAPY, OCCUPATIONAL THERAPY, AND MEDICAL TECHNOLOGY**

MEDICINE	PER QUARTER	PER ACADEMIC YEAR
RESIDENT	\$190.00	\$ 570.00
NONRESIDENT	365.00	1,095.00

#### **PHYSICAL THERAPY, OCCUPATIONAL THERAPY, AND MEDICAL TECHNOLOGY**

##### **FULL TIME**

RESIDENT	115.00	345.00
NONRESIDENT	275.00	825.00

##### **\*PART TIME**

RESIDENT	81.00	243.00
NONRESIDENT	211.00	633.00

Information concerning resident, nonresident, and veterans status can be found in the *Rules and Regulations* section in this Catalog. General student body fees are also listed there.

**Microscope Purchase (\$350-\$500):** All first-year medical students must buy microscopes so they may be used in the first week of Autumn Quarter. A scientific supply house in Seattle furnishes the kind of microscope students should use. Students who plan to buy second-hand, foreign-made, or other nonrecommended instruments should make sure they meet the standards of the Medical School Committee on Microscopes. The minimum requirements for a suitable microscope are a monocular type with three achromatic objectives of approximately the following magnifications: X10, X45, and X95; an X10 ocular; and an uncalibrated mechanical stage and carrying case. A binocular microscope is highly recommended. Students may obtain more

detailed information from the School of Medicine regarding the purchase of microscopes.

**Books and Supplies.** The average annual cost for medical students is \$100-\$150.

**Transportation.** Beginning in Winter Quarter of the second year, medical students must make arrangements for transportation to and from various hospitals in Seattle where they receive part of their training.

#### **Financial Aid**

The lengthy training required to master the accumulated knowledge necessary to the practice of medicine has resulted in costs which seem prohibitive to many prospective students. No student interested in becoming a physician should be deterred from applying to the University of Washington School of Medicine for financial reasons. Both public and private endowments have been given to the School which provide financial aid to deserving medical students. During the academic year 1965-66 scholarships and grants-in-aid totaled approximately \$95,000; loans, \$167,000. Increasing amounts will be available in the future.

#### **Application for Aid Procedures**

Unless otherwise specified, application for fellowships, scholarships, and grants-in-aid should be directed to the Office of the Dean of Medicine before March 1 of each year. Application forms and related information may be obtained from the Office of the Dean of Medicine upon request. The student must be willing to submit a detailed and realistic analysis of his complete financial situation. In case of emergency or special need, an application for grant-in-aid may be made at any time. Application for a loan may also be made at any time to the Office of the Dean. Application for assistantships should be made to faculty members. All payment of monies concerned with endowment awards, prizes, stipends, grants-in-aid, and loans are made by the University comptroller.

#### **Scholarships and Grants-in-Aid**

A scholarship is an academic award based upon both scholarship and need and is designed to aid and encourage the student in the furtherance of his studies or research.

Grants-in-aid are made to students in good standing on the basis of need only.

\*Clinical Training

The recipients of either a scholarship or grant-in-aid may engage in remunerative employment only with the written consent of the Scholarship Committee. The Committee may cancel either award at any time.

Stipends of the various scholarships listed in the *Handbook of Scholarships* range from full tuition and fees (\$570) to larger amounts sufficient to cover the entire financial needs of the student through four years of medical school.

A limited number of four-year scholarships have been established for the purposes of meeting the full needs of especially gifted and promising students who would otherwise be unable to finance their medical education. Continuance of the scholarship is contingent upon satisfactory scholastic standing, need, and application.

#### Research and Training Grants

Each year grants from various public and private sources are received by individual faculty members and by the School of Medicine to support medical research and training in teaching and research. Extensive training programs, supported largely by the National Institutes of Health, provide training in teaching and research to individuals at the undergraduate, graduate, and post-doctoral levels.

#### Fellowships for a Full Year

A few suitably qualified students may wish to interrupt their formal medical education to gain experience in research. Such students are often gifted in research and later choose a research career.

In order to encourage such students, a post-sophomore fellowship program has been established. Although the drop-out period permitted is one to three years, most post-sophomore fellows elect a period of one year. Six of these fellowships are available from the Medical Student Research Training Grant. They carry a tax-free stipend of \$3,200 plus an allowance of \$350 for each dependent and tuition.

#### Traineeships

A traineeship is an academic award of honor, based upon scholastic achievement, designed to aid and encourage the student in his studies or research. In cases in which the trainee collaborates with a faculty member, the trainee is expected to take the lead as principal investigator. The trainee is allowed freedom of publication of his results as a condition of the grant. He is expected to devote his full time and energy to his

project and may not be otherwise gainfully employed during the period of his traineeship. A traineeship may be canceled at any time by the Scholarship Committee. Ordinarily, the traineeships cover the three months of the summer. Under certain circumstances, investigative work may be continued throughout the year at a reduced stipend.

#### Assistantships

A number of positions with individual faculty members are usually available to medical students during the summer months. Most of these positions involve laboratory work on research projects.

#### Traineeships for the Summer Months

Each year a considerable number of research traineeships carrying stipends are available to provide qualified medical students with the opportunity to engage in investigative work during the summer recess. The smaller stipends are frequently supplemented by funds from other sources. In special cases, the traineeships may carry on through the year on a reduced stipend.

Information relative to the complete list of grants available in medicine is contained in the *Handbook of Scholarships*, Office of the Dean of Students.

#### Honors

*Medical Student Honors Day* is held late in the spring of each year under the auspices of the Scholarship Committee. It provides an opportunity for selected students to present formally the results of their investigations to the students and faculty of the School of Medicine. Various scholarships, awards, and research fellowships are granted on this occasion.

A charter as Alpha of Washington was granted to the School of Medicine in 1950 by *Alpha Omega Alpha*, the honorary medical fraternity. Members are elected by the membership of Alpha Omega Alpha on the basis of high scholarship and good moral character.

#### Awards and Prizes

##### HISTORY OF MEDICINE PRIZE

An award of an appropriate historical publication is given for outstanding work in the field.

##### DR. EVERETT O. JONES SCHOLARSHIP PRIZES

Prizes are awarded students who have demonstrated outstanding scholarship each year.



**FREDERIC C. MOLL PRIZE IN PEDIATRICS**

An annual award of \$100 was established by Margaret H. O'Donnell in 1957 to be awarded to the senior medical student who has done outstanding work in the field of pediatrics.

**O'DONNELL AWARD**

An annual award of \$250 was established by Margaret H. O'Donnell in 1952 to be awarded by the Department of Psychiatry to the senior medical student who has done outstanding academic and creative work in psychiatry.

**ROCHE AWARD**

An annual award of a gold Omega watch is given by the Hoffman-LaRoche Company to the sophomore who has shown outstanding scholarship, character, personality, and seriousness of purpose during his first two years in the study of medicine.

**SEATTLE GYNECOLOGICAL SOCIETY PRIZE**

The Seattle Gynecological Society in 1960 established an annual award of \$250 for outstanding achievement in obstetrics and gynecology by a senior student.

**SEATTLE SURGICAL SOCIETY PRIZE**

The Seattle Surgical Society in 1961 established an annual award of \$250 for outstanding achievement in surgery by a senior student.

**TACOMA SURGICAL CLUB AWARD**

The Tacoma Surgical Club offers annual awards of \$100 and \$50 for outstanding achievement in biological structure by medical students.

**THESIS AWARD**

An award of \$100 is given for the best thesis written by a graduating senior as determined by the Thesis Committee.

**UPJOHN ACHIEVEMENT AWARD**

An award in recognition of clinical activity as expressed by interest and concern for patients. Established in 1966 as an annual award for senior medical students.

**Student Achievement and Promotion**

Each department keeps careful records of student work. At the end of each academic year the Executive Committee of the School of Medicine on the advice of the Evaluation Committee reviews the accomplishment of

the student during that year and determines his fitness for promotion. When general academic achievement is unsatisfactory in any year, the student is subject to dismissal from the School. In special circumstances the student may be allowed to repeat the year. In that case the failures remain on his record but he is given whatever grade he earns in the repetition.

Students who receive *E* in one major subject may be permitted to take additional work and a re-examination, if permission is granted by the instructor in the course, the Dean, and the Executive Committee. If the additional work and re-examination are satisfactory, the student's grade may be raised from *E* to *D* and promotion may be granted provided that the remainder of the work is satisfactory. If a student successfully passes in another school or college a medical school course which he has previously failed, it shall in no way be regarded as evidence that the student's abilities justify his readmission to the School of Medicine.

Students who have been dismissed because of low scholarship can be readmitted only by action of the Executive Committee; those who are readmitted are on probation and must maintain a quality of work consistently above the minimum requirements. The faculty of the School of Medicine does not favor repetition of courses in cases of low scholarship and will not permit a student to repeat a year of work except when illness or some other extenuating circumstance justifies an exception.

**Evaluation of Fourth-Year Students**

All fourth-year students are required to take Part II of the National Board Examinations in April of the year of graduation. Those receiving an over-all score of less than 75 will be examined by a committee of the faculty.

**Class Schedules**

Current schedules for all classes are distributed to medical students at the beginning of each academic year. The 1966-67 schedules are listed at the close of this section.

**First and Second Years**

During the first and second years of the medical course, the school year is divided into three quarters of eleven weeks each. These quarters conform to the University calendar. In the first year, the major courses of instruction are biological structure, biochemistry, and physiology and biophysics, with introductory courses in psychiatry. In the second year, the major courses are

pathology, microbiology, pharmacology, and conjoint physical diagnosis, with a course in psychiatry and an introductory course in preventive medicine.

The second year serves as a bridge between the basic health sciences and the clinical sciences on which the student will concentrate during the third and fourth years. During the latter part of the second year, the student devotes an increasing amount of time to learning the art of history-taking and physical examination, thus preparing himself for the role of physician.

#### **Third and Fourth Years**

During the third and fourth years of the medical school program, a major amount of the student's time is devoted to his clinical clerkships. In the clinical clerkship, the student has an opportunity to take histories, and to examine patients and follow the progress of their illness. The student is carefully supervised. Instruction is largely on an individual or small group basis. There is decreasing utilization of lectures and large group conferences. During the clinical clerkship, the student has an opportunity to study the health problems of individual patients, to learn to advance his knowledge of these problems through personal study in textbooks and the current medical literature, and to discuss problems presented by his patients with the teaching staff.

In the third year of the course, the school year is divided into four terms of eight weeks each; twelve weeks of medicine; eight weeks of surgery; eight weeks of pediatrics; four weeks of psychiatry. The terms are preceded by approximately one week's preparatory training in laboratory procedure.

During the fourth year of the course, the school year is divided into three terms of twelve weeks each: six weeks of selective surgical specialties; eight weeks of obstetrics-gynecology; two weeks of anesthesiology; two weeks of physical medicine and rehabilitation; twelve weeks of an integrated program of medicine, psychiatry, and preventive medicine; and six weeks of elective work.

Specialty instruction in such fields as ophthalmology, otolaryngology, radiology, forensic and legal medicine, medical ethics, medical economics, urology, orthopedics, hematology, cardiology, gastroenterology, dermatology, etc., is given in the regularly assigned class hours.

The Saturday morning schedule of the third and fourth years includes lectures, clinical pathological confer-

ences, conjoint sessions, and grand rounds which are assigned to the departments of the School of Medicine.

#### **Elective Courses**

Approximately 25 per cent of the available class hours in the first, second, and fourth years is left unscheduled in the required curriculum, thus providing students with time in which they may elect work in areas of special interest. In the first and second years, Tuesday and Thursday afternoons are unscheduled throughout the year. In the fourth year, a block of six weeks is available for required electives. Information concerning elective course offerings is available at the Dean's Office.

#### **General Practice Externship**

The general practice externship is available as an elective to fourth-year students. Periods of two to six weeks may be spent with a general physician engaged actively in practice in the Pacific Northwest area. During this time the student lives in the home of the physician preceptor, accompanies him in his medical work in his office, at the hospital, and on sick calls in the homes of patients. This affords the student first-hand knowledge of the life and work of the family doctor and gives him a type of teaching which he may not get in his clinical clerkships. The student also has an opportunity to see the role which the physician plays as a citizen in his own community.

#### **Medical Thesis Program**

The medical thesis program of the School of Medicine is voluntary, and participation in it is initiated by the student. Often a student will become especially interested in some particular field in medicine. This interest will lead him to a desire to learn more about the field or to do special work in it. The thesis program is a means of fulfilling his desire. A prize is awarded for the best thesis submitted each year, and certain departments have available prizes for the best thesis written under that department's supervision. The preparation of a satisfactory thesis generally carries with it honors in the department. Further information concerning the thesis program may be obtained from the chairman of the Medical Thesis Committee or from the Dean's Office.

#### **Doctor of Medicine—Master of Science Program**

The interested and qualified medical student may earn a Master of Science degree while enrolled in the School of Medicine. To enter the M.D.-M.S. program, the medical student must meet the admissions requirements



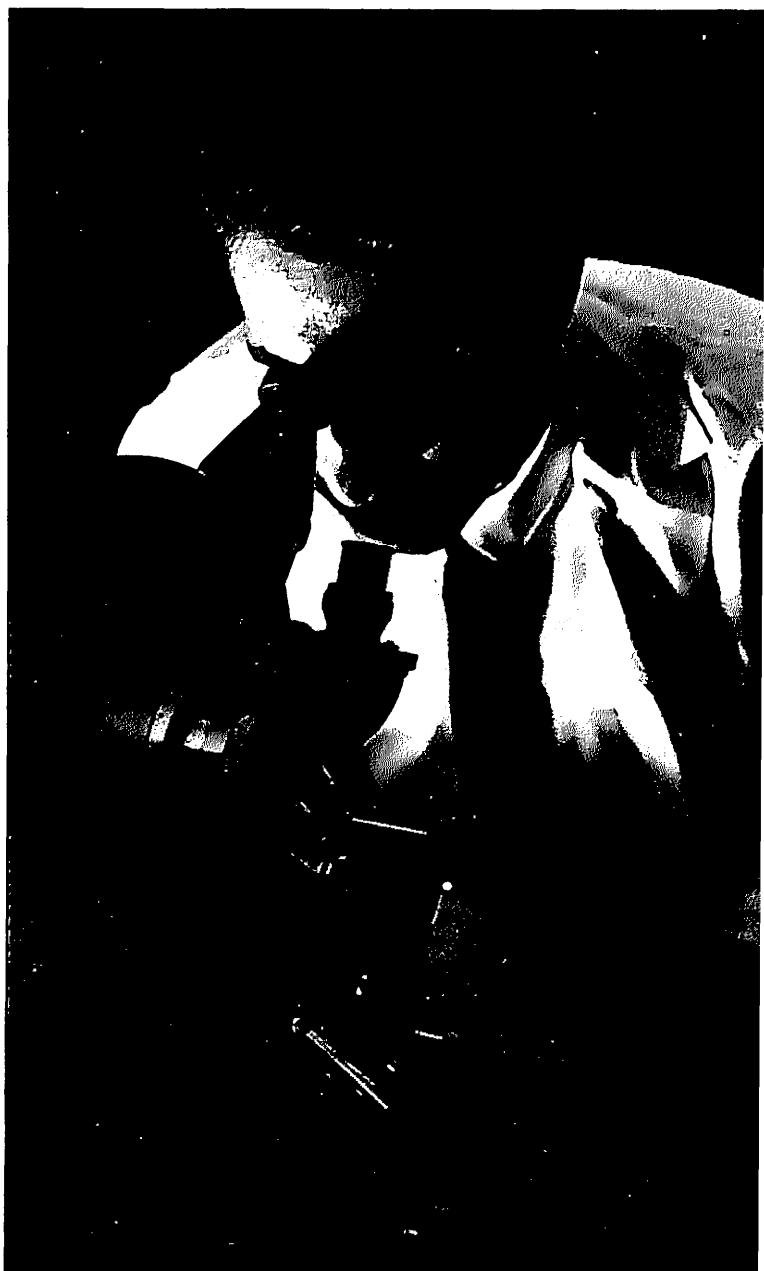
of the University of Washington Graduate School and be accepted into one of the departments of the School of Medicine which offers a program leading to the master's degree. By registering as a graduate student during three successive summer quarters, the medical student can fulfill the residence requirements for the M.S. degree. He may fulfill the credit requirements for this degree as defined by the Graduate School by enrolling in courses during the Summer Quarter and by selection of appropriate electives during the first two years of medical school. The medical student may petition the Dean of the Graduate School for permission to apply approved elective courses toward a master's degree. Electives that must be taken by the student as requirements for the M.S. degree vary according to each department. In addition to the residence requirements and the degree requirements, it is necessary for all M.D.-M.S. students to meet the Graduate School requirement for a reading knowledge in one foreign language and the preparation of a satisfactory thesis.

A medical student may fulfill all these requirements by adding certain graduate courses without necessarily increasing his total time in the School of Medicine. The medical student who wishes to enter the M.D.-M.S. program should arrange for admission to the Graduate School and to a sponsoring department at the earliest time during his freshman year in the School of Medicine, or before. At the present time it is possible to acquire the M.D.-M.S. degree in the Departments of Biological Structure, Pathology, Microbiology, and Physiology and Biophysics.

#### **Medical Student Research Training Program**

Research traineeships are available to medical students and selected premedical students for participation in the Medical Student Research Training Program at the School of Medicine. Each year, from mid-June to mid-September, the Research Training Program offers an opportunity for interested medical students to engage in research and to acquire, through a specially designed lecture series, additional background and training in the University disciplines basic to modern medical research. Each medical or premedical trainee works under the supervision of a faculty sponsor in pursuit of an original research project. In addition to the intramural research training program courses offered, the student may enroll in courses considered contributory to his research potential in the regular University Summer Quarter or Evening Classes. The Research Training Program defrays his tuition expenses. Each student receives a stipend for the three-month period, the

amount of stipend depending upon the number of summers the trainee has participated in the program. His participation in the Medical Student Research Training Program and any courses completed during the association with the program are recorded on the trainee's transcript.





## FIRST-YEAR SCHEDULE

### Autumn Quarter

HOUR	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
8:30	BIOL. STR. 405-	BIOL. STR. 401-	BIOL. STR. 405-	BIOL. STR. 401-	BIOL. STR. 404	UNASSIGNED
9:30	BIOL. STR. 405- LABORATORY	BIOL. STR. 401- LABORATORY	BIOL. STR. 405- LABORATORY	BIOL. STR. 401- LABORATORY		
10:30						
11:30	BIOCH. 440		BIOCH. 440		BIOCH. 440	
12:30	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	
1:30	BIOCH. 443 LABORATORY	UNASSIGNED	BIOCH. 443 LABORATORY	UNASSIGNED	BIOL. STR. 401-	
2:30					BIOL. STR. 401- LABORATORY	
3:30						
4:30						

### Winter Quarter

8:30	BIOL. STR. -406	BIOL. STR. -402	BIOL. STR. -406	BIOL. STR. -402	BIOL. STR. -402	UNASSIGNED
9:30	BIOL. STR. -406 LABORATORY	BIOL. STR. -402 LABORATORY	BIOL. STR. -406 LABORATORY	BIOL. STR. -402 LABORATORY	BIOL. STR. -402 LABORATORY	
10:30					BIOL. STR. -402 LABORATORY	
11:30	BIOCH. 441		BIOCH. 441		BIOCH. 441	
12:30	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	
1:30	P. BIO. 401-	UNASSIGNED	P. BIO. 401-	UNASSIGNED	P. BIO. 401-	
2:30	P. BIO. 401- CONF.		P. BIO. 401- CONF.		P. BIO. 401- LABORATORY	
3:30	PSYCHIAT. 400		PSYCHIAT. 400			
4:30			PSYCHIAT. 400			

### Spring Quarter

8:30	BIOL. STR. -403	CONJ. 409	BIOL. STR. -403	CONJ. 409	CONJ. 409	UNASSIGNED
9:30	BIOL. STR. -403 LABORATORY	CONJ. 409 LABORATORY	BIOL. STR. -403 LABORATORY	CONJ. 409 LABORATORY		
10:30					BIOL. STR. -403 CONJ. 409	
11:30	BIOCH. 442		BIOCH. 442		BIOCH. 442	
12:30	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	
1:30	P. BIO. -402	UNASSIGNED	P. BIO. -402	UNASSIGNED	P. BIO. -402	
2:30	P. BIO. -402 LABORATORY		P. BIO. -402 CONF.		P. BIO. -402 LABORATORY	
3:30						
4:30			BIOL. STR. -403			



**SECOND-YEAR SCHEDULE**

**Autumn Quarter**

HOUR	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
8:30	PATH. 440-	PHARMACOL. 442-	PATH. 440-	PHARMACOL. 442-	PHARMACOL. 442-	MICRO. 441-
9:30	PATH. -441- LABORATORY	MICRO. 441-	PATH. -441- LABORATORY	MICRO. 441-	UNASSIGNED	MICRO. 441- LAB.
10:30		MICRO. 441- LABORATORY		MICRO. 441- LABORATORY		PSYCHIAT. 430
11:30	PATH. 440-		PATH. 440-		PHARMACOL. 442-	
12:30	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
1:30	PATH. 440-	UNASSIGNED	PHARMACOL. 442- LABORATORY	UNASSIGNED	PATH. 440-	
2:30	PATH. -441- LABORATORY				PATH. -441- LABORATORY	
3:30						
4:30	PATH. CONF.				PATH. 440-	

**Winter Quarter**

8:30	PATH. -442-	PHARMACOL. -443	CONJ. 426-	PHARMACOL. -443	CONJ. 426-	MICRO. -442
9:30	PATH. -442- LABORATORY	MICRO. -442	CONJ. 426- CLIN. INSTRUCT.	MICRO. -442	CONJ. 426- CLIN. INSTRUCT.	MICRO. -442 LAB. FIRST 5 WEEKS PATH. -442- LAB. LAST 5 WEEKS
10:30		MICRO. -442 LABORATORY		MICRO. -442 LABORATORY		
11:30						PATH. -442-
12:30	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
1:30	PATH. -442-	UNASSIGNED	PATH. -442-	UNASSIGNED	PHARMACOL. -443	
2:30	PATH. -442- LABORATORY		PATH. -442- LABORATORY		PHARMACOL. -443 LABORATORY	
3:30						
4:30	PATH. -442- CONF.		PATH. -442-			

**Spring Quarter**

8:30	CONJ. -427	CONJ. -427	CONJ. -427	CONJ. -427	PATH. -443	PATH. -443
9:30	CONJ. -427 CLIN. INSTRUCT.	CONJ. -427 CLIN. INSTRUCT.	CONJ. -427 CLIN. INSTRUCT.	CONJ. -427 CLIN. INSTRUCT.	PATH. -443 LABORATORY	PATH. -443 LABORATORY
10:30						
11:30					PATH. -443	PATH. -443
12:30	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
1:30	MICRO. 443, 444	UNASSIGNED	MICRO. 443, 444	UNASSIGNED	PREV. MED. 425	
2:30	PATH. -443		MICRO. 443, 444 LABORATORY		MICRO. 443, 444	
3:30	PATH. -443 LAB.				LABORATORY	
4:30	PATH. -443 CONF.				MICRO. 443, 444	

**THIRD-YEAR CLERKSHIP SCHEDULE, 1967-68** (Dates in this schedule are subject to change without notice)

2 WK.		TERM I—8 WEEKS		TERM II—8 WEEKS		TERM III—8 WEEKS		TERM IV—8 WEEKS		1 WK.	1 WK.
SECTIONS		SEPT. 25-NOV. 22		NOV. 27-JAN. 30		JAN. 31-MARCH 28		MARCH 29-MAY 25			
LABORATORY PROCEDURES	SECTION A ¼ OF CLASS	MEDICINE CLERKSHIP		MEDICINE CLERKSHIP	PSYCHIATRY CLERKSHIP	SURGERY CLERKSHIP		PEDIATRICS CLERKSHIP			
	SECTION B ¼ OF CLASS	MEDICINE CLERKSHIP	PSYCHIATRY CLERKSHIP	SURGERY CLERKSHIP		PEDIATRICS CLERKSHIP		MEDICINE CLERKSHIP			
	SECTION C ¼ OF CLASS	SURGERY CLERKSHIP		PEDIATRICS CLERKSHIP		MEDICINE CLERKSHIP		MEDICINE CLERKSHIP	PSYCHIATRY CLERKSHIP		
	SECTION D ¼ OF CLASS	PEDIATRICS CLERKSHIP		MEDICINE CLERKSHIP		MEDICINE CLERKSHIP	PSYCHIATRY CLERKSHIP	SURGERY CLERKSHIP			
READING PERIOD EXAMINATIONS											

**THIRD-YEAR LECTURE SCHEDULE**

Lectures for third year are confined to Saturday mornings in which all clinical departments take part, calling in basic science departments on certain problems. Many of the lectures are the conjoint treatment of a subject by more than one department.

**FOURTH-YEAR CLERKSHIP SCHEDULE, 1967-68** (Dates in this schedule are subject to change without notice)

	TERM I—12 WEEKS			TERM II—12 WEEKS			TERM III—12 WEEKS			JUNE 5-9
SECTIONS	SEPT. 18-DEC. 9			DEC. 11-MARCH 9			MARCH 11-JUNE 1			
SECTION A ⅓ OF CLASS	MEDICINE PSYCHIATRY PREVENTIVE MEDICINE			ELECTIVES		SELECTED SURGICAL SPECIALTIES	OBSTETRICS- GYNECOLOGY	OBSTETRICS- GYNECOLOGY	ANESTHESI- OLOGY PHYS. MED. AND REHAB.	EXAMINATIONS
SECTION B ⅓ OF CLASS	ELECTIVES		SELECTED SURGICAL SPECIALTIES	OBSTETRICS- GYNECOLOGY	OBSTETRICS- GYNECOLOGY	ANESTHESI- OLOGY PHYS. MED. AND REHAB.	MEDICINE PSYCHIATRY PREVENTIVE MEDICINE			
SECTION C ⅓ OF CLASS	OBSTETRICS- GYNECOLOGY	OBSTETRICS- GYNECOLOGY	ANESTHESI- OLOGY PHYS. MED. AND REHAB.	MEDICINE PSYCHIATRY PREVENTIVE MEDICINE			ELECTIVES		SELECTED SURGICAL SPECIALTIES	

**FOURTH-YEAR LECTURE SCHEDULE**

Lectures for fourth year are confined to Saturday mornings in which all clinical departments take part, calling in basic science departments on certain problems. Many of the lectures are the conjoint treatment of a subject by more than one department.



## Departmental Programs

The School of Medicine, through its departments and interdepartmental programs, offers curricula leading to the degrees of Doctor of Medicine; Bachelor of Science in Medical Technology, in Physical Therapy, and in Occupational Therapy; and graduate study leading to the degrees of Master of Science and Doctor of Philosophy in accordance with the requirements of the Graduate School.

### Doctor of Medicine

Upon completion of the four-year curriculum of the School of Medicine, the M.D. degree is awarded to candidates who have (1) given evidence of good moral character; (2) completed the last two years of medical training as regularly matriculated students in the School of Medicine; (3) satisfactorily completed the required work throughout the course; (4) fulfilled all special requirements; and (5) discharged all indebtedness to the University.

### Doctor of Medicine with Honor

A degree of Doctor of Medicine with Highest Honor or . . . with Honor is awarded those students in the highest 10 per cent of the class who have written a thesis acceptable to the Thesis Committee of the School of Medicine.

### Bachelor of Science

A curriculum leading to a bachelor's degree with a major in microbiology is offered through the College of Arts and Sciences. Microbiology courses may be found in the *Description of Courses* section at the back of this Catalog, and the curriculum is described in the *College of Arts and Sciences* section.

### Bachelor of Science in Medical Technology

The medical technology program is designed to train young men and women to be professional workers in hospital, clinic, public health, and medical research laboratories. The prescribed preparatory program consists of three years of regular university training with emphasis upon certain courses in chemistry and biology. This is followed by a 12-month period of full-time instruction and training in medical technology itself. Information concerning curriculum and admission to the program in medical technology may be found under the Department of Pathology.

### Bachelor of Science in Physical Therapy

A curriculum in physical therapy is offered by the Department of Physical Medicine and Rehabilitation



in the School of Medicine. It provides professional training in the basic sciences and the clinical use of accepted physical therapy modalities and procedures. Information concerning admission to Physical Therapy and its curriculum may be found under the Department of Physical Medicine and Rehabilitation.

#### **Bachelor of Science in Occupational Therapy**

A curriculum in occupational therapy is offered by the Department of Physical Medicine and Rehabilitation in the School of Medicine. It provides professional training in the basic sciences and the clinical use of occupational therapy. Information concerning admission to Occupational Therapy and its curriculum may be found under the Department of Physical Medicine and Rehabilitation.

#### **Master of Science and Doctor of Philosophy**

Work leading to master's degrees and doctoral degrees is offered, in accordance with the requirements of the Graduate School, in the Departments of Biological Structure, Biochemistry, Microbiology, Pathology, Pharmacology, Physiology and Biophysics. A master's degree program is offered by the Departments of Physical Medicine and Rehabilitation, Preventive Medicine, and Surgery.

Students who intend to work toward one of these degrees should confer with the chairman of the department in which they intend to pursue their graduate study. Specific requirements for admission to work for advanced degrees are given in the *Graduate Study* section.

#### **Licensure**

Admission to the practice of medicine in any state is conditional upon the requirements of a state board of examiners. Admission to practice in the state of Washington is dependent upon the candidate's having an M.D. degree, completing a one-year rotating internship, and passing the basic science and licensing examinations. For candidates who are already licensed to practice in another state, the licensing examination may be waived by reciprocity with that state or with the National Board of Medical Examiners. Completion of the basic science requirements may be arranged by reciprocity with the National Board of Medical Examinations and with certain specified states.

Further information about licensure requirements may be obtained from the State Department of Licenses, Professional Division, Olympia, Washington.

### **Postgraduate Medical Education**

#### **Internships and Residencies**

Internships of one-year duration in clinical medicine are available at the University Hospital, the King County Hospital, and the Children's Orthopedic Hospital and Medical Center. All clinical departments participate in the training program for interns in one or more of these institutions. Residency training programs are available in the clinical fields of anesthesiology, cardiology, general surgery, medicine, neurology, neurosurgery, obstetrics, gynecology, orthopedic surgery, pathology, pediatrics, physical medicine and rehabilitation, psychiatry, radiology, and urology. The residency programs vary in duration from two to five years and are integrated, providing for rotation through several of the University affiliated hospitals during this period of training.

#### **Postdoctoral Fellowships and Traineeships**

Postdoctoral fellowships and traineeships are available in all basic health sciences and clinical departments. They are designed to provide further research and teaching experience for the advanced student who has already obtained his Ph.D. or M.D. degree.

### **Continuing Education**

#### **Director**

John N. Lein  
AA320 University Hospital

The School of Medicine functions as a center for continuing medical education for physicians in the region. A series of short courses (in general extending from one day to one week) designed primarily for the general physician is offered at various times throughout the year. The clinical faculty, with the assistance of basic science investigators, plans and gives courses which provide the practicing physician with an opportunity to review fundamental concepts and to go into recent advances in diagnosis and treatment in some depth in specialized fields, such as cardiology, electrolyte and fluid balance, gastroenterology, hematology, infectious diseases, neurology, metabolism, allergy, practical psychiatry, emotional problems in children, gynecologic and obstetric endocrinology, and so forth.

The School cooperates with the Washington State Department of Health and other governmental agencies, physicians' organizations, and voluntary organizations in developing refresher courses in cancer, diseases of the heart, diabetes, alcoholism, safety, and so forth.



Physicians are always welcome to participate in the regular rounds and conferences scheduled in the University Hospital and clinics and the hospitals affiliated with the University in the teaching program.

Refresher courses are extended to other health professions such as medical technologists, physical therapists, and occupational therapists.

Detailed information about such instruction is given in announcements describing the specific courses, the time they are scheduled, the number of students accepted, and the tuition fees.

## BASIC HEALTH SCIENCES

### BIOCHEMISTRY

#### Chairman

Hans Neurath  
J409 Health Sciences Building

#### Professors

Earl W. Davie, Edmond H. Fischer, Milton P. Gordon, Donald J. Hanahan, Edwin G. Krebs, Hans Neurath, William J. Rutter, Philip E. Wilcox

#### Associate Professors

Alex Kaplan, Kenneth A. Walsh

#### Assistant Professors

David R. Morris, David C. Teller, Guy A. Thompson, Jr.

Biochemistry, the study of the chemistry of life processes, is one of the rapidly expanding branches of biological sciences. The Department of Biochemistry offers graduate degree programs and also offers courses at the undergraduate level both for any regularly enrolled student and for professional students in Medicine, Dentistry, and Pharmacy.

### Graduate Programs

#### Graduate Program Adviser

William J. Rutter  
J405 Health Sciences Building

The basic requirements for admission to the Department of Biochemistry are one year of organic chemistry, one year of physics, one year of physical chemistry,

including laboratory, and mathematics through integral calculus. Students must also meet the general admission requirements of the Graduate School. The course of advanced study is designed to give each student a firm foundation upon which to base further professional progress. In the first year of academic work most students attend courses in biochemistry and in related fields such as advanced chemistry, genetics, or microbiology. In the second and succeeding years, an increasing amount of time is devoted to research and to independent study. Each student is required to gain teaching experience, usually during part of the first and second years. Most students require approximately four years after admission to the Graduate School to fulfill the requirements for the Ph.D. degree. Students entering with advanced training in biochemistry may complete their requirements in a shorter period of time.

### PROGRAMS OF STUDY

#### Master of Science

Although the Department of Biochemistry does not have a formal program which terminates in the master's degree, under certain circumstances students seeking the master's degree are accepted.

#### Doctor of Philosophy

The Department of Biochemistry offers an advanced program leading to the Ph.D. degree. This graduate program prepares students for professional careers in universities and colleges, in research institutes, in medical schools and hospitals, in government laboratories, such as those of the National Institutes of Health.

Dissertation research is carried out under the guidance of members of the graduate faculty in biochemistry. The laboratories of the Department of Biochemistry are excellently equipped for modern biochemical research.

Financial support is available to students in good standing throughout their graduate career in the form of raineeships and assistantships. For further information, inquiring students should request from the Department of Biochemistry the pamphlet describing the graduate program in Biochemistry.

### BIOLOGICAL STRUCTURE

#### Chairman

N. B. Everett  
G511 Health Sciences Building

#### Professors

David L. Bassett, Richard J. Blandau, N. B. Everett, Lyle H. Jensen, Edward C. Roosen-Runge

#### Associate Professors

Charles W. Bodemer, Douglas E. Kelly, John H. Luft, George F. Odland, Julia G. Skahen

#### Assistant Professors

James K. Koehler, Barbara Landau, Earl P. Lasher, John W. Prothero, M. Roy Schwarz, Thomas A. Stebbins, John W. Sundsten, Daniel G. Szollosi

#### Instructor

Daniel O. Graney

#### Research Professor

Edward A. Boyden

#### Research Assistant Professor

Ruth E. Rumery

#### Research Instructors

Anita E. Hendrickson, Brian I. Lord

In the Department of Biological Structure, courses are offered which comprise all levels of structural organization of the body, from the gross to the molecular.

### Graduate Programs

#### Graduate Program Adviser

L. H. Jensen  
G519 Health Sciences Building

The traditional major fields of anatomy are represented in the Department by three divisions: Gross Anatomy and Neuroanatomy, Growth and Development, and Histology. The submicroscopic and molecular levels are represented by the Division of Ultrastructure.

In addition to courses for students in medicine, dentistry, dental hygiene, nursing, physical therapy, and occupational therapy, a graduate program is offered to provide the background necessary for pursuing a professional career in a variety of fields relating to the morphological sciences, *e.g.*, anatomy, biology, and biophysics. Students who intend to work toward a degree of Master of Science or Doctor of Philosophy must meet the requirements of the Graduate School as outlined in the *Graduate Study* section.

#### Continuous Courses

The courses listed below are offered throughout the school year.

*Gross Anatomical Dissection.* Physicians who desire additional individual experience in the dissection of the entire cadaver or parts thereof may make arrangements through the Division of Continuing Medical Education and the Department of Biological Structure. Laboratory space and anatomical material will be provided (no staff participation). The fees are in proportion to the amount of gross material supplied.

## MICROBIOLOGY

#### Chairman

Charles A. Evans  
G305 Health Sciences Building

#### Professors

Howard C. Douglas, Charles A. Evans, Neal B. Groman, Bernard S. Henry, Brian J. McCarthy, Erling J. Ordal, John C. Sherris, Russell S. Weiser, Helen R. Whiteley

#### Associate Professor

Peter K. Vogt

#### Assistant Professors

Ingegerd Hellstrom, Eugene W. Nester, Charles R. Spotts

#### Instructors

Esther A. Duchow, Robert McAlister

#### Research Assistant Professor

Velma C. Chambers

#### Lecturers

Patricia C. Bevan, Dorothy I. Cramer, Carol Laxson, Ramona Memmer, Margaret O. Parker

Microbiology is the science of microscopic organisms, their biological characteristics, chemical activities, industrial uses, and disease-producing mechanisms. The related fields concerned with parasites, viruses, and immunity are included in the work of this Department.

### Undergraduate Programs

In addition to courses for professional students, and students interested in microbiology as a part of their general education, the Department of Microbiology offers programs in microbiology leading to a bachelor's degree in the College of Arts and Sciences. (See *College of Arts and Sciences* section.) The undergraduate degree prepares the individual for the responsibilities of a microbiologist upon graduation and also provides him with



the background for advanced study if his capabilities warrant it. An honors program leading to a bachelor's degree with honors or distinction in Microbiology is available for qualified undergraduates (see *College of Arts and Sciences* section, Honors in Microbiology).

## Graduate Programs

### Graduate Program Adviser

Howard C. Douglas  
H309 Health Sciences Building

Students who intend to work toward a degree of Master of Science or Doctor of Philosophy must apply for admission to the Graduate School and meet the requirements of the Graduate School as outlined in the *Graduate Study* section. Prospective candidates for advanced degrees are selected primarily upon the basis of scholarship and motivation. The fields of specialization for advanced degrees are general and medical bacteriology, immunology, medical mycology, virology, and microbial physiology and genetics. An undergraduate record of at least a B average is considered an indication that the student is capable of more advanced work.

While the academic background of students entering graduate work in microbiology is variable, it is generally agreed that a strong background in chemistry and biology is essential. One year of physics and mathematics through analytic geometry and calculus is also strongly recommended.

## PATHOLOGY

### Chairman

Earl P. Benditt  
D511 Health Sciences Building

### Professors

Ellsworth C. Alvord, Jr., Earl P. Benditt, N. Karle Mottet, Leo M. Sreebny

### Associate Professors

Carl E. Hellstrom, Cecil Hougie, David Lagunoff, George M. Martin, Russell Ross, Edward A. Smuckler, Nancy E. Warner

### Assistant Professors

J. Bruce Beckwith, James L. Bennington, Ruth E. Bulger, Robert A. Fouty, Victor E. Goldenberg, Dennis Reichenbach, Cheng-Mei Shaw, Gary E. Striker, Rudolph Vracko

### Instructors

Richard W. Sagebiel, Abraham I. Schweid, Helju Siimo, Shuzo Mark Sumi, Louise Wiegenstein

### Research Associate Professor

Elizabeth K. Smith

### Research Assistant Professor

Nils Eriksen

### Research Instructor

Ruth E. Bulger

### Lecturer and Hospital Clinical Laboratories Supervisor

Ivan B. Budd

Pathology is that branch of biologic science which endeavors to clarify the natural history and mechanisms of disease processes. In its broadest sense, it encompasses the entire animal and plant kingdoms. Experimental pathologists are concerned with the basic mechanisms involved in the reaction to injury and may investigate a variety of species. In this Department, however, as in all departments of pathology primarily associated with a medical school, the motivating interest is in human disease and therefore the emphasis is on vertebrate and in particular mammalian species.

The pathologist has traditionally concentrated on the gross and microscopic anatomic alterations associated with disease. Microscopy is still his principal tool. However, he may study a disease process at many levels of organization, ranging from the molecular to the sociologic. His techniques may therefore vary from those of the physical chemist to those of the epidemiologist. In this Department, however, the emphasis is on cellular and molecular pathology, the analysis of disease by light and electron microscopy, histo- and cytochemistry, analytic biochemistry, cell and tissue culture, and immunology.

Courses are offered for medical students, dental students, medical technology students, and other students of the health sciences.

## Undergraduate Programs

### Advisory Office

D511 Health Sciences Building

### BACHELOR OF SCIENCE IN MEDICAL TECHNOLOGY

#### The Preprofessional Program

The program of instruction in Medical Technology is supervised by the Department of Pathology in the



School of Medicine. A preprofessional program in Medical Technology is supervised by the College of Arts and Sciences during the first three years. Students are referred to the *College of Arts and Sciences* section of this Catalog for explanation of the basic proficiency and distribution requirements, and to the *Description of Courses* section. The advisory office of the College of Arts and Sciences is in B10 Padelford Hall. During Spring Quarter of the third year, advising will be transferred to the Department of Pathology in the School of Medicine.

#### The Professional Program

At the end of the Winter Quarter of the third year, students apply for admission to the School of Medicine for the 12-month period of full-time instruction in Medical Technology. During this period they register for Pathology 321, 322-424-425, and 426 (Medical Technology). The first five months of this period consist of full-time classroom and laboratory instruction offered in the School of Medicine. This is followed by approximately seven months of full-time instruction and supervised experience in affiliated hospital and public health laboratories.

Specialized undergraduate training is also available in electron microscopy, histochemistry, and cytotechnology. Graduates of this program may look forward to employment in hospital, clinical, and medical research laboratories as medical technologists.

The program is approved by the Council on Medical Education and Hospitals of the American Medical Association. Graduates are eligible for examination by the Board of Registry of the American Society of Clinical Pathologists. They are urged to take this examination and become Registered Medical Technologists.

#### CURRICULUM IN MEDICAL TECHNOLOGY

A list of preprofessional and professional courses is given in a general sequential pattern as follows:

First Year	CREDITS
CHEM 140, 150, 151 GENERAL . . . . .	8
CHEM 160 GENERAL AND 170 QUAL. ANAL. . . . .	6
MATH 105 OR MATH. 155 COLLEGE ALGEBRA . . . . .	5 OR 3
ZOOL 111, 112 (GENERAL) . . . . .	10
<b>Second Year</b>	
CHEM 221 QUANT. ANALYSIS . . . . .	5
CHEM 231, 241, 232, 242 ORGANIC AND LAB. . . . .	10
<b>Third Year</b>	
BIOCHEM 405, 406, 408 INTRO. TO BIOCHEM I, II, AND LAB . . . . .	9
MICRO 441-442 MED. BACT., VIROLOGY, AND IMMUN. . . . .	10
MICRO 443 MED. MYCOLOGY AND 444 MED. PARASITOL. . . . .	6

Permission is required for courses in biochemistry and microbiology.

Approved electives should be chosen keeping in mind the distribution requirements needed for fulfillment of a degree from the College of Arts and Sciences in the event the major is changed from medical technology.

Some other science electives recommended for the pre-medical technology student include:

	CREDITS
B STR 301 GENERAL ANATOMY . . . . .	4
PATH 110 LECTURES IN MEDICAL TECHNOLOGY . . . . .	1
PHYSICS 114, 115, 117, 118 GENERAL AND LABORATORY . . . . .	10
ZOOL 208 HUMAN PHYSIOLOGY . . . . .	5

#### Fourth Year

During the 12-month period of specialized training the student becomes familiar with the common clinical laboratory procedures and with the interpretation of the results obtained. They learn the tests used in the laboratories of clinical chemistry, hematology, serology, urinalysis, microbiology, and pathology. Special programs, such as cytology, histochemistry, and electron microscope technique, are available as areas of specialization in the last year of training. Further information can be obtained from the Department of Pathology.

#### Graduate Programs

##### Graduate Program Adviser

George M. Martin  
D511 Health Sciences Building

##### Master of Science and Doctor of Philosophy

Programs in the field of experimental pathology leading to the Master of Science and Doctor of Philosophy degrees are offered through the Graduate School. Graduates of the program are qualified for research associate or academic appointments in medical, dental, or veterinary schools. There is also a great demand for experimental pathologists in government laboratories and in private industry, particularly in the pharmaceutical industry.

##### Postdoctoral Traineeships in Experimental Pathology

Traineeships in experimental pathology include specialized programs in neuropathology and hematology.

#### Residency Training Program

The Department supervises an intern and a residency training program in Anatomic and Clinical Pathology for qualified medical doctors. This program utilizes the facilities of the University, King County, and Veterans hospitals, and the Children's Orthopedic Hospital and Medical Center. Graduates of this program are eligible for certification by the American Board of Pathology. Such highly skilled diagnostic pathologists may look forward to challenging and rewarding careers in the private practice of pathology, in teaching, and in research.



*Review for Specialty Boards.* Physicians who want to review material in preparation for specialty boards may study gross and microscopic material, with descriptions, in the departmental laboratories. This is not a course but a program of individual study, which may be arranged in accordance with individual needs. Inquiries should be directed to the Department of Pathology.

## PHARMACOLOGY

**Chairman and Graduate Program Adviser**

James M. Dille

F421 Health Sciences Building

### Professors

James M. Dille, Akira Horita, Ted A. Loomis, Theodore C. West

### Associate Professor

Audrey R. Holliday

### Assistant Professors

Robert L. Dixon, Lawrence M. Halpern

### Instructor

Lavern J. Weber

Pharmacology deals with the mechanisms by which drugs modify physiological function, and with the application of drugs to the relief and treatment of disease.

The Department of Pharmacology provides courses for students of medicine, dentistry, and pharmacy, and for graduate students in pharmacology and the allied biomedical fields. Students who intend to work toward a degree of Master of Science or Doctor of Philosophy must meet the requirements of the Graduate School as outlined in the *Graduate Study* section. They must present a bachelor's degree with a major in any of the sciences, such as zoology, chemistry, physics, pharmacy, psychology, or physiology. Applicants should communicate with the Graduate Program Adviser before registration.

## PHYSIOLOGY AND BIOPHYSICS

### Chairman

Harry D. Patton

G405 Health Sciences Building

### Professors

Harry D. Patton, Theodore C. Ruch, Robert F. Rushmer, Allen M. Scher, Arnold L. Towe, J. Walter Woodbury, Allan C. Young

### Associate Professors

Arthur C. Brown, Mitchell Glickstein, Julia G. Skahen, Orville A. Smith, Robert L. Van Citters, Curt A. Wiederhielm

### Assistant Professors

John T. Conrad, Charles C. Gale, Albert M. Gordon, Thomas F. Hornbein, Theodore H. Kehl, Thelma T. Kennedy, Barbara Landau, Charles F. Stevens

### Instructor

Fredric A. Harris

### Research Assistant Professors

Clarence L. Morgan, John M. Reid

### Research Instructor

Edmund H. Brand

Physiology deals with the processes, activities, and phenomena incidental to and characteristic of life and living organisms. Courses in this field are given for medical, dental, pharmacy, and nursing students, and for graduate students.

Physiology, based upon zoology, physics, chemistry, and mathematics, interlocks closely with the other basic medical sciences—biological structure, biochemistry, pharmacology, and pathology—and with psychology. For this reason, physiology appeals to students with diverse backgrounds and goals. Courses in this field are given for medical, dental, pharmacy, and nursing students, and for graduate students.

Biophysics emphasizes the physical aspects of organs and control systems, studied by the instruments and methods of thinking used by physicists.

### Graduate Programs

#### Graduate Program Adviser

Julia G. Skahen

G205 Health Sciences Building

Students who intend to work toward a degree of Master of Science or Doctor of Philosophy must meet the requirements of the Graduate School. Students with a bachelor's degree in zoology, psychology, chemistry, engineering, physics, or with an M.D. degree are acceptable as prospective candidates for M.S. and Ph.D. degrees.

Graduate students in physiology and biophysics with a medical degree will have their curricula adjusted in accordance with their training.

Effective Autumn Quarter 1967, graduate student applicants will be required to take the aptitude, verbal, quantitative, and advanced portions of the Graduate Record Examination administered by the Educational Testing Services, The Psychological Corporation, 304 East 45th Street, New York, New York 10017.

#### PROGRAMS OF STUDY

In the organization of the graduate program in physiology and biophysics, several specializations within the broad field of physiology are recognized, and the requirements and curricula are different for each, although there is considerable overlapping. The areas of specialization may be described as (1) mammalian and pathological physiology, (2) biophysics, for which undergraduate mathematics and physics are prerequisites, and (3) physiology of behavior, in which undergraduate psychological training is a prerequisite.

For the biophysics program, a bachelor's degree in physical science or the equivalent is required.

For students wishing a more equal distribution of time between physiology and psychology, an interdisciplinary Ph.D. program, administered by the Physiology Psychology Group of the Graduate School, is offered. (See *Interdisciplinary Graduate Degree Programs* section of this Catalog.)

The basic graduate courses in physiology and biophysics include 401-402 (Advanced Human Physiology) and Conjoint 409 (Basis of Neurology).

## PREVENTIVE MEDICINE

#### Chairman

J. Thomas Grayston  
F358 Health Sciences Building

#### Professors

John P. Fox, J. Thomas Grayston, James R. McCarroll, Donovan J. Thompson

#### Associate Professors

E. Russell Alexander, Blair M. Bennett, Edward B. Perrin, G. Spencer Reeves, Sanpin Wang

#### Assistant Professors

Marion K. Cooney, Theodore C. Doege, Irvin Emanuel, Carrie E. Hall, Jack B. Hatlen, George E. Kenny, Alfred Kogon, Richard Kronmal, Caswell A. Mills

#### Instructors

John O. Fish, Hjordis M. Foy, Richard A. Kronmal

#### Research Assistant Professors

Harley H. Bovee, Kenneth S. W. Kim

#### Research Instructors

Edwin S. Boatman, Peter A. Breysse

The major areas of interest in the Department of Preventive Medicine include epidemiology, communicable disease control, environmental health, biostatistics, and public health. The Department provides required courses as part of the School of Medicine curriculum. In addition, courses are provided for undergraduate and graduate students in the areas listed above.

The Department offers an approved residency program in preventive medicine, provides postdoctoral research training, and offers an M.S. in Preventive Medicine. An M.D., D.V.M., or Ph.D. in medical science is a prerequisite for admission.

An environmental health curriculum leading to a B.S. degree is offered by this Department through the College of Arts and Sciences. A health education curriculum leading to a B.A. degree with a teaching certificate is offered through the School of Physical and Health Education.

#### Graduate Programs

##### Graduate Program Adviser

John P. Fox  
F262 Health Sciences Building

The Department offers a graduate program leading to the degree Master of Science in Preventive Medicine.

The faculty in Preventive Medicine participates in an interdisciplinary Biomathematics Group of the Graduate School which offers a program leading to the M.S. and Ph.D. degrees. See the *Interdisciplinary Graduate Degree Programs* section of this Catalog for further information.



## BIOMEDICAL HISTORY

### Head

Charles W. Bodemer  
A225 Health Sciences Building

### Associate Professor

Charles W. Bodemer

The history of medicine and its allied sciences comprises an integral part of the history of western civilization. Study of the history of the biomedical sciences provides simultaneously a greater understanding of these sciences and a heightened awareness of their relation to the social, economic, philosophic and religious factors influencing and influenced by them at different times and places during their development. The biomedical sciences lend another dimension to history valuable to the scientist and non-scientist alike.

The Division of Biomedical History offers courses and sponsors research in the history of medicine and allied sciences. Courses are available to undergraduates, medical students, and graduate students. Approximately eight hundred rare books relevant to the development of the modern medical sciences provide a valuable adjunct to the teaching program.

## CONJOINT COURSES AND MEDICAL PRACTICE

### CONJOINT COURSES

Conjoint courses are offered cooperatively by departments in the School of Medicine. They are designed to integrate basic medical training with clinical work and, in some cases, to integrate basic medical training in two or more fields.

### MEDICAL PRACTICE

For the list of courses, see the *Description of Courses* section at the back of this Catalog. Nearly seventy general practitioners from the Seattle area are affiliated with the School of Medicine to provide instruction.

## CLINICAL MEDICAL SCIENCES

### ANESTHESIOLOGY

#### Chairman

John J. Bonica  
SS704 University Hospital

#### Professors

John J. Bonica, B. Raymond Fink

#### Associate Professors

John M. Hansen, Rudolph De Jong

#### Assistant Professors

Geordis M. Aasheim, Toshio Akamatsu, Gerald D. Allen, Stefano Brena, Edward W. Crawford, Felix G. Freund, Thomas F. Hornbein, William F. Kennedy, Jr., Wayne E. Martin, Richard J. Ward

#### Instructors

Mullen A. Chinn, Frederick W. Cheney, Jr., William K. Maxwell, Lumen B. Schilling, Desmond Sweeney, Cornelius I. Voth, Ralph D. Williamson

#### Research Instructor

Patrick J. Graesch

The Department of Anesthesiology has broad responsibilities for the teaching of medical students throughout their four years of undergraduate training. Members of the Department participate in the teaching of applied anatomy to students during their first year. During the second year, members of the Department who also have joint appointments in physiology and pharmacology participate in teaching of students in these areas. During the clinical years, the students are taught the basic principles of anesthesiology, including artificial respiration and resuscitation. Instruction is provided by means of lectures, conjoint courses, and clinical clerkships. In addition, the Department carries out an active training program for interns and residents in anesthesiology and affords residents in surgery, obstetrics, and oral surgery experience in anesthesiology.

## MEDICINE

#### Chairman

Robert G. Petersdorf  
BB561 University Hospital

#### Professors

George N. Aagaard, Robert A. Bruce, John Butler, J. Thomas Dowling, Robert S. Evans, Clement A.

Finch, Stanley M. Gartler, John R. Hogness, William M. M. Kirby, Arno G. Motulsky, Robert G. Petersdorf, Cyrus E. Rubin, Belding H. Scribner, E. Donnell Thomas, Wade Volwiler, Robert H. Williams.

#### **Associate Professors**

Edwin L. Bierman, Gian E. Chatrjian, Leonard A. Cobb, John L. Decker, Seymour J. Klebanoff, Mart Mannik, Wil B. Nelp, George F. Odland, C. Alvin Paulsen, Clayton Rich, Donal B. Sparkman, August G. Swanson, Paul P. Van Arsdell, Jr.

#### **Assistant Professors**

John R. Blackmon, Paul Bornstein, Roger Bulger, Robert D. Conn, Ralph E. Cutler, John W. Ensinnck, L. Frederick Fenster, Philip J. Fialkow, Charles J. Goodner, Louis A. Healey, Robert S. Hillman, Willard P. Johnson, Thomas E. Morgan, Jr., Frank Parker, Charles E. Pope II, Daniel Porte, Jr., C. Evans Roberts, David P. Simpson, Phillip Swanson, Marvin Turck, Peter O. Ways, Francis C. Wood, Jr.

#### **Instructors**

David J. Baylink, Harry N. Beaty, Coldevin Carlson, F. Kingsbury Curtis, John K. Dawborn, Shmuel Eidelman, Robert B. Epstein, Donald L. Gordon, John R. Green, Lawrence A. Harker, John D. Heywood, J. Ward Kennedy, John E. Milner, Richard W. Sagebiel, David R. Saunders, Floyd Short, John M. Short, Jonas A. Shulman, Carlo A. Tassinari, Henrich Tenckhoff, Stephen Yarnall

#### **Research Associate Professors**

James M. Burnell, John A. Glomset, Akira Yoshida

#### **Research Assistant Professors**

Patrick D. Goldsworthy, Loring B. Rowell, George Stamatoyannopoulos

#### **Research Instructors**

Margaret N. Bingham, Abbas E. Kitabchi, Amelia L. Schultz, Jon E. Wergedal

The student is introduced in the second year to many problems of clinical medicine and the main avenues for their resolution. In the third year, he becomes more adept in the complete work-up and therapy of problems in general internal medicine. In the fourth year, emphasis is placed on the difficult and special problems.

An active teaching program is carried on at the King County Hospital, the Seattle Veterans Hospital, the Public Health Service Hospital, and Firland Sanatorium

as well as at the University Hospital for interns, medical residents, and postdoctoral research fellows. More than 40 medical residents rotate through the hospitals, and there are more than 80 postdoctoral research fellows working in various divisions of the Department.

## **NEUROLOGICAL SURGERY**

#### **Chairman**

Arthur A. Ward, Jr.  
BB673 University Hospital

#### **Professors**

Eldon L. Foltz, Arthur A. Ward, Jr.

#### **Associate Professors**

Gian E. Chatrjian, Lowell E. White, Jr.

#### **Assistant Professor**

William A. Kelly

#### **Instructors**

William H. Calvin, Jerry H. Greenhoot, John Loeser, Linda Moretti, George A. Ojemann, Carlo A. Tassinari

#### **Research Assistant Professor**

June L. DeVito

#### **Research Instructors**

Richard G. Black, Joan S. Lockard

The Department of Neurological Surgery participates in medical student instruction during the medical student's second, third, and fourth years. In the second year, the Department collaborates with the Division of Neurology in teaching neurological diagnosis as part of the general course in physical diagnosis. In the third year, a series of scheduled Saturday morning lectures entitled "Introduction to Neurological Surgery" is given to outline the breadth and depth of the field to the entire third-year student body. The purpose of this is twofold: (1) to expose the entire class to the basic fundamentals of part of the field of neurological surgery; (2) to stimulate student interest in neurological surgery whereby interested students will select neurological surgery clerkships in their fourth year.

In the fourth year, the inpatient clerkship in neurological surgery is a three-week or elective six-week clerkship on an active neurological surgery service of a University of Washington affiliated hospital. Hospital selection by the student is possible. As a member of



the professional staff, the student actively participates in the diagnostic work-up as well as pre-operative and post-operative care of neurosurgical patients. The student is an important member of all ward rounds and clinical conferences of the Department. The three-week course is selected by the student as one of two courses available from a selection of three surgical specialty fields during any six-week quarter. The six-week course is an entirely elective course available in all quarters. Operating Room experience is optional and not extensive. Since only two to three students are allowed on any hospital service at the same time, close personal contact with patients and with the staff maximizes the learning experience.

In addition to the basic undergraduate instruction, a fully certified residency program in neurological surgery is available. The Department participates actively in the Student Summer Fellow Research Program.

## OBSTETRICS AND GYNECOLOGY

### Chairman

Charles A. Hunter, Jr.  
BB617 University Hospital

### Professors

Charles A. Hunter, Jr., Walter Herrmann

### Associate Professors

David C. Figge, Wayne L. Johnson

### Assistant Professors

John T. Conrad, John N. Lein, Ronald J. Pion, Leon R. Spadoni, Kent Ueland

### Instructors

George C. Denniston, Frank F. Fullington, Julian T. Parer

### Research Assistant Professors

Suzanne H. Conrad, Darrel H. Spackman

### Research Instructor

Jerry De Groot

The Department of Obstetrics and Gynecology represents the field of normal and complicated obstetrics, growth and development of the fetus, medical and surgical diseases of women, endocrinology as it is peculiar to the female, and the preventive phases of obstetrics and gynecology.

## OPHTHALMOLOGY

### Chairman

Carl Kupfer

### Professors

John L. C. Downer, Carl Kupfer

### Associate Professor

Sidney Futterman

This newly created department is responsible for the instructional and research programs in diseases of the eye and related structures.

## ORTHOPEDICS

### Chairman

D. Kay Clawson  
BB417 University Hospital

### Professor

D. Kay Clawson

### Associate Professor

Wayne H. Akesson

### Assistant Professors

Louis R. Fry, Thomas K.F. Taylor

The Department of Orthopedics carries out an active program of instruction in the diagnosis and treatment of disorders of the musculo-skeletal system. The medical student, in the second year, is introduced to techniques of physical examination. An elective course (Medical Practice 411) is offered for students desiring more knowledge of first aid and resuscitation techniques. Instruction in the third year is confined to a series of lectures and conjoint conferences as an introduction to the problems of diagnosis and management.

The Department's primary teaching responsibility is in the fourth year when students are offered clerkships as part of their surgical selective electives, or during the elective block when they have an opportunity to care for patients with musculoskeletal problems, under supervision. First-hand experience in the management of fractures and other trauma is obtained. Seminars in correlative anatomy and pathology are conducted during the clerkship.

In addition to instruction for medical students, the Department of Orthopedics participates in the teaching program of students in the Schools of Nursing and Dentistry, and in Physical and Occupational Therapy. A fully approved residency, with opportunities to carry out fundamental research, is offered. Residents may apply for admission to the Graduate School and pursue a program of graduate study under the sponsorship of a department or unit authorized to offer a program leading to the Master of Science degree.

## OTOLARYNGOLOGY

### Chairman

James A. Donaldson  
D217 Health Sciences Building

The Department of Otolaryngology is responsible for the teaching of the principles and practical aspects of the diagnosis and treatment of diseases of the ear, nose, throat, and larynx to medical students during their second, third, and fourth years of training. In addition, the Department assumes responsibility for the organization and supervision of a residency training program, and provides consultation and instruction to interns and members of the residency training programs at the University of Washington.

## PEDIATRICS

### Chairman

Ralph J. Wedgwood  
BB813 University Hospital

### Professors

Robert A. Aldrich, Irving Berlin, Robert W. Deisher, Vincent C. Kelley, Miriam E. Lowenberg (visiting), Bruce Mackler, Thomas K. Oliver, Jr., Nathan J. Smith, Ralph J. Wedgwood

### Associate Professors

E. Russell Alexander, Pierre E. Ferrier, Warren G. Guntheroth, Robert P. Igo, Robert F. Labbe, William O. Robertson, Thomas H. Shepard, David B. Shurtleff, David W. Smith

### Assistant Professors

David Baum, Abraham B. Bergman, Mary M. Campbell, Marilyn L. Cowger, Starkey D. Davis, Irvin Emanuel, C. Benjamin Graham, Sherrel L. Hammar, William A. Hodson, George A. Limbeck, Charles P. Mahoney, Beverly C. Morgan, Donald A. Pious, Christopher P. Williams

### Instructors

Helen T. Baker, Virginia A. Campbell, Coldevin Carlson, Yi-Chuan Ching, Ann Doege, Nasrollah Hakami, Patricia W. Hayden, Ralph R. Hollingsworth, Vanja Holm, Jack Lazerson, John F. Lefebvre, H. E. McLean, Ellen McNellis, Jackson D. Nickols, James W. M. Owens, Ann Pytkowicz, Otis E. Ramsey, C. George Ray, Rogelio Ruvalcaba, Mary Jane Schaller, C. Ronald Scott, E. Franklin Stone, Lore Tenckoff

### Lecturer

Norris G. Haring

### Research Associate Professor

Elizabeth K. Smith

Pediatrics involves the study of the physical and behavioral development of man, in health and disease, from conception to maturity. Alterations of the developmental process (from both genetic and environmental causes), the changing response to stress during maturation, and the effect of nutritional, physical, and emotional stress on development, are the manifestations of child health of primary pediatric concern. The holistic approach to the ontogenetic and ecologic changes is intrinsic to understanding the changes (both of disease and function) occurring throughout the life span of man.

During the first and second years, through electives and conjoint teaching, the student is provided with an opportunity to study the developmental processes and to learn some of the techniques for the proper examination and evaluation of the child. In the third year, the required clerkship is primarily devoted to developing the ability of the student to recognize and treat childhood disease, both on the inpatient and outpatient services. In the fourth year, through conjoint and elective courses, the student may extend his experience both in the broader areas of the social implication of childhood diseases and in selected specialized disciplines. Fourth-year students may also elect to extend their clinical experience in childhood diseases through the senior clerkship or subinternship.

Instruction is provided through conjoint courses, lectures, conferences, and clerkships.



## PHYSICAL MEDICINE AND REHABILITATION

### Chairman

Justus F. Lehmann  
CC814 University Hospital

### Professor

Justus F. Lehmann

### Associate Professors

Wilbert E. Fordyce, Walter C. Stolov

### Assistant Professors

Joseph C. Honet, Robert H. Jebesen, Jo Ann McMillan,  
M. Geraldine Shevlin, Donald R. Silverman, David C.  
Symington

### Instructors

Roy S. Fowler, Gary E. Hall, Fredric A. Harris, Ronald  
B. Hartley, Jennie A. Lucci, Densley H. Palmer, Ruth  
M. Peterson, Ann Olason, Bernard C. Simons, Roberta  
B. Trieschmann, Martha J. Trotter, Janet J. Whitmore

The Department of Physical Medicine and Rehabilitation provides instruction for medical students, interns, and residents in the comprehensive approach to rehabilitation problems. This includes special diagnostic and evaluative procedures; methods and rationale for use of physical therapy, occupational therapy, and other health professions; and advanced investigation of special problems encountered in the field. In addition, the Department conducts a residency training program for the specialty of Physical Medicine and Rehabilitation.

The Department offers curricula leading to a Bachelor of Science in Occupational Therapy, a Bachelor of Science in Physical Therapy, and a program in physical medicine and rehabilitation leading to the Master of Science degree in the Graduate School. The three-year residency alone is felt to be less than optimal training for the pursuit of a future academic career in Physical Medicine and Rehabilitation. The addition of a master's program provides essential experience in selecting, organizing, carrying out, and preferably publishing, an item of original research. Furthermore, advanced training through course work is a valuable addition to the student's preparation for such a career.

## Undergraduate Programs

### OCCUPATIONAL THERAPY

#### Head

Geraldine Shevlin  
EE803 University Hospital

Occupational therapy is the treatment, through planned activity, of persons who are physically or mentally ill or disabled by accident, disease, or birth defects. Activities used for treatment include creative and manual arts, recreational, educational, and prevocational activities, and skills of independent daily living.

The curriculum in Occupational Therapy is planned to give the student a broad base of liberal arts and humanities as well as specialized training. Since judgment is basic to effective application of skill and knowledge, the student is encouraged to develop the habits of investigation and continued study.

The trained therapist may look forward to a wide range of employment in rehabilitation centers and hospitals for the physically ill and disabled; in special programs such as public schools for handicapped children; and in private, state, and federal institutions for the mentally ill. Salaries compare with those of other service professions, and with the present critical shortage of qualified men and women for administrative, consultant, research, and teaching positions, the advancement opportunities are excellent.

### Bachelor of Science in Occupational Therapy

The Department offers undergraduate courses leading to the degree of Bachelor of Science in Occupational Therapy in the School of Medicine. The program is accredited by the American Occupational Therapy Association and the Council on Medical Education of the American Medical Association.

### The Preprofessional Program

Students at the University should register in the College of Arts and Sciences as pre-occupational therapy majors. High school students should arrange their current program of study for admission to that College. Transfer students should consult the Division of Occupational Therapy at University Hospital to determine their eligibility for the preprofessional or professional program. University of Washington freshmen should enroll for the orientation course Physical Medicine and Rehabilitation N107 Autumn Quarter. Sophomores take Physical Medicine and Rehabilitation 290 with permission from the Division of Occupational Therapy adviser.



### The Professional Program

Students are admitted to this curriculum at the junior level and, among other qualifications, must ordinarily have completed the following courses or their equivalent, with a cumulative grade-point average of 2.50. Exceptional cases will be considered when application is supported by adequate evidence of qualification.

Art 109 (Design); Chemistry 101, 102 (General and Organic Chemistry); Psychology 100 (General Psychology); Sociology 110 (Survey of Sociology).

### Graduation Requirements

*University requirements:* 180 credits plus 3 physical education activity credits.

*Proficiency requirements:* English 101, 102, 103 (Composition); Mathematics 101 (or comparable score on the Intermediate Mathematics Test); University language courses on first-year level (or equivalent score on placement test).

*Distribution requirements:* A total of 80 credits selected from three groups—humanities, social sciences, and natural sciences. Not more than 30 nor fewer than 20 credits may be counted from any one group. Selections must be made from the Special List and the College List found in the *College of Arts and Sciences* section of this Catalog. Credits in second-year language courses may be counted toward the humanities requirement. The courses required for the occupational therapy curriculum are of such a broad nature that there is generally little problem in satisfying these distribution requirements.

*Specific requirements:* These must be completed before the third year. Art 109 (Design); Chemistry 101 (General Chemistry) and 102 (Organic Chemistry); Psychology 100 (General Psychology) or 190 (Introduction to the Scientific Analysis of Behavior); Sociology 110 (Survey). It is also desirable to complete Biological Structure 301 (General Anatomy) and Zoology 208 (Elementary Human Physiology).

A total of approximately 30 quarter credits of varied skills to be chosen from the arts (fine and applied), from education, from recreation, or from other departments of the University, upon approval by the occupational therapy adviser, are required for graduation. The following basic skills courses are usually required of occupational therapy students at the University of Washington as a part of the above requirements:

Education 182 (Industrial Education: General Shop); Education 280 (Industrial Education: Fundamentals of Woodwork) and Education 383- (Industrial Education: Woodworking Technology); Home Economics 329 (Hand Weaving), and a course in ceramics.

### CURRICULUM IN OCCUPATIONAL THERAPY

A list of preprofessional and professional courses is given in a general sequential pattern as follows:

#### Junior Year

AUTUMN QUARTER	CREDITS
ELECTIVE . . . . .	5
PSYCHIAT 450 PRINCIPALS OF PERSONALITY DEVELOPMENT . . . . .	2
H EC 329 WEAVING . . . . .	2
EDUC 280 INDUSTRIAL EDUC: FUNDAMENTALS OF WOODWORK . . . . .	3
SKILLS ELECTIVE . . . . .	3
	<hr/> 15

WINTER QUARTER	CREDITS
PSYCHIAT 451 PRINCIPALS OF PERSONALITY DEVELOPMENT . . . . .	2
PM&R 380 O.T. THEORY I . . . . .	2
PM&R 469 THERAPEUTIC ACTIVITIES II . . . . .	4
ELECTIVE COURSE IN CERAMICS . . . . .	3
PSYCH 306 DEVELOPMENTAL PSYCHOLOGY . . . . .	5
	<hr/> 16

SPRING QUARTER	CREDITS
PSYCHIAT 452 CLINICAL PSYCHIATRY . . . . .	3
B STR 301 GENERAL ANATOMY . . . . .	4
ZOOL 208 ELEM. HUMAN PHYSIOLOGY . . . . .	5
PM&R 481 O.T. THEORY II . . . . .	3
	<hr/> 15

#### Senior Year

AUTUMN QUARTER	CREDITS
PM&R 332 PATH. PHYSIOL. FOR P.T. & O.T. . . . .	5
PM&R 444- FUNCTION OF LOCOMOTOR SYS. . . . .	4-
PM&R 444L- ANAT. LAB. FOR O.T. . . . .	1-
PM&R 468 THERAPEUTIC ACTIVITIES I . . . . .	4
	<hr/> 14

WINTER QUARTER	CREDITS
PM&R 320- MEDICAL SCIENCE . . . . .	4-
PM&R -445 FUNCTION OF LOCOMOTOR SYS. . . . .	4-
PM&R -445L ANAT. LAB. FOR O.T. . . . .	1-
PM&R 482 O.T. THEORY III . . . . .	4
B STR 331 NEUROANATOMY . . . . .	2
	<hr/> 15

SPRING QUARTER	CREIDTS
PM&R -321 MEDICAL SCIENCE . . . . .	4-
PM&R 442 ADV. KINESIOLOGY . . . . .	3
PM&R 483 O.T. THEORY IV . . . . .	4
PM&R 484 O.T. THEORY V . . . . .	2
EDUC 383- INDUSTRIAL EDUC: WOODWORKING TECHNOL. . . . .	3-
	<hr/> 16



#### **Clinical Affiliations**

A minimum of eight months total of clinical affiliations are required, to include experience treating patients of all age groups with physical disabilities and with psychological and social problems. Part of these affiliations are given at the University Hospital and part must be taken in other institutions. Students are given an opportunity to select from approved teaching programs throughout the United States. Clinical affiliations must be satisfactorily completed before the degree is awarded.

#### **PHYSICAL THERAPY**

##### **Head**

Jo Ann McMillan  
CC817 University Hospital

The profession of physical therapy offers a rewarding career of personal satisfaction through service to ill and physically handicapped people. The physical therapist is concerned with helping patients develop their abilities to the greatest degree possible in order that they may attend school or work and become contributing members of their families and their communities.

The health team of which the physical therapist is a member, is composed of physicians, nurses, occupational therapists, medical social workers, psychologists, vocational counselors, and others. All work together to help the patient achieve maximum rehabilitation. Typical of the patients referred for physical therapy are those whose disabilities result from fractures, nerve

injuries, arthritis, poliomyelitis, cerebral palsy, stroke, and other diseases or injuries of bone, joint, or neuromuscular systems.

After completing an approved physical therapy program, the therapist will find a wide variety of opportunities for employment. Positions are open in general and special hospitals, rehabilitation centers, physicians' offices and clinics, and in schools or institutions for handicapped children. Other opportunities exist in the area of home care programs, nursing homes, and other convalescent centers. The experienced therapist may choose to teach in a school of physical therapy. Research opportunities exist in many of the above-mentioned positions.

#### **Bachelor of Science in Physical Therapy**

This degree, granted through the School of Medicine, is offered through a four-year program. The curriculum is one of 42 approved by the American Physical Therapy Association and by the Council on Medical Education of the American Medical Association.

#### **Graduation Requirements**

The program is divided into two parts. The first portion of the program requires that the student enroll in prephysical therapy in the College of Arts and Sciences. Course work prerequisite to the advanced level is the basic framework for these two years. Students are also encouraged to enroll in courses in the humanities and social sciences. A cumulative grade-point average of 2.50 is required for entrance into the third year of the program.

Some students will need to complete part or all of the two years of prephysical therapy course work at another college or university before transferring to the University of Washington. This arrangement is acceptable, but requires students to have frequent conferences with a curriculum adviser to assure careful course evaluation and planning. A scheduling error may result in a loss of credit on transfer and produce a deficiency which would delay admission. Students may enter the third year during Autumn Quarter only. For this reason, transfer students are encouraged to schedule a planning session with a curriculum adviser early in the freshman year.

The last two years of the curriculum *must* be taken at the University of Washington in the School of Medicine. Entrance to this part of the program is dependent on the decision of the Advisory and Evaluation Committee for Physical Therapy. Students who

plan to enter the third year in the Autumn Quarter must make application to this committee before March 1 of the same year. Applications are available in the departmental office. Students are evaluated and admitted on the merits of demonstrated academic abilities and various measured aptitudes. Currently, a cumulative grade-point average of 2.50 is required for entrance, promotion, and graduation.

Students enrolled in their fourth year of college study who become interested in the profession of physical therapy are encouraged to investigate the requirements of those schools offering a certificate in physical therapy (12-15 months), as all students graduating from the University of Washington curriculum must complete the final seven quarters on this campus.

**University requirements:** 180 credits plus 3 physical education activity credits.

**Proficiency requirements:** These courses must be completed within the first two years—English 101, 102, 103 (Composition); Mathematics 101 (or comparable score on Intermediate Mathematics Test) and 104 (or satisfactory completion of trigonometry in high school). Completion of University language courses on first-year level (or equivalent score on a placement test).

**Distribution requirements:** A total of 80 credits selected from three groups—humanities, social sciences, and natural sciences. Not more than 30 nor fewer than 20 credits may be from any one group. Selections must be made from the Special List and the College List, found in the *College of Arts and Sciences* section of this Catalog. Credits in second-year language courses may be counted toward the humanities requirement.

**Specific requirements:** To be completed before the third year are:

#### **Humanities**

NO SPECIFIC REQUIREMENTS

#### **Social Sciences**

PSYCHOLOGY 100 OR 190 . . . . . 5 CREDITS  
ONE ADDITIONAL PSYCHOLOGY OR PSYCHIATRY COURSE . . . 2-5 CREDITS

#### **Natural Sciences**

B STR 301 GENERAL ANATOMY . . . . . 4  
CHEM 101 GENERAL AND 102 ORGANIC . . . . . 10  
MICRO 301 GENERAL . . . . . 5  
PHYS 114, 115 GENERAL . . . . . 8  
PHYS 117, 118 GEN. PHYSICS LAB. . . . . 2  
ZOO 208 ELEM. HUMAN PHYSIOL. . . . . 5



Students enrolled in other institutions should compare the catalog descriptions of the above courses to assure equivalency of content.

*Major requirements:* These are covered in the following courses taught in the last two years.

#### In Major Department

COURSE	CREDITS
PM&R 320-321 MEDICAL SCIENCES . . . . .	4-4
PM&R 332 PATHOLOGIC PHYSIOLOGY FOR P.T. AND O.T. . . . .	5
PM&R 408 TESTS AND MEASUREMENTS . . . . .	3
PM&R 414 PSYCHOLOGICAL ASPECTS OF DISABILITY . . . . .	2
PM&R 415 PROFESSIONAL RELATIONS . . . . .	2
PM&R 416 PRINCIPLES OF PHYSICAL THERAPY ADMINISTRATION . . . . .	2
PM&R 442 ADVANCED KINESIOLOGY . . . . .	3
PM&R 444-445 FUNCTION OF THE LOCOMOTOR SYSTEM . . . . .	4-4
PM&R 451 ANATOMY DISSECTION FOR P.T. . . . .	4
PM&R 461 MASSAGE . . . . .	2
PM&R 463-464 MODALITY TREATMENTS . . . . .	4-4
PM&R 466-467 ADVANCED BIOPHYSICAL AND PHYSIOLOGICAL EFFECTS OF MODALITIES . . . . .	2-2
PM&R 470-471-472 THERAPEUTIC EXERCISE . . . . .	3-3-2
PM&R 475-476 PHYSICAL RESTORATION OF THE DISABLED . . . . .	3-2
PM&R 489, 490, 491 CLINICAL CLERKSHIPS . . . . .	2,3,4
PM&R 495 CLINICAL AFFILIATION IN P.T. . . . .	5

#### In Supporting Departments

NURS 315 NURSING FOR P.T. . . . .	3
PATH 310 GENERAL . . . . .	2
B STR 331 NEUROANATOMY . . . . .	2

#### CURRICULUM IN PHYSICAL THERAPY

A list of preprofessional and professional courses is given in a general sequential pattern as follows:

##### First Year

AUTUMN QUARTER	CREDITS
CHEM 101 GENERAL . . . . .	5
ENGL 101 COMPOSITION . . . . .	3
PHYS. EDUC. ACTIVITY . . . . .	1
APPROVED ELECTIVES . . . . .	7
	16

WINTER QUARTER	CREDITS
CHEM 102 ORGANIC . . . . .	5
ENGL 102 COMPOSITION . . . . .	3
MATH 101 INTERMEDIATE ALGEBRA . . . . .	5
PHYS. EDUC. ACTIVITY . . . . .	1
APPROVED ELECTIVES . . . . .	2
	16

SPRING QUARTER	CREDITS
ENGL 103 COMPOSITION . . . . .	3
MATH 104 PLANE TRIGONOMETRY . . . . .	3
PHYS. EDUC. ACTIVITY . . . . .	1
APPROVED ELECTIVES . . . . .	9
	16

##### Second Year

AUTUMN QUARTER	CREDITS
PSYCH 100 GENERAL . . . . .	5
PHYS 114 GENERAL . . . . .	4
PHYS 117 GEN. PHYSICS LAB. . . . .	1
APPROVED ELECTIVES . . . . .	5
	15

WINTER QUARTER	CREDITS
MICRO 301 GENERAL . . . . .	5
PHYS 115 GENERAL . . . . .	4
PHYS 118 GEN. PHYSICS LAB. . . . .	1
APPROVED ELECTIVES . . . . .	5
	15

SPRING QUARTER	CREDITS
B STR 301 GENERAL ANATOMY . . . . .	4
ZOOL 208 ELEM. HUMAN PHYSIOLOGY . . . . .	5
APPROVED ELECTIVES . . . . .	6
	15

##### Third Year

AUTUMN QUARTER	CREDITS
PM&R 332 PATH. PHYSIOLOGY FOR P.T. & O.T. . . . .	5
PM&R 415 PROFESSIONAL RELATIONS . . . . .	2
PM&R 444- FUNCTION OF THE LOCOMOTOR SYSTEM . . . . .	4-
PATH 310 GENERAL PATHOLOGY . . . . .	2
APPROVED ELECTIVES . . . . .	2
	15

WINTER QUARTER	CREDITS
PM&R 320- MEDICAL SCIENCE . . . . .	4-
PM&R -445 FUNCTION OF THE LOCOMOTOR SYSTEM . . . . .	4-
PM&R 461 MASSAGE . . . . .	2
B STR 331 NEUROANATOMY . . . . .	2
APPROVED ELECTIVES . . . . .	3
	15

SPRING QUARTER	CREDITS
PM&R -321 MEDICAL SCIENCE . . . . .	4-
PM&R 408 TESTS & MEASUREMENTS . . . . .	3
PM&R 442 ADVANCED KINESIOLOGY . . . . .	3
PM&R 451 ANATOMY DISSECTION FOR P.T. . . . .	4
APPROVED ELECTIVES . . . . .	1
	15

##### Fourth Year

AUTUMN QUARTER	CREDITS
PM&R 466- ADVANCED BIOPHYSICAL & PHYSIOLOGICAL EFFECTS OF MODALITIES . . . . .	2-
PM&R 470- THERAPEUTIC EXERCISE . . . . .	3-
PM&R 475- PHYSICAL RESTORATION OF THE DISABLED . . . . .	3-
PM&R 489 CLINICAL CLERKSHIPS IN P.T. . . . .	2
NURS 315 NURSING FOR P. T. . . . .	3
APPROVED ELECTIVES . . . . .	2
	15

WINTER QUARTER	CREDITS
PM&R 414 PSYCHOLOGICAL ASPECTS OF DISABILITY . . . . .	2
PM&R 463- MODALITY TREATMENTS . . . . .	4-
PM&R -467 ADVANCED BIOPHYSICAL & PHYSIOLOGICAL EFFECTS OF MODALITIES . . . . .	-2
PM&R -471- THERAPEUTIC EXERCISE . . . . .	-3-
PM&R -476 PHYSICAL RESTORATION OF THE DISABLED . . . . .	-2
PM&R 490 CLINICAL CLERKSHIPS IN P.T. . . . .	3
	16

SPRING QUARTER	CREDITS
PM&R 416 PRINCIPLES OF PHYSICAL THERAPY ADMINISTRATION . . . . .	2
PM&R -464 MODALITY TREATMENTS . . . . .	4-
PM&R -472 THERAPEUTIC EXERCISE . . . . .	-2
PM&R 491 CLINICAL CLERKSHIPS IN P.T. . . . .	4
APPROVED ELECTIVES . . . . .	3
	15

SUMMER QUARTER	CREDITS
PM&R 495 CLINICAL AFFILIATION IN P.T. . . . .	5

## **Comparison of Curricula in Occupational and Physical Therapy**

The educational programs in Occupational Therapy and in Physical Therapy share a common need for studies in human anatomy and physiology with a special emphasis on the musculo-skeletal and nervous systems and a need for basic studies in pathological physiology and medical sciences. In these areas of study, the two curricula share identical courses. In other areas, the two curricula are independent programs, with separate faculties for instruction in the professional courses and separate Advisory and Evaluation Committees.

The application procedures, student promotion policies, and fees apply to both curricula except where exceptions are specifically noted.

### **Admission**

For entrance to the Autumn Quarter, the applicant must initiate the following steps on or before March 1: (1) Arrange a personal interview with a member of the teaching staff of the division; this may be waived under certain conditions. (2) Submit formal application to the Advisory and Evaluation Committee of the division concerned, c/o Department of Physical Medicine and Rehabilitation, CC814 University Hospital (application forms are available from the Department). (3) Arrange for official transcript(s) to be sent directly from the registrar(s) of previous college(s) to the Advisory and Evaluation Committee, including complete record with grades and credits to date. (When college transcripts do not include a complete list of high school courses and credits, such a list must be submitted with the application. Also include a list of courses the applicant is currently taking or will take to complete preprofessional requirements. An official record of grades for such courses must be submitted when available.) (4) An unmounted recent photograph, 2x2 inches, is desirable but not required.

The Advisory and Evaluation Committee bases its decision on the objective evaluation of applicant's residence, preprofessional training, evidences of scholarship, and evidences of personal qualification for the work. The Committee or any one of its members may request a personal interview with the applicant to supplement the above information.

The Committee gives written notice to the applicant as soon as possible after a decision is made. Within two weeks after a candidate has been notified that he is

accepted, the Comptroller of the University requires a deposit of \$50.00. This deposit is applied to the tuition for the first quarter. It is refundable only in cases of withdrawal for bona fide illness, failure to complete basic preprofessional requirements, induction into military service, or failure to pass the physical examination required of all students at the time of registration.

### **Student Achievement and Promotion**

The University grade-point system is used. Students are notified of their grades at the end of each quarter.

A student must maintain a satisfactory academic standing to be graduated. A University of Washington cumulative grade-point average of 2.50 is currently required. If the work in a course is incomplete, a grade of I may be given. This Incomplete must be removed before September 15 if the student is to advance into the next year's class.

At the end of each academic year the Advisory and Evaluation Committees evaluate the accomplishment of the student during the year and determine his fitness for promotion. When promotion is not recommended, the student is subject to dismissal from the curriculum. The Advisory and Evaluation Committees reserve the right to dismiss a student from the curriculum for any reason deemed sufficient. A student is advanced only when his general attitude, scholastic progress, and personal attributes are considered satisfactory.

### **Class Schedules**

The curriculum in Physical Therapy and the curriculum in Occupational Therapy operate on the quarter system of the University. There are three 11-week quarters in the third and fourth years.

Occupational Therapy requires a minimum of nine months or three quarters of additional clinical affiliation. Physical Therapy requires three months of clinical practice which is completed in the summer quarter of the senior year.

### **Tuition and Fees for Third and Fourth Years**

All tuition and fees are payable at the time of registration. The University reserves the right to change any of its fees without notice. The following is a table of charges per quarter for the six quarters of academic work in the curriculum of Physical Therapy and in the curriculum of Occupational Therapy.



	ACADEMIC QUARTER	ACADEMIC YEAR	SUMMER QUARTER
FULL-TIME RESIDENT . .	\$115.00	\$345.00	
FULL-TIME NONRESIDENT	275.00	825.00	
PART-TIME (CLINICAL TRAINING)			
RESIDENT AND NONRESIDENT . . . . .			\$81.00
PART-TIME RESIDENT . .	81.00	243.00	
PART-TIME NONRESIDENT .	211.00	633.00	

EXEMPTIONS, SPECIAL FEES, AND REFUND OF FEES  
(Same as for medical students)

## Graduate Program

### Graduate Program Adviser

Justus F. Lehmann  
CC814 University Hospital

The graduate program in Physical Medicine and Rehabilitation leads to the Master of Science degree. Applicants for admission to the program must meet the requirements of the Graduate School. (See the *Graduate Study* section of this Catalog.)

It is anticipated that graduate students working toward the Master of Science degree will take some of the course work during their three-year residency and will devote an additional one to two years to the master's program. Opportunity will be given to students who have already completed their residency to combine the course work and research in a two- to three-year program.

## PSYCHIATRY

### Chairman

Herbert S. Ripley  
BB867 University Hospital

### Professors

Herbert S. Ripley, Irving N. Berlin, Thomas H. Holmes III, Charles R. Strother

### Associate Professors

Joseph Becker, John L. Hampson, Merlin H. Johnson, Nathaniel N. Wagner

### Assistant Professors

Cornelis B. Bakker, Carl N. Brownsberger, Mary M. Campbell, John E. Carr, Adolph E. Christ, Gordon D. Jensen, Caroline E. Preston, Herbert C. Wimberger

### Instructors

G. Gordon Biely, George C. Bolian, Albert S. Carlin,

Laurence P. Jacobs, Jackson D. Nickols, E. Mansell Pattison, Ann R. Pytkowicz, Otis E. Ramsey, Jr., Ronald C. Simons, Otto H. Spoerl, Brenda D. Townes

### Research Assistant Professor

Minoru Masuda

The Department of Psychiatry aims to provide students of medicine, nursing, psychology, social work, education, and others concerned with human problems with a scientific grasp of psychiatric principles so that they will be able to evaluate interpersonal relationships and use to the greatest advantage their potentialities for understanding and dealing with personality reactions.

Instruction in psychiatry is given during each of the four years of the medical course and is coordinated and integrated with the various disciplines in medicine. Thus, from the beginning of his medical career the student is stimulated to think in terms of understanding the totally functioning human being.

## RADIOLOGY

### Chairman

Melvin M. Figley  
SS230 University Hospital

### Professors

Melvin M. Figley, Robert G. Parker

### Associate Professors

Robert S. Leighton, John W. Loop, Wil B. Nelp, Leon A. Phillips

### Assistant Professors

Julian H. Capps, Gerald M. Christensen, C. Benjamin Graham, Kenneth L. Jackson, Howard J. Ricketts, James W. Rowe, Peter Wootton

### Instructors

John R. Gustafson, Joachim F. Sailer, Robert E. Schaefer

### Lecturer

Ralph M. Baltzo

Radiology is that branch of clinical medicine which applies electromagnetic and nuclear radiations to the detection and treatment of disease. In diagnostic radiology, the differential absorption of penetrating radiation is detected by fluorescent crystals (fluoro-

scopy) or by photographic emulsions (radiography). The majority of important diseases have some radiologic expression. The diagnostic radiologist is, in effect, a general pathologist with special methods for internal examination.

Therapeutic radiology depends upon the differential destruction of neoplastic cells by radiations. Many forms of cancer are best treated by radiation either for primary cure or palliation of symptoms. Of necessity, the therapeutic radiologist is a specialist in dealing with cancer.

The radiations emanating from disintegrating radioactive isotopes can be measured in quantity and energy and plotted spatially in living tissues as well as in samples of body fluids. Nuclear medicine is that branch of radiology which concerns itself with isotopes in organs and metabolic systems for diagnosis and treatment.

Radiation biology and radiation physics are the basic sciences related to clinical radiology having to do with study of the effect of radiations on living systems and the description of radiation fields in terms of geometry and intensity. Research in these aspects, including the development of instrumentation, is basic to progress in clinical radiology.

The Department of Radiology is represented in each of these divisions by senior staff with extensive practical experience. Instruction is provided in each area for medical students, residents, and other physicians. Certain courses are open to graduate students. The staff and its teaching and research activities are represented in each of the hospitals affiliated with the University.

## **SURGERY**

### **Chairman**

K. Alvin Merendino  
BB477 University Hospital

### **Professors**

John W. Bell, James R. Cantrell, Henry N. Harkins, K. Alvin Merendino, Lloyd M. Nyhus

### **Associate Professors**

Robert V. De Vito, David H. Dillard, John K. Stevenson, Donald E. Strandness, Jr., Loren C. Winterscheid

### **Assistant Professors**

Edwin Brockenbrough, Hubert M. Radke

### **Instructor**

Cyril S. Ito

### **Research Professor**

T. Lloyd Fletcher

### **Research Assistant Professor**

June L. DeVito

### **Research Instructors**

Moses Namkung, Hsi-Lung Pan

In the Department of Surgery, instruction is carried on during all four years of the medical student's training and is integrated with that of the other departments in the School of Medicine. In the first year, lectures are given concerning a few selected basic surgical applications of biology. In the second year, emphasis is placed on surgical physical diagnosis. In the third year, the inpatient clerkship in general surgery forms the core of the entire program. The student is assigned patients and handles all aspects of care except direction of treatment. In the fourth year, attention is paid to neurological surgery, orthopedics, and urology. Special studies in general surgery, experimental surgery, ophthalmology, otolaryngology, plastic and maxillofacial surgery, and other surgical specialties are offered as electives.

The purpose of the undergraduate instruction in surgery is to provide the student with a basic background of surgical principles and surgical diagnosis and a knowledge of surgical diseases.

In addition to the basic undergraduate instruction, a fully certified surgical residency program is available in general and thoracic surgery.

## **Graduate Program**

### **Graduate Program Adviser**

David H. Dillard  
BB447 University Hospital

The faculty in the Department of Surgery offer a program in the Graduate School leading to the degree of Master of Science.

Students participating in residency programs may apply for admission to the Graduate School to work toward a degree of Master of Science by meeting the requirements of the Graduate School as outlined in the *Graduate Study* section. Performance of a fundamental experimental research problem of high caliber is an additional requirement for this advanced degree.



## UROLOGY

**Chairman**

Julian S. Ansell  
D416 Health Sciences Building

**Professor**

Julian S. Ansell

**Assistant Professors**

Warren H. Chapman, Norman R. Zinner

**Instructor**

John A. Wolf, Jr.

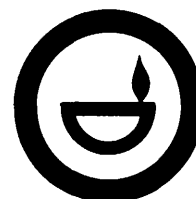
In urology, which is the surgical discipline concerned with diseases of the male genitourinary organs and the female urinary tract, training for medical students starts in the second year and continues through the third and fourth years.

Training is also provided for interns, nurses, and physical medicine technologists and allied specialists.

Two candidates are admitted yearly to the four-year urology residency program which is fully approved and certified.







## NURSING

### **Dean**

Mary S. Tschudin  
C309 Health Sciences Building

### **Assistant Dean**

Katherine J. Hoffman

### **Professors**

Elizabeth C. Giblin, Katherine J. Hoffman, Kathleen M. Leahy (emeritus), Miriam Lowenberg, B. Louise Murray, Elizabeth S. Soule (emeritus), Mary S. Tschudin

### **Associate Professors**

Marjorie B. Batey, A. Evelyn Burke, Marguerite Cobb, Dorothy M. Crowley, Richard M. Emerson, Doris Geitgey, Florence I. Gray, Laurie Gunter, M. Edith Heinemann, Dolores Little, Louise Mansfield, Gladys Nite, Virginia Olcott, Maxine L. Patrick, Harriet H. Smith (emeritus)

### **Assistant Professors**

John R. Atkins (acting), Kathryn E. Barnard, Mary Boozer, Edna M. Brandt, Pauline Bruno, Doris Carnevali, Carrie Hall, Elizabeth Hastie, Stella I. Hay, Ingegerd Hellstrom, Joy R. Joffe, M.D., Edith Metz, Jeanette G. Nehren, Barbara K. Redman, Margaret Regan, Patricia A. Rose, Patricia Sand, M. Jean Saxon, Evalyn Taylor, Tomine Tjelta

### **Instructors**

Dorothy Bruner Amis, Zoe Anderson, Patricia M. Bentz, Flora Breckenridge, Susan Brueckner, Joan V. Buckles, Leah Cashar, Louise A. Colin, Mary E. Durand, Patricia A. FitzGerald, Mary Jean Garlinghouse, Janet George, Carol J. Gray (acting), Susan J. Greenleaf, Benita Hall, Margaret E. Hardy, Shirley J. Harlow, Isobel D. Hartley, Rita L. Hoeschen, Linda Hulthen, Margaret John, Mary C. Jones, Doris Julian, Barbara R. Killen, Margaret G. Klemer, Constance Macdonald, M.D., Mabel Mettler, Kathryn F. Meuwly, Aline Midthun, Dorothy Olson, Linda Olson, Rosemary Pittman, Marcene Powell, Mary Poxorski, Catherine Rehbein, Janet S. Reinbrecht, Joan F. Risley, W. Louise Shores, Muriel V. Standeven, Margo Stephens, Sandra A. Stevens, Joan Wilson, Elizabeth Worthy

### **Lecturers**

Alice L. Fisher, Lucille B. Stewart

The School of Nursing assumes the responsibility for the quality of its educational programs and for promoting effective nursing service for the public through teaching, research, and service.

The professional nurse is characterized by her ability to give complete nursing care in all fields; to make effective use of basic communication skills in organizing, planning, and directing the work of others; to establish cooperative relationships with allied professional and citizen groups for the improvement of total health services; to maintain personal identity; and derive satisfaction in her daily life as she serves her community, upholds the ideals of the nursing profession, and works toward its continued improvement and growth.

The qualified student brings to the professional school a sufficient background from which she makes her individual contribution to nursing. Self-direction, diversified interests, and a breadth of academic background gained through the use of all University resources contribute to fulfillment of professional responsibilities and personal interests. The physical, biological, and social sciences and the humanities are recognized as essential aspects of professional nursing education.

Curricular offerings are organized to develop a professional nurse who can give complete nursing care within the framework of the physician's therapeutic design, carry out nursing procedures competently and with understanding, exercise discriminative judgment and insight, and assist in the prevention of disease and in the conservation of physical and mental health in the community. Correlated theory and clinical experience are offered in the care of the physically and mentally ill in the hospital and in the home, and in teaching, treatment, rehabilitation, prevention, and health conservation for all age groups. Nursing experiences are planned to encourage the student to integrate knowledge from all areas and to gradually broaden and deepen her understanding, values, and skills. Individual counseling and directed learning help the student to develop her personal and professional potentialities. This broad background of education facilitates the student's continuing professional development following graduation and provides the foundation for graduate study.

In its graduate programs, the School endeavors to assist qualified graduate students toward the attainment of individual professional goals. The student should increasingly assume independent responsibility for learning, scholarly investigation, and communication of the outcome of research. The School of Nursing promotes and fosters opportunities for individual, group, intra- and interdisciplinary study and research, and for a mutual sharing of contributions.

In order to qualify for a graduate degree, the student should be able to work effectively with others to meet the health needs of people and, since research in nursing is essential for the continuing growth of the profession, be able to use a scientific approach in solving nursing problems and to communicate the findings effectively. Graduate work should be directed toward intensive study in a selected area or areas of nursing. It is recognized that the level of accomplishment in clinical nursing, teaching, or supervision will vary for each student. All students are expected to be basically competent in nursing. One of the criteria for admission to graduate study is evidence of undergraduate preparation in all clinical fields including psychiatric nursing and public health nursing. The School offers programs leading to the degrees of Bachelor of Science in Nursing, Master of Arts, and Master of Nursing. Individually planned post-master degree programs are available. A minor in nursing on the doctoral level is offered for students matriculated in another discipline. The School also offers supplementary work in psychiatric and public health nursing and courses in specific clinical subjects for affiliating students in other schools of nursing. All programs are fully approved by the National League for Nursing. The baccalaureate program is approved preparation for Public Health nursing.

Majors in nursing are held responsible for knowing and adhering to the rules and regulations of the University of Washington and the School of Nursing. Because the School has a responsibility to the public and to the profession of nursing, it must require of its graduates not only adequate knowledge of nursing theory and practice, but also the qualifications which are important to a professional nurse. Maintenance of good relationships with patients and co-workers, a well adjusted mental outlook, and a sincere interest in people are considered requisite for a successful nursing career. Good physical and mental health is another necessary factor for continuing success in nursing.

The School of Nursing reserves the privilege of retaining only those students who, in the judgment of the faculty, satisfy the requirements of scholarship, health, and personal suitability for nursing.

Nursing education at the University began in 1917, under the leadership of Mrs. Elizabeth S. Soule, with a pre-nursing program, consisting of a few public health nursing courses for graduates of hospital schools of nursing. These offerings were extended until both undergraduate and graduate programs were developed. The School of Nursing was established in 1934 in the



College of Arts and Sciences and in 1945 became an independently organized professional school in the Division of Health Sciences.

### **School Facilities and Services**

The Health Sciences Building, located at the south end of the campus near the Portage Bay Yacht Basin, houses the administrative units of the Schools of Nursing, Dentistry, and Medicine, a variety of classrooms, research and laboratory facilities, a library, and an auditorium. The University Hospital, adjacent to the Health Sciences Building, which was opened in May 1959, has a 320-bed capacity. It provides extensive inpatient and outpatient departments and is an excellent teaching and research facility for students in nursing and other health sciences fields.

In conducting the undergraduate and graduate clinical teaching programs, the School of Nursing utilizes the facilities of the University Hospital, the general facilities of the King County Hospital System, with a bed capacity of 392 in King County Unit I and 189 in Unit II; Swedish Hospital Medical Center, with a bed capacity of 400; Virginia Mason Hospital, with a bed capacity of 235; and The Doctors Hospital, with a bed capacity of 184. Hospitals offering health care for selected individuals or specific illnesses include the Children's Orthopedic Hospital and Medical Center, with a capacity of 209 beds; Firland Sanitorium, with a capacity of 300; the United States Veterans Administration Hospital, capacity 320; and the state mental hospitals: Northern State Hospital, capacity 1,119; Western State Hospital, capacity 2,309; and Eastern State Hospital, capacity 1,324. Experience in community health nursing is arranged through the Public Health Departments of Seattle-King County, Tacoma-Pierce County, Snohomish County, Bremerton-Kitsap County, Benton-Franklin County, Clark-Skamania County, Bellingham-Whatcom County, the City of Spokane, and Spokane County Health Departments. Other community facilities are used, as necessary, to provide selected learning experiences for students.

### **Associated Nursing Students**

All students registered in the basic program of the School of Nursing are eligible for membership in the Associated Nursing Students organization. By belonging to ANS, students are eligible to belong to SWANS (State of Washington Association of Nursing Students), which is made up of students from all the schools of nursing in Washington. As a member of SWANS, a student is automatically a member of the National Student Nurse Association.

Among the functions of ANS are those which provide for unity and fellowship among classes, the promotion of interest in nursing, and the promotion of the interests and welfare of the nursing student.

### **RN Club**

All graduate nurses in the baccalaureate and graduate programs are eligible for membership in the Registered Nurses Club.

### **Admission**

#### **Admission as Freshman**

To prepare for normal progress in the School of Nursing, the student requesting admission as a freshman is expected to meet the scholastic criteria that all students meet for entrance to the University. In addition, students are advised to select chemistry as their first laboratory science and physics as an elective. A third year of mathematics is strongly recommended, and a fourth unit in English will be found helpful.

#### **Progression to the Clinical Program**

Progression to the clinical program (last three years) is selective and based on availability of adequate clinical facilities. To be considered for progression into the second year, the student must have achieved a minimum cumulative grade-point average of 2.00 at the end of the Winter Quarter of the freshman year.

#### **Admission With Advanced Standing**

Available clinical facilities place certain limitations on the number of transfer students who may be accepted. Not all students who apply and meet minimum standards of the University can be placed in the School of Nursing. Students will be selected to the extent that facilities are available and according to the qualifications they present.

Applicants who are registered nurses must be graduates of an approved junior college or hospital school of nursing whose curriculum included psychiatric nursing. (This criterion may be met through a supplementary course in psychiatric nursing offered by the University of Washington prior to admission to the baccalaureate program.)

Registered nurse applicants for admission to advanced undergraduate standing should request their school of nursing to send two copies of their record to the University of Washington Office of Admissions as part of the admission procedure. Admission to the graduate program of the School of Nursing requires acceptance by the School of Nursing as well as formal admission to the Graduate School.

### **Extra Fees and Expenses**

In addition to usual tuition and fees, students should be prepared to pay the cost of transportation between the University campus and the teaching units. This amount will vary from quarter to quarter. Basic degree students should plan approximately \$50.00 for the purchase of uniforms in the sophomore year and approximately \$10.00 for special achievement tests throughout the program. Undergraduate registered nurse students are required to take a Comprehensive Placement Examination before registration. Graduate students who are candidates for an advanced degree should plan to have available approximately \$150 for costs connected with the preparation of the master's thesis.

### **Licensure**

Nurses who are graduates of approved nursing programs may be admitted to the School of Nursing prior to completion of the State Board Examination, but continuation in either the undergraduate or graduate program requires that students be currently licensed to practice nursing in some state or country. Nurses who expect to be employed in nursing while attending the University must be licensed to practice in the state of Washington.

### **Health Care**

All students in the School of Nursing are required to take a special health examination, chest X rays, and inoculation for smallpox, typhoid, tetanus, poliomyelitis, and diphtheria before beginning clinical laboratory courses, and previous to the public health nursing field quarter. Defects must be corrected at the student's own expense. Students are expected to assume initiative in following the health program.

### **Financial Aids**

A number of scholarships are awarded annually on a competitive basis. In general, scholarships are awarded on the basis of (1) scholarship achievement above the 3.00 (B) grade-point average, (2) financial need, and (3) participation in the extracurricular activities of the campus and community.

Applications are available through the Office of the Dean of Students during Winter Quarter, and awards are made late in the spring for the following academic year. The University bulletin, *Handbook of Scholarships*, describes the various awards. All students are encouraged to investigate resources in their communities for possible scholarships or other financial aids.

### **Undergraduate Scholarships, Awards, and Loans for Nursing Students**

A limited number of scholarships, awards, and loans are administered by the School of Nursing Scholarship Committee for currently enrolled students. These are listed in the *Handbook of Scholarships*. The *Wealthy Ann Robinson Scholarship* is awarded to an outstanding registered nurse preparing for public health nursing. Students may also apply through this Committee to the local leagues for nursing for scholarship assistance and for the *Elizabeth Sterling Soule Scholarship* in the Washington State Nurses' Association.

Loan funds of both an emergency and long-term nature are available upon application to the Office of the Dean of Students. This office also assumes responsibility for the National Defense Student Loan Program. Loans are available under the Nurse Training Act of 1964 for students on all levels. Full-time students who are making normal and satisfactory progress are eligible to apply.

Amounts up to \$200 are loaned, upon application to the School of Nursing Scholarship Committee, from the Nursing Education Loan Fund. Registered nurses may apply directly to the Loan Fund of the Washington State Nurses' Association.

The Swedish Hospital Award is given by the Board of Directors of the Swedish Hospital to the outstanding basic student at the end of the junior year. Candidates are selected on the basis of their scholarship, their contribution to the community, the University, and the School of Nursing.

Federal grants and traineeships are available to registered nurse students who qualify in the baccalaureate program for the final four quarters of the curriculum. Basic and registered nurse students who anticipate continuing with graduate study in psychiatric nursing and who meet requirements may be considered for the National Institute of Mental Health Traineeship during the junior and senior years of their baccalaureate studies. Applications for federal grants and traineeships are made to the Dean of the School of Nursing.

### **Educational Programs Offered by the Military Services**

The Army Student Nurse Program provides two years of educational opportunity on enlisted reserve status during the junior and senior years of the curriculum. Upon completion of the basic nursing program and licensure as registered nurses, participants are required to accept commissions as second lieutenants in the



Army Nurse Corps and to serve on active duty for a period determined by the time spent in the student nurse program.

The Navy Nurse Corps Candidate Program offers a similar opportunity for qualified students during the junior and senior years. Upon graduation and licensure as registered nurses, appointees under this program will be obligated to accept appointment as ensigns in the Nurse Corps of the Naval Reserve and to serve on active duty for a period determined by the time spent in the student nurse program.

Undergraduate registered nurse students in the baccalaureate program may apply for appointment in the Army or Navy Student Nurse Programs discussed above.

Students in the baccalaureate programs may also apply to the Officer Student Training and Extern Program offered by the U.S. Department of Health, Education, and Welfare.

#### **Postbaccalaureate and Graduate Traineeships, Assistantships, and Fellowships**

The University of Washington participates in the Professional Nurse Traineeship Program as administered by the Division of Nursing of the U.S. Public Health Service. This program offers a limited number of traineeships for qualified applicants who are preparing for administration, teaching, supervision or clinical specialization in nursing, including public health nursing. Under the program of the National Institute of Mental Health a limited number of traineeships are available for nurses eligible for advanced study in psychiatric nursing, and for psychiatric nurses who are seeking doctoral level study in other disciplines.

Graduate students are eligible to apply to the Office of the Dean of Students for a National Defense Loan under the Nurse Training Act of 1964.

Under a grant from the Public Health Service, traineeships are available for a limited number of students enrolled in the Nurse-Scientist Graduate Program leading to the Doctor of Philosophy degree.

Applications for the above traineeships should be made directly to the Office of the Dean of the School of Nursing.

The Graduate School provides for the employment of teaching and research assistants. (See *Graduate Study* section.) Foreign students on an educational visa are eligible to apply for such assistantships.

Requests for assistantship application forms should be sent to the Admissions Office, and the completed application should be returned to the Dean, School of Nursing.

Post-master degree students in nursing, and predoctoral students with a major in another discipline and a minor in nursing, may be eligible for financial assistance through one of the following fellowship programs. Applications should be made directly to the agency administering the fellowship. *The United States Public Health Service Fellowship*: Chief, Research Grants Branch, Division of Nursing, Public Health Service, DHEW, Silver Spring, Maryland, 20910. *The Nurses Educational Fund Incorporated*: 10 Columbus Circle, New York, N.Y., 10019.

#### **Navy Nurse Corps Candidate Program**

Graduate students, who are accepted, incur the same service obligations as do undergraduate candidates. Upon completion, they are commissioned as lieutenants junior grade or lieutenants, depending upon their professional nursing experience.

#### **Nursing Education Award**

The Nursing Education Award is granted annually to the outstanding graduate of each of the programs of the School of Nursing. Candidates are selected on the basis of their scholarship, their contribution to the community, the University, and the School of Nursing, and their potential contribution to the profession of nursing.



## UNDERGRADUATE PROGRAMS

### Advisers

Florence Gray  
D325 Health Sciences Building  
Virginia Olcott  
D325 Health Sciences Building

### Bachelor of Science in Nursing

The curriculum leading to the Bachelor of Science in Nursing degree is designed for two types of students; one is the student with no previous preparation in nursing, the other the student who is a graduate of a hospital or community college school of nursing. For the student with no previous preparation in nursing the curriculum is planned for four academic years and one summer session at the end of the sophomore year. For the student who is a registered nurse, the length of the program will vary depending on her previous education and the course load carried while at the University. There is a close interrelationship between the general and professional aspects of the program. The distribution of required courses provides a balance between general and professional education. An academic adviser will assist the student in the selection of the appropriate required courses and will make suggestions for electives in the humanities and social sciences which will contribute to the individual's intellectual and personal development.

Clinical instruction is provided in all of the major fields of nursing: medical-surgical, maternal-child health, psychiatric, and public health nursing. This instruction is carried on in a variety of hospitals and other community facilities.

Public health nursing field instruction during the senior year may be in one of several agencies either in or outside of Seattle. During the field instruction quarter the student usually lives in the area in which she has been assigned. She must be prepared to have a car for use during that quarter, have a current driver's license, and meet state requirements for insurance protection.

### Distribution of required courses:

<i>Area</i>	<i>Credits</i>
Nursing	90
Related Medical Sciences	8
Physical and Biological Sciences	31
Humanities	24
Social Sciences	14
Electives (Humanities and Social Sciences)	13
<b>Total</b>	<b>180</b>

Plus 3 Physical Education Activity credits

### Program for Students With No Previous Preparation in Nursing

Study in the arts and sciences is distributed over the first three years. Professional nursing study is dispersed throughout the curriculum, but greater concentration is provided during the junior and senior years.

Graduates of the program are prepared to enter nursing practice in all clinical fields of nursing. They are eligible to take the state licensing examination to become registered nurses.

### Requirements of this program are:

<i>Area</i>	<i>Credits</i>
Nursing (102, 227, 228, 229, 260, 298, 299, 301, 367, 368, 369, 370, 371, 372, 373, 374, 409, 412, 413, 414, 415, 416, 421, 422, 429)	90
Related Medical Sciences (Preventive Medicine 323, 410, and Pharmacy 352)	8
Physical and Biological Sciences (Chemistry 101, 102, Physics 114, Microbiology 301, Conjoint 316, 317-318)	31
Humanities (English 101, 102, 103 required and Humanities 101, 102 recommended)	24
Social Sciences (Psychology 100, Sociology 110, Home Economics 319)	14
Electives in Humanities and Social Sciences	13
<b>Total</b>	<b>180</b>

Plus 3 Physical Education Activity credits

### CURRICULUM

#### First Year

<b>AUTUMN QUARTER</b>	<b>CREDITS</b>
CHEM 101 GENERAL . . . . .	5
ENGL 101 COMPOSITION . . . . .	3
HUM ELECTIVE . . . . .	5
*PE 112 BASIC ACTIVITIES (GENERAL) . . . . .	1
ELECTIVE . . . . .	2
	<b>16</b>

<b>WINTER QUARTER</b>	<b>CREDITS</b>
CHEM 102 GENERAL AND ORGANIC . . . . .	5
ENGL 102 COMPOSITION . . . . .	3
HUM ELECTIVE . . . . .	5
NURS 102 INTRODUCTION TO PROFESSIONAL NURSING . . . . .	2
*PE 114 BASIC ACTIVITIES (APPLIED) . . . . .	1
	<b>16</b>

<b>SPRING QUARTER</b>	<b>CREDITS</b>
ENGL 103 COMPOSITION . . . . .	3
ELECTIVE . . . . .	3
HUM ELECTIVE . . . . .	5
PHYSICS 114 GENERAL . . . . .	4
PE ACTIVITY ELECTIVE . . . . .	1
	<b>16</b>

\* Physical Education 112 and 114 recommended but not required.





Sociology 110 and Physics 114 may be taken in either the freshman or sophomore year.

Courses in the freshman year may be taken in any accredited college, or university. The remainder of the program is to be completed at the University of Washington. Students who wish to transfer to this School from another university school of nursing may be admitted to the basic professional program if they qualify for admission to the University and there are facilities available in the class they wish to enter. (See Admission With Advanced Standing.)

#### Registered Nurse Program

This program differs in specific content and sequence from the program for students with no preparation in nursing, but is designed to attain the same goals.

A student in this program may be allowed a limited number of credits in nursing on the basis of the results of a Comprehensive Nursing Examination on selected nursing courses administered at the University of Washington. An appointment to take this examination may be requested of the Bureau of Testing at the University, at any time, but must be completed at least five working days prior to registration. Credits earned in biological and physical sciences ten years prior to entering the program are not accepted.

Registered nurse students are urged to carry professional liability insurance.

The requirements of this program are:

<i>Area</i>	<i>Credits</i>
NURSING (Courses which must be taken at the University of Washington are: 301, 351, 353, 354, 356, 358, 412, 415, 416, 421, 422, 429)	90
RELATED MEDICAL SCIENCES (Preventive Medicine 323, 410, and Pharmacy 352)	8
PHYSICAL AND BIOLOGICAL SCIENCES Biological Structure (Anatomy) and Physiology, 12 credits (preferably Conjoint [Medical] 316, 317-318) General Physics, 4 credits (preferably 114) General and Organic Chemistry, 10 credits (preferably 101 and 102) General Microbiology, 5 credits required (301)	31

#### HUMANITIES

(English 101, 102, 103 required and Humanities 101, 102 recommended)

24

#### SOCIAL SCIENCES

General Psychology, 5 credits (preferably 100)  
General Sociology, 5 credits (preferably 110 or 310)  
Family Nutrition, 4 credits (preferably Home Economics 319)  
Interviewing, 2 credits (Social Work 401)

16

ELECTIVES IN HUMANITIES OR SOCIAL SCIENCES 11

Total 180\*

## GRADUATE PROGRAMS

#### Graduate Program Adviser

Edith Metz  
D311 Health Sciences Building

The School of Nursing offers graduate curricula leading to the degree of Master of Arts or Master of Nursing. Post-master's programs planned on an individual basis are also available, including a doctoral minor for students matriculated in another discipline.

#### Master's Programs

The curricula provide for advanced professional preparation and research in a specialized clinical area of nursing and in teaching, supervision, or administration. Majors are offered in the following nursing areas: maternal-child, medical-surgical, psychiatric, public health, administration of nursing services, and administration of schools of nursing.

Most programs are four quarters in length, but they may vary with the particular major field and the number of credits carried each quarter. At least half of the total credits taken must be at the 500 level or above. Each student in the master's degree program carries out research in nursing and presents a written thesis. Within the first quarter of graduate study, the student should plan her entire program with her major adviser in order to ensure a satisfactory sequence of courses.

\* It is required that 60 of these credits be in upper-division courses.





**Master of Nursing:** Emphasis is on advanced preparation in an area of specialization in nursing. Supporting courses from at least two fields outside of nursing are required. A foreign language is not required for this degree.

<i>Area of Study</i>	<i>Credits</i>	<i>Area of Study</i>	<i>Credits</i>
Major: advanced nursing courses	18	Major: advanced nursing courses	18
Related Fields: courses in at least two other disciplines	12	Minor: courses in another discipline (min.)	12
Research: courses in research and thesis	15	Research: courses in research and thesis	15
	<hr/> 45		<hr/> (min.) 45

**Master of Arts:** This program includes a major in nursing and a minor in another discipline. Students are encouraged to select a minor which will serve as a basis for further post-master study. Students are expected to meet the undergraduate prerequisites of the minor department. The required course work and exact number

of credits for the minor are determined by the minor department. A prospective candidate for this degree must demonstrate a reading knowledge of one foreign language.

<i>Area of Study</i>	<i>Credits</i>
Major: advanced nursing courses	18
Minor: courses in another discipline (min.)	12
Research: courses in research and thesis	15
	<hr/> (min.) 45

#### **Post-Master's Programs**

Students who hold the master's degree may enroll for an additional period of study at the post-master level for the purpose of gaining additional depth in an area of study, added breadth of preparation, and increased knowledge and skill in nursing research. Post-master study is offered in the areas of maternal-child nursing, medical-surgical nursing, psychiatric nursing, mental



retardation, administration of schools of nursing, and research in nursing. Individual programs of study may be planned in keeping with the student's scholarly interests and long-range professional goals.

The School of Nursing offers a minor on the doctoral level for those students who are matriculated in other disciplines. The minor in nursing should total 35 graduate credits, of which at least half must be at the 500 level. The recommended sequence of courses for each student is determined in the light of her previous work and future goals.

#### **Nurse-Scientist Graduate Program**

Under a grant from the Public Health Service, the University of Washington offers a graduate program which is designed for the preparation of the nurse-scientist and which leads to the Doctor of Philosophy degree. The student in this program may elect to major in one of the following fields: anthropology, microbiology, physiology, or sociology. The minor field is nursing.

## **OTHER PROGRAMS**

#### **Supplementary Public Health Nursing Program**

A period of supplementary study to prepare the registered nurse holding a bachelor or higher degree for public health nursing is available.

Satisfactory completion of a minimum of 20 credits in required and elective courses, extending over at least two quarters at the University of Washington, is required. At least half the course credits must be in nursing. The program must include public health nursing field experience and at least 5 quarter credits in Preventive Medicine. Satisfactory completion of the program will be noted on the student's transcript.

#### **Affiliate Program**

The School of Nursing provides lower-division, undergraduate courses in psychiatric nursing for students enrolled in various hospital and community college schools of nursing in the state of Washington. These courses are directed toward technical competence in the clinical area. Public health nursing theory and field courses are open to students enrolled in certain university schools of nursing.

Affiliating students enroll in the University and the School of Nursing for the quarter that they are taking the designated courses. They are required to meet the admission requirements prescribed for this program and must pay the usual tuition and fees. Appropriate University credit is granted upon successful completion of the courses.





## PHARMACY

### **Dean**

Jack E. Orr  
102 Bagley Hall

### **Associate Dean**

Louis Fischer

### **Professors**

Louis Fischer, Forest J. Goodrich (emeritus), Nathan A. Hall, E. Roy Hammarlund, Alain C. Huitric, Edward Krupski, Walter C. McCarthy, Jack E. Orr, Elmer M. Plein, L. Wait Rising

### **Associate Professors**

Lynn R. Brady

### **Assistant Professor**

Wendel L. Nelson

### **Lecturer**

Joy B. Plein

### **Research Associate Professor**

Robert G. Benedict

Washington statutes define "practice of pharmacy" as "... the practice of that profession concerned with the art and science of preparing, compounding, and dispensing of drugs and devices, whether dispensed on the prescription of a medical practitioner or legally dispensed or sold directly to the ultimate consumer, and

shall include the proper and safe storage and distribution of drugs, the maintenance of proper records therefor, and the responsibility of relating information as required concerning such drugs and medicine and their therapeutic values and uses in the treatment and prevention of disease."

The College of Pharmacy bears a responsibility to the public and to the profession to prepare qualified men and women for professional service in one or more of the fields of pharmaceutical practice and for responsible citizenship. A primary objective of the College is, therefore, the provision of an instructional program assuring academic and technical proficiency in the basic sciences and their pharmaceutical application combined with education in the liberal arts. An equally important objective is the cultivation of high regard for professional ethics and the concept of service.

A third major objective of the College is the advancement of the level of professional practice and service through research. This search for new knowledge is indispensable in helping achieve the major goals of the health professions, the maintenance of public health and relief of human ills. The graduate program is designed to prepare advanced students for teaching and research careers in the specialized pharmaceutical sciences.

The College considers a program of continuing education essential in maintaining a high level of professional practice, and meets this objective through an extension program of seminars, institutes, short courses, lectures, and other services.

Holders of the Bachelor of Science in Pharmacy degree can qualify for a wide variety of professional positions. By far the greatest proportion of graduates engage in the community practice of pharmacy with approximately half being owners or part-owners of pharmacies. In addition to their professional qualifications, owners and managers of pharmacies must have competence in business management.

Other opportunities exist for pharmacists in hospital and clinic pharmacies; as medical representatives for pharmaceutical manufacturers; as production, control, and research pharmacists in the manufacture of medicinal and pharmaceutical products; as personnel in wholesale drug distribution; as food and drug control chemists or inspectors for local, state, and federal health agencies; as pharmacists in the United States Public Health Service, the Veterans Administration, the Armed Forces, and other government departments; and in pharmaceutical journalism. Research and teaching careers in industry and in colleges of pharmacy are available after the completion of graduate study.

Founded in 1894, the University of Washington College of Pharmacy adopted the present five-year curriculum in 1957. Since 1925 the College has accepted prospective candidates for the degree of Doctor of Philosophy with specialization in pharmaceutical and medicinal chemistry, pharmacognosy, and pharmacy.

The College of Pharmacy is within the Division of Health Sciences, and is a member of the American Association of Colleges of Pharmacy. It is accredited by the American Council on Pharmaceutical Education.

### **College Facilities and Services**

Instruction in pharmacy is centered in Bagley Hall, which houses pharmacy and chemistry. This building was completed in 1937 and was named for one of the founders of the University, Rev. Daniel Bagley.

Among the College of Pharmacy facilities in Bagley Hall are laboratories for pharmacy, prescription practice, manufacturing pharmacy, pharmaceutical and medicinal chemistry, pharmacognosy, drug assaying, and research; a branch library; a drug service department; and a stockroom.

The University Hospital Pharmacy and the Student Health Center Pharmacy serve as clinical training facilities for the College. Senior students are assigned on a regular schedule to these pharmacies where they gain practical experience in compounding and dispensing prescriptions under the direction of staff pharmacists. The University Hospital Pharmacy and eleven other hospital pharmacies in Seattle serve as laboratories for the undergraduate and graduate programs in hospital pharmacy. The programs are directed by the Coordinator of Pharmaceutical Services, and laboratory instruction is given by the hospitals' chief pharmacists, each of whom holds the University rank of clinical instructor in pharmacy.

The Drug Plant Gardens of the College comprise approximately three acres of garden area, including a laboratory building that contains five greenhouses; three research laboratories; drug drying, milling, and extraction equipment; a darkroom, and a preparation room. Several hundred species of pharmaceutically important plants are maintained in the gardens and greenhouses. One greenhouse is devoted to plants of tropical habitat; others are used for student instruction in methods of drug plant culture and for research in plant-growth regulators and the biosynthesis of plant constituents. An extensive seed exchange program is conducted with medicinal plant gardens throughout the entire world.

The drug service facility manufactures specialized pharmaceutical preparations for the Schools of Medicine and Dentistry, the Student Health Service (Hall Health Center), the University Hospital, and other sections of the University. Much of the work done by this facility is in formulation and product development of drugs and dosage forms to be used in clinical and experimental research.

The College maintains a laboratory for the analysis of food products submitted by the Office of the Director of the State Department of Agriculture, drugs submitted by the State Pharmacy Board, and alcoholic products for the State Liquor Control Board. The Dean of the College is the State Chemist.

Various pharmaceutical manufacturing companies encourage pharmacy students to visit their plants and to become acquainted with their facilities. To help students take advantage of these tours, the companies provide hotel facilities and meals during the visits. Every other year a group of students from the College of Pharmacy, with a faculty adviser, makes a trip of about ten days, spending a day or two with each company. These tours



enable students to observe pharmaceutical manufacturing in some of the world's largest and most modern plants.

The American Pharmaceutical Association, established in 1852, maintains student chapters so that students in the various colleges of pharmacy may join the national organization. The campus branch meets monthly during the academic year and sponsors lectures, social functions, and field trips. All students in the College are eligible for membership.

Upon graduation, affiliation with the organization may be continued on a full-membership basis. There are many active chapters, located in various parts of the country, in which the member may continue his association. One of these, the Puget Sound Chapter of the American Pharmaceutical Association, has its headquarters in Seattle.

#### Honorary and Fraternal Societies

Election to membership in *Rho Chi*, the pharmaceutical honor society, is on the basis of high scholarship and professional promise. *Rho* Chapter, at the University of Washington, one of 68 collegiate chapters, was established in 1932. Students who have completed 60 per cent of the credits required for graduation in pharmacy with a grade-point average of at least 3.00 are eligible for membership. The purpose of *Rho Chi* is to promote the scientific advancement of pharmacy and to encourage high academic attainments.

*Kappa Psi* is a national professional pharmaceutical fraternity dedicated to the promotion of industry, mutual fellowship, high ideals, and high scholarship among its members, and to fostering pharmaceutical research. The University of Washington chapter, *Beta Omicron*, is one of 54 collegiate chapters and sends delegates to the Grand Council, which meets biennially. The campus chapter meets twice a month in alternate business and social meetings.

*Lambda Kappa Sigma*, the oldest and largest pharmaceutical sorority in the world, promotes the profession of pharmacy among women. There are now 37 collegiate and 19 alumnae chapters. *Chi* Chapter, at the University of Washington, participates in many activities. New members are selected during the first professional year on the basis of character, scholarship, and personality.

#### Employment

A list of positions open in retail and hospital pharmacies is maintained by the College of Pharmacy.

## UNDERGRADUATE PROGRAMS

#### Adviser

Louis Fischer  
300 Bagley Hall

#### Graduation Requirements

The pharmacy program is a five-year course of study which leads to a Bachelor of Science in Pharmacy degree. This program is made up of one preprofessional year and four years of study in the professional area. Students working towards the bachelor's degree in Pharmacy must meet certain general requirements of the University and the following College requirements: completion of the prescribed Pharmacy curriculum, with a minimum of 231 academic credits, plus 3 credits in physical education activity; completion of 8 credits in approved business administration courses and 29 credits in approved humanities and social sciences courses (exclusive of English 101, 102, 103, Economics 200 and Preventive Medicine 323). The student must have a cumulative grade-point average of 2.00 (C) in the professional courses and an over-all cumulative average of 2.00 (C). No more than 18 credits in advanced ROTC courses and no more than 6 credits in professional courses numbered 499 may be applied toward graduation.

#### Licensure

In order to be admitted to the practice of pharmacy as a registered pharmacist in the state of Washington, the candidate must graduate from an accredited college of pharmacy, complete the internship requirements as prescribed, and pass the licensing examination.

After enrollment in the College of Pharmacy, the student should file with the State Board of Pharmacy an application for registration as a pharmacy intern (fee \$1.00). The Board requires 1,800 hours of internship experience, of which 600 hours must be served after graduation from an accredited college of pharmacy. This experience must be obtained in a licensed pharmacy meeting the requirements promulgated by the Board. Experience gained before registration as a pharmacy intern, or during the school term, may not be counted toward the licensure requirement.

The examination consists of two parts, a theoretical part and a practical part which may be taken only after completion of the internship requirement.

Further information about licensure requirements may be obtained from the State Board of Pharmacy, 311 Public Health Building, Olympia.

## Curriculum

### First Year

AUTUMN QUARTER		CREDITS
CHEM 140	GENERAL OR *100 CHEMICAL SCIENCE . . . . .	3
ENGL 101	COMPOSITION . . . . .	3
MATH 105	COLLEGE ALGEBRA . . . . .	5
PHARM 204	ORIENTATION & HISTORY . . . . .	2 OR 3
APPROVED ELECTIVE . . . . .		2
†PHYSICAL EDUCATION ACTIVITY . . . . .		
		15-18

WINTER QUARTER		CREDITS
CHEM 150	GENERAL . . . . .	3
CHEM 151	GENERAL LAB . . . . .	2
ENGL 102	COMPOSITION . . . . .	3
‡MATH 104	PLANE TRIGONOMETRY . . . . .	3
APPROVED ELECTIVES . . . . .		5
†PHYSICAL EDUCATION ACTIVITY . . . . .		
		16

SPRING QUARTER		CREDITS
CHEM 160	GENERAL . . . . .	3
CHEM 170	QUAL. ANALYSIS . . . . .	3
ENGL 103	COMPOSITION . . . . .	3
APPROVED ELECTIVES . . . . .		6
†PHYSICAL EDUCATION ACTIVITY . . . . .		
		15

### Second Year

AUTUMN QUARTER		CREDITS
PH CH 237	ORGANIC . . . . .	3
BOT 111	ELEMENTARY . . . . .	5
PHYS 114 AND 117	GENERAL AND LAB . . . . .	5
APPROVED ELECTIVE . . . . .		2
		15

WINTER QUARTER		CREDITS
PH CH 238	ORGANIC . . . . .	3
PH CH 248	ORGANIC LAB . . . . .	3
ZOOL 111	GENERAL . . . . .	5
PHYS 115 AND 118	GENERAL AND LAB . . . . .	5
		16

SPRING QUARTER		CREDITS
PH CH 239	ORGANIC . . . . .	3
PH CH 249	ORGANIC LAB . . . . .	3
ZOOL 112	GENERAL . . . . .	5
MICRO 301	GENERAL . . . . .	5
		16

### Third Year

AUTUMN QUARTER		CREDITS
PH CH 325	QUANT. PHARM. ANAL. . . . .	5
PHARM 331	GENERAL AND PHYS. PRINC. . . . .	4
P BIO 360	GENERAL HUM. PHYSIOL. . . . .	5
APPROVED ELECTIVE . . . . .		2
		16

WINTER QUARTER		CREDITS
PH CH 326	QUANT. PHARM. ANAL. . . . .	5
PHCOL 301-	GENERAL PHARMACOLOGY . . . . .	4-
PHARM 332	GENERAL AND PHYS. PRINC. . . . .	4
BIOC 405	INTRO. TO BIOCHEMISTRY I . . . . .	3
		16

SPRING QUARTER		CREDITS
PH CH 430	INORGANIC MED. PROD. . . . .	3
PHCOL -302	GENERAL PHARMACOLOGY . . . . .	-5
PHARM 333	GENERAL AND PHYS. PRINC. . . . .	4
BIOC 406	INTRO. TO BIOCHEMISTRY II . . . . .	3
		15

### Fourth Year

AUTUMN QUARTER		CREDITS
PH CH 440	MEDICINAL CHEM. . . . .	3
PHCOG 312	GENERAL PHARMACOGNOSY . . . . .	4
ECON 200	INTRODUCTION . . . . .	5
APPROVED ELECTIVES . . . . .		3
		15

WINTER QUARTER		CREDITS
PH CH 441	MEDICINAL CHEM. . . . .	3
PHCOG 313	GENERAL PHARMACOGNOSY . . . . .	4
PHARM 318	PHARM. ACCOUNTING . . . . .	5
P MED 323	PUBLIC HEALTH PRIN. AND PRACT. . . . .	3
		15

SPRING QUARTER		CREDITS
PH CH 442	MEDICINAL CHEM. . . . .	3
PHCOG 314	GENERAL PHARMACOGNOSY . . . . .	4
APPROVED ELECTIVES . . . . .		8
		15

### Fifth Year

AUTUMN QUARTER		CREDITS
PHARM 407	DISPENSING . . . . .	4
PHARM 410	CLIN. DISP. PHARM. . . . .	1
PHARM 450	PHARM. LAWS . . . . .	3
APPROVED ELECTIVES . . . . .		7
		15

WINTER QUARTER		CREDITS
PHARM 408	DISPENSING . . . . .	3
PHARM 451	SPEC. PHARM. PRACT. . . . .	3
H ED 429	METHODS IN TEACH. FIRST AID AND SAFETY . . . . .	3
APPROVED ELECTIVES . . . . .		6
		15

SPRING QUARTER		CREDITS
PH CH 497	TOXICOLOGY . . . . .	2
PHARM 409	DISPENSING . . . . .	3
PHARM 452	PROFESSIONAL MANAGEMENT . . . . .	3
APPROVED ELECTIVES . . . . .		7
		15

\*Chemistry 100 (5 credits) required of students with no high school chemistry.

†See *College of Arts and Sciences* section for physical education activity requirement.

‡Exempt if trigonometry was taken in high school.

§At least 8 credits of Business Administration electives are required.

## GRADUATE PROGRAMS

### Graduate Program Adviser

Jack E. Orr  
102 Bagley Hall

### Admission

Students who intend to work toward a Master of Science or Doctor of Philosophy degree must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section. Graduate students must satisfy the requirements for an advanced



degree which are in force at the time the degree is to be awarded. Graduate study requires approval of both the College of Pharmacy and the Graduate School.

Students with undergraduate degrees in pharmacy or in the biological or physical sciences are accepted for graduate study in the pharmaceutical sciences. Students without undergraduate degrees in pharmacy will be required to complete courses basic to their chosen field of study during their graduate careers.

Undergraduates who plan to pursue graduate study may expedite their programs by selection of pertinent electives. Although the choice of electives will vary with the identity of the student's selected field in the pharmaceutical sciences it should be emphasized that graduate studies in the College of Pharmacy require adequate preparation in the physical and biological sciences, in mathematics, and in foreign language. Mathematics through calculus and courses in physical chemistry, qualitative organic, and biochemistry should be taken prior to admission to graduate study. However, students who have not completed certain desired courses during their undergraduate work may be permitted to do so during their graduate programs.

Specialization is offered in pharmaceutical and medicinal chemistry, pharmacognosy, pharmacy, and hospital pharmacy. Graduate study toward an advanced degree in pharmacology is directed by the Department of Pharmacology of the School of Medicine. The hospital pharmacy program may include a hospital pharmacy internship or residency if desired by the student.

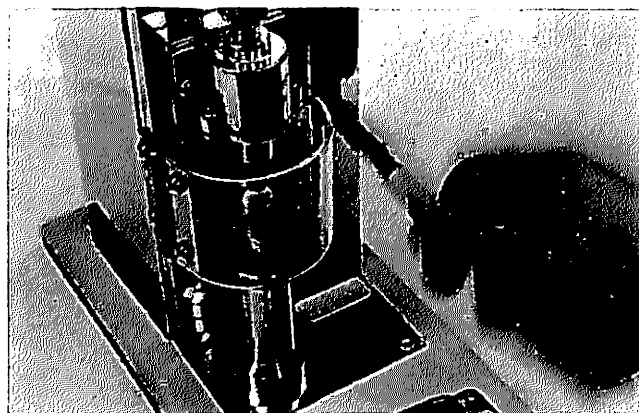
Graduate programs of study vary with the specialization selected. Although the programs are flexible, certain general recommendations may be made. In addition to studies in their chosen field, students with specializations in pharmaceutical chemistry and pharmacy are required to follow programs of course work usually selected from advanced courses in organic chemistry, physical chemistry, biochemistry, or radiochemistry. A course in statistical methods or a course in computer programming is basic to all programs.

For specialization in hospital pharmacy, courses in the basic medical sciences are necessary in addition to the specialized courses in hospital pharmacy and manufacturing pharmacy.

For specialization in pharmacognosy, courses in organic chemistry, biochemistry, and plant physiology are basic to most programs. These are generally best supple-

mented by courses in plant anatomy, taxonomy, microbiology, mycology, specialized courses in organic chemistry, analytical chemistry, and physical chemistry.

All graduate students are encouraged to pursue additional courses in the pharmaceutical sciences other than their fields of specialization. Specific recommendations based upon individual interests, and information concerning courses may be obtained from the chairman of the department concerned or from the Graduate Program Adviser.



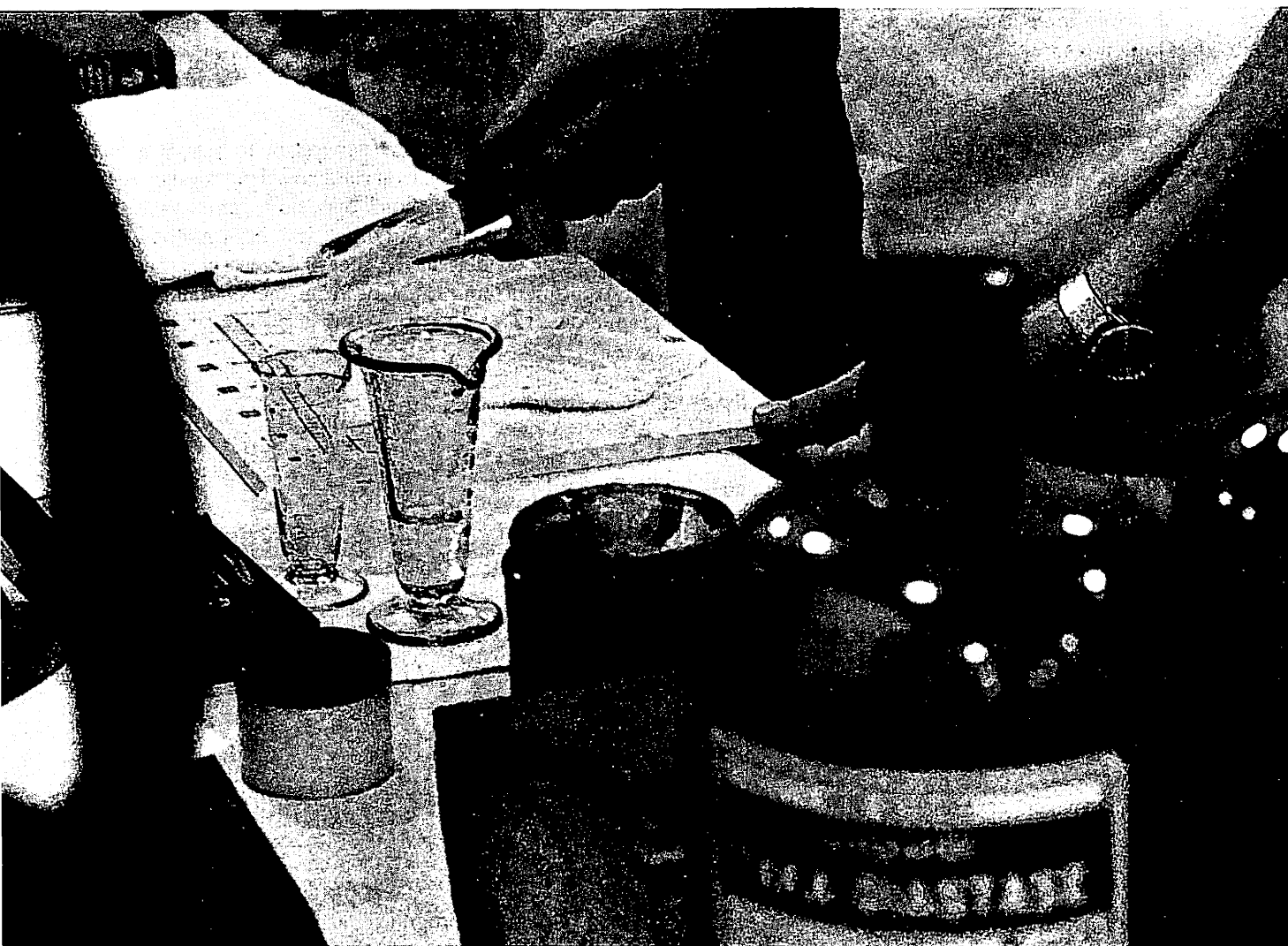
### Master of Science

A student in this program must present at least 27 credits of course work, exclusive of thesis and nonthesis research. He must complete a research project, prepare an acceptable thesis, and pass a Final Examination. The student must present a certificate of proficiency in one foreign language.

### Doctor of Philosophy

A student in this program must present a minimum total of 56 credits of course work, exclusive of dissertation and nonthesis research. The credits earned for the master's degree may be applied toward the doctor's degree. The student must pass a General Examination for admission to candidacy for the doctor's degree, complete a research project, prepare an acceptable dissertation, and pass a Final Examination. The research for the doctor's degree must be done at the University of Washington. The doctoral student must present a certificate of proficiency in two foreign languages (one in addition to the Master of Science requirement) prior to the General Examination.





## PHARMACEUTICAL SCIENCES

### PHARMACEUTICAL CHEMISTRY

**Chairman**

Louis Fischer  
300 Bagley Hall

The Department of Pharmaceutical Chemistry offers, for undergraduate students, courses which deal with the application of chemistry to the study of substances used in pharmacy and medicine. Advanced courses covering specialized techniques in pharmaceutical chemistry, medicinal chemistry, and plant chemistry are presented at the graduate level.

Students who have been admitted for work toward a Master of Science or Doctor of Philosophy degree should contact the chairman of the Department before registration.

### PHARMACOGNOSY

**Chairman**

Lynn R. Brady  
303 Bagley Hall

Pharmacognosy deals with the systematic study of natural drug products employed as pharmaceuticals and



medicinals. The Department of Pharmacognosy offers courses in the general aspects of plant and animal drug principles, including their sources, separation, biosynthesis, identification, and uses. Other courses of advanced nature include the subjects of hormones and problems in drug plant cultivation. These courses are also available to qualified students from related science areas. The Department directs the activities of the Drug Plant Gardens and Laboratory. An extensive collection of living drug plants is maintained for experimental use.

Students who have been admitted for work toward a Master of Science or Doctor of Philosophy degree should communicate with the chairman of the Department before registration.

## PHARMACY AND PHARMACY ADMINISTRATION

### Chairman

L. Wait Rising  
306 Bagley Hall

The Department of Pharmacy and Pharmacy Administration teaches the courses directly concerned with professional orientation, fundamental pharmaceutical procedures, prescription compounding, hospital pharmacy, manufacturing, and management. Graduate work is available leading to the Master of Science and Doctor of Philosophy degrees in the various fields of pharmacy. The Department also offers several service courses to nonmajors in other divisions of the University.

Students who have been admitted for work toward a Master of Science or Doctor of Philosophy degree should communicate with the chairman of the Department before registration.



**Director**

Brewster C. Denny  
266 Smith Hall

**Graduate Program Adviser**

George A. Shipman  
266 Smith Hall

**Faculty (Including Cooperating Faculty)**

Kenneth C. Cole, Richard A. Cooley, James A. Crutchfield, Jr., Brewster C. Denny, Ralph Johnson, Morton Kroll, Fremont Lyden, Marion E. Marts, Kenneth M. McCaffree, Ernest G. Miller, Robert H. Pealy, George A. Shipman, Charles Tiebout, Robert Warren, Donald H. Webster

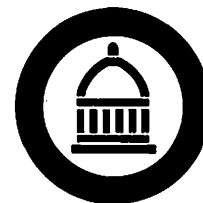
The Graduate School of Public Affairs is a graduate professional school providing education and research for the public service. The School offers a program of studies leading to the degree of Master of Public Administration, designed to prepare the student for service as a professional administrator in the public service at all levels—local, state, national, and international.

Graduates serve in such varied positions as foreign service officers, city managers, and budget analysts. The School draws upon those disciplines of the University which contribute to professional education and research in the field, and thus the faculty includes participating members from these disciplines. The School also cooperates with a number of University departments in doctoral programs having a significant public policy or public administration content.

**Master of Public Administration**

The School offers a program leading to the degree of Master of Public Administration. Admission to this program requires formal admission to the Graduate School as well as acceptance by the Graduate School of Public Affairs. There is no formal requirement for specific undergraduate courses or majors. The School invites applications from students of such varied backgrounds as political science, economics, business administration, history, social work, engineering, public health, and other fields in the social and physical sciences to undertake a program leading to professional public service. The student will ordinarily need a background in the social sciences, in the nature and historical background of American institutions, basic preparation in general economics, and a mature capacity to digest reading and to express himself in clear and lucid English. The student who lacks sufficient background in these areas may be required to make up these deficiencies by taking or auditing appropriate courses in addition to the course requirements for the degree. Ordinarily, the degree of Master of Public Administration is awarded upon the successful completion of two years of course work, a summer internship, a degree project and a comprehensive examination. This is a nonthesis program. There is no formal language requirement.

Students may select their field of emphasis from two general concentrations: Public Administration, for students primarily interested in general administrative or managerial positions in the public service, and Public Policy, for students preparing for government positions which require professional preparation in one or more



## PUBLIC AFFAIRS

particular areas of public policy such as foreign and defense policy, natural resources, urban affairs, and the like. The student, with the approval of the Graduate Program Adviser, selects courses from among those offered by the School and by other departments of the University.

In addition to the basic course work and the summer internship, the student has the opportunity to participate in the General Seminar at which distinguished public servants appear, in workshops and conferences sponsored by the Graduate School of Public Affairs, and in the activities of the Institute for Administrative Research. An important feature of the program of the School is the sponsorship of the Public Policy Seminars. These are faculty seminars in which professors from several colleges, schools, and departments of the University and distinguished experts from off-campus discuss a particular problem area of public policy. Students participate as auditors at the invitation of faculty members. Interdisciplinary seminars in natural resources, urban and regional public policy, and health care are already regular features of the program. Others are in the planning stages for future years.

### **Mid-Career Education**

A number of students in the School are public servants with several years of public service who, on a part-time or full-time basis, take graduate work at mid-career to prepare themselves for new and broader policy and administrative responsibilities. Beginning in the Autumn of 1966, the University joins six other universities as host to the Career Education Awards program spon-

sored by the National Institute of Public Affairs. Under this program approximately ten federal, state, and local officials will enroll each year in the Graduate School of Public Affairs for a special mid-career educational program with emphasis on natural resources public policy. In addition to their academic work, the National Institute of Public Affairs fellows will be available for consultation with faculty and students on policy and administrative questions in their fields of experience.

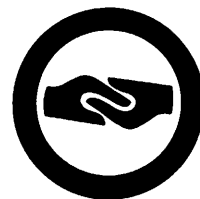
### **The Institute for Administrative Research**

The Institute for Administrative Research was established by the University to provide a means whereby members of the Graduate School of Public Affairs faculty, together with other University faculty members, may sponsor and reinforce programs of research activity which express the shared research interests of the faculty and the needs of the professional field. It provides a means and a facility for seeking and administering grants and contracts in support of these research efforts. Primary concern is with interdisciplinary, group-executed projects involving the nature of the governmental administrative process and the analysis of public policy. The Institute also provides consulting services to assist in the practical application of the results of research.

### **Further Information**

For further information and a detailed publication on this program, write to the Director, Graduate School of Public Affairs, University of Washington, Seattle, Washington 98105.





# SOCIAL WORK

## **Dean**

Charles B. Brink  
204 Eagleson Hall

## **Associate Dean**

Thomas Fred Lewin  
205 Eagleson Hall

## **Assistant Dean**

Jerry L. Kelley  
207 Eagleson Hall

## **Professors**

Arthur C. Abrahamson, Charles B. Brink, David H. Gronewold, Marquerite Hunt, Thomas Fred Lewin, Henry W. Maier, Jack R. Parsons

## **Associate Professors**

Arthur S. Farber, James E. Herrick, Jerry L. Kelley, Catherine J. Macdonald, Robert W. Macdonald, Le-Nora B. Mundt, Lawrence K. Northwood, Gerald W. Pepper, Florence Ray, Grace D. Reiss, Edmund A. Smith, Calvin Y. Takagi

## **Assistant Professors**

Allethia L. Allen, William C. Berleman, Moya M. Duplica, Jack A. Ellis, John H. J. Eymberts, M. John

Griswold, Robert W. Kessel, Sidney Miller, Eugene Mochizuki, Sidney Olyan, Edward C. Teather, Joseph V. Thompson

## **Lecturers**

Courtenay W. Bell, Agnes E. Dixon, Loretta M. Class, Patricia Denny, Carl M. Dickinson, Bertha Doremus, Gladys Randall, Arlene Robinovitch

Social work is the professional service which helps mankind, individually and collectively, seek and find solutions to the problems of social welfare. In our increasingly scientific and industrialized society, the tasks of providing for man's economic, social, and emotional needs have become more immense and more complex, and are faced by all people. No longer can social problems be viewed as restricted to the poor, the felons, the mentally ill, and the handicapped.

Social work is rooted in public and private humanitarianism and in the principles of the great, organized religions. Social workers now perpetuate these traditions in many capacities: from adoptive services for infants to residential care of the aged; from private practice in helping troubled people to industrial consultation; and from local agency services to national welfare planning. Career opportunities in social work

are virtually boundless for those who share the basic belief in the dignity and worth of the individual human being regardless of station, color, or creed.

Consistent with the aims of the University, the program of the School of Social Work has three major dimensions: (1) The transmission of existing knowledge through the professional curriculum and participation in instructional offerings of other units of the University; (2) the acquisition of new knowledge through research and scholarship by the faculty and students; and (3) service to the community through collaborative training programs, sponsorship of professional institutes, and consultation.

Primarily, the School is dedicated to excellence in the preparation of future social work practitioners through the two-year postgraduate curriculum. This dedication is shared by the administrative and instructional personnel in the community agencies which provide extensive field training for the students. The School also offers undergraduate courses, some of which are part of the social welfare major within the General Studies program of the College of Arts and Sciences.

### **Admission**

Admission to the graduate professional program of the School of Social Work requires formal admission to the Graduate School as well as to the School of Social Work; hence, separate application forms should be submitted.

Foreign students are advised to allow three years for completion of the degree program. One year of previous employed experience involving use of English is highly desirable.

### **College Facilities and Services**

All students enrolled in the professional curriculum in social work are eligible for membership in the Student Social Work Club. Through participation in the Club program and committee work, students have an opportunity to enlarge and enrich their professional education. The Club serves as sponsor of several social events.

The Student Club and the School of Social Work annually plan a Student Social Work Conference to honor students who have written outstanding papers during the academic year. Members of the professional community as well as faculty members of other colleges and universities are invited to attend. The conference

serves to interpret the program of the school and display the work of the students through these presentations. Members of the faculty and personnel from social agencies participate in the discussion of the papers. In addition, an eminent visitor is invited to present a luncheon address.



## **GRADUATE PROGRAM**

**Graduate Program Adviser**

Jerry L. Kelley  
207 Eagleson Hall

### **Master of Social Work**

Professional social work education prepares students for professional practice in social work. It is a two-year program of study leading to the Master of Social Work degree. Among the areas of practice in which students are prepared to accept staff positions are the following: adoptions, foster home care, institutional care, child protection, child guidance, family counseling, probation and parole, medical social work, psychiatric social work, school social work, public assistance service, community center work, and social group service programs. Consistent with its responsibility to the profession of social work, the School exercises professional judgment concerning the suitability of students for admission to, or continuation in, the degree curriculum.

The curriculum is composed of courses concerned with the philosophy, organization, and administration of social service programs; the understanding of human growth and behavior; the understanding and use of



social work methods; and the understanding and use of research methods. An integrated combination of class and field instruction is offered. Through this blending, theory is applied and practice is conceptualized as competence is being developed.

The following are the credits required in the class instruction segments of the curriculum:

#### SOCIAL WELFARE ORGANIZATION

Social Work 502, 503, 504, plus 4 additional credits (10 credits). Additional credits may be elected from the 520 seminar series, 587, or from sociology courses listed under *Courses in Affiliated Departments*. (See *Description of Courses* in this Catalog.)

#### HUMAN GROWTH AND BEHAVIOR

Social Work 550, 551, 552, 556, and Psychiatry 553 (10 credits). Additional credits may be elected from Social Work 557 or from psychiatry and psychology courses listed under *Courses in Affiliated Departments*. (See *Description of Courses* in this Catalog.)

#### SOCIAL WORK METHODS

Students must satisfactorily complete 6 quarters of methods courses, usually in one method. (Social Casework or Social Group Work); Social Work 510, 511, 512, 530, 531, 532 (Social Casework) or 521, 522, 523, 524, 525, 526 (Social Group Work). With permission, a few second-year students may instead elect a concentration in social community organization, 573, 574, 575.

In addition, students must also take the beginning courses in other methods, 510 or 521, plus 572. Additional credits may be elected from the 520 seminar series, 533, 534, and 570.

Students must also satisfactorily complete 24 credits of field instruction 515 and 535. They spend an average of two days each week testing their developing knowledge and skill in one of a variety of settings where the professional methods of social casework, social group work, and social community organization are practiced. This laboratory experience is under the supervision and instruction of carefully selected, professionally prepared social workers. It provides students with an opportunity to develop skills in working with individuals and groups, to integrate classroom theoretical material with an actual work experience, and to develop professional attitudes and efficient methods of professional work. In addition to tuition costs and general fees, each student must plan for the costs of

transportation to and from the field instruction agencies (approximately \$15.00 per month), and the payment of a special laboratory fee for the field instruction courses.

#### RESEARCH

Social Work 590 (Social Work Research), 2 credits plus 6 credits from either the group research project 593-594-595 or an individual thesis, 700.

Requirements for the degree include: Completion of the prescribed curriculum, a minimum of three quarters in residence at this School, the equivalent of field instruction in six quarters, and completion of either an individual thesis or a group research project. Each student must present a total of 72 quarter credits of passing work and maintain a B average in all courses numbered 300 and above. In addition, the student must present a minimum of 65 quarter credits of B work or better. The degree is awarded on the basis of the student's competence in theory and practice, as evidenced through satisfactory completion of class and field courses. A comprehensive oral examination must be passed during the second year of study. There is no foreign language requirement.

#### Program Options

The School of Social Work offers its Master of Social Work degree program through two options. Under one, students complete their programs on the Seattle campus. Under the second, they complete half of their education in the Spokane, Washington, area.

The course requirements of the two programs are equivalent, with the provision of some accelerated sections of courses for the Spokane students. Under the first plan, the students begin in the Autumn Quarter of the first year with concurrent classroom courses and field instruction which continues in Seattle throughout the six quarters. The normal study program is 12 credits each quarter. Under this plan the students complete their work in two regular three-quarter academic years with an intervening summer vacation between the two years.

Under the Spokane plan, students complete the requirements for the Master of Social Work in six consecutive quarters without a summer break. They also begin their professional education in the Autumn Quarter in Seattle. They remain in Seattle for Autumn and Winter Quarters, enrolled only in classroom courses designed to ground them in basic knowledge and theory relevant to social work practice. At the end of Winter



Quarter the students transfer to Spokane where they remain for the following Spring, Summer, and Autumn Quarters. During these three quarters they complete all of the field instruction requirements in a single agency in the Spokane area under the direction of field instructors provided by the agencies. Thirty-two hours each week are spent in the agency and, in addition, the students take classroom courses in methods and human growth and behavior. These courses are taught by a faculty member of the University of Washington School of Social Work, who is the director of the Spokane program. The students in Spokane also do the initial part of their work on the research project. The normal class load, as in the Seattle program, is 12 credits.

A week's holiday is scheduled between each quarter, including the Summer and Autumn Quarters. The Autumn Quarter begins and ends several weeks before the regular Autumn Quarter. Hence, the students have a five-week break before returning to Seattle for the start of the Winter Quarter.

The sixth, or final, quarter on the Seattle campus is again devoted to classroom work and the completion of the research project begun in Spokane.

### Special Program in Social Work Research

A special program of courses is available to students enrolled in the regular professional curriculum who desire additional training in Social Work Research (24 credits). Students electing this program must register for a field research practicum during the Summer Quarter between the first and second years. During the two-year period, students will be enrolled in Social Work 591, 592 (Social Work Research), 593-594- (Field Practice in Research), and 700 (Thesis). (See *Description of Courses* in this Catalog.)

### Courses for Non-Social Work Majors

Class enrollment permitting, and with permission, a number of courses are available to students enrolled in other graduate and professional departments of the University. These are: Social Work 502, 503, 504, 509, 510, 521, 572, and 587.

### Financial Aids

For information concerning scholarship awards, fellowships, stipends, and loans, consult the Office of The Dean of Students. A substantial number of awards, in

amounts up to \$3,000 per year, are available to graduate students.

### Employment

For information concerning part- and full-time work off campus see *Undergraduate Education*. Listings of part-time work in social agencies in the community are included in placement files within the School of Social Work.

### Placement After Graduation

Because of the critical shortage of professionally prepared social workers, employment opportunities for graduates are numerous. Position vacancies in agencies and organizations in the immediate geographical region are maintained in a placement file within the library of the School of Social Work. All agencies and organizations in the region are encouraged to list their vacancies with the School of Social Work. A file of announcements of the position vacancies, nationwide and in foreign countries, is maintained. Representatives of major agencies visit the campus each year to recruit graduating students. Students are encouraged to interview agency representatives.

### Typical Programs of Graduate Study

#### First Year

AUTUMN QUARTER	CREDITS
502 SOCIAL WELFARE ORGANIZATION . . . . .	2
510 SOCIAL CASEWORK . . . . .	2
515 FIELD INSTRUCTION . . . . .	4-8
521 SOCIAL GROUP WORK . . . . .	2
550 HUMAN GROWTH AND BEHAVIOR . . . . .	2

WINTER QUARTER	CREDITS
503 SOCIAL WELFARE ORGANIZATION . . . . .	2
511 SOCIAL CASEWORK OR 522, SOCIAL GROUP WORK . . . . .	2
515 FIELD INSTRUCTION . . . . .	4-8
551 HUMAN GROWTH AND BEHAVIOR . . . . .	2
572 SOCIAL COMMUNITY ORGANIZATION . . . . .	2

SPRING QUARTER	CREDITS
504 SOCIAL WELFARE ORGANIZATION . . . . .	2
512 SOCIAL CASEWORK OR 523, SOCIAL GROUP WORK . . . . .	2
515 FIELD INSTRUCTION . . . . .	4-8
552 HUMAN GROWTH AND BEHAVIOR . . . . .	2
590 SOCIAL WORK RESEARCH . . . . .	2

#### Second Year

AUTUMN QUARTER	CREDITS
520 SEMINAR . . . . .	2
530 ADVANCED SOCIAL CASEWORK OR 524, ADVANCED SOCIAL GROUP WORK . . . . .	2
535 ADVANCED FIELD INSTRUCTION . . . . .	4-8
593- FIELD PRACTICE IN RESEARCH (2-) OR 700 THESIS . . . . .	2
PSYC 533 PSYCHODYNAMICS AND PSYCHOPATHOLOGY . . . . .	2



WINTER QUARTER		CREDITS
ELECTIVE . . . . .	2	
520 SEMINAR . . . . .	2	
531 ADVANCED SOCIAL CASEWORK OR 525, ADVANCED SOCIAL GROUP WORK . . . . .	2	
535 ADVANCED FIELD INSTRUCTION . . . . .	4-8	
-594- FIELD PRACTICE IN RESEARCH (-2-) OR 700 THESIS . . . . .	2	
SPRING QUARTER		CREDITS
ELECTIVE . . . . .	2	
532 ADVANCED SOCIAL CASEWORK OR 526, ADVANCED SOCIAL GROUP WORK . . . . .	2	
535 ADVANCED FIELD INSTRUCTION . . . . .	4-8	
556 SOCIAL ASPECTS OF ILLNESS AND DISABILITY . . . . .	2	
-595 FIELD PRACTICE IN RESEARCH (-2) OR 700 THESIS . . . . .	2	

## UNDERGRADUATE PROGRAMS

### Adviser

Jerry L. Kelley  
207 Eagleson Hall

### Admission

The School of Social Work participates in a program leading to an undergraduate major in social welfare in collaboration with the General Studies program of the College of Arts and Sciences. Students preparing for admission to a professional school of social work, students who are interested in securing social welfare positions which do not require professional education, and students who wish a liberal arts background with concentration in the social sciences and social welfare may fulfill their interests by enrollment in this major.

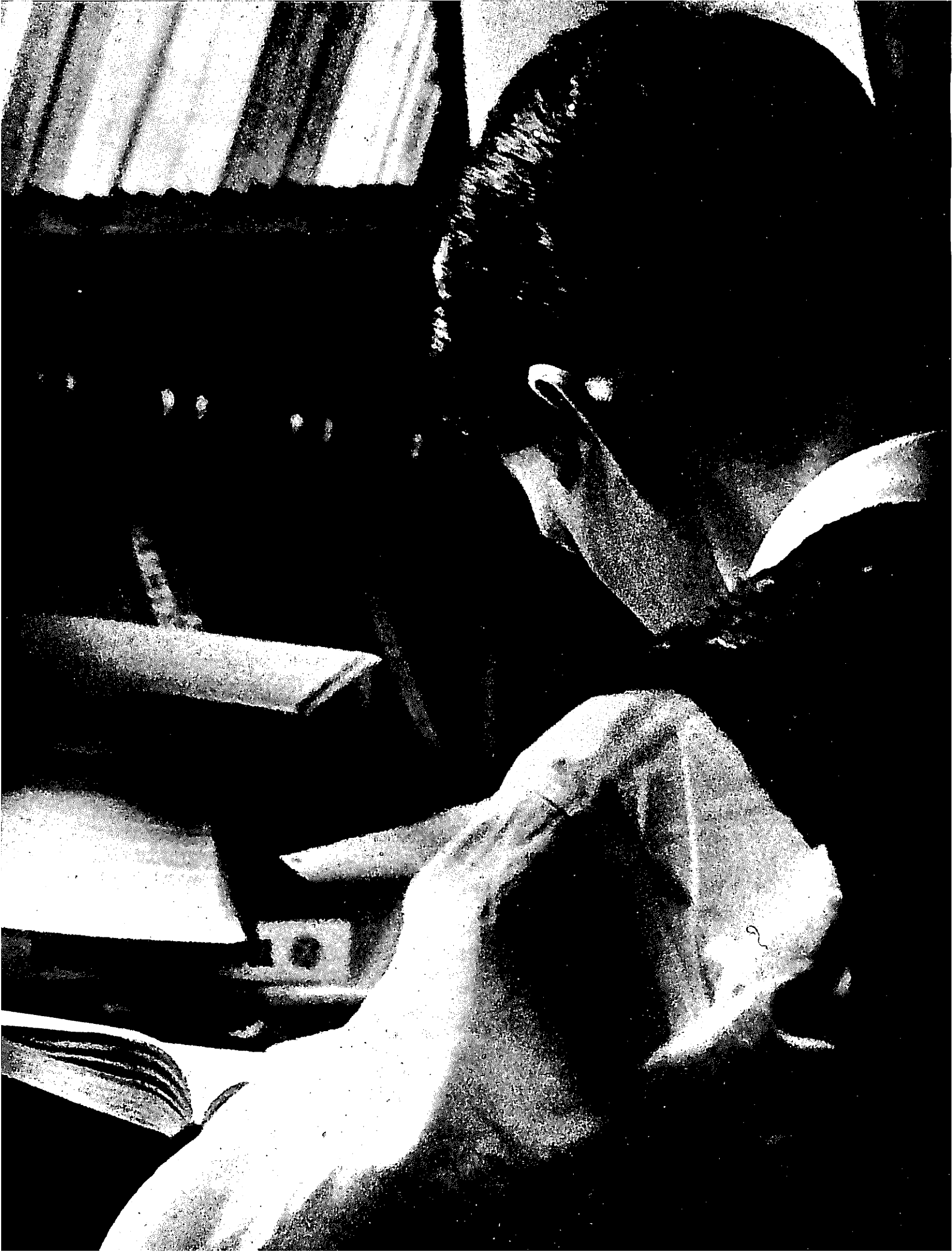
The social welfare program is designed to achieve a broader and deeper understanding of man and society through a pattern of study in the social sciences, including advanced requirements in psychology and sociology.

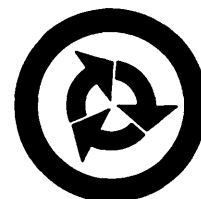
In addition, members of the faculty of the School of Social Work teach specific courses pertaining to social welfare and social work. These courses combine classroom study, an extended agency observation, and an individual thesis, in providing both scope and depth in the examination of social welfare institutions and services.

The agency observation course (Social Work 391) is available in two forms. (See *Description of Courses* in this Catalog.) It is offered for 5 credits as part of the social welfare major and, occasionally, for 6 credits Summer Quarter as a part of the Work-Study Program in Mental Health sponsored by the Western Interstate Commission on Higher Education.

Social Work 400 and 401 are also available as service courses to students in other University departments.

Educational advising for this curriculum is provided by the Director of General Studies, and for the social welfare courses by the coordinator of the undergraduate curriculum in the School of Social Work. Members of the faculty of the School of Social Work are available to advise students on their career interests and career planning in professional social work.





# INTERDISCIPLINARY GRADUATE DEGREE PROGRAMS

## BIOMATHEMATICS

Chairman of Biomathematics Group and Graduate Program Adviser  
D. G. Chapman  
203 Engineering Annex

Biology and medicine are currently undergoing revolutionary advances in their development as quantitative sciences. New technological advances find expression in new research tools. New theoretical concepts are being employed in the analysis of quantitative data. The techniques and viewpoints of mathematics and statistics, traditionally peripheral to biology and medicine, are being woven into the fabric of the life sciences. The recent emergence and rapid growth of interest in mathematical biology provide exciting new opportunities in research and teaching.

The University of Washington, through the Biomathematics Group of the Graduate School, has established a program leading to degrees of Master of Science and Doctor of Philosophy. In this program, students develop competence in mathematical statistics and in applying mathematics and statistics to a biological field of their choice.

## Admission

Students may enter the program from undergraduate majors in mathematics or statistics or any biological field. In particular, students should have 30 quarter credits in mathematics and statistics (beyond college algebra) and 15 quarter credits in basic biology or 30 quarter credits in a biological field and 15 quarter credits in calculus.

## PROGRAMS OF STUDY

Students ordinarily take, depending upon their background, half to two-thirds of their course work in mathematical statistics, the balance in courses from biological areas; these latter include Preventive Medicine, Fisheries, Forestry, Zoology (Ecology), Genetics, Physiology and Biophysics or Psychology, though other possibilities are also available.

## Master of Science

RECOMMENDED COURSES	CREDITS
MATHEMATICS 481 (CALCULUS OF PROBABILITIES) . . . . .	5
MATHEMATICS 482 (STATISTICAL INFERENCE) . . . . .	3
MATHEMATICS 483 (THEORY OF CORRELATION) . . . . .	3
MATHEMATICS 484 (DISTRIBUTION-FREE INFERENCE) . . . . .	3
(Note: 483, 484 are usually taken concurrently.)	

PREVENTIVE MEDICINE 535-536-537, (STOCHASTIC MODELS IN BIOLOGY AND MEDICINE) (3-3-3) . . . . .	9
or	
FISHERIES 556 (INTRODUCTION TO QUANTITATIVE POPULATION DYNAMICS) . . . . .	5
FISHERIES 557 (THEORETICAL MODELS OF EXPLOITED ANIMAL POPULATIONS) . . . . .	5
FISHERIES 558 (ESTIMATION OF POPULATION PARAMETERS) . . . . .	5

Approved Electives: 9-18 credits depending on student's background.

A thesis and demonstration of proficiency in one foreign language are required.

#### Doctor of Philosophy

RECOMMENDED COURSES (in addition to those listed for the M.S.)

MATHEMATICS 424, 425, 426 (FUNDAMENTAL CONCEPTS OF ANALYSIS) (3,3,3) . . . . .	9
MATHEMATICS 581, 582, 583 (ADVANCED THEORY OF STATISTICAL INFERENCE) (3,3,3) . . . . .	9

Approved Electives: 12 credits (in addition to the 9-18 indicated for the M.S. program).

A demonstration of proficiency in two foreign languages is required.

At the completion of two years of course work the student will take the General Examination—a written examination in each of the fields represented in his studies and an oral examination to test his ability to integrate mathematical methods with the field of application.

While most of the student's time after completion of the Ph.D. General Examination would be devoted to his dissertation research program, he would also be expected to devote part of his time to consultation in order to gain greater facility in using mathematical tools in these interdisciplinary problems. Formal credit could be earned for this in the course numbered 600 in the appropriate department. Such consultation is a most essential part of the student's training.

## COMPARATIVE LITERATURE

Chairman of Comparative Literature Group and  
Graduate Program Adviser

Frank Jones  
A106 Padelford Hall

The graduate program in Comparative Literature, leading to the Master of Arts and Doctor of Philosophy degrees is administered by an interdisciplinary Comparative Literature Group of the Graduate School.

A comparative study of literary history has three objectives: to discover what happens to a literary work which passes from the time and place of its origin to

other times and places; to describe literary traditions that have prevailed for long periods in large cultural areas such as Europe, India, and the Far East; and to discern what principles, if any, are common to literary activity in all times and places. On receiving the Master of Arts or the Doctor of Philosophy degree, the graduates are qualified for teaching and research in world literature, the history of literary genres, and international literary relations.

The student pursuing a program leading to the Master of Arts degree may work mostly with literature translated into English; but he must have and demonstrate adequate reading knowledge of two of the languages included in the program. A study of these topics at the Ph.D. level involves intensive work in two or more national literatures, read in their original tongues.

During their period of study, students working for advanced degrees in Comparative Literature are eligible for teaching assistantships in the language of their major literature, namely, Classics, English, Far Eastern and Slavic, Germanic, Romance, or Scandinavian.

All requests for information regarding the Comparative Literature program should be addressed to the Graduate Program Adviser.

## DRAMA ARTS

Chairman of Drama Arts Group

Gregory A. Falls  
113 Drama-TV Building

Graduate Program Adviser

Bertram L. Joseph  
27 Drama-TV Building

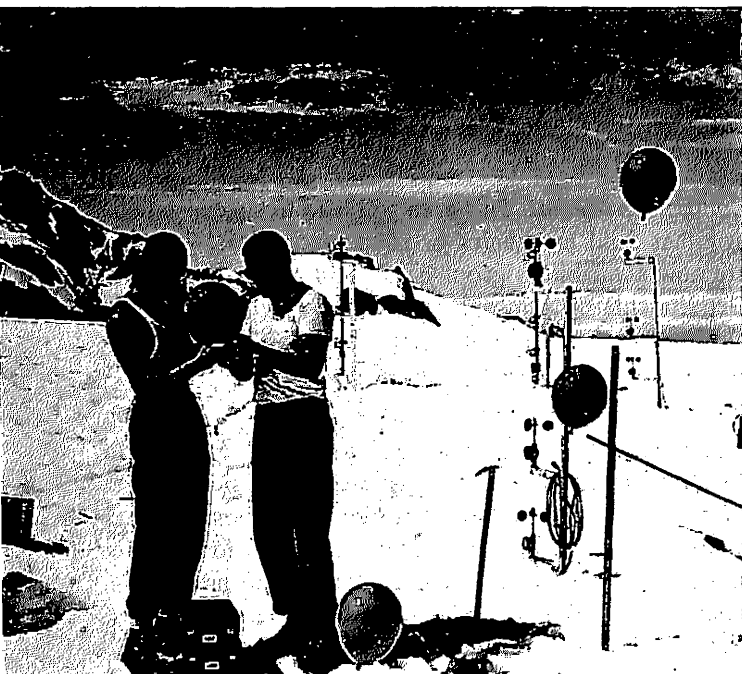
The University of Washington, through the interdisciplinary Drama Arts Group of the Graduate School, comprised of faculty members from Drama, Art, Classics, English, Far Eastern Languages and Literature, Music, Scandinavian Languages and Literature and other languages, has established a program leading to the Doctor of Philosophy degree for students who can demonstrate a mature artistry in one of the theatre arts.

A student may choose to concentrate in theatre history, dramatic literature, or criticism. Study is not limited to the English language theatre and drama; it



is ultimately a study of world theatre and drama. The University provides extensive offerings in dramatic literature and criticism (English as well as other languages) and students in the Drama Arts program may choose widely among the courses in a number of departments and schools.

Students must meet all the general degree requirements for the Ph.D. at the University of Washington.



## GEOPHYSICS

Chairman of Geophysics Group and  
Graduate Program Adviser

Arthur W. Fairhall  
22 Bagley Hall

### Geophysics Group

#### Professors

Joost A. Businger (Atmospheric Sciences), Kenneth C. Clark (Physics), Arthur W. Fairhall (Physics and Chemistry), Robert G. Fleagle (Atmospheric Sciences), Peter H. Misch (Geology), Maurice Rattray, Jr. (Oceanography), Richard J. Reed (Atmospheric Sciences), H. Myron Swarm (Electrical Engineering)

#### Associate Professors

R. G. Bostrom (Geology), M. Grant Gross, Jr. (Oceanography), Paul W. Hodge (Astronomy)

#### Assistant Professor

Randall L. Gresens (Geology)

Geophysics is concerned with the nature and behavior of our physical environment. It rests directly on physical law and utilizes mathematical and observational methods, and seeks to apply these laws and methods to the complex and unique phenomena which arise from the great dimensions and enormous energy sources of the geophysical system. Gravitation, geomagnetism, atmospheric motions, ocean waves, mountain building, and solar wind are examples of such geophysical phenomena which cannot be duplicated in the laboratory or adequately studied by existing theory alone.

Study of problems of this sort requires mastery of a fairly broad segment of physics, chemistry, and mathematics, combined with equally broad understanding of the geophysical environment. Many of the most important problems are exceedingly difficult to solve in a thoroughly quantitative sense, and the successful student of geophysics must combine educational accomplishment with liking for complexity and the ability to mix quantitative methods with intuitive insights.

The University, through the Geophysics Group of the Graduate School, offers a program of teaching and research in interdisciplinary areas of geophysics with participation by members of the faculty in the following fields: aeronautics and astronautics, atmospheric sciences, civil engineering, chemistry, electrical engineering, geology, oceanography, and physics. The geophysics program leads to the degrees of Master of Science and Doctor of Philosophy. Because the requirements to fulfill the program are rather demanding, it is designed primarily for aspirants to the Ph.D. degree.

### Admission

The minimum undergraduate preparation for embarking on the graduate program in geophysics should include the following courses or their equivalents:

Mathematics 438 (Principles of Differential Equations, 3 credits); Physics 221, 222 (Mechanics, 6 credits); Physics 320 (Introduction to Modern Physics, 3 credits); Physics 323 (Introduction to Nuclear Physics, 3 credits); Physics 325, 326, 327 (Electricity and Mag-

netism, 10 credits); Physics 371, 372 (Properties of Matter, 6 credits); Chemistry 140, 150, 160 (General Chemistry, 9 credits); Chemistry 151 (General Chemistry Laboratory, 3 credits); Chemistry 170 (Qualitative Analysis, 3 credits).

Depending upon a student's proposed specialization within the geophysics program, competence in the material of additional undergraduate courses will often be required.

Because a requirement for the Master of Science degree is competence in one acceptable foreign language, and for the Doctor of Philosophy degree, competence in two foreign languages, the prospective graduate student should attain mastery of at least one acceptable foreign language and preferably two *before* applying for admission.

#### PROGRAMS OF STUDY

Students entering the graduate program in geophysics will be expected to take Introduction to Geophysics and to pursue course work in the areas designated as *particle properties*, *continuous media*, and *electromagnetics*.

All students will be expected to take, with the approval of the Graduate Program Adviser, 19 credits, of which 9 credits are selected from the following courses in the area of particle properties:

Chemistry 455, 456, 457 (Physical Chemistry, 10 credits); Chemistry 458 (Physical Chemistry Laboratory, 4 credits); Physics 461, 462, 463 (Introduction to Atomic and Nuclear Physics, 9 credits); Physics 471, 472, 473 (Atomic and Nuclear Physics Laboratory, 9 credits).

Six credits are selected from the following courses in the area of continuous media: Civil Engineering 494 (Introduction to the Mechanics of Continuous Media, 3 credits); Aeronautics and Astronautics 575 (Thermodynamics and Electrodynamics of Continua, 3 credits); Atmospheric Sciences 541 (Dynamic Meteorology, 3 credits); Oceanography 511 (Marine Hydrodynamics I, 4 credits).

Of the 6 credits, at least 3 should be taken in one of the first two courses listed above.

Four credits are selected from the following courses in the area of electromagnetics: Electrical Engineering 469 (Fields and Waves, 4 credits); Physics 513 (Electricity and Relativity, 4 credits).

Following these basic courses, students may specialize in the following:

**Particle Properties.** Students will be expected to take more advanced general courses in particle properties which are given in the Departments of Physics and Chemistry. These courses will lead to specialization in the fields of astrophysics, solar physics, aeronomy, crystalline state, isotope geophysics, and geochemistry. Courses in geochemistry are given in the Departments of Chemistry, Geology, and Oceanography.

**Continuous Media.** This area will lead to specialization in either fluid mechanics or solid mechanics. Courses are now available in geophysical fluid mechanics in the Departments of Atmospheric Sciences and Oceanography. Courses in tectonics and solid earth geophysics are offered in the Department of Geology.

**Electromagnetics.** More advanced general courses in this area are given in the Department of Physics. These courses will lead to specialization in geomagnetism, radio astronomy, and investigations of the ionosphere and magnetosphere. Specialized courses are now available in the Departments of Atmospheric Sciences (jointly with Geophysics), and Electrical Engineering.

**Intermediate Areas.** In the intermediate area between particle properties and continuous media, courses relating to energy transfer with specifically geophysical orientation are offered by the Departments of Atmospheric Sciences and Oceanography. A course in phase transitions and associated energy transfer in solids and fluids under high temperature and pressure is planned.

In the intermediate area between continuous media and electromagnetics, a course in magnetohydrodynamics is offered jointly by the Departments of Atmospheric Sciences and Geophysics. In the intermediate area between particle properties and electromagnetics no advanced courses with geophysical orientation are offered.

#### Master of Science

The requirements for a Master of Science degree are 27 credits selected from those courses outlined above, and



a master's thesis. The thesis must represent a problem of substantial scientific importance and demonstrate the student's ability to use research methods. After the first year of residence, prospective candidates for the degree of Master of Science must pass a qualifying examination which will stress the fundamentals of physical science and the material covered in the sequence Geophysics 403J (Introduction to Geophysics: The Atmosphere), 404J (Introduction to Geophysics: The Ocean), 405J (Introduction to Geophysics: The Earth). Students who fail the qualifying examination may, upon recommendation of the examining committee, be permitted to take the examination again within one calendar year.

#### Doctor of Philosophy

A student who passes the qualifying examination with distinction or has shown outstanding ability while fulfilling the requirements for the Master of Science degree may become an aspirant for the Doctor of Philosophy degree. He will be expected to complete the minimum requirements in each of the three areas described here. In most cases, students will be expected to take more than the minimum in at least two of the three areas or in the intermediate areas. Courses in the field of specialization will be chosen with the approval of the student's Supervisory Committee.

As soon as possible after the completion of his second year of residence (and after passing his second foreign language competency examination) the student will be expected to take the General Examination—comprising a written examination which will test his mastery of the general and theoretical foundations of geophysics and of the relevant mathematical methods, and an oral examination which will test the depth of his understanding of a topic within his field of specialization which is selected in advance. A student who fails the General Examination may, upon the recommendation of his Supervisory Committee, be allowed to repeat the examination within one calendar year.

Students who pass the General Examination will become Candidates for the Ph.D. degree. In many cases students will have begun a program of research before taking the General Examination, and this should be considered normal. The dissertation is an important part of the Candidate's program, and must represent an original solution of a problem of substantial scientific importance. Normally, the equivalent of a full academic year or more will be devoted to the dissertation.

The Final Examination, conducted following the oral presentation of the dissertation, will be devoted mainly to the subject area of the dissertation.

## PHYSIOLOGY PSYCHOLOGY

Chairman of Physiology Psychology Group

Moncrieff H. Smith, Jr.

419G Denny Hall

Graduate Program Adviser

Mitchell Glickstein

1545A Regional Primate Research Center

This interdisciplinary program administered by the Physiology Psychology Group of the Graduate School has been designed to meet an evident need for intensive training in the overlapping area of the behavioral and physiological sciences. Currently, physiology and other departments of medical schools are appointing psychologists to carry on certain types of physiological research and to teach medical students. Psychology departments have long felt the need for individuals more highly conversant with physiological techniques and concepts than is usual for Ph.D.'s in psychology. Further, because physiological psychology is a fruitful research field, numerous research institutes are seeking men trained in both disciplines.

Individuals could take a Ph.D. in each subject. In practice this is rarely feasible, with the result that individuals in physiological psychology and in behavioral neurophysiology are usually less than adequately trained in one or the other of the parent disciplines. Therefore, it is the aim of the faculty in Psychology and the faculty in Physiology to work jointly to afford graduate students intensive training in the large area of overlap between the disciplines.

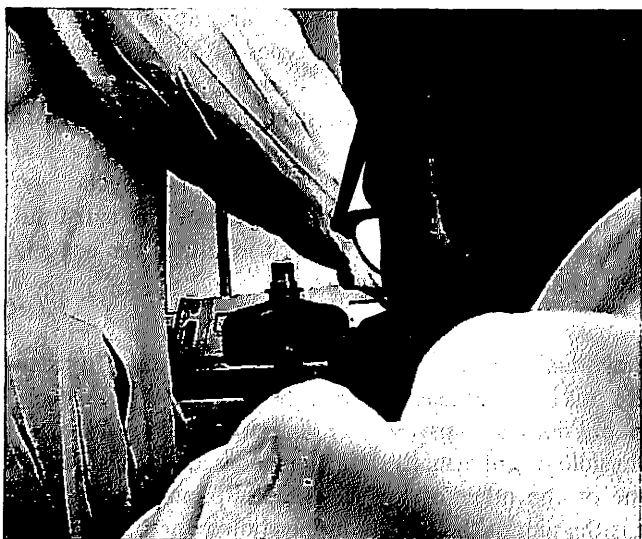
The program of each student will be administered by a committee of four staff members, two from each discipline. Each student will be expected to do laboratory work in both areas in order to familiarize himself with current research techniques in the respective departments. Although no formal master's degree program is provided, each student will be expected to do independent research in one discipline or the other prior to undertaking a doctoral research program.



Each student will spend approximately one year in basic course work in each discipline. At the conclusion of these two years of study, his training will consist of advanced seminars in either area, and doctoral research.

Because physiological psychology and neurophysiology are strongly developed at the University of Washington, the graduate student will find the latest in instrumentation and research techniques in both fields.

In addition to the facilities of both the Physiology and Psychology Departments, students will have the opportunity of working with laboratory primates at a newly established Regional Primate Center. At the Center there are facilities for a wide variety of behavioral and physiological studies of a number of primate species. Since primates offer unique advantages both for the behavioral and physiological work, the Center is a valuable addition to the resources of the training program.



## RADIOLOGICAL SCIENCES

Chairman of Radiological Sciences Group, and  
Graduate Program Adviser

Kenneth L. Jackson  
104 Fisheries Center

The program leading to the degree of Master of Science in Radiological Science is offered by the Radiological Sciences Group of the Graduate School. Study for this

degree is open to students with bachelor's degrees in a physical or biological science or in engineering.

Two options for a program of study leading to the master's degree are offered in order to satisfy the somewhat different requirements and interests of biological scientists and physical scientists or engineers. The Physical Science Option is designed to give the student advanced training in radiation physics and nuclear engineering, together with a broad background in biology, biophysics, radiochemistry, and other areas of radiological science. The Biological Science Option is designed to give the student advanced training in radiation biology and in related biological and health sciences, together with instruction in radiation physics, physical chemistry, radiochemistry, and other areas of radiological science.

Specific course recommendations for each of the two options are given below. The curricula include radiological science seminars, which are conducted by local and visiting scientists who are active in radiation research. Thesis topics are generally chosen in some area of radiation research, and include studies in radiation biology, radioecology, nuclear medicine, radiochemistry, radiation physics, or nuclear engineering. Thesis research may be carried out in various University laboratories of the School of Medicine, College of Arts and Sciences, College of Engineering, College of Fisheries, or the Center for Radiological Sciences. Opportunity for research in the Hanford Laboratories of the U.S. Atomic Energy Commission may also be provided through special arrangement. There is no foreign language requirement. The general requirements of the Graduate School for the master's degree apply, however, including the completion of 18 credits in courses numbered 500 or above. For specific requirements, see the *Graduate Study* section of this Catalog.

A student who has completed any of the recommended courses of his program at a prior time may substitute elective courses with the approval of the Graduate Program Adviser. Electives may be chosen in the fields of biology, medicine, public health, chemistry, physics, mathematics, and engineering.

A student with a deficiency in one area of the prerequisites may be accepted for the program, provided he removes the deficiency during the first year of graduate study. Credit toward the degree is not ordinarily granted for a course used to remove a deficiency.



## Physical Science Option

### Prerequisites

Prerequisites include a bachelor's degree in a physical science or in engineering, and Physics 323 (Introduction to Nuclear Physics) or the equivalent, Mathematics 238 (Elements of Differential Equations) or the equivalent, and a year of general biology at the college level.

RECOMMENDED COURSES*	CREDITS
PHYS 471, 473 ATOMIC AND NUCLEAR PHYSICS LABORATORY . . .	3,3
NUC E 484 INTRODUCTION TO NUCLEAR ENGINEERING . . . .	4
NUC E 559 CONTROL OF RADIOACTIVE WASTES . . . . .	3
CHEM 410 RADIOCHEMICAL TECHNIQUES AND RADIOACTIVITY MEASUREMENTS	
or	
NUC E 485 NUCLEAR INSTRUMENTS . . . . .	3
FISH 473 RADIONUCLIDES IN THE AQUATIC ENVIRONMENTS . .	3
RADGY 501-502 BIOLOGICAL EFFECTS OF IONIZING RADIATION . .	2-2
RADGY 501L-502L LABORATORY IN RADIATION BIOLOGY . . .	1-1
RADGY 507 RADIATION HAZARDS ANALYSIS AND CONTROL . . .	1
RADGY 517 RADIATION DOSIMETRY . . . . .	4
RAD S 520 RADIOLOGICAL SCIENCE SEMINAR . . . . .	2
RAD S 700 THESIS . . . . .	9

## Biological Science Option

### Prerequisites

Prerequisites include a bachelor's degree in a biological science, and courses in mathematics through differential and integral calculus, chemistry through quantitative analysis, and organic chemistry.

RECOMMENDED COURSES*	CREDITS
THREE CREDITS IN A 500-LEVEL COURSE IN A BIOLOGICAL SCIENCE	3
RADGY 501-502 BIOLOGICAL EFFECTS OF IONIZING RADIATION . .	2-2
RADGY 501L-502L LABORATORY IN RADIATION BIOLOGY . . .	1-1
RADGY 504 RADIOLOGICAL PHYSICS . . . . .	2
RADGY 507 RADIATION HAZARDS ANALYSIS AND CONTROL . . .	1
FISH 473 RADIONUCLIDES IN THE AQUATIC ENVIRONMENTS . .	3
CHEM 350,351 ELEMENTARY PHYSICAL CHEMISTRY . . . .	3,3
CHEM 410 RADIOCHEMICAL TECHNIQUES AND RADIOACTIVITY MEASUREMENTS	
or	
FISH 472 METHODS OF AQUATIC RADIOECOLOGY . . . . .	3
PHYS 320 INTRODUCTION TO MODERN PHYSICS . . . . .	3
PHYS 323 INTRODUCTION TO NUCLEAR PHYSICS . . . . .	3
RAD S 520 RADIOLOGICAL SCIENCE SEMINAR . . . . .	2
RAD S 700 THESIS . . . . .	9

\*Modification of these requirements may be made in special cases at the discretion of the Graduate Program Adviser. More detailed information concerning course content may be obtained by referring to *Description of Courses* section in this Catalog.



## DESCRIPTION OF COURSES

Course listings are arranged in alphabetical order according to department.

Courses numbered from 100 through 299 are lower-division courses for freshmen and sophomores; those numbered from 300 through 499 are upper-division courses for juniors, seniors, and fifth-year students.

Courses numbered 500 and above are intended for and restricted to graduate students. Some courses numbered in the 300's and 400's are open both to graduates and to upper-division undergraduates. Such courses, when acceptable to the major department and the Graduate School, may be part of the graduate program. The Graduate School accepts credit in approved 300-level courses for the minor or supporting fields only; approved 400-level courses are accepted as part of the major.

Undergraduate students of senior standing who wish to register for a 500-level course must obtain permission from both the instructor of the class and the Dean of the Graduate School.

The number in parentheses following the course title indicates the amount of credit each course carries. In most lecture courses, a credit is given for each weekly class hour during a quarter; laboratory courses generally carry less credit than the work time required. An asterisk in place of a credit number means that the amount of credit is variable. Courses to which the letter J is appended are joint courses in which two or more departments participate.

The letters A, W, Sp, and S, following the number of credits, refers to the quarter or quarters in which the course is offered. A refers to Autumn Quarter, W to Winter, Sp to Spring, and S to Summer. Where no quarter is indicated the course is usually not given during the current year.

Not all of these courses are offered every quarter. Final confirmation of courses to be offered, as well as a list of times and places of class meetings, is given in the *Time Schedule*.

# ACCOUNTING

## ACCOUNTING

### Courses for Undergraduates

#### INTRODUCTORY ACCOUNTING

##### 210 Fundamentals of Accounting (3) AWSpS

Basic principles, theories, and procedures for recording business transactions; development and interpretation of accounting reports. Prerequisite, sophomore standing.

##### 220 Fundamentals of Accounting (3) AWSpS

Continuation of 210. Prerequisite, 210.

#### MANAGERIAL ACCOUNTING

##### 230 Basic Accounting Analysis (3) AWSpS

Analysis of accounting information for decision making. Prerequisite, 220.

##### 311 Cost Accounting (3) AWSpS

Theory of cost accounting; accumulation and allocation of costs; managerial control through cost data. Prerequisite, 230.

##### 460 Advanced Cost Accounting (3) WSp

Advanced analysis of standard and other predetermined costs; special application of advanced cost accounting techniques; the study of budget techniques; principle of budgetary control. Prerequisite, 311.

##### 475 Administrative Controls (3) ASp

Concept of control. The use of the budgetary, statistical, and accounting systems in planning operations and achieving planned objectives. Responsibility reporting. Elements of information systems. (Cannot be used to satisfy accounting major requirements if elected as a part of the core curriculum.) Prerequisites, 230 and Business Statistics 201.

#### FINANCIAL ACCOUNTING

##### 301 Intermediate Accounting I (3) AWSpS

Concepts and principles underlying accounting. Theory and problems of financial accounting. (301 and 302 replace 331). Prerequisite, 230.

##### 302 Intermediate Accounting II (3) AWSpS

Continuation of 301. Prerequisite, 301.

##### 303 Advanced Accounting (3) AWSpS

Theory and problems in accounting for ownership equities in corporations and partnerships. Financial statement analysis and internal measurement of business performance. Prerequisites, 301, 302.

##### 375 Topics in Financial Reporting (3) WSp

A critical examination of the uses and limitations of general purpose financial statements which have been prepared in accordance with generally accepted accounting principles. Prerequisite, 230; not open to accounting majors.

##### 485 Consolidated Financial Statements (3) AWSpS

Accounting for parent-subsidiary and branch relationships, domestic and foreign; mergers. Prerequisite, 303.

##### 486 Fiduciary Accounting (2) Sp

Accounting and reporting for estates, trusts, bankruptcies, inheritances, etc. Prerequisite, 303.

##### 490 Advanced Problems (3) WSp

Intensive study of accounting principles, procedures, and presentations, principally through consideration of C.P.A. problems. Prerequisites, 311, 421, 485.

##### 495 Advanced Accounting Theory (3) Sp

Theory of accounting related to income measurement, assets, and equities. Prerequisite, 303, and senior standing.

#### INCOME TAX

##### 421 Federal Income Tax (5) AWSp

Individual, partnership, and corporation income tax, including installment sales and inventory tax accounting. Prerequisite, 303, or permission.

##### 450 Special Tax Problems (3) WSp

Special problems in income tax, including partnerships, estates and trusts, corporate reorganizations, gift and estate taxes, basic tax research. Prerequisite, 421.

#### AUDITING

##### 371 Auditing or Industrial Internship (2) Sp

One quarter's internship with a certified public accounting firm, industrial organization, or government agency. Prerequisite, prior departmental approval.

##### 411 Auditing Standards and Principles (3) AWSpS

Generally accepted auditing standards and principles; auditing objectives and their attainment through procedures. Prerequisites, 303, 311.

##### 470 Case Studies in Auditing (5) WSpS

Application of standards and principles to case studies in auditing, including practice case. Prerequisite, 411.

#### SYSTEMS AND DATA PROCESSING

##### 341 Machine Accounting (2) A

Study of modern punch-card machines and their application to accounting procedures. Prerequisite, 230.

##### 344 Introduction to Electronic Data Processing (3) ASp

Current use of computers in business; impact of high-speed computation on decision making; the design of electronic data-processing systems. Prerequisites, 230 and Business Statistics 201.

##### 440 Accounting Systems (3) AWSp

System design and installation, with emphasis on internal control. Prerequisite, 301, 302.

##### 444J Computer Programming for Business Application (3) AW

SHARPE

Methods of programming electronic computers for business operations; design and use of special-purpose and general-purpose programming languages. Offered jointly with Business Statistics. Prerequisites, 230, Business Statistics 200 and 301, or permission.

#### INSTITUTIONAL ACCOUNTING

##### 480 Fund Accounting (3) ASp

Fund and budgetary accounting as applied to governments and to institutions such as hospitals and colleges. Prerequisite, 303.

#### ACCOUNTING RESEARCH

##### 499 Undergraduate Research (3, max. 9) AWSpS

Prerequisite, permission.

### Courses for Graduates Only

##### 500 Managerial Accounting (5) A

Covers concepts and procedures for presentation of data for managerial and financial decisions. Income determination, cost analysis, cash flow, and analytical reports. Interpretation, use, limitations of accounting reports. Prerequisite, permission.

##### 510 Concepts in Accounting Measurements (3) W

An intensive study of accounting principles underlying financial statements, the measurement of income, and the valuation of assets. Emphasis is placed on the uses and limitations of accounting data. Prerequisites, 230 or 500 and permission.

##### 511 Concepts in Accounting Measurements (3) W

An intensive study of the theory and issues involved in determining unit costs; changing price levels; accounting for corporate stock equities; analysis and interpretation of financial statements. Prerequisite, 510.

##### 520 Seminar in Financial Accounting (3) AS

A critical examination of accounting theories, concepts, and standards pertaining to current assets and liabilities and relevant income determination problems. Prerequisite, 303 and permission.

##### 521 Seminar in Financial Accounting (3) W

A critical examination of accounting theories, concepts, and standards pertaining to non-current balance sheet items and relevant income determination problems. Prerequisite, 303 and permission.

## 522 Seminar in Cost Accounting (3) Sp

Critical examination of theories of managerial accounting. Differentiation of objectives of managerial and financial accounting; joint costs; absorption, direct, standard, and distribution costing; techniques of analysis of data, including differential cost analysis. Prerequisites, 460 and permission.

## 540 Seminar in International Accounting (3) Sp

Emergence of the international accounting problem and organizations associated with the study of the issues involved; national differences in accounting thought and practice; international standards of accounting and auditing and financial reporting. Prerequisite, 511 or permission.

## 571-572 Research Reports (3-3) AWSpS

Independent study in business administration; critical evaluation of business analysis and research methods. Effective communication of ideas is emphasized. Methods and content of independent research studies being completed by the students are subjected to critical evaluation in seminar discussion. Prerequisites, instructor's approval of preliminary research topic outline for 571-; 571- for -572; 571-572 open only to M.B.A. nonthesis students.

## 592 Seminar in Administrative Controls (3) AWSpS

The use of accounting and statistics by management in the exercise of its planning and controlling functions; e.g., forecasting, budgets, standard costs, analysis of cost variations. Controllership as a function in the business enterprise. Prerequisites, 230 and permission.

## 604 Research (\*, max. 10) AWSpS

Prerequisite, permission.

## 700 Thesis (\*) AWSpS

## 702 Degree Final (6) AWSpS

Limited to students completing a nonthesis degree program.

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ADVERTISING—See Communications

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# AERONAUTICS AND ASTRONAUTICS

## Courses for Undergraduates

### 200 Introduction to Aeronautics and Astronautics (2) AWSp

BOLLARD

Introduction to the field of aerospace engineering; discussion of basic concepts and typical problems.

### 300 Aerodynamics (3) AW

GANZER

The atmosphere and the fluid medium. Dimensional analysis and development of force

coefficients. Momentum concepts. Introduction to performance. Kinematics and dynamics of flow fields; incompressible flow about a body. Prerequisites, Physics 121, 122, 123, Mathematics 238.

### 301 Aerodynamics (3) WSp

GANZER

Thin airfoil theory and two-dimensional flows; the finite wing, and three-dimensional flows. Introduction to stability and control. Compressible fluids; thermodynamics of ideal gases; one-dimensional compressible flow. Prerequisites, 300 and Mechanical Engineering 320.

### 302 Aerodynamics (3) SpS

GANZER

Two-dimensional supersonic flow, including linear and shock-expansion techniques; wings in compressible flow. Viscous flows and introduction to the boundary layer. Performance, stability, and control. Prerequisite, 301.

### N320-N321-322 Junior Laboratory (0-0-3) A,W,Sp

PARMERTER

### 330, 331, 332 Structural Analysis (3,3,3) AW, WSp, SpS

D.L.L.

Development of the equations of elasticity, viscoelasticity, and plasticity. Plane stress, plane strain; torsion, bending, and stability of rods and beams; virtual work, potential energy, Castigliano's theorem; statically indeterminate structures; bending of plates and shells. Prerequisites, Civil Engineering 292 for 330; 330 for 331; 331 for 332.

### N390-N391-392 Seminar (0-0-1) A,W,Sp

Preparation and presentation of at least one topic by the student. Prerequisite, senior standing.

### 400 Introduction to Theoretical Aerodynamics (3) A

AHLSTROM

Review of thermodynamics, introduction to elementary kinetic theory and statistical mechanics. One-dimensional gas dynamics, one-dimensional wave motion, waves in supersonic flow, flow in ducts and wind tunnels. Prerequisite, 301.

### 401 Elements of Gas Dynamics (3) W

AHLSTROM

Measurements in fluid dynamics. Inviscid equations of motion, incompressible potential flows, vortex flows, small perturbation flows, bodies of revolution, similarity laws. Prerequisite, 400.

### 402 Aerodynamics of Viscous Flow (3) Sp

AHLSTROM

Transonic flow, hypersonic flow, method of characteristics. Equations with viscosity and heat conductivity, examples of viscous flows, boundary layer flows. Prerequisite, 401.

### 410 Aircraft Design (3) A

GANZER

Preliminary design of a modern airplane to satisfy a given set of requirements; estimation of size, selection of configuration, weight and balance, and performance. Prerequisite, 302.

### 411 Aircraft Design (3) W

GANZER

Design of the aircraft to satisfy stability, control, and handling qualities requirements. FAA load requirements. Prerequisite, 410.

### 412 Aircraft Design (3) Sp

O'BRIEN

Loads analysis for the entire airplane; selection and disposition of structural materials for airplane components; influence of fabrication techniques on structural design; coordination of structural design with aerodynamic and other design requirements; basic principles of optimum design. Prerequisite, 411.

### 420, 421, 422 Senior Projects Laboratory I, II, III (3,3,3) A,W,Sp

Prerequisite, 322.

### 425 Flight Test Laboratory (3) Sp

JOPPA

Theory of flight test; calibration of flight instruments, performance and stability measurements in flight; reduction of flight test data. Prerequisite, 302.

### 430 Matrix Structural Analysis (3) A

MARTIN

Introduction to matrix methods of structural analysis. Prerequisite, 331.

### 431 Plates and Shells (3) W

MARTIN

Introduction to the theory of plates and shells. Prerequisites, 331, 332.

### 432 Special Topics in Structural Analysis (3) Sp

MARTIN

Problems and introduction to theory associated with plastic behavior, viscoelastic materials, filament wound and laminated structures, fatigue, creep, and impact. Prerequisite, 331.

### 440 Flight Mechanics (3) A

GANZER

Vehicle equations of motion near a flat earth; the performance problem within the atmosphere; an introduction into the dynamic stability of vehicles subject to aerodynamic forces. Prerequisite, senior standing.

### 441 Advanced Structural Design (3) W

MARTIN

The philosophy and practice of structural design; selection and disposal of material to withstand imposed loads or other disturbances in the presence of appropriate environmental conditions. Prerequisite, 332.

# AERONAUTICS AND ASTRONAUTICS

## 450, 451 Astronautics I, II (3,3) W, Sp

STREET

Celestial mechanics; calculation of terrestrial and interplanetary trajectories and orbits; dynamics of rocket flight; introduction to aerodynamic, thermal, and other problems associated with extraterrestrial flight. Prerequisite, senior standing for 450; 450 for 451.

## 460 Propulsion (3) A

EASTMAN

Performance and operating characteristics of engines and propeller combinations. Prerequisite, Mechanical Engineering 320.

## 461 Propulsion (3) W

EASTMAN

Study of jet and rocket engines with regard to flow through inlets, compressors, burners, turbines, and nozzles. Prerequisite, 460.

## 462 Propulsion (3) Sp

EASTMAN

Various means for creating thrust; thrust contribution to lift, v/stol configurations; completely integrated thrust and lift; shaft and jet driven helicopter rotors. Prerequisite, 461.

## 470 Analytical Problems in Aeronautics (3) W

Application of mathematical methods to problems in aerodynamics, structures, and dynamics. Prerequisite, Mathematics 238 or permission.

## 480 Systems Dynamics (3) W

FYFE

Equations of motion and solutions for selected problems; natural frequencies and mode shapes; response of simple systems to applied loads. Prerequisite, senior standing.

## 481 Elementary Aeroelasticity (3) Sp

O'BRIEN

Discussion of aeroelastic problems in aircraft design; elementary development of static and dynamic aeroelastic problems. Prerequisite, 480.

## 499 Special Projects (2-5, max. 10) AWSp

An investigation on a special project by the student under the supervision of a staff member. Prerequisite, senior standing.

## Courses for Graduates Only

### 501, 502 Physical Gas Dynamics I, II (3, 3) W, Sp

STREET

501: Review of thermodynamics; thermodynamic properties derived from classical statistical mechanics, reacting gas mixtures; equilibrium flow. 502: Non-equilibrium flow; kinetic theory; radiation gas dynamics. Prerequisite, 501 for 502.

### 504, 505, 506 Fluid Mechanics I, II, III (3,3,3) A, W, Sp

AHLSTROM

Review of thermodynamics; vectors and dyads. Derivation of the Navier-Stokes equations, stream functions and potential functions, integrals of the equations of motion. Boundary conditions and discontinuity surfaces in fluids. Derivation of the Boltzmann equation, derivation of continuum equations from the Boltzmann equation. Dimensional analysis, sound waves, surface waves. Ideal incompressible flows, compressible flows. Laminar and turbulent viscous flows, transonic flow, hypersonic flow, combustion, super fluids. Prerequisite, 567 (may be taken concurrently with 504).

### 507 Aerodynamics of Viscous Fluids I (3) A

STREET

Equations of motion of a viscous compressible fluid; exact solutions; the laminar boundary layer equations; solutions for the flat plate and wedge in incompressible flow; Karman's momentum integral; laminar and turbulent boundary layer over wings and bodies. Prerequisite, 506.

### 508 Aerodynamics of Viscous Fluids II (3) W

STREET

The laminar compressible boundary layer equations; similarity solutions based upon the reduction of the compressible flow problem to incompressible form; momentum and energy intervals; heat transfer by high speed forced convection; extension to hypersonic flow with shock wave-boundary layer interaction. Prerequisite, 507.

### 509 Aerodynamics of Viscous Fluids III (3) Sp

STREET

Equations of motion of a dissociating or reacting gas; reduction of equations to boundary layer form; solutions of the boundary layer equations for laminar and turbulent flow. Prerequisite, 508.

### 510 Wave Propagation in Fluids and Solids (3) Sp

FYFE

Time dependent fluid flow problems; wave and shock propagation in gases and solids; the interaction of different wave forms and boundaries. Prerequisite, 532.

### 511 Unsteady Aerodynamics (3) W

O'BRIEN

Oscillating airfoils at subsonic and supersonic speeds; consideration of wings and bodies in unsteady flow. Prerequisite, permission.

### 512 Magneto-Fluid Dynamics (3) Sp

AHLSTROM

Review of electrodynamics and Maxwell's equations; orbit theory of charged particles, statistical mechanics of ionized gases; continuum magneto-fluid dynamics, the two-fluid model and the one-fluid model; wave propagation in a plasma. Prerequisite, 575.

### 514 Rarefied Gas Dynamics (3) A

STREET

Kinetic theory of gases; Boltzmann equation and the Maxwell transport equation; equations of continuum and slip flow, free-molecule and near free-molecule flows; applications to ultra-high altitude flight. Prerequisite, 501.

### 516 Stability and Control I (3) W

GANZER

Aerodynamics of control; the general problem of dynamic stability; the influence of aerodynamic parameters on flying characteristics. Prerequisite, course in static stability and control.

### 517 Stability and Control II (3) Sp

GANZER

Equations of motion with control terms; response of airplane to actuation of controls; automatic stability and control. Prerequisite, 516.

### 519 Special Topics in Stability and Control (3, max. 6) A

JOPPA

Prerequisites, 516, 517.

### N520-N521-522 Seminar (0-0-1)

### 523 Seminar in Aerodynamics (1-3, max. 12) A,W,Sp

Study of recent advances in aerodynamics. Topics vary from year to year. Open only to students having the M.S. degree or its equivalent.

### 530 Theory of Elastic Structures (3) W

MARTIN

Stresses, strains, displacements; Hooke's law; basic equations of elasticity; virtual work and energy theorems; application of theory to selected problems; approximate methods.

### 532 Mechanics of Solids (3) A

DILL

Phenomenological constitutive equations of solids. The mechanisms of fracture and fatigue. The process of melting and ablation. The impact of high-velocity particles.

### 533 Theory of Plasticity (3) Sp

MARTIN

Physical behavior of elastic-plastic and plastic structures; development of stress-strain relations and conditions for yielding; discussion of extremum principles; application of theory to representative problems.

### 535, 536, 537 Analysis of Shells I, II, III (3,3,3) A, W, Sp

O'BRIEN

Nonlinear equations of thin shells. Solution of the linearized equations for shells of revolution and other shapes. Buckling of shells. Post-buckling deformation of shells.

**540, 541, 542 Finite Element Analysis I, II, III (3,3,3) W, Sp, A**

MARTIN

The finite element concept; historical background; relation to classical theory; finite element models; general finite element theory. Finite elements in structural mechanics; structural idealization; constraints; linear and nonlinear problems. Finite element theory for inelastic bodies; problems in structural dynamics and wave propagation; finite element applications to other fields.

**545, 546 Bioastronautics I, II (3,3) W, Sp**

BOLLARD

Systematic study in how the principles of engineering science apply to specific biosystems and to acquaint the student with the principles of structure and function of the human organism in the alien space environment. Prerequisite, 545 for 546.

**550 Space Dynamics (3) A**

FYFE

Basic concepts of dynamics. Variational principles and Lagrange's equations. Rigid body kinematics and equations of motion.

**551 Aerospace Systems (3) W**

FYFE

The study of aerospace system analysis employing transform methods: the effect of subsystem behavior such as the flexibility of flight vehicle structure, aerodynamic forces, etc. Prerequisite, 550.

**553 Vibrations of Aerospace Systems (3) W**

O'BRIEN

Natural frequencies and modes of vibrations of linear systems; forced vibrations and motion dependent forces; Lagrange's equations and Hamilton's principle; matrix methods for discrete and continuous systems. Prerequisite, 550.

**555 Special Topics in Aerospace Systems (3, max. 6) ASp**

BOLLARD

**556 Aeroelasticity (3) Sp**

O'BRIEN

Concept of functional diagrams and aeroelastic operators; quasi-static lifting-surface deformations and stability; control surface effectiveness; nonstationary lifting-surface deformations and stability; general dynamics of aerodynamic, structural, and control system interactions. Prerequisites, 481, 553.

**557 Nonlinear Problems in Aerospace Systems (3) A**

The application to aeronautics of nonlinear ordinary differential equations and the topology of their integral curves in the phase plane; dynamical interpretation of singular points; existence of periodic solutions; questions of stability; nonlinear resonance; frequency demultiplication; relaxation oscillations.

**562, 563, 564 Methods of Partial Differential Equations I, II, III (3,3,3) A, W, Sp**

KEVORKIAN

First order partial differential equations: characteristics, conservation laws, shocks, applications in geometrical optics and Hamilton-Jacobi theory. Elliptic equations: fundamental solution, Green's function, conformal mapping, boundary-value problems. Parabolic equations. Hyperbolic equations: characteristics, shocks, examples from fluid dynamics, approximate methods. For other courses on partial differential equations, see Mathematics 574, 575, 576. Prerequisite, 569J.

**565 Approximate Analysis I (3) A**

Approximate solution of differential equations (by infinite series and finite differences) and integral equations. Variational methods of Ritz and Galerkin. Prerequisites, 568 or Mathematics 428 and 429.

**566 Approximate Analysis II (3) W**

Conformal transformations of regions and their application to the solution of boundary value problems for harmonic and biharmonic functions. Prerequisites, 567, 568, or Mathematics 427, 428, and 429.

**567, 568 Analysis in Engineering (3,3) A,W**

Mathematical methods for solving problems arising in engineering. 567: vector analysis, matrices, tensors. 568: calculus of variations, Sturm-Liouville problems, series solutions and special functions for ordinary differential equations, orthogonal functions.

**569J Partial Differential Equations (3) Sp**

Classification of second order partial differential equations; solution by separation of variables and reduction to a boundary value problem; theory of characteristics and solutions by means of Green's functions. Examples from classical mechanics of continua. Offered jointly with the Department of Mathematics. Prerequisite, 568 or Mathematics 428.

**571, 572, 573 Space Flight Mechanics I, II, III (3, 3, 3) W, Sp, A**

STREET

Orbit mechanics; position and velocity in two-body orbits; two-body orbit determination and orbital transfer; perturbation methods; celestial navigation; optimization of flight paths; application to lunar and interplanetary flight.

**575 Thermo- and Electrodynamics of Continua (3) W**

DILL

The application of the principles of the phenomenological theory of irreversible thermodynamics and of the electrodynamics of continuous media to fluids and solids. Prerequisite, 567.

**576, 577, 578 Perturbation Theory I, II, III (3, 3, 3) A, W, Sp**

KEVORKIAN

Basic concepts of asymptotic expansions: evaluation of integrals. Singular perturbations: limit process expansions, matching,

uniformly valid approximations. Theory for nonlinear oscillations: multiple variable expansions, adiabatic invariance, canonical perturbation theory.

**580, 581, 582 General Theory of Continuous Media I, II, III (3,3,3) A,W,Sp**

DILL

General formulation of the classical field theories: fundamental concepts of motion, stress, energy, entropy, and electromagnetism for a continuum; conservation of mass; balance of momentum; balance of energy, including thermodynamics of irreversible deformations; balance of electromagnetism. General nature of constitutive equations for a continuum. Examples of kinematic, energetic, mechanical, thermomechanical, electromagnetic, and electromechanical constitutive equations. Prerequisites, 567, and intermediate standing.

**583 Special Topics in Solid Mechanics (3) AWSp**

DILL

Study of recent advances in the mechanics of solids. May be repeated for credit by permission.

**599 Special Projects (2-5, max. 15) AWSp**

An investigation on a special project by the student under the supervision of a staff member.

**600 Research (\*) AWSp**

Prerequisite, permission of Department chairman.

**700 Thesis (\*) AWSp**

**702 Degree Final (6) AWSp**

Limited to students completing a nonthesis degree program.

**AEROSPACE STUDIES**

**Courses for Undergraduates**

**101, 102, 103 Aerospace Studies 100 (1,1,1) A, W, Sp**

A study of world military systems, causes of conflict, role and relationship of military power to that conflict, and the responsibility of an Air Force officer. One classroom hour and one hour of Corps Training per week.

**211, 212, 213 Aerospace Studies 200 (1,1,1) A, W, Sp**

A study of world military systems and trends in the development and employment of military power. One classroom hour and one hour of Corps Training per week.

**250 Aerospace Studies 200 (5) S**

A six-week field training course at an Air Force base. A special course designed to give basic military training prior to entrance into the Air Force Professional Officer Course, for those students who have not taken Aerospace Studies 100 and 200 series.

## AEROSPACE STUDIES

### 321, 322, 323 Aerospace Studies 300 (3,3,3) A,W,Sp

A study of the history, growth, and development of Aerospace Power. Three classroom hours and one hour of Corps Training per week.

### 350 Aerospace Studies 300 (3) S

A four-week field training course at an Air Force base. Familiarization with the duties and problems encountered by the Air Force junior officer.

### 430 Flight Instruction Program Ground School (3) A

Ground school to supplement flight training in light aircraft; includes weather, navigation, and Federal Aviation Agency regulations.

### 431, 432, 433 Aerospace Studies 400 (3,3,3) AWSp

A study of professionalism, leadership, and management. Includes professional responsibilities, military justice system, leadership theory functions and practices, management principles and functions, and problem solving. Three classroom hours and one hour of Corps Training per week.

## ANESTHESIOLOGY

### 480 Clinical Clerkship (\*)

BONICA

Each fourth-year medical student is assigned to anesthesiology for a period of four weeks, half days. During this time he participates actively in the management of surgical, obstetric, and medical patients who require anesthesiologic care. The various techniques of general, regional, and psychologic analgesia and anesthesia are demonstrated in the operating room, and subsequently the student carries out these various procedures under the supervision of the staff. Laboratory demonstrations are used to emphasize certain important anatomic, physiologic, and physical problems that may arise during clinical anesthesia. The student participates in the pre- and postanesthetic management of patients. Required for fourth-year medical students.

### 486 Externship in Anesthesiology (\*) AWSpS BONICA

The student is given an opportunity to study and obtain experience in clinical anesthesia in depth. During the period of six weeks he obtains experience in all techniques of inhalation anesthesia, regional anesthesia, intravenous anesthesia, and the pre- and postanesthetic care of surgical and obstetric patients and in the management of special anesthesiologic problems encountered in general surgery, orthopedics, neurosurgery, urologic surgery, pediatric surgery, cardiovascular surgery, and obstetrics. He is also given ample opportunity to participate in the care of patients with special medical problems such as intractable pain, chronic pulmonary insufficiency, and peripheral vascular disease. Elective for medical students. Prerequisite, permission.

### 498 Undergraduate Thesis (\*) AWSpS

For medical students. Prerequisite, 499.

### 499 Undergraduate Research (\*)

Specific research problems relating to pulmonary, cardiovascular, renal, and central nervous system functions and their alteration by anesthetic agents and techniques. For medical students. Prerequisite, permission.

### 521, 522, 523 Anesthesiology Seminar (2, 2, 2) A,W,Sp

Seminars, covering a period of over two years, deal with basic science correlated to anesthesiology, with quarterly themes of physiology and pharmacology of circulation, respiration, acid-base regulation, anesthetic uptake, gestation, pain.

## ANTHROPOLOGY

### Courses for Undergraduates

#### 100 Introduction to the Study of Man (5) AWSp

Nontechnical survey of the fields that make up anthropology. Physical anthropology: man as a biological organism, evolution, and race. Archaeology: prehistory and the beginnings of history, including the earliest cultures and civilizations. Ethnology, social anthropology, and linguistics: living and recent societies of the world, their languages and cultures. (Not open to students who have taken 250 or 280.)

#### 201 Physical Anthropology: Man in Nature (5)

An introduction to physical anthropology. The basic principles of human genetics, the evidence for human evolution, and the study of race. Prerequisite, 100 or sophomore standing.

#### 202 Cultural Anthropology: Comparison and Analysis (5)

Social, political, and religious institutions in selected communities around the world which illustrate diversity and universality in human cultures. Prerequisite, 100 or sophomore standing.

#### 203 Prehistoric Cultures of the Old World (5) WSp

GREENGO

An introduction to the prehistory of man. The beginnings of culture in the Old World to the early Iron Age in Western Europe. Prerequisite, 100 or sophomore standing.

#### 210 North American Indians (3)

Historic Indian cultures and their modern representatives.

#### 211 Oceania (3)

READ

Ethnographic analysis of the islands of the Pacific; the effects of modern contacts.

#### 213 Africa (3)

OTTENBERG

Basic social groupings and cultures.

### 215 Peoples of South America (3)

Contemporary societies of South America: economic, political, ethnic, and cultural characteristics; historical background.

### 250 The Nature of Culture (2) AWSp

Orientation to cultural anthropology; introduction to primitive and modern societies and their present day relationships. (Not open to students who have had 100 or 202.)

### 270 Field Course in Archaeology (12) S

GREENGO

Methods and techniques as demonstrated through field experience. Prerequisite, permission. (Offered Summer Quarter only.)

### 272 Prehistoric Cultures of North America (3)

GREENGO, KRIEGER

Archaeology from the earliest evidence to the coming of Europeans. (Course number changes to 472 Autumn Quarter 1967.)

### 273 Prehistoric Cultures of the New World (3)

GREENGO, KRIEGER

An introduction to pre-Columbian cultures, based on archaeological and ecological evidence. Prerequisite, sophomore standing.

### 274 Prehistoric Cultures of South America (3)

KRIEGER

From earliest evidence of man to the period of conquest by the Spanish. (Course number changes to 474 Autumn Quarter 1967.)

### 280 Theories of Race (2) AWSp

Biological, social, cultural, and psychological aspects of race and race relations. Selected problems in the definition of race concepts, origin and evolution of races, nature of race differences. (Not open to students who have taken 100 or 201.)

### 311 Indian Cultures of the Pacific Northwest (3)

GARFIELD

Comparative analysis of material culture and social, religious, and political institutions.

### 314J Peoples of Central and Northern Asia (3)

FAIRSERVIS

Offered jointly with the Far Eastern and Russian Institute. Prerequisite, major standing in Anthropology or Far Eastern, or permission. (Offered alternate years; not offered 1967-68.)

### 315 Peoples of the Far North (3)

Arctic and Sub-Arctic peoples of Asia and North America; nonliterate peoples of Old and New World and cultural history of the Far North.



**317 Ethnology of Southeast Asia (3)**

KEYES

A survey and analysis of the cultural diversity and unity of the peoples of Burma, Thailand, Indo-China, Malaysia, Indonesia, and the Philippines. Prerequisite, major standing in Anthropology or Far Eastern, or permission.

**319 Peoples and Cultures of the Iranian Plateau (3)**

AMOSS

Survey of cultural and geographical characteristics; present-day problems of culture change in Iran and Afghanistan, including transition from nomadism to farming, urbanization, and economic development.

**320 Primitive Technology (5)**

Study of the material culture of primitive peoples with analysis of techniques of manufacture. Museum material is used for laboratory work.

**332 The Religions of Primitive Peoples (3)**

A survey of beliefs and practices designed to provide a world ethnographic sample of the materials. Prerequisite, upper-division standing or permission.

**350 Basis of Civilization (3)**

Inventions, discoveries, and technological achievements of the ancient and primitive worlds; the beginnings of science; the impact of civilization.

**370 Methods and Problems of Archaeology (5)**

GREENGO

Field experience in this locality is included. Prerequisite, permission.

**371 Analysis of Archaeological Data (3)**

GREENGO

Designed for students who have had field experience in archaeology. Prerequisite, permission.

**380 Primate and Human Evolution (3)**

NEWMAN

Development and relationships of primates, including man, traced from comparative and paleontological data. Prerequisite, 201.

**412 South Asian Social Structure (3)**

HARPER

Caste dynamics, political control, economic organization and religion in Hindu village India. Prerequisite, permission.

**415 The Character of Eskimo Life (3)**

An analysis of cultures, aboriginal and contemporary, in terms of the shaping of lives of individuals.

**417 Middle American Civilization (3)**

KRIEGER

Development of the high cultures of Mexico, Guatemala, and Northern Central America from earliest evidence to Spanish conquest.

**418 Ethnology of Meso-America (3)**

Indian and peasant cultures from Mexico through Nicaragua. Cultural and social types, acculturation, and relations to national cultures. Prerequisite, major standing in anthropology, Latin-American studies, sociology, or permission.

**425 Applied Anthropology (3)**

Planned and directed social and cultural change. Prerequisite, 202 or permission.

**431 Primitive Literature (3)**

Mythology and folk tales of nonliterate peoples. Theories of interpretation of oral literature and analysis of tales for cultural content and style.

**432 Magic, Religion, and Philosophy (3)**

READ

Comparative systems, beliefs, and philosophical concepts of nonliterate peoples.

**433 Primitive Art (3)**

Aesthetic theories and artistic achievements of preliterate peoples. Museum material is used for illustration. Prerequisite, 10 credits in anthropology or art.

**434 Comparative Morals and Value Systems (3)**

READ

The sociological functions of morality in simple societies.

**435 Primitive and Peasant Economic Systems (3)**

WATSON

Description and analysis of chief conceptual and empirical features of nonmonetary and simple monetary economies; the impact of monetary economy and industrial technology on nonwestern societies.

**437 Primitive Political Institutions (3)**

Comparative analysis of selected nonliterate societies. Prerequisite, 202.

**438 The Analysis of Kinship Systems (3)**

READ

Organization and types of kinship structures among western and nonwestern peoples. Prerequisite, 202 or permission.

**441 Introduction to Culture and Personality (3)**

An introductory survey which will consider the logical status of culture and personality within anthropology, the relationship of this sub-field to other disciplines, and a review of its basic concepts and contributions as illustrated through specific studies. Prerequisites, 100 or 202, Psychology 100, junior standing, or permission.

**442 Childhood and Society (3)**

The relationship between child training and the functioning of social systems. Cross-cultural materials are examined. Prerequisite, 202 or 15 credits in social sciences.

**443 Advanced Culture and Personality (3)**

Emphasis on field and research methods; a consideration of special problem areas, including personality and culture change, social psychiatry, and the "New Culture and Personality." Original research will be encouraged. Prerequisite, 441 or permission.

**450 Introduction to Language (3) A**

JACOBS

An anthropological introduction to language as basic to culture. Techniques of analysis and study, descriptive and historical. (Formerly 355.)

**451J, 452J, 453J Phonetics and Phonemics (3,3,3) A,W,Sp**

GREKOFF

Detailed study of speech sounds, mechanism of their production, and structuring of sounds in languages; practical experience with a wide variety of languages; field techniques. Offered jointly with the Department of Linguistics.

**454J Methods in Comparative Linguistics (3) W, S**

FILONOV, GOVE

Method and theory of comparative linguistics in relation to anthropological research. Offered jointly with the Department of Linguistics. Prerequisite, 400 or permission.

**455J Areal Linguistics (3, max. 6) ASp**

LUKOFF

Linguistic analyses of the languages of a selected area. Offered jointly with the Department of Linguistics.

**460 History of Anthropology (3)**

JACOBS

Systematic discussion of developments in the several fields of general anthropology. Prerequisite, 15 credits in anthropology.

**462J, 463J Morphology and Syntax (3,3) W, Sp, S**

SAPORTA, CONTRERAS

Study of the structuring of meaningful elements in language; practical experience with a wide variety of languages; field techniques. Offered jointly with the Department of Linguistics. Prerequisite, 400 or permission.

**471 Trans-Oceanic Voyages in Pre-Columbian Times (3) W**

KRIEGER

Examination of accumulating evidence that peoples of Japan, China, Southeast Asia, and India may have occasionally crossed the Pacific Ocean to Middle and South America from about 3000 B.C. onward, and similar problems involving the Atlantic Ocean, in pre-Columbian times.

**472 Prehistoric Cultures of North America (3)**

GREENGO, KRIEGER

Advanced study of prehistoric cultural developments in North America north of Mexico. Prerequisites, 203, 273, or permission.

# ANTHROPOLOGY

## 474 Prehistoric Cultures of South America (3)

KRIEGER

Advanced study of the development and variation of prehistoric cultures. Prerequisites, 203, 273, or permission.

## 475 The Prehistoric Near East (3)

FAIRSERVIS

The evolution of Near-Eastern cultures from a hunting-gathering level to a stage anticipating civilization.

## 476 The Character of Ancient Egyptian Civilization (3)

FAIRSERVIS

The cultural features of ancient Egypt, their origin, function, and change.

## 477 The Character of Early Mesopotamian Civilization (3)

FAIRSERVIS

The cultural features of early Mesopotamian civilization, their origin, function, and change, with emphasis upon the Sumerian and Akkadian periods.

## 478 The Archaeology of India-Pakistan (3)

FAIRSERVIS

Archaeological evidence and interpretations for the prehistory and pre-Islamic periods of South Asia; ethnohistory of India; development of civilization from the food-gathering stage.

## 480 Physical Anthropology: Primate Anatomy (5) A

NEWELL, NEWMAN

The anatomy of primates with emphasis on evolutionary changes, involving laboratory dissection of primate specimens. Prerequisite, 201.

## 481 Physical Anthropology: Structure and Function (5) W

NEWELL, NEWMAN

Analysis of structural and functional approaches to primate evolution, involving laboratory projects. Prerequisites, 201, 480 or Zoology 453-454.

## 482 Physical Anthropology: Population Genetics (5)

The population as a unit of study will be defined, and methods of analyzing the forces of evolution operative in human populations will be presented. Prerequisite, 201 or Genetics 351.

## 491 Museology (3, max. 6)

QUIMBY

A tutorial course offering training in the technical competencies involved in the collection, storage, care, preparation, and exhibition of anthropological materials. Prerequisite, permission.

## 499, 499H Undergraduate Research (\*, max. 12; max. 18 for honors students only) AWSp, AWSp

Prerequisite, permission.

## Courses for Graduates Only

### 500, 501, 502 Preceptorial Reading (6,6,6) A,W,Sp

A series of core courses for the beginning graduate student in which the fields and problems of contemporary anthropology are systematically surveyed.

### 505 Field Techniques in Ethnography (3)

The techniques of collecting, recording, ordering, and utilizing ethnographic data in the field. Problems of rapport, sample, interview, observation, and interpretation.

### 510 Seminar on North American Indians (3)

An advanced comparative treatment of selected aspects of the Indian cultures and societies of North America.

### 511 Cultural Problems of the Northwest Coast (3, max. 6)

GARFIELD

The major ethnological questions of the region are examined.

### 512 Seminar on Oceania (3)

WATSON, CARROLL

An advanced comparative treatment of selected aspects of the cultures and societies of Oceania.

### 513 Seminar on Africa (3)

OTTENBERG, WINANS

An advanced comparative treatment of selected aspects of the cultures and societies of Africa.

### 515 Seminar on South America (3)

An advanced comparative treatment of selected aspects of the cultures and societies of South America.

### 516 Seminar on Southeast Asia (3)

KEYES

An advanced comparative treatment of selected aspects of the cultures of Southeast Asia.

### 517 Seminar on South Asia (3)

HARPER

An advanced analysis of selected problems in South Asian ethnology and social structure.

### 518 Seminar on Middle America (3)

An advanced comparative treatment of selected aspects of the cultures and societies of Middle America.

### 519J Seminar on Asia (3, max. 6) Sp

FAIRSERVIS

The large cultural regions of the continent are studied in succession, with special reference to ethno-historical problems. Offered jointly with the Far Eastern and Russian Institute. (Offered alternate years; not offered 1967-68.)

### 521 Native American Culture History (4)

An historical interpretation of the geographical distribution of critical aspects of North and South American Indian cultures.

### 522 Cultural Problems of Western America (3)

Analysis of the components of representative Indian cultures west of the Rocky Mountains and research on selected problems.

### 524 Seminar in Cultural Problems of Arctic and Sub-Arctic (3, max. 6)

Cultural relationships across the North Pacific; culture history of Arctic regions, Asiatic and American; cultural factors in cold-land adaptation and adjustment.

### 525 Seminar in Culture Processes (3, max. 6)

The concept of process and its application to the study of culture.

### 527 Acculturation (3)

Systematic analysis of psychological, social, and cultural implications of the contact of peoples.

### 530 Structures and Functions of Oral Literature (3) A

JACOBS

Of interest to students of language and literature.

### 531 Analysis of Oral Literature (3, max. 6) W

JACOBS

Various approaches to the study of folklore and myth. Of interest to students of language and literature.

### 532 Content Analysis of Oral Literatures (3)

JACOBS

Analysis of oral literatures for main themes, relationships, personalities, tragedy, humor, values, world view, and their sociocultural connections. Of interest to students of language and literature. Prerequisite, permission.

### 537 Non-Western Political Systems (3)

OTTENBERG

Ethnic manifestations, methodological problems, and theoretical implications of polity in a wide range of cultures.

### 540 Anthropology and Health (3)

Seminar on the history, development, and future of anthropological contributions to problems of health and illness. Prerequisite, permission.

### 541 Seminar in Psychological Aspects of Culture (3)

Selected problems in the relation of culture and personality types.

**553J Analysis of Linguistic Structures**  
(3, max. 6) AW

KEILER, LUKOFF

Offered jointly with the Department of Linguistics. Prerequisite, permission.

**559 Seminar in Language and Culture (3)**

Theoretical and methodological problems in language and culture.

**561 Seminar in Methods and Theories**  
(3, max. 9)

**562J Implications of Concepts from Anthropology for Nursing (3)**

ATKINS

An examination of selected core concepts from anthropology and an assessment of the implications of these concepts for nursing research. Offered jointly with the School of Nursing.

**563 Structural-Functional Analysis (3-9)**

**564 Formal Methods of Analysis for Social Anthropology (3)**

ATKINS

A seminar on selected nonstatistical mathematical methods and models of relevance to various problems in social anthropology.

**565, 566, 567 History of Anthropological Sciences (3,3,3) A,W,Sp**

OTTENBERG

A series of core courses for the beginning graduate student, in which the growth and development of anthropological science is analyzed.

**569J Social and Cultural Change: Africa (3)**

OTTENBERG, VAN DEN BERGHE, WINANS

Urbanization, stratification, technology, education, social and religious movements, and cultural pluralism in contemporary Africa. Offered jointly with the Department of Sociology. Prerequisite, graduate standing in a social science department.

**570 Seminar in Theory and Method in Archaeology (3)**

GREENGO, KRIEGER

**571 Field Course in Archaeology (5) S**

GREENGO

Study of prehistoric cultures through archaeological excavation and analysis. Work will be largely in the state of Washington, but other areas may be included.

**572 Seminar in North American Archaeology (3, max. 6)**

GREENGO, KRIEGER

Selected problems in the archaeology of America north of Mexico. Prerequisite, 472 or permission.

**573 Seminar in Middle American Archaeology (3, max. 6)**

KRIEGER, GREENGO

Selected problems in the archaeology of Middle America. Prerequisite, 417 or permission.

**574 Seminar in South American Archaeology**  
(3, max. 6)

KRIEGER

Selected problems in the archaeology of South America and southern Central America. Prerequisite, 474 or permission.

**582 Seminar in Race and Genetics (3)**

NEWMAN

Prerequisite, 482 or permission.

**591 Seminar in Museology (3)**

QUIMBY

Research into problems of museology. Prerequisite, permission.

**600 Research (\*)**

**700 Thesis (\*)**

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ARABIC—See *Classics*

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## ARCHITECTURE

### Courses for Undergraduates

**100,101 Architectural Appreciation (2,2)**  
A,W

HERRMAN

Survey of architectural design from an historical viewpoint. For nonmajors.

**105 The House (2) Sp**

HERRMAN

Analysis of domestic architecture.

**106 Introduction to Architecture and Urban Planning (5) A**

BONSTEEL

Survey of architecture, urban planning, and the environmental designs and construction. Historical and contemporary. College majors or permission.

**124,125,126 Architectural Design, Grade I, AWSpS, AWSpS, AWSpS**

Design and drawing fundamentals to provide a working knowledge, language, and tools for the architect. College majors or permission.

**200,201,202 History of Architecture (3,3,3)**  
A,W,Sp

HILDEBRAND

Comparative study of the Classic, Byzantine, Romanesque, Gothic, Renaissance, and Baroque periods.

**224,225,226—Architectural Design, Grade II (6,6,6) AWSpS, AWSpS, AWSpS**

Prerequisite, 126.

**235,236,237 Mechanical Equipment of Buildings (2,2,2) A,W,Sp**

Analysis and methods of plumbing and sanitation; electric wiring and illumination; heating, ventilation, and air conditioning.

**276 Statics (3) A**

Basic analysis of forces and force systems by analytical and graphic methods. Stress analysis of trusses. Prerequisite, Mathematics 105.

**277 Strength of Materials (3) W**

Stress and strain. Strength and elastic properties of structural materials. Riveted and welded joints. Designs of simple timber and steel beams, girders, and columns. Prerequisite, 276.

**278 Analysis and Design of Trusses (3) Sp**

Determination of roof loads. Complete design of various types of roof trusses in timber and steel. Prerequisite, 277.

**303 History of Architecture (3) A**

JOHNSTON

Analysis of architectural developments since the Baroque.

**324,325,326 Architectural Design, Grade III (6,6,6) AWSpS, AWSpS, AWSpS**

Prerequisite, 226.

**330 Materials and Their Uses (3) A**

MGBROFF

Manufacture, properties, and design potentials of building materials.

**333 Characteristics of Puget Sound Architecture and Towns (3) S**

STEINBRUECK

Form, detail, and construction as determining and identifying qualities of buildings. Esthetic and historical values as seen in the visual qualities of the urban form of the Puget Sound town.

**338 Illumination Seminar (2) W**

FITZMAURICE

Principles of illumination as applied to buildings. Prerequisite, senior in architecture.

**339 Acoustics Seminar (2) Sp**

TOWNE

Principles of acoustical designing as applied to buildings. Prerequisite, senior in architecture.

**360 Design Theory and Analysis (3) WSp**

SELIGMANN

Design theory, analysis of planning, and building types. Prerequisite, 303 or permission.

**369 Specifications and Contracts (2) W**

MITHUN

Form and composition of building specifications and related contract documents. Prerequisite, 330.

# ARCHITECTURE

## 370 Building Economics (2) Sp

MITHUN

Social, political, and economic factors affecting the location, construction, financing, and marketing of buildings. Prerequisite, senior in architecture.

## 376 Structural Design: Timber and Steel (4) A

RADCLIFFE, TORRENCE

Analysis and design of complete building frames. Laminated wood frames. Uses of arches and rigid frames in building construction. Earthquake resistance in design. Prerequisite, 278.

## 377, 378 Structural Design: Reinforced Concrete (4,4) W,Sp

RADCLIFFE, TORRENCE

377: introduction to the analysis of continuous structures. Development of basic design equations. Design of reinforced concrete beams, girders, and one-way and two-way floor slabs. Prerequisite, 376. 378: design of flat slabs, columns, stairways, footings, foundation walls, and retaining walls. Prerequisite, 377.

## 400 Survey of Environmental Arts (5) S

HILDEBRAND

The environmental arts of architecture, landscape architecture, and urban planning. An historical evolution with special emphasis on factors shaping these arts in the Western World and the twentieth century.

## 414 Visual Design (2) A

THIEL

Principles of visual organization applied to problem-solving in multi-dimensional media. Prerequisite, 126 or permission.

## 415 Graphic Representation and Simulation (2) W

THIEL

Lectures and problems in the representation of objects and space, using traditional, experimental, figurative, and abstract idioms. Prerequisite, 126 or permission.

## 416 Light and Color (2) Sp

THIEL

Experimental studies in light and color directed toward their creative manipulation in art and architecture. Prerequisite, 126 or permission.

## 424, 425, 426 Architectural Design, Grade IV (6,6,6) AWSpS, AWSpS, AWSpS

Prerequisite, 326.

## 430, 431, 432 Contract Drawings (3,3,3) A,W,Sp

VAREY

Lectures and drafting-room practice. Prerequisite, 326.

## 440 Human Needs Analysis (3) A

WINKEL

The development of programming methods for the study of human needs in relation to architectural design.

## 441 Laboratory in Human Needs Analysis (3) W

WINKEL

The application of human needs programming methods in architectural settings.

## 442 Social Implications of Architecture (3) S

WINKEL

A consideration of the ways man both shapes and is shaped by his physical environment.

## 468 Professional Practice (2) Sp

MITHUN

Introduction to the architectural office, business operation, and professional procedure. Prerequisite, senior in architecture.

## Courses for Graduates Only

### 524, 525, 526 Advanced Architectural Studies (6,6,6) AWSpS, AWSpS, AWSpS

Advanced experimental studies dealing with significant architectural relationships involving scholarly investigation, development and presentation of results.

### 560 Graduate Seminar: Relationship of Human Behavior and the Physical Environment (3) Sp

WINKEL

This course is oriented toward a discussion and development of a theoretical view of man and the physical environment. Alternative descriptions of architecture are considered from the point of view of man's physiological and psychological needs.

### 561 Graduate Seminar: Research and Analysis I (3) A

SCHULTZ, WINKEL

An examination of the changing role of the architect in modern society through a consideration of the effects of design decisions. Concepts are drawn primarily from the social sciences. Major emphasis is given to methodology relevant to the design process and research investigations.

### 563 Graduate Seminar: Research and Analysis II (3) W

SCHULTZ, WINKEL

A survey of quantitative concepts useful in research and analysis. Introduction to probability and statistics, sampling methods, decision theory, and systems analysis.

### 600 Research (\*) AWSpS

Student research will be permitted and encouraged when the studies support departmental interests.

### 700. Thesis (\*) AWSpS

## ART

## Courses for Undergraduates

### Humanities 102 The Arts (5) AWSp

Painting, sculpture, music, architecture, the dance, and drama studied through example, discussion, and criticism.

### 105, 106, 107 Drawing (3,3,3) AWSpS, AWSpS, AWSpS

Perspective, light and shade, composition. Prerequisites, 105 for 106; 106 for 107.

### 109, 110 Design (3,3) AWSpS, AWSpS

Art structure as the basis for creative work. Organization of line, space, and color. Lectures, discussion, and supplementary reading. Prerequisite, 109 for 110.

### 129 Appreciation of Design (2) AWSp

Lectures on design fundamentals, illustrated with slides and paintings, pottery, textiles, etc. Reading and reference work.

### 201, 202, 203 Ceramic Art (3,3,3) AWSpS, AWSp, AWSp

Pottery: hand-building processes, wheel throwing, glazing, kiln firing. Prerequisites, 107, 110, 129 for 201; 201 for 202; 202 for 203.

### 205 Lettering (3) AWSp

Design and composition of letters. Prerequisites, 107, 110, 129.

### 253, 254, 255 Design and Materials (3,3,3) AWSp, AWSp, AWSp

Materials as a factor in design. Class experimentation and research. 253, wood and plaster; 254, metal, glass, and plastics; 255, textiles. Prerequisites, 107, 110, 129.

### 256 Painting (3) AWSpS

Beginning oil painting. Prerequisites, 107, 110, 129.

### 257 Painting (3) AWSpS

Oil painting. Prerequisite, 256.

### 258 Water Color (3) AWSpS

Prerequisites, 107, 110, 129.

### 259 Advanced Water Color (3) AWSpS

Prerequisite, 258.

### 261 Elements of Interior Design (3) AWSp

Study of basic residential spaces and furnishings. Scale drawings. materials, and color.

### 262 Essentials of Interior Design (2) Sp

Illustrated lectures on color, texture, and form in residential space.

### 265, 266, 267 Advanced Drawing (3,3,3) AWSp, AWSp, AWSp

Prerequisites, 107, 110, 129 for 265; 265 for 266; 266 for 267.

### 268 Anatomical Drawing (3) ASp

Study of figure's internal structure and its relationship to surface appearance. Drawing from the model and anatomical material. Prerequisites, 107, 110, 129.

**272, 273, 274 Beginning Sculpture Composition (3,3,3)**  
AWSpS, AWSpS, AWSpS

Fundamentals of composition in the round and in relief. Prerequisites, 107, 110, 129 for 272; 272 for 273; 273 for 274.

**280, 281, 282 Furniture Design: (3,3,3) A,W,Sp**

Design and full-scale construction of furniture in the shop, includes working drawings, scale models, and layout. Prerequisites, 107, 110, 129, Architecture 124, 125, 126; 280 for 281; 281 for 282.

**300 Art Education: Crafts (3) AW**  
FULLER

Design in leather. Exploration of techniques and processes leading to creative work. Prerequisite, junior standing in art.

**302 Art Education: Crafts (3) SpS**

Bookbinding. The design and construction of books including decorative paper techniques. Prerequisite, junior standing in art.

**303 Art Education: Crafts (3) AS**

Paper techniques and processes. Prerequisite, junior standing in art.

**304 Art Education: Crafts (3) WS**

Textile techniques and processes. Prerequisite, junior standing in art.

**305 Art Education: Crafts (3) SpS**

General techniques and processes involved with various materials. Prerequisite, junior standing in art.

**307, 308, 309 Portrait Painting (3,3,3) AWSpS, AWSpS, AWSpS**

Prerequisite, 257 for 307; 307 for 308; 308 for 309.

**310, 311, 312 Interior Design (5,5,5) A,W,Sp**  
HILL

Analysis of interior spaces and furnishings in relation to human needs. Includes study of materials, scale drawings, models, and presentation. Prerequisites, 262, 280, 281, 282, 283; Architecture 124, 125, 126; Home Economics 125; 310 for 311; 311 for 312.

**313, 314 Fundamentals of Photography (3,3) W,Sp**  
RIECKS

Basic theory and techniques of photographic reproduction. Lighting, exposure, camera technique, and processing. Application of photographic techniques to the solution of problems in visual presentation. Prerequisite, junior standing in Graphic or Industrial Design for 313; 313 for 314.

**316, 317, 318 Design for Industry (5,5,5) A,W,Sp**  
SMITH

Product design, working drawings, models, presentation drawings, product analysis, dis-

play, marketing. Prerequisites, junior standing in industrial design: 316 for 317; 317 for 318.

**322, 323, 324 Life Sculpture (3,3,3) AWSp, AWSp, AWSp**

DU PEN

Work in clay from the posed model. Figure composition, discussions, reading, and sketchbook. Prerequisites, 274 and junior standing in art; 322 for 323; 323 for 324.

**332, 333, 334 Intermediate Sculpture Composition (3,3,3)**  
AWSpS, AWSpS, AWSpS

DU PEN

Advanced work in various media and techniques. Prerequisites, 324 for 332; 332 for 333; 333 for 334.

**340 Design for Printed Fabrics (3) W**  
PENINGTON

Hand-block and silk-screen printing; mass-production design. Prerequisite, 255 or permission.

**350 Introduction to Printmaking (3) ASpS**

ALPS

Studio problems. Prerequisite, junior standing in art.

**351 Printmaking (3) WSpS**

ALPS

Continuation of 350. Prerequisite, 350.

**352 Printmaking (3) SpS**

ALPS

Prerequisite, 351.

**353, 354, 355 Advanced Ceramic Art (5,5,5)**  
AWSp, AWSp, AWSp

Pottery—advanced work in forming, decorating, and glazing. Prerequisites, 203 for 353; 353 for 354; 354 for 355.

**357 Metal Design (3) AWSp**

PENINGTON

Construction includes processes of raising, soldering, forging in copper, pewter, silver. Lectures and research on historic and contemporary examples. Prerequisite, junior standing in art.

**358 Jewelry Design (3) AWSp**

PENINGTON

Jewelry design and construction, including stone setting and forging in silver and gold. Lectures and research on historic and contemporary examples. Prerequisite, junior standing in art.

**359 Enameling (3) AWSp**

PENINGTON

Enamel design for metal work or jewelry, champlevé, Plique-à-jour, Limoges, Cloisonné on copper, silver, or gold. Prerequisite, 357 or 358.

**360, 361, 362 Life (3,3,3)**  
AWSpS, AWSpS, AWSpS

Drawing and painting from the model. Prerequisites, 257 for 360; 360 for 361; 361 for 362.

**366, 367, 368 Graphic Design (3,3,3) A,W,Sp**

DAHN

366, advanced lettering; 367, poster design; 368, display design. Prerequisites, 205 for 366; 366 for 367; 367 for 368.

**369, 370, 371 Costume Design (2,2,2)**  
A,W,Sp

Design of clothing with emphasis on line, color, materials, use. For Home Economics majors only. (Offered alternate years; not offered 1968-69.)

**410 Illustration (5) A**

RAND

Book and magazine illustration. Composition and history. Prerequisite, 368.

**436, 437, 438 Sculpture Composition (5,5,5)**  
AWSpS, AWSpS, AWSpS

DU PEN

Individual compositions in various media in large scale. Prerequisites, 334 and senior standing in art for 436; 436 for 437; 437 for 438.

**445, 446, 447 Advanced Industrial Design (5,5,5) A, W, Sp**

DEL GIUDICE

Market analysis and selected professional problems in industrial design. Consultation techniques; psychological, sociological, and economic factors involved in designing for consumer acceptance. Prerequisites, 318 for 445; 445 for 446; 446 for 447.

**450, 451, 452 Advanced Printmaking (5,5,5)**  
AWSpS, AWSpS, AWSpS

ALPS

Studio problems. Prerequisites, 352 for 450; 450 for 451; 451 for 452.

**457 Advanced Metal Design (3) AWSp**

PENINGTON

Individual problems in metal design and construction. Prerequisite, 357.

**458 Advanced Jewelry Design (3) AWSp**

PENINGTON

Individual problems in jewelry design and construction. Prerequisite, 358.

**459 Advanced Enameling (3) AWSp**

PENINGTON

Individual problems in enameling. Prerequisite, 359.

**463, 464, 465 Composition (3,3,3) AWSpS, AWSpS, AWSpS**

Development of individuality in painting through creative exercises. Prerequisite, 257 for 463; 463 for 464; 464 for 465.

# ART

## 466, 467, 468 Graphic Design (5,5,5) A,W,Sp CAPLAN

Composition in advertising art; expression of ideas in terms of design. Variety of media and reproduction processes. Prerequisites, 368 for 466; 466 for 467; 467 for 468.

## 472, 473, 474 Advanced Interior Design (5,5,5) A,W,Sp FOOTE

Comprehensive problems related to contemporary needs, both public areas and residences, usually offered in conjunction with off-campus designers. Further research of historic interior masterpieces. Models, materials and their sources, perspective and working drawings. Prerequisites, 312 for 472; 472 for 473; 473 for 474.

## 475, 476, 477 Advanced Painting (3,3,3) AWSpS, AWSpS, AWSpS

Prerequisites, 362, 465 for 475; 475 for 476; 476 for 477.

## 479, 480 Fashion Illustration (3,3) W,Sp RAND

Prerequisites, 410 for 479; 479 for 480.

## 485, 486, 487 Advanced Ceramic Art (5,5,5) AWSp, AWSp, AWSp SPERRY

Pottery design and construction; stone ware; clay bodies; glazes. Prerequisites, 355 for 485; 485 for 486; 486 for 487.

## 490 Art Education in the Schools (3) S JOHNSON

For school administrators and teachers needing help in problems relating to the teaching of art. Workshop experiences, lectures, and discussions. No previous art experience necessary. Prerequisite, teaching experience.

## 498 Individual Projects (3 or 5, max. 15) AWSp

Prerequisite, permission.

## ART HISTORY

### 212, 213, 214 History of Western Art (3,3,3) A,W,Sp

An introduction to major achievements in the principal media from prehistoric times to the present. Illustrated lectures. 212, Ancient and Early Medieval; 213, Late Medieval, Renaissance, and Baroque; 214, Modern. Prerequisites, sophomore standing for 212; 212 for 213; 213 for 214.

### 215 Survey of Asian Art (5) A ROGERS

The origins and interplay of the major movements of Asian art.

### 283 History of Furniture and Interior Architecture (3) A FOOTE

Illustrated lectures on the evolution of furniture and interior architecture.

### 320 History of Modern Sculpture (2) Sp DU PEN

Sculpture from the Renaissance to the present; lectures and slides. Prerequisites, 212, 213, 214.

### 325 History of Pottery (3) Sp KOTTLER

Survey of stylistic and technical history of world pottery. Prerequisite, junior standing.

### 326 History of Painting Since the Renaissance (2) W MOSELEY

Illustrated lectures. Prerequisites, 212, 213, 214.

### 327 History of Printmaking (2) W ALPS

A selective survey of major artists and media in the field of printmaking. Prerequisite, junior standing in art. (Not offered 1968-69.)

### 341J Greek Archaeology and Art (2) A EDMONSON

A survey of major art forms from the Mycenaean to the Hellenistic period, with special attention to modern archaeological methods and excavations, illustrated by slides. Offered jointly with the Department of Classics.

### 342J Roman Archaeology and Art (2) W PASCAL

A survey of major art forms, with special attention to modern archaeological methods and excavations, illustrated by slides. Offered jointly with the Department of Classics.

### 388 Medieval Art (3) Sp ROGERS

Stylistic and iconographic analysis of medieval art from the Early Christian period to the fourteenth century. Prerequisites, 212, 213, 214.

### 401 Oriental Ceramic Art (2) W ROGERS

A survey illustrated by specimens in the collection of the Seattle Art Museum. Prerequisite, 215 or major in ceramic art. (Formerly 428.)

### 402J Greek and Roman Pottery (3) A EDMONSON

Shapes, fabrics, and decorations from the Neolithic period to the sixth century A.D. Offered jointly with the Department of Classics. (Not offered 1967-68.)

### 404J Greek and Roman Sculpture (3) W EDMONSON

History and development of Greek sculpture and sculptors, their Roman copyists, and Roman portraits and sarcophagi. Emphasis will be on Greek Sculpture of the fifth century B.C. Offered jointly with the Department of Classics. (Not offered 1967-68.)

### 406 History of American Art to 1913 (3) W STEIN

Survey of American art, especially painting, to the Armory Show, with attention to major

figures, the American cultural context, and parallel European trends. Prerequisite, familiarity with vocabulary of art or related history or literature.

### 423, 424, 425 Art History and Criticism (3,3,3)

### 426 Origins of Modern Art (3) A STEEFEL

Stylistic and iconographic study of European painting and sculpture from 1750 to 1848. Prerequisites, 212, 213, 214.

### 427 Impressionism and Post-Impressionism (3) W STEEFEL

Stylistic and iconographic study of European painting and sculpture from 1848 to 1900. Prerequisites, 212, 213, 214.

### 428 Art of the Twentieth Century (3) Sp STEEFEL

Painting and sculpture in Europe and America from 1900 to present. Prerequisites, 212, 213, 214.

### 482 Art of India (3) W ROGERS

Stylistic and iconographic study of the art of India. Prerequisite, 215 or permission.

### 483 Art of China (3) W WEBB

Stylistic and iconographic study of the art of China. Prerequisite, 215 or permission.

### 484 Art of Japan and Korea (3) ASp WEBB

Stylistic and iconographic study of the art of Japan and Korea. Prerequisite, 215 or permission.

### 491 Early Renaissance Painting (3) A MERRILL

The painting of the fourteenth and fifteenth centuries in Florence and Siena. Prerequisite, familiarity with vocabulary of art or related history.

### 492 Northern Renaissance Painting (3) W MERRILL

Netherlandish painting of the fifteenth and sixteenth centuries. Prerequisite, familiarity with vocabulary of art or related history.

### 493 High and Late Renaissance Painting (3) Sp MERRILL

The painting of the sixteenth century in Florence and Rome. Prerequisite, familiarity with vocabulary of art or related history.

### 494 Baroque and Rococo Art (3) A STEEFEL

Painting and sculpture in the seventeenth and early eighteenth centuries. Prerequisites, 212, 213, 214.

## Courses for Graduates Only

**500, 501, 502 Seminar in Art Education**  
(3 or 5 each) AWSpS, AWSpS, AWSpS  
JOHNSON

Special problems related to the teaching of art. Prerequisites, teaching experience and permission.

**507, 508, 509 Portrait Painting**  
(3,3,3) AWSpS, AWSpS, AWSpS

**522, 523, 524 Sculpture**  
(3 or 5 each) AWSpS, AWSpS, AWSpS

**530, 531, 532 Design (3 or 5 each)**  
AWSpS, AWSpS, AWSpS

**550, 551, 552 Printmaking (3 or 5 each)**  
AWSpS, AWSpS, AWSpS  
ALPS

**553, 554, 555 Ceramic Art**  
(3 or 5 each) AWSp, AWSp, AWSp

**560, 561, 562 Life Painting (3 or 5 each)**  
AWSpS, AWSpS, AWSpS

**563, 564, 565 Composition (3 or 5 each)**  
AWSpS, AWSpS, AWSpS

## ART HISTORY

**503, 504, 505 Seminar in the General Field of Art (3 or 5 each) A,W,Sp**  
MERRILL

**526 Problems in Early Modern Art (5) A**  
STEEFEL

Stylistic and iconographic problems of later eighteenth and early nineteenth century painting and sculpture. Prerequisites, graduate standing, 426 or equivalent.

**527 Problems in Later Nineteenth Century Art (5) W**  
STEEFEL

Stylistic and iconographic problems of later nineteenth century painting and sculpture. Prerequisites, graduate standing, 427 or equivalent.

**528 Problems in Twentieth Century Art (5) Sp**  
STEEFEL

Iconographic and stylistic problems of twentieth century painting and sculpture. Prerequisites, graduate standing, 428 or equivalent.

**573 Seminar on Art Historical Methodology (5) A**  
STEEFEL

Seminar on art historical methodology in nineteenth and twentieth century art. Prerequisites, 526, 527, 528.

**574 Seminar in Criticism of Contemporary Art (5) W**  
STEEFEL

Seminar on contemporary art and appropriate critical methodology. Prerequisites, 526, 527, 528 (573 recommended).

**582 Seminar in Indian Art (3, max. 9) Sp**  
ROGERS

A critical appraisal of the principal research methods, theories, and types of literature dealing with the art of India. Prerequisite, 482.

**583 Seminar in Chinese Art (3, max. 9)**  
WEBB

A critical appraisal of the principal research methods, theories, and types of literature dealing with the art of China. Prerequisite, 483.

**584 Seminar in Japanese Art (3, max. 9) WSp**  
WEBB

A critical appraisal of the principal research methods, theories, and types of literature dealing with the art of Japan. Prerequisite, 484.

**600 Research (\*) AWSp**

**700 Thesis (\*) AWSp**

**702 Degree Final (6)**

Limited to students completing a nonthesis program for M.A.T. degree.

## ASTRONOMY

### Courses for Undergraduates

**101 Astronomy (5) AWSp**

Celestial sphere, solar, sidereal universe.

**301 Astronomy for Scientists and Engineers (3)**

Introduction to astronomy for students in the physical sciences. Prerequisite, Physics 123.

**411 Spherical and Practical Astronomy (3) A**  
JACOBSEN

Spherical triangles, precession, aberration. Prerequisites, 101 or equivalent, calculus, permission.

**421 Solar System and Dynamical Astronomy (3) W**  
JACOBSEN

Planetary motion, special subjects. Prerequisites, 101 or equivalent, calculus, permission.

**422 Astronomical Orbits (3) Sp**  
JACOBSEN

Methods of calculating orbits of planets and comets, as well as visual, spectroscopic, and eclipsing binary stars. Stellar masses.

**431 Stellar Astronomy and Astrophysics (3) Sp**  
WALLERSTEIN

Stellar spectra, luminosity, radii, and temperatures. Stellar structure, energy sources, and compositions. Prerequisite, Physics 320 or 371 or equivalent.

**499 Undergraduate Research (\*, max. 15) AWSp**

Current or special astronomical problems. Prerequisite, permission.

## Courses for Graduates Only

**501 Solar System Astrophysics (3) W**  
HODGE

Atmospheres, surfaces, and interiors of planets. Natural satellites, asteroids, comets, meteors, meteorites. Meteorite craters, micro-meteorites, and meteoritic dust. Interplanetary medium. Prerequisite, modern physics. (Offered alternate years; offered 1967-68.)

**502 Seminar in Solar System Problems (3) Sp**  
HODGE

Origin of the solar system, as inferred from its dynamical, astrophysical, and chemical properties. Emphasis on current research. Prerequisite, modern physics. (Offered alternate years; offered 1967-68.)

**511 Galactic Structure (3) Sp**  
HODGE

Kinematics, dynamics, and contents of the galaxy. Spiral structure. Structure of other galaxies. Evolution of galaxies. Prerequisite, modern physics. (Offered alternate years; not offered 1967-68.)

**512 Extragalactic Astronomy (3) W**  
HODGE

Types of galaxies. Integrated properties, content, and dynamics. Extragalactic distance scale, groups and clusters. Radio sources. Observational cosmology. Prerequisite, modern physics. (Offered alternate years; not offered 1967-68.)

**521 Stellar Atmospheres (3) A**  
WALLERSTEIN

Theory of continuous radiation and spectral line formation. Applications to the sun and stars. Prerequisite, modern physics. (Offered alternate years; offered 1967-68.)

**522 Chemical Composition of Stellar Atmospheres (3) W**  
WALLERSTEIN

Methods of determining stellar chemical composition. Applications to the sun, normal stars, peculiar stars. Nuclear astrophysics and its effects upon the chemical composition of stars. Prerequisite, modern physics. (Offered alternate years; offered 1967-68.)

**531 Stellar Interiors (3) A**  
BARDEEN

The physical laws governing the temperature, pressure, and mass distribution in stars. Equation of state, opacity, nuclear energy generation. Models of main sequence stars. Prerequisite, modern physics. (Offered alternate years; not offered 1967-68.)

**532 Stellar Evolution (3) W**  
BARDEEN, WALLERSTEIN

Theoretical and observational approaches to stellar evolution. Prerequisite, modern physics. (Offered alternate years; not offered 1967-68.)

**541 Interstellar Matter (3)**

Physical conditions and motions of neutral and ionized gas in interstellar space. Interstellar dust, magnetic fields, formation of grains, clouds, and stars. Prerequisite, modern physics or permission.

# ASTRONOMY

## 551 Stellar Dynamics

Kinematics and dynamics of stars in clusters and galaxies. Prerequisites, classical mechanics and differential equations.

## 598 Topics in Theoretical Astrophysics (1-5)

## 600 Research (\*) AWSp

# ATMOSPHERIC SCIENCES

## Courses for Undergraduates

### 101 Survey of the Atmosphere (5) AWSp

Composition and structure of earth's atmosphere; relation of earth to sun and consequent geographical temperature distribution; processes within the atmosphere which produce rain, snow, and other condensation phenomena; tropical and extratropical storms, thunderstorms, chinooks, and cold waves.

### 301 Introduction to Atmospheric Sciences (5) W

BADGLEY, REED

Composition and structure of the atmosphere. Solar and terrestrial radiation. Water substance and processes. Thermodynamic processes. Air motions. Physical properties and processes of the upper atmosphere.

### 321 Physical Climatology (5) A

CHURCH

Analysis of effects of latitude, altitude, mountains, ocean currents, wind systems, and various surfaces on the distribution of air temperatures, precipitation, and other climatic elements. Statistical reduction and interpretation of climatic data. Prerequisite, 101.

### 322 Regional Climatology (5) W

CHURCH

Principles of several climatic classifications. Description of elements of climatic types of continents, emphasizing North America, and adjacent ocean areas based on the Koeppen and Thornthwaite classification systems. Prerequisite, 101.

### 329 Microclimatology (3) Sp

BUETTNER, KRITSCHEN

Climatic characteristics in the lower layers of the atmosphere. Soil temperatures and their relation to temperatures of overlying air. Vertical temperature, moisture, wind speed, and wind direction gradients. Effects of plane, concave, and convex surfaces, and vegetal covering on temperature and wind distribution. Prerequisite, 101 or permission.

### 340 Introduction to Atmospheric Physics (5) Sp

BUSINGER, HOBBS

Earth's field of gravity. Atmospheric thermodynamics; properties and distribution of atmospheric gases. Introduction to cloud physics. Prerequisite, Mathematics 125 or permission.

### 350 Introduction to Atmospheric Analysis (5) A

REED, WALLACE

Thermodynamic diagrams. Analysis of surface and upper-level charts and vertical cross sections. Elementary applications of hydrostatic and geostrophic equations. Objective methods of analysis. Prerequisites, one year of calculus and general physics.

### 360 Meteorological Instruments and Observations (5) Sp

BADGLEY

Accuracy and sensitivity of meteorological instruments and representativeness of meteorological observations; principles and techniques of using common meteorological instruments for measuring precipitation, temperature, pressure, humidity, and wind (including winds aloft); principles of operation of radiosondes. Prerequisite, one year of calculus.

### 390H Tutorial in Atmospheric Sciences (\*, max 6) Sp

Review and discussion of selected problems in atmospheric sciences. Introduction to research methods. Presentation of a research paper. Prerequisites, Mathematics 224, Physics 123.

### 403J Introduction to Geophysics: The Atmosphere (5) W

BUSINGER, FLEAGLE

The atmosphere in its relation to the environment, gravity, geomagnetism, composition, transfer processes, motions, clouds, signal phenomena. Offered jointly with Geophysics. Prerequisites, Mathematics 325, Physics 371, or equivalent.

### 431 Atmospheric Physics (5) A

BADGLEY, BUSINGER

Properties of cloud particles, solar and terrestrial radiation, transfer processes and applications. Prerequisites, 340 or Physics 371, and Mathematics 325.

### 432 Atmospheric Physics (3) W

HOBBS

Electromagnetic principles and application to the atmosphere, properties of waves, atmospheric probing, natural signal phenomena, radar effects of nuclear explosions. Prerequisites, 340 or Physics 371, and Mathematics 325.

### 441, 442 Atmospheric Motions (5,5) A,W

FLEAGLE, HOLTON, REED

441: preliminary mathematics, vector operations, fundamental equations, simple manipulations of equations, circulation and vorticity, the role of friction. Prerequisites, Mathematics 325, Physics 371, or Atmospheric Sciences 340. 442: numerical weather prediction, barotropic and baroclinic wave theory, the general circulation. Prerequisite, 441.

### 451 Atmospheric Analysis (5) W

REED, WALLACE

Horizontal motion: streamlines, trajectories, divergence, vorticity, deformation. Vertical motion. Variation of wind with height. Frontal characteristics. Jet stream. Graphical integration of prediction equations. Lectures and laboratory. Prerequisites, 350 and 442, which may be taken concurrently.

### 452 Forecasting Laboratory (5) Sp

REED, WALLACE

Daily practice in map analysis and forecasting, using current weather data. Severe storm forecasting. Statistical methods. Prerequisite, 451.

### 462 Sea-Air Transfer Processes (6) S

BADGLEY, FLEAGLE

Classroom work and field observations relating to the physical processes occurring at ocean-atmosphere boundary. Transfer of energy, momentum, and moisture and their effects on small-scale and large-scale phenomena, including fog formation, convection, modification of air masses. Prerequisite, 442 or permission.

### 492 Readings in Meteorology or Climatology (\*) AWSp

Prerequisite, permission.

### 493 Special Problems in Meteorology or Climatology (\*) AWSp

Prerequisite, permission.

### 494 Meteorological Statistics (\*) AWSp

Prerequisite, permission.

## Courses for Graduates Only

### 522 Advanced Regional Climatology (3) W

CHURCH

Intensive study of the characteristics of climatic elements for a selected region or climatic type and a statistical analysis of the elements studied. Prerequisite, 322 or permission.

### 528 Applied Meteorology and Bioclimatology (3) Sp

BUETTNER

Interrelationship of meteorology and climatology to human health and heat balance, aviation and space medicine, air pollution, agriculture, forestry, transportation, etc. Prerequisites, 322 and 340, or permission.

### 531 The Upper Atmosphere (3) A

BUETTNER

Structure, composition, and dominant physical and photochemical processes. Sound propagation, aurora, air glow, ionosphere, and Van Allen belts. Role of the sun, planetary atmospheres. Prerequisites, Mathematics 238 and Physics 320, or permission.

### 532 Atmospheric Electricity (3) W

BUETTNER

Formation and disappearance of atmospheric ions. Normal air electrical field. Lightning and its causes. Earth magnetic field. Prerequisite, 531 or permission. (Offered alternate years; offered 1967-68.)

### 533 Atmospheric Radiation (3) W

BUETTNER

Solar spectrum. Atmospheric scattering, spectra of water vapor and other gases. Albedo of earth and atmosphere. Radiative heat balance. Prerequisites, Physics 320 and Mathematics 238. (Offered alternate years; offered 1967-68.)



**535 The Physics of Clouds (3) A**

HOBBS

Study of the microphysical processes, leading to the formation of clouds and production of rain, snow, and thunderstorm electrification. Prerequisite, 340 or permission.

**536J Geomagnetism (3) W**

SUGIURA

Description and theory of earth's permanent magnetic field. Secular variations. Solar and lunar magnetic variations. Atmospheric tides. Dynamo theory. Ionosphere. Solar-terrestrial relationships. Magnetic storms. Offered jointly with Geophysics. Prerequisite, Physics 483 or Aeronautics and Astronautics 567, or permission.

**537J Magnetosphere I (3) Sp**

SUGIURA

Adiabatic invariants. Radiation belts. Solar wind. Interaction between solar wind and the earth's magnetic field; the boundary of the magnetosphere. Offered jointly with Geophysics. Prerequisites, Physics 483 or Aeronautics and Astronautics 567, or permission.

**538J Magnetosphere II (3) A**

SUGIURA

Plasma waves. Propagation of very low frequency and hydromagnetic waves in the magnetosphere. Interactions between plasma waves and particles. Offered jointly with Geophysics. Prerequisite, 537J.

**541, 542 Dynamic Meteorology (3,3) W,Sp**

FLEAGLE

541: basic equations of dynamic meteorology, general theorems, scale analysis. Prerequisite, Mathematics 325, 567 or equivalent. 542: hydrostatic balance, geostrophic balance, anelastic balance. Prerequisite, 541.

**543, 544 Planetary Fluid Dynamics (3,3) A,W**

FLEAGLE, HOLTON

543: perturbation equations in Eulerian and Lagrangian form, simple wave motions in incompressible and compressible fluids, linear baroclinic theory. Prerequisites, 541 or Oceanography 511, or equivalent. 544: theorems on baroclinic instability, the equations of motion in spectral form, nonlinear interactions, laboratory analysis, the general circulation. Prerequisite, 543.

**546, 547, 548 Atmospheric Turbulence (3,3,3) A,W,Sp**

BADGLEY, BUSINGER

546: laminar and turbulent flow; analogy between kinetic theory of gases and turbulence theory; Reynolds averaging; dissipation of energy; statistical descriptions of turbulent flow. Prerequisite, 442 or permission. 547: diffusion of matter in the atmosphere; application of Fickian and statistical theories of diffusion; use of Lagrangian and Eulerian correlation functions. Prerequisite, 546. 548: turbulent flux of heat, momentum, and moisture in the layer of the atmosphere next to the earth; Richardson's stability criterion; free convection. Prerequisite, 546.

**551 Advanced Atmospheric Analysis (5, max. 10) Sp**

REED, WALLACE

Selected advanced nonroutine types of analysis. Exercises in objective map analysis and numerical weather prediction. Prerequisite, 442 or permission.

**560 Theory of Meteorological Instruments (3) W**

BADGLEY, BUSINGER

Physical theory of operation of meteorological instruments. New and specialized research instruments and more difficult problems involving standard instruments. Prerequisites, one year of calculus and permission.

**570 Seminar on Cloud Physics (3) Sp**

HOBBS

Detailed study of recent work on microphysics of clouds, and the physics of snow and ice. Prerequisite, permission.

**572 Seminar on Polar Meteorology (3) W**

Critical examination of source materials and original papers on selected topics applicable to polar meteorology. Prerequisite, permission.

**593 Laboratory in Experimental Meteorology (3, max. 6) Sp**

The role of controlled-model experiments in meteorology. Laboratory study of cloud formation and modification; convection cells, turbulent air motion; thermally induced air drainage; flow over obstacles; wave motion; surface of discontinuity; atmospheric circulation. Prerequisite, 542.

**600 Research (\*)**

**700 Thesis (\*)**

**BIOCHEMISTRY**

**405, 406 Introduction to Biochemistry I, II (3,3) W,Sp**

An introductory two-quarter course in general biochemistry covering basic principles, including the structure and metabolism of biologically important compounds. For students in dentistry, pharmacy, home economics, medical technology, and others. Prerequisites, Chemistry 232 for 405; 405 for 406.

**407 Dental Students' Laboratory (3) Sp**

Laboratory exercises and conferences. Certain experimental aspects of biochemistry of special interest to dental students are considered. For dental students. Prerequisite, 406, which may be taken concurrently.

**408 Introduction to Biochemistry Laboratory (3) Sp**

Laboratory exercises in general biochemistry for students in home economics, medical technology, and others by permission. Prerequisite, 406, which may be taken concurrently.

**440, 441, 442 Biochemistry (3,3,3) A,W,Sp**

Lectures and conferences cover the fundamentals of biochemistry with emphasis upon chemical structure, enzymatic reactions, intermediary metabolism, biosynthesis and biochemistry of physiological functions. Recommended for advanced undergraduate or graduate students of chemistry, biochemistry, and various biological sciences. Required for first-year medical students. Prerequisites, Chemistry 337 or permission for 440; 440 or permission for 441; 441 or permission for 442; introductory physical chemistry is recommended.

**443 Medical Student Laboratory (3) A**

Required for first-year medical students; open to a limited number of students with allied interests. Prerequisite, permission; 440 to be taken concurrently.

**444 Biochemistry Laboratory (3) W**

Laboratory projects and conferences. For students of biochemistry, chemistry, and various biological sciences. Prerequisites, 440 and 441; the latter course to be taken concurrently.

**460 Physical Biochemistry (2) A**

TELLER

This course acquaints the student with certain specialized applications of physical chemistry and their use in biochemical research. Quantitative aspects of methods especially applicable to the study of macromolecules and systems of biological interests are considered. Prerequisites, 442 and Chemistry 351 or permission. (Formerly 562.)

**498 Undergraduate Thesis (\*)**

For senior medical students. Prerequisite, permission.

**499 Undergraduate Research (\*)**

Investigative work on enzymes, proteins, lipids, nucleic acids, protein biosynthesis, intermediary metabolism, physical biochemistry, and related fields. Prerequisite, permission.

**Courses for Graduates Only**

**519 Graduate Seminar (1-3) AWSp**

Required for first- and second-year students in Biochemistry.

**520 Seminar (1-3, max. 9) AWSp**

Prerequisite, permission.

**563, 564 Proteins and Enzymes (2,2) W,Sp**

Chemical composition, structure and function of peptides and proteins; methods of analysis and their interpretation. Considerations of the structure and function of enzymes and model systems; chemical structure of active sites. Mechanism of enzyme action and control of enzyme activity. Prerequisites, 442 or permission for 563; 563 or permission for 564.

## BIOCHEMISTRY

### 568 Biochemistry of Lipids (2)

HANAHAN, THOMPSON

Selected topics concerning the structure and metabolism of simple and complex lipids will be treated on an advanced level. Prerequisite, 442 or permission.

### 569 Biochemistry of Nucleic Acids (2)

DAVIE, GORDON

Chemistry and structure of nucleic acids, enzymes active toward nucleic acids, replication of nucleic acids, the coding problems and biosynthesis of proteins. Prerequisite, 442 or permission. (Offered 1967-68.)

### 570 Regulation of Metabolism (2) Sp

KREBS

The processes through which cells regulate biosynthetic and energy-producing metabolic pathways are discussed. The principal sites for control are delineated and regulatory mechanisms are explained. Although emphasis is given to basic mechanisms at the enzymic or cellular level, the control of metabolism in higher animals is also treated. Prerequisite, 442 or permission. (Offered 1967-68.)

### 600 Research (\*)

Limited to graduate students in the Department of Biochemistry and medical students who are post-sophomore fellows.

### 700 Thesis (\*)

Graduate students in the Department of Biochemistry only.

## BIOLOGICAL STRUCTURE

### 301 General Anatomy (4) Sp

Elementary work in human anatomy with lectures, correlated laboratories, and demonstrations. For health education, anthropology, physical education, speech students, and medical technicians; others by permission. Not open to premedical, pre dental, or nursing students.

### Conjoint 316, 317-318 Introductory Anatomy and Physiology (2, 5-5)

(See Conjoint Courses.)

### 328 Dental Gross Anatomy (6) A

Lectures and dissection. The course includes a general coverage of the thorax and abdomen and a detailed coverage of head and neck. For dental students; others by permission.

### 330 Microscopic Anatomy (4) A

Lecture and laboratory work in microscopic anatomy. For dental students; others by permission.

### 331 Neuroanatomy (2) W

Lecture and laboratory work in neuroanatomy. For dental students; others by permission.

### Conjoint 400 Human Anatomy and Physiology (6 or 9)

(See Conjoint Courses.)

### 401-402-403 Gross Anatomy (6-6-4) A,W,Sp

BASSETT

Intensive lectures and dissection accompanied by roentgenographic demonstrations. Study of the entire human body except the brain and spinal cord. Required for first-year medical students. Prerequisite for nonmedical students, permission.

### 404 Human Embryology (3) A

BLANDAU

Lectures and laboratory demonstrations covering the development of the human embryo and fetus, with emphasis on abnormal development; special attention to problems of maturation, fertilization, and physiology of the gametes. Required for first-year medical students. Prerequisite for nonmedical students, permission.

### 405-406 Microscopic and Submicroscopic Anatomy (4-4) A,W

LUFT, ROOSEN-RUNGE

Essentials of microscopic, submicroscopic, and chemical anatomy. Required for first-year medical students. Prerequisite for nonmedical students, permission.

### 407 Cell Ultrastructure (3) Sp

LUFT

Electron microscopic structure of animal, plant, and bacterial cells together with the associated extracellular materials. Prerequisite, permission.

### Conjoint 409 Basis of Neurology (3, 5, or 8)

(See Conjoint Courses.)

### 440 Special Topics in Dissection (1 or 2, max. 6) AWSp

BASSETT

Individual work in dissection and study of selected regions of the body. Prerequisite, permission.

### 498 Undergraduate Thesis (\*)

For medical students. Prerequisite, permission.

### 499 Undergraduate Research (\*)

For medical students. Prerequisite, permission.

## Courses for Graduates Only

### 505 Advanced General Histology (3) W

ROOSEN-RUNGE

Comparative study of tissues in selected phyla of vertebrates and invertebrates. Prerequisite, 330, 405, or permission.

### 510 Cytochemistry (4) Sp

SZOLLOSI

The finer distribution of chemical substances in cells and tissues; methods of cytochemistry and their theoretical basis and validity. Prerequisite, permission.

### 515 Biological X-ray Structure Analysis (3) W

JENSEN

Theory of X-ray diffraction, with emphasis on applications to biological systems. Prerequisite, permission.

### 518 Developmental Neurology (2) W

BODEMER

Detailed consideration of the problems of development, growth, and regeneration of the nervous system and its functions. Prerequisite, Zoology 456 or equivalent.

### 521 Seminar in Molecular and Submicroscopic Anatomy (2) AWSpS

LUFT

The molecular and micellar basis of bodily structure. Prerequisite, permission.

### 525 Brain Dissection (2) AWSpS

EVERETT

A detailed consideration of the macroscopic anatomy of the human brain (individual study). Prerequisite, permission.

### 530 Biological Tracer Techniques (2) AW

EVERETT, RIEKE

Techniques of using radioactive isotopes as tracers in biological research. Prerequisite, permission.

### 531, 532, 533 Electron Microscopy (1-5, 1-5, 1-5) A,W,Sp

LUFT

Theoretical and practical aspects of electron microscopy of biological material, including electron diffraction. Prerequisites, 405-406 or permission.

### 540 Embryology of the Heart (2) W

BLANDAU

A detailed study of the embryology of the heart and great vessels during the first eight weeks of life. Prerequisite, 404. (Offered alternate years; offered 1968-69.)

### 555 Mammalian Reproduction (3) Sp

BLANDAU, ROOSEN-RUNGE, SZOLLOSI

Fundamental processes of reproductive anatomy and physiology of laboratory animals. Prerequisite, permission.

### 557 Seminar (1, max. 9) AWSp

Prerequisite, permission.

### Conjoint 585 Surgical Anatomy (1-3, max. 12)

(See Conjoint Courses.)

### 600 Research (\*)

Prerequisite, permission.

### 700 Thesis (\*)

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BIOLOGY—See Botany/Zoology

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## BIOMEDICAL HISTORY

### 301 Historical Development of Medical Thought (3) AW

BODEMER

Survey of the history of medicine from antiquity to the twentieth century, emphasizing concepts and ideas that influenced and were influenced by medicine. For undergraduate students.

### 401 History of Medicine from Antiquity to 1700 (2) A

BODEMER

Origins and development of medicine, emphasizing the various socio-economic, philosophic, religious, and technological factors operative in the growth of medical concepts and practice.

### 402 History of Medicine Since 1700 (2) W

BODEMER

Development of medicine since 1700, describing the evolution of the basic concepts and techniques of modern medical science.

### 419J Historical Foundations of Modern Biology (3) Sp

BODEMER

A history of the biological sciences from their beginnings to their emergence as distinct disciplines. Emphasis is placed on origins of ideas contributing to the development of modern biology. Offered jointly with the Department of History.

### 476 Historical Background of Contemporary Medical Problems (\*) AWSp

HAVILAND

Seminar. Limited to senior medical students.

### 498 Undergraduate Thesis (\*) AWSpS

BODEMER

Prerequisite, permission.

### 499 Undergraduate Research (\*) AWSp

BODEMER

Investigative work in history of the biomedical sciences. Prerequisite, permission.

### 500 Biomedical Historiography (4) A

BODEMER

Emphasis is placed on bibliography and utilization of bibliographic sources. Practice in techniques of organizing and writing history of medicine. Prerequisite, permission.

### 501 History of Medicine from Antiquity to 1700 (3) A

BODEMER

Origins and development of medicine, emphasizing socio-economic, philosophic, religious, and technological factors operative in the growth of concepts. Analysis and critical discussion of original and secondary sources. Prerequisite, permission.

### 502 History of Medicine Since 1700 (3) W

BODEMER

Development of medicine since 1700, describing the evolution of the basic concepts and techniques of modern medical science. Analysis and critical discussion of original and secondary sources. Prerequisite, permission.

### 510, 511 Topics in Biomedical History (3, max. 9; 3, max. 9) WSp

BODEMER

Detailed study of selected topics in biomedical history through lectures, seminars, and discussion. Open to graduate students and qualified medical students. Prerequisite, permission.

### 520 Seminar (3-6, max. 12) W

BODEMER

Seminar in the history of medicine and allied sciences, stressing original literature and emphasizing independent research by the student. Prerequisite, permission.

## BOTANY

### Courses for Undergraduates

#### BIOLOGY

Courses in biology are administered jointly by the Departments of Botany and Zoology. There is no biology curriculum leading to a degree, but students may use biology courses to satisfy some of the requirements for a major in either botany or zoology. The Departments of Botany and Zoology jointly offer a major in biology for students in the College of Education (see *College of Education* section and *Description of Courses* section under the heading Genetics).

### 101-102 General Biology (5-5) AW

ILLG, KOHN, KRUCKEBERG, MEEUSE, ORIAN

Principles of living systems as viewed at levels from the subcellular to the community. Emphasis on structural and functional analysis of biological organization—its adaptedness, its genetic diversity, its energetics—leading to an evolutionary synthesis. The position of man in the biological world. For nonmajors and teaching majors in biology. (Credit will not be given for 101-102 if any two of the following courses, or their equivalents, have previously been taken: Zoology 111, 112; Botany 111, 112.)

### 210, 211, 212 Introductory Biology (5,5,5)

A,W,Sp

CLELAND, DIXON, FARNER, GORBMAN, KELLY, SPOTTS

An introduction to the phenomena of life for students intending to go on to more advanced biology courses and into pre-professional programs. Emphasis is placed on features common to all living things: molecular and subcellular phenomena; cellular structure, metabolism and energetics; genetic regulation of development; the nature, functional properties, and evolution of plant and animal organisms and groups of organisms. Prerequisite, one year college chemistry or permission.

### 401 Cytology (3) W

HSU

Structure and function of the cell. Prerequisites, Genetics 451, Botany or Zoology 112, or permission.

### 401L Cytology Laboratory (2) W

HSU

Prerequisites, 401 concurrently and permission.

### 454 Evolutionary Mechanisms (3)

KRUCKEBERG

Evolutionary change as determined by mutation, recombination, and selection. Effects of the genetic system, isolating mechanisms, hybridization, and polyploidy on speciation. Examples of micro- and megaevolutionary changes from plant and animal kingdoms. For advanced undergraduate and graduate students in the biological sciences. Prerequisite, Genetics 451 or equivalent. (Offered alternate years; not offered 1967-68.)

### 472 Principles of Ecology (3) W

EDMONDSON

Population biology, interactions between organisms in biological communities, relationship of community to environment. Prerequisite, 10 credits in upper-division biological science or permission.

### 472L Ecology Laboratory (3) Sp

EDMONDSON

Prerequisites, 472 and permission.

### 473 Limnology (3) A

EDMONDSON

Biological, physical, and chemical features of lakes and other inland waters. Prerequisites, Botany or Zoology 112, one year of college chemistry, and upper-division standing.

### 473L Limnology Laboratory (2) A

EDMONDSON

Examination of biota of fresh waters, survey of limnological methods, and analysis of data. Prerequisites, 473 and permission.

## BOTANY

### 111 Elementary Botany (5) ASp

Structure, physiology, and reproduction of plants, with emphasis on seed producing groups. Suitable for the nonscience major, since general biological principles are stressed. Open by permission of instructor to those who have had 105.

### 112 The Plant Kingdom (5) W

BLASER, NORRIS

An introduction to the major groups of the plant kingdom. Structure and reproduction and the theories of evolutionary relationships of the phyla are considered. Prerequisite, 111, or Biology 101-102, or Zoology 112.

### 113 Elementary Plant Classification (5) Sp

HITCHCOCK

An introduction to plant classification; field study and laboratory identification of the common plant families and the conspicuous flora of western and central Washington. Two full-day field trips required of all students—one on Friday, one on Saturday.

## 201, 202, 203 Plant Propagation (2,2,2)

A,W,Sp

MUHLICK

201: hardy bulbs; broadleaf and conifer cuttings; operation of a small greenhouse. 202: tender bulbs, orchids, grafting. 203: care and treatment of seeds and seedlings; division and layering; care of the home grounds. Intended for students desiring knowledge of the principles involved in growing plants in the greenhouse and garden. Prerequisite for each course, 111 or 114, or Biology 101-102, or permission.

## 311, 312 Plant Kingdom—Form and Function (5, 5) W, Sp

BLASER, HASKINS

A study of structure and function of representative plants. Laboratory culture, growth studies, and experimental manipulations of plant materials. Emphasis will be on non-vascular plants during the first quarter, and on vascular plants during the second quarter. Intended for upper-division students with basic biological background. Prerequisites, 10 credits in biological science or junior standing, and permission.

## 313 Introductory Taxonomy (5) A

HITCHCOCK

Principles of classification; rules of nomenclature; botanical exploration (western North America). Field and laboratory study of Washington flora, concentrating on largest and most important groups, especially grasses, sunflower family. Not open to students who have taken Botany 113. Prerequisites, 10 credits in biological science or junior standing, and permission.

## 331 Ornamental Plants (3) Sp

HITCHCOCK, KRUCKEBERG

Identification, recognition, and use of cultivated trees and shrubs. Emphasis on laboratory and field study of woody species used in Northwest landscapes; plant exploration and origins of ornamentals. Prerequisite, 113 or 10 credits in biological science. For non-majors, teaching majors in biology, and students in forestry and landscape design.

## 332 Taxonomy Field Trip (\*, max. 27)

## 360 General Mycology (5) Sp

STUNTZ, WHISLER

General survey of the fungi with emphasis on life cycles, structure, physiology, economic importance. Prerequisite, 10 credits in biological science or permission.

## 371 Elementary Plant Physiology (5) Sp

MEEUSE, WALKER, CLELAND

Study of nutrition, assimilation, transport, growth, photosynthesis and cellular respiration in plants, with the aid of simple physical and chemical principles. For nonmajors. Not open to those who have had 216. Prerequisites, 111 or Biology -102, and Chemistry 102, or permission.

## 421 Bryology (3) W

LAWTON

Taxonomy of the mosses, with emphasis on the moss flora of the Pacific Northwest. Intensive practice in identification of mosses in laboratory. Field study for collections, recognition, and natural history of mosses. For undergraduate and graduate majors in botany and related fields. Prerequisite, 113 or equivalent. (Offered alternate years; not offered 1967-68.)

## 431, 432 Taxonomy (5,5) W,Sp

HITCHCOCK

Morphology and phylogeny of families of seed plants; flora of western North America. Prerequisite, 113 or equivalent. (Offered alternate years; offered 1967-68.)

## 441 Morphology of Vascular Cryptogams (5)

BLASER

Comparative study of lower vascular plants, psilophytes through ferns; the areas of relationship and fossil ancestry. Prerequisite, 112 or 312, or permission. (Offered alternate years; not offered 1967-68.)

## 442 Morphology of Seed Plants (5)

BLASER

Comparative morphology of gymnosperms and selected topics in angiosperm morphology. Prerequisite, 112 or 312, or permission. (Offered alternate years; not offered 1967-68.)

## 443 Freshwater Algae (5)

NORRIS

Morphology, life-histories, systematics, and ecology of freshwater algae, with emphasis on the local flora. Opportunities provided for students to learn basic cytological, morphological, and physiological characteristics of the freshwater algae. Studies will be made on algae collected in the field and on specimens grown in laboratory culture. Students will be given the opportunity to isolate and grow laboratory cultures of certain local algae. Prerequisite, 112 or 311, or permission. (Offered alternate years; not offered 1967-68.)

## 444 Plant Anatomy (5) A

BLASER

Tissues of vascular plants; origin and development of the stele; practice in histological analysis of plant materials. Prerequisite, 111 or 312, or permission. (Offered alternate years; offered 1967-68.)

## 445 Marine Algology (6) S

DIXON, NORRIS

Morphology, life-histories, systematics, and ecology of marine algae, with emphasis on the local flora. Opportunities provided for students to learn basic morphological and physiological characteristics of marine algal phyla, and to apply this knowledge in studying in the field and laboratory cultures. (Offered at Friday Harbor Laboratories.) Prerequisite, 112 or 311, or permission.

## 446 Algology (5) Sp

DIXON, NORRIS

Examination of algal phyla from the viewpoint of morphological and physiological characteristics important to their systematics. Points emphasized are: phylogeny of various lines of evolution in algae, relationships between algae and other parts of plant and animal kingdoms, algal geography and species of economic importance. Prerequisite, 112 or 311, or 20 credits in biology.

## 447 Phytoplankton Morphology and Taxonomy (4) A

NORRIS

Advanced discussion of phytoplankton morphology with emphasis on characteristics important to their taxonomy. Emphasis placed on cytology of the organisms, their life histories, adaptive morphological characteristics, and isolation and culture of phytoplankton organisms. Prerequisite, 445 or 446, or permission. (Offered alternate years; offered 1967-68.)

## 448 Marine Algal Ecology (4) W

DIXON

The marine environment in relation to the distribution of marine algae, zonation of benthic algae, interactions of algae and animals and the biological basis for phycogeography. Prerequisite, 445 or 446, or permission. (Offered alternate years; not offered 1967-68.)

## 461 Yeasts and Molds (5) W

STUNTZ

Development, structure, and classification of fungi that can be grown in culture. Prerequisite, 15 credits in botany, microbiology, or zoology. Prerequisite, 360 or permission.

## 462 Basidiomycetes (5) A

STUNTZ

Structure and classification of the Basidiomycetes. Prerequisite, 360 or permission.

## 463 Phycomycetes and Related Fungi (5) Sp

WHISLER

Life history, development, taxonomy, and physiology of slime molds and Phycomycetes. Prerequisites, 360, Microbiology 400, or permission. (Offered alternate years; not offered 1967-68.)

## 464 Ascomycetes (5) Sp

STUNTZ

Structure and classification of the Ascomycetes. Prerequisite, 360 or permission. (Offered alternate years; offered 1967-68.)

## 465 Marine Mycology (6)

WHISLER

Morphology, physiology, and ecology of aquatic fungi with emphasis on marine forms, collection and culture methods. Consult "Announcement of the Friday Harbor Laboratories" for year offered. Prerequisite, 112 or 311 or 360 or 20 credits in biology.

# BUILDING TECHNOLOGY AND ADMINISTRATION

## 469 Development in Lower Plants (5) W WHISLER

A comparative study of growth and differentiation in the higher protista, with emphasis on sporogenesis, sexuality, nutrition, and cell-wall development in the fungi and algae. Prerequisite, Botany 112 or permission. (Offered alternate years; offered 1967-68.)

## 472 Plant Physiology (5) A CLELAND, MEEUSE, WALKER

Covers the same field as Botany 371, but stresses biochemical approaches. Recommended for biology majors. Not open to those who have taken 371. Prerequisites, 111 or Biology -102, or Biology 212, and completion of, or concurrent registration in, Chemistry 232, or permission.

## 473 Plant Metabolism (3) W MEEUSE

Metabolism of organic compounds, with emphasis on photosynthesis and cellular respiration. Prerequisites, 472 and Chemistry 232, or equivalent, and permission. (Offered alternate years; not offered 1967-68.)

## 473L Plant Metabolism Laboratory (2) W MEEUSE

Must be accompanied by 473.

## 474 Water Relations (3) Sp WALKER

Permeability and water relationships, with special emphasis on influences affecting behavior of plants in the field. Prerequisite, 371 or 472, or equivalent. (Offered alternate years; offered 1967-68.)

## 474L Water Relations Laboratory (2) WALKER

Must be accompanied by 474. (Offered alternate years; offered 1967-68.)

## 475 Problems in Algal Physiology (6)

Metabolic activity of the algae. Consult "Announcement of the Friday Harbor Laboratories" for year offered. Prerequisites, 472 or 371, Chemistry 232, and permission.

## 476 Mineral Nutrition (2) Sp WALKER

Absorption, translocation, and utilization of essential mineral elements. The soil culture and solutions as nutrient media for the growth of plants considered in theory and practice. Prerequisite, 371 or 472, or equivalent.

## 476L Mineral Nutrition Laboratory (3) Sp WALKER

Must be accompanied by 476.

## 477 Plant Growth and Development (3) W CLELAND

Control of growth, development, and differentiation in higher plants. Prerequisite, 472 or permission. (Offered 1967-68.)

## 477L Plant Growth and Development Laboratory (2) CLELAND

Experimental methods for studying plant growth and development. Must be accompanied by 477. (Offered 1967-68.)

## 498 Special Problems in Botany (1-15) AWSp

Students with suitable background in botany may enroll to do special study in algology, anatomy, bryology, cytology, morphology, physiology, or taxonomy. Prerequisite, permission of instructor.

## Courses for Graduates Only

### BIOLOGY

## 501 Advanced Cytology (5) Sp HSU

Detailed study of the structure and function of the cell.

## 508 Cellular Physiology (3) W WHITELEY

The cell membrane and permeability, cytoplasmic physiology, intracellular energetics and biosynthesis, physiology of cell division, cell movement. Prerequisite, Zoology 400 or permission.

## 508L Cellular Physiology Laboratory (2) W WHITELEY

Prerequisites, concurrent registration in 508 or 509, and permission.

## 509 Cellular Physiology (3) W WHITELEY

Chemistry and physiology of the interkinetic and dividing nucleus, nucleocytoplasmic interactions, physiology of differentiated cells. Prerequisite, Zoology 400 or permission. (Biology 508 and 509 may be elected separately, or in either sequence.)

## 573 Topics in Limnology (3) W EDMONDSON

May be repeated for credit.

## 586 Analysis of Development (3) A

An analysis of structural, physiological, and molecular levels of developmental processes, including gametogenesis, fertilization, cell and tissue movements, induction, and cytodifferentiation. Prerequisites, Biochemistry 442, Zoology 456, or permission.

### BOTANY

## 520 Seminar (1) AWSp Prerequisite, permission.

## 521 Topics in Plant Physiology (2, max. 10) W MEEUSE, WALKER, CLELAND Modern trends and methods in plant physiology: Prerequisite, permission.

## 522 Seminar in Morphology and Taxonomy (2, max. 10) A HITCHCOCK, KRUCKEBERG, BLASER

Current research and trends in morphology and taxonomy of higher plants. Comparison of classical with modern approaches and concepts. Prerequisite, permission.

## 523 Selected Topics in Mycology (2, max. 10) Sp STUNTZ, WHISLER

Selected topics from all phases of mycology. Prerequisite, permission.

## 524 Topics in Algology (2, max. 10) W DIXON, NORRIS

Selected topics from all phases of algology. Prerequisite, permission.

## 600 Research (\*) AWSp

Original investigations of special problems in algology, cytology, genetics, morphology, mycology, taxonomy, or plant physiology.

## 700 Thesis (\*) AWSp

# BUILDING TECHNOLOGY AND ADMINISTRATION

## Courses for Undergraduates

## 301, 302 Building Industry (3,3) A,W EBERHARDER

Organization and functioning of the building industry, legal, ethical, business, and management aspects.

## 310 History of Building (3) Sp HILDEBRAND

A historical survey of building techniques and materials as conditioned by environmental, technical, and social influences.

## 320 Building Equipment and Techniques (3) Sp POMEROY

The equipment and construction techniques of the building industry with emphasis on rationalizing trends. Prerequisites, 302 and Architecture 330.

## 401, 402 Building Estimating (3,3) A,W HUTCHINSON

The principles of building costs, estimating, and construction cost control. Prerequisite, Architecture 330.

## 410 Senior Study (3) AWSp

Independent study of a specific building industry problem with assigned proctor. Prerequisite, senior standing.

## 420 Building Financing (2) Sp FLAHERTY

The financing of building construction, financial institutions, regulations, government participation, and financing principles. Prerequisites, 302 and Real Estate 301.

# BUSINESS AND ITS ENVIRONMENT

**BULGARIAN**—See *Far Eastern and Slavic Languages and Literature*

## BUSINESS AND ITS ENVIRONMENT

### Courses for Graduates Only

**500 Business Economics and Forecasting (5) AS**

CHAMBERS

Factors underlying the determination of cost and prices for the industry and the firm; forecasting at the level of the industry and the firm. Prerequisite, permission.

**510 Business and Public Policy (3) AWSpS**

GREINER, GOLDBERG

Legal institutions and processes in the business environment; contract, property, and the corporation; business, labor, and governmental participation in development of public policies affecting business. Prerequisite, permission.

**552 Legal Aspects of Business Regulation (3) Sp**

GREINER, GOLDBERG

Examination, from the administrative point of view, of advanced legal problems bearing upon top management's basic operating policy. Prerequisite, permission.

**562 Responsibilities of Business Leadership (3) AWSpS**

GOLDBERG

Relationships between business and consumers, government, labor, and agriculture as affected by changing social forces. Problems of business ethics. Prerequisite, permission.

**571-572 Research Reports (3-3) AWSpS**

See Accounting for description.

**590 Business History (3) WS**

WHEELER

Development of the American business system—with special emphasis upon the dynamic forces, both internal and external, shaping the form and character of the macro- and micro-business. Prerequisite, permission.

**593 Seminar in Business Fluctuations (3) ASpS**

BOURQUE

Business cycles, economic growth and industrial change; national income and output analysis; appraisal of corrective measures internal and external to business. Prerequisite, permission.

**594 Seminar in Business Forecasting (3) Sp**

BOURQUE

Problems of forecasting business conditions; analysis of forecasting methods and techniques of preparing forecasts used by corporations, advisory services, and government. Empirical as well as theoretical problems. Prerequisite, permission.

**597 Behavioral Science of the Business System (3) AWS**

ROBINSON

Analysis of the business system in the light of the concepts and methods of the behavioral disciplines. Attention centers on the business scholar's need to develop an integrative approach to social science. Prerequisite, permission.

**598 Analysis of Business Behavior (3) WS**

MONSEN, SCOTT

Current broad problems of business concerns in the American economy. The topics, one of which is usually discussed each quarter, emphasize practical price determination, cost analysis, firm behavior, motivation, or other similar subjects. Prerequisite, permission.

**604 Research (\*, max. 10) AWSpS**

Prerequisite, permission.

**700 Thesis (\*) AWSpS**

**702 Degree Final (6) AWSpS**

Limited to students completing a nonthesis degree program.

## BUSINESS COMMUNICATIONS

### Courses for Undergraduates

**301 Written Business Communications (3) AWSpS**

HARDER, MURPHY, PECK

A broad integrated approach to written communications as a management tool. Analysis of the psychology, semantics, planning, and principles of effective business writing. Practical application through the writing of business letters, short reports, and applications for positions. Prerequisite, 75 credits.

**410 Advanced Written Business Communications (5) Sp**

HARDER, MURPHY, PECK

An intensive consideration of advanced written business communication situations. Analysis and writing of analytical and research reports; and sales, adjustment, credit, and collection letters. Prerequisite, 301 or permission.

## BUSINESS LAW

### Courses for Undergraduates

**201 Legal Factors in the Business Environment (3) AWSpS**

DURNING

Legal institutions and processes; law as a system of social thought and behavior, a frame of order and authority within which rival claims are resolved and compromised; legal reasoning; law as a process resolving social conflict—examples from American labor law. Prerequisite, English 102.

**202 Business Agreements (3) AWSpS**

HAY, CARR

The nature, development, and operation of those principles of contract law primarily affecting business agreements. Prerequisite, 201.

**307 Business Law for Engineers (3) ASp**

Introduction to the law of contracts. Special emphasis on problems which are of concern to the practicing engineer or architect. Construction and materials purchase contracts, labor and mechanics liens, the community property concept. Open to students in the Colleges of Engineering, Architecture and Urban Planning, and Forestry. Not open for credit to Business Administration students. Prerequisite, inquire at Guggenheim 208.

**403 Commercial Law (5) AWSpS**

CARR

Principles of the law of property, sales, negotiable instruments, and security transactions. Prerequisites, 201, 202.

**420 Law in Accounting Practice (3) A**

CARR

Advanced business law problems for C.P.A. candidates. Prerequisite, 403.

## BUSINESS STATISTICS AND OPERATIONS RESEARCH

### Courses for Undergraduates

**200 Introduction to Computer Programming (1) AWSpS**

Instruction in the programming and use of the computer; applications to business problems.

**201 Statistical Analysis (3) AWSpS**

A survey of descriptive statistics; introduction to probability; sampling and sampling distributions; methods of estimation and testing hypotheses; simple linear regression and correlation; applications to problems in business. Prerequisite, School of Business Administration mathematics requirement.

**301 Quantitative Methods for Business Decisions (3) AWSpS**

Use of statistical methods in support of business decision making; modern statistical analysis; time series analysis; linear programming; total and marginal value analysis. Prerequisite, 201.

**330 Time Series Analysis and Index Number Theory (3)**

PAGE

Concepts and techniques useful in the analysis of economic time series, and construction of index numbers; applications in business forecasting. Prerequisite, 301. (Offered alternate years; offered 1967-68.)

**340 Survey Research Methods for Business (3) W**

BRABB

Concepts and techniques useful in survey research in business. Practical experience in their application through a class project. Prerequisite, 301. (Offered alternate years; not offered 1967-68.)

**350 Quantitative Analysis for Business (5) A**  
PAGE

Introduction to mathematical tools utilized for analysis of business problems; appreciation of the uses of these tools in business situations. Prerequisite, Mathematics 101 or equivalent.

**401 Advanced Business Statistics (4) ASp**  
CHIU

Fundamental concepts necessary to the proper application of advanced analytical statistical techniques in business. Chi-square and other nonparametric inference techniques; analysis of variance and covariance. Prerequisite, 301.

**444J Computer Programming for Business Applications (3) AW**

SHARPE

Methods of programming electronic computers for business operations; design and use of special purpose and general purpose programming languages. Offered jointly with Accounting. Prerequisites, 200 and 301, Accounting 230, or permission.

**450 Operations Research Techniques I (3) WSp**

NEWELL

Quantifying business problems and obtaining solutions through the application of the tools of operation research. Emphasis is placed on the techniques of mathematical programming. Prerequisites, 301 and 350, or School of Business Administration mathematics requirement.

**451 Operations Research Techniques II (3) Sp**

MEIER

Additional techniques of operations research useful in business analysis: queuing theory, simulation and game theory. Prerequisite, 450.

**460 Multivariate Analysis for Business (3) Sp**  
CHIU

Functional analysis techniques for business research. Variance and covariance; multiple and partial regression; problems of serial correlation, interdependence, and identification in parameter estimation. Prerequisite, 401.

**499 Undergraduate Research (3, max. 9) AWSpS**

Research in selected problems in business statistics, operations research, decision theory, and computer applications. Prerequisites, 301 and permission.

**Courses for Graduates Only**

**500 Business Statistics (3) AWS**

CHIU

A treatment of statistical measurements useful in the decision-making process. Includes analysis of distributions, probability and inference, correlation and regression, risk and uncertainty in estimation, and decision roles. Prerequisite, 350 or equivalent.

**510 Quantitative Methods (3) AWSp**

BELL

A survey of techniques in analytical statistics and operations research useful in guiding business decisions. Prerequisite, 500 or equivalent.

**516 Statistical Decision Processes for Business (3) W**

BRABB

Analysis of the classical and Bayesian statistical models as guides for business. Expected loss, expected utility, costs of uncertainty, and minimax strategies are included. Prerequisite, 510 or equivalent.

**520 Seminar in Business Statistics (3) Sp**

CHIU

Reading, discussion, and limited practice in application of selected statistical techniques. Areas: statistical decision processes; nonparametric statistics; advanced application of statistical techniques in administrative control; advanced multivariate analysis; theories and techniques of time series analysis and index number construction. Prerequisite, permission.

**544 Seminar in Business Use of Computers (3) A**

SHARPE

Intensive inquiry into the economic feasibility and desirability of using computers in business. Selected topics will be chosen to evaluate the advantages, disadvantages, and relative costs of using computers in major areas of business analysis. Prerequisite, 444J or equivalent.

**550 Seminar in Operations Research Techniques (3, max. 6) AWSp**

BELL, MEIER

An intensive study into operations research tools useful in business analysis, such as linear and other programming techniques, queuing theory, and simulation. Prerequisites, 510 and permission.

**571-572 Research Reports (3-3) AWSpS**

See Accounting for description.

**604 Research (\*, max. 10) AWSpS**

Prerequisite, permission.

**700 Thesis (\*, max. 9) AWSpS**

**702 Degree Final (6) AWSpS**

Limited to students completing a nonthesis degree program.

*CATALAN—See Romance Languages and Literature*

**CHEMICAL ENGINEERING**

**Courses for Undergraduates**

**200 Introduction to Chemical Engineering (3) W**

The engineering design process: conception, analysis, detailed process and equipment design, operation; familiarization with the techniques of design. Prerequisite, sophomore standing or permission.

**210 Material and Energy Balances (4) A, Sp**

Chemical and physical process calculations: steady and unsteady state material and energy balances with specific examples in vapor-liquid contact operations and multi-phase extraction, and introductory thermochemistry. Prerequisite, 200 or permission. (Formerly 384.)

**325 Thermodynamics (3) A**

Basic principles of thermodynamics and the behavior of pure substances with applications in compression and expansion operations, fluid flow, power cycles, and refrigeration. Prerequisite, 210, which may be taken concurrently. (Formerly 385.)

**326 Thermodynamics and Kinetics (4) W**

Phase equilibria and chemical equilibria in multicomponent systems; theories of solution; chemical reaction analysis. Prerequisites, 325 and Chemistry 456, which may be taken concurrently.

**330 Transport Process Principles (4) Sp**

Diffusive transport of momentum, heat and mass; general aspects of fluid flow; the Navier-Stokes equations; one-dimensional flow with engineering applications. Prerequisite, 326. (Formerly 470.)

**435 Heat and Mass Transfer (3) A**

Applications of the principles of heat and mass transfer to problems of engineering significance. Methods for evaluating heat and mass transfer coefficients; use of coefficients in equipment design. Particular attention is given to problems in physical separations and to alternative means of accomplishing desired mass exchange. Prerequisite, 330.

**436 Chemical Engineering Laboratory I (4) A**

Lectures on statistical analysis of data, instrumentation, and report writing; laboratory experiments on transport phenomena and the analog computer. Emphasis on experimental methods and report writing. Prerequisite, 330.

**437 Chemical Engineering Laboratory II (2) W**

A continuation of 436. Laboratory investigation of chemical engineering principles applied to equipment design with emphasis on heat transfer and mass transfer operations. Prerequisite, 436. (Formerly 475.)

# CHEMICAL ENGINEERING

## 438 Chemical Engineering Laboratory III (1-3) Sp

Special projects in the design, construction, and operation of chemical engineering equipment. Prerequisite, 437.

## 440 Fluid Mechanics (3) A

A concise survey of fluid mechanics. Qualitative aspects of non-Newtonian behavior; basic physical and mathematical ideas of parallel flow, creeping motion, potential motion, turbulence, and boundary layers. Prerequisite, 330.

## 450 Heat Transfer (3) W

Application of steady-state and transient conduction theory, including numerical methods; elements of heat transfer by radiation; basic concepts and applications of convective heat transfer theory. Prerequisite, 435.

## 460 Mass Transfer (3) W

Diffusion equations; interphase mass transfer; models and analogy expressions; simultaneous heat and mass transfer; mass transfer design principles. Prerequisite, 435.

## 465 Reactor Design (3) W

Application of principles of chemical kinetics to the design of commercial-scale chemical reactors; characterization of batch and flow reactors, in homogeneous and heterogeneous systems. Prerequisite, 435.

## 470 Chemistry of Wood (3) A

Chemical and physical properties of cellulose, lignin, hemicellulose, and extractives; wood as a raw material for the chemical industry. Prerequisite, Chemistry 102 or 232, or permission. (Formerly 451.)

## 471 Pulp and Paper Technology (3) W

Morphology of wood fibers, manufacture of mechanical and chemical pulps, stock preparation, paper machine operation, coated papers, paper-plastic combinations, converting operations. Prerequisite, Chemistry 102 or 232, or permission.

## 472 Pulp and Paper Laboratory (2) Sp

Laboratory experiments in the pulping of wood, fiber technology, and the physical and chemical characterization of paper and pulp. Prerequisite, 471.

## 480 Process Dynamics and Control (3) A

Analysis of the dynamics of simple chemical process units and systems; applications to stability, control, and instrumentation of such processes. Prerequisite, senior standing.

## 481 Process Optimization (3) Sp

Concepts and techniques of optimizing chemical engineering processes and systems, including classical and direct methods, methods of experimental search, linear and nonlinear programming, and dynamic programming. Prerequisite, 435. (Formerly 581.)

## 485 Process Design Principles II (2) W

Applied economics in chemical engineering design and operations; market survey and plant location; introduction to plant and process design. Prerequisite, 435. (Formerly 482.)

## 486 Process Design (4) Sp

Comprehensive design of a specific process, including economic feasibility studies, utilization of market survey and plant location studies, process equipment design and optimization, and over-all plant integration and layout. Prerequisite, 485. (Formerly 483.)

## 499 Undergraduate Research (1-6, max. 12) AWSp

Independent research projects in chemical engineering. Prerequisite, permission.

## Courses for Graduates Only

### NS20, NS21, 522 Seminar (0,0,1) A,W,Sp

### 523 Seminar in Chemical Engineering (0-3, max. 12) AWSp

Reports by students and staff on topics of current interest in chemical engineering. Prerequisite, one year of graduate study or permission.

### 525 Chemical Engineering Thermodynamics (3) A

Review of principles of thermodynamics; statistical foundations. Applications to problems in multiphase and multicomponent systems. Irreversible thermodynamics. Prerequisite, undergraduate thermodynamics.

### 530 Introduction to Transport Phenomena (3) A

SATHER

Derivation of the differential equations for mass, heat, and momentum transport from both continuum and molecular viewpoints of matter. Irreversibility and dissipation. Formulation of flux relations and determination of transport coefficients. Prerequisite, 330 or permission.

### 531, 532 Topics in Transport Phenomena I, II (1-3, max. 6, 3) W,Sp

SATHER

A more comprehensive treatment of the material presented in 530 with particular emphasis on molecular mechanisms for transport in dense gases and liquids. Prerequisite, one year of graduate study or permission.

### 540, 541 Fluid Mechanics (3,3) W,Sp

SLEICHER

An introduction to fundamental concepts and methods of analysis in fluid mechanics. Stress rate-of-strain relationships, general deductions from the equations of motion, parallel flow, vorticity and circulation, creeping motion, irrotational motion, introduction to stability and turbulence, boundary layer theory. Prerequisites, 530 and Aeronautics and Astronautics 567, or permission.

## 542 Hydrodynamic Stability (3) A

SLEICHER

Methods used in analyses of hydrodynamic stability. Stability of accelerated interfaces, jets of immiscible fluids, vortex sheets, and rotating flow. Convective and magnetohydrodynamic instability, stability of parallel flows including boundary layers, the Orr-Sommerfeld equation. Prerequisite, 6 credits in graduate fluid mechanics.

## 543, 544 Fluid Turbulence (3,3) A,W

SLEICHER

Statistical and phenomenological theories of turbulence. Introductory concepts, velocity correlations, the energy spectrum, the decay of turbulence, scalar fields, turbulent transport, shear turbulence, wall turbulence, phenomenological theories of energy transport, instrumentation, recent literature. Prerequisite, 6 credits in graduate fluid mechanics.

## 550 Heat Transfer (3) W

DAVID

Steady and unsteady state conduction with emphasis on numerical methods. Thermal radiation exchange between surfaces and in gas-filled enclosures. Basic concepts and recent developments in convective heat transfer theory and applications thereof. Prerequisites, 525 and 530, or permission.

## 551 Topics in Heat Transfer (1-3, max. 6) Sp

DAVID

Methods and developments in heat transfer theory of interest in chemical engineering with emphasis on convection (including condensation, boiling, and two-phase flow) and radiation. Prerequisite, 550 or permission.

## 560 Mass Transfer (3) Sp

HEDEGER

Diffusion equations; transfer of material between phases; mathematical models. Dispersion in flow systems; residence time analyses. Simultaneous mass transfer and chemical reaction. Prerequisites, graduate standing and 530.

## 561 Topics in Mass Transfer (1-3, max. 6) W

HEDEGER

Consideration of special topics in the general area of mass transfer. Discussions and readings of the current literature. Subject matter changes from year to year. Prerequisite, one year of graduate study in chemical engineering or permission.

## 565 Kinetics and Catalysis (3) Sp

JOHANSON

Homogeneous and heterogeneous systems with emphasis on chemical engineering principles applied to industrial reactor design. Prerequisite, 525.

## 566 Topics in Reaction Kinetics (1-3, max. 6) W

JOHANSON

Considerations of particular problems in chemical reactions, combustion, elevated temperature systems, reactor design. Prerequisite, 565 or permission.



**570 Chemistry of High Polymers**  
(3, max. 6) Sp

Fundamentals of high polymer chemistry, including kinetics of addition and condensation polymerization, the determination of average molecular weights and chain length distributions, solution properties and the relationship between molecular structure and plastic film and fiber properties of various polymers. Prerequisite, an undergraduate sequence in organic chemistry.

**571 Cellulose and Lignin (3)**

Chemistry and technology of cellulose, lignin, and related substances. Origin and status in plant tissue, isolation procedures, physical characteristics, and chemical reactions. Chemical processing in pulp, paper, rayon, and plastics industries. Prerequisite, an undergraduate sequence in organic chemistry.

**575 Topics in Analysis in Chemical Engineering (1-3, max. 6) A**

GARLID

Discussion of topics in applied mathematics of importance in chemical engineering problems, including both classical contributions and topics of current interest. Subject matter varies from year to year. Prerequisite, one year of graduate study in chemical engineering or permission.

**580 Process Dynamics I (3)**

GARLID

Mathematics of process dynamics and control including differential equations, perturbation techniques, transform methods. Basic methods of control system design. Effects of control loop imperfections such as hysteresis, measurement lag, and dead time. Prerequisite, one year of graduate study in chemical engineering or permission.

**581 Process Dynamics II (3)**

GARLID

A continuation of 580. Statistical dynamics of control systems. Z-transforms and sampled data systems. Applications to flow and pressure systems, load and inventory systems, thermal dynamics, fractioning columns, stirred and tubular reactors. Optimization of over-all process design and operation, linear programming, dynamic programming. Prerequisite, 580.

**588J Nuclear Fuel Management (3) W**

BABB

Applications of chemical engineering principles to processing of nuclear reactor materials and irradiated fuels. Fuel cycles; properties of irradiated fuel; theory of molecular separations processes; analysis of steady state and transient characteristics of chemical processing operations. Offered jointly with Nuclear Engineering. Prerequisites, 530, Nuclear Engineering 484, or permission.

**599 Current Topics in Chemical Engineering (1-3, max. 12)**

Readings or lectures and discussions of topics of current interest in the field of chemical engineering. Subject matter changes from year to year. Prerequisite, permission.

**600 Research (\*) AWSp**

Prerequisite, permission of the Graduate Program Adviser.

**700 Thesis (\*) AWSp****CHEMISTRY****Courses for Undergraduates****100 Chemical Science (5) ASpS**

Atoms, molecules, and chemical reactions. A survey of fundamental principles. Designed both as a terminal course for nonscience majors and as an introductory course for those who wish to continue with 101 or 140. (Note Mathematics prerequisite for 140.) Chemistry 100 is given in two versions, with (A, S) and without (Sp) laboratory. The laboratory version is recommended for students who intend to continue with 101 or 140. No credit to those who have had one unit or more of high school chemistry.

**101 General Chemistry (5) AW**

For nonscience and nonengineering majors who plan to terminate their study of chemistry with 101 or 102. Molecular theory, quantitative relationships in chemical processes, solutions, ionic equilibria, acids, bases, and salts. Chemistry of common metals and nonmetals. Prerequisite, one unit of high school chemistry or 100.

**102 General and Organic Chemistry (5) WSp**

Organic compounds; hydrocarbons, alcohols, aldehydes, ketones, ethers, acids, aromatics, fats and oils, proteins and carbohydrates. Students who plan to take 231 should not take 102. Prerequisite, 101.

**140 General Chemistry (3) AWSp**

For science, engineering, and other majors who plan to take a year or more of chemistry courses. The structure of matter, atomic and molecular theory, the elements, valence and quantitative relationships. Prerequisites, high school chemistry or 100, Mathematics 101 or passing score on algebra qualifying test.

**141 General Chemistry Laboratory (1)**

Introduction to laboratory techniques and apparatus in chemistry. Prerequisites, high school chemistry or 100; 140 to be taken concurrently.

**145H General Chemistry (4) A**

Honors course paralleling 140 and part of 150, including stoichiometry, solutions, kinetics, and acid and base equilibria. Prerequisites, one year of high school chemistry, Mathematics 101 or equivalent, and permission.

**146H General Chemistry Laboratory (2) A**

Honors course paralleling 151. Prerequisites, concurrent registration in 145H and permission.

**150 General Chemistry (3) AWSp**

Stoichiometry, aqueous solutions, kinetics, acid and base equilibria, electrochemistry, oxidation and reduction. Prerequisite, 140.

**151 General Chemistry Laboratory (2) AWSp**

Experiments illustrating the quantitative relationships in chemistry. Prerequisites, 140 and concurrent registration in 150.

**155H General Chemistry (4) W**

Honors course paralleling part of 150 and 160. Prerequisite, A or B grade in 145H or permission.

**160 General Chemistry (3) AWSp**

Periodic system, phase equilibria, metals and nonmetals, metallurgy, and nuclear reactions. Prerequisite, 150.

**170, 170H Qualitative Analysis (3) AWSpS**

Semi-microqualitative analysis for common cations and anions; separation and identification procedures. Prerequisites, 151 and 160 (the latter may be taken concurrently with 170).

**198, 198H Tutorial Study (1, max. 3) AWSp, AWSp**

For chemistry majors only. Discussion in small groups of aspects of chemistry of current interest to undergraduates. Prerequisite, permission of chemistry adviser and grade-point average of 3.00 for freshmen, 2.50 for sophomores. Not to be taken concurrently with 199.

**199, 199H Special Problems (1, max. 6) AWSp, AWSp**

Problems relating to experimental chemistry. For chemistry majors only. Prerequisite, permission of chemistry adviser and a chemistry grade-point average above 3.00.

**221 Quantitative Analysis (5) AWSpS**

Volumetric and gravimetric. Prerequisite, 170.

**231 Organic Chemistry (3) ASpS**

For students planning only two quarters of organic chemistry. Structure, nomenclature, reactions and synthesis of the main types of organic compounds. Prerequisite, 151.

**232 Organic Chemistry (3) AWS**

Continuation of 231. Prerequisite, 231.

**241 Organic Chemistry Laboratory (2) ASpS**

Usually to accompany 231. Preparation of representative compounds. Prerequisite, 231, which may be taken concurrently.

**242 Organic Chemistry Laboratory (2) AWS**

Usually to accompany 232. Preparations and qualitative organic analysis. Prerequisites, 232, which may be taken concurrently, and 241.

# CHEMISTRY

## 335 Organic Chemistry (3) A

For chemistry and chemical engineering majors and other qualified students planning three or more quarters of organic chemistry. Structure, nomenclature, reactions, and synthesis of organic compounds. Theory and mechanism of organic reactions. Prerequisite, 170, which may be taken concurrently.

## 336 Organic Chemistry (3) W

Continuation of 335. Prerequisite, 335.

## 337, 337H Organic Chemistry (3) Sp, Sp

Continuation of 336. Prerequisite, 336.

## 345, 345H Organic Chemistry Laboratory (2) A, A

Usually to accompany 335. Organic syntheses. Prerequisite, 335, which may be taken concurrently.

## 346, 346H Organic Chemistry Laboratory (1) W, W

Continuation of 345. Usually to accompany 336. Prerequisites, 336, which may be taken concurrently, and 345.

## 347, 347H Organic and Qualitative Organic Laboratory (3) Sp, Sp

Continuation of 346. Usually to accompany 337. Prerequisites, 337, which may be taken concurrently, and 346.

## 350 Elementary Physical Chemistry (3) WS

Survey of some major topics in physical chemistry. Prerequisites, two quarters general chemistry, Physics 116, Mathematics 124.

## 351 Elementary Physical Chemistry (3) SpS

Continuation of 350, which is prerequisite.

## 401 Principles of Chemistry (3, max. 6) S

Primarily for high school teachers. Principles of chemistry, atomic and molecular nature of matter, periodic system, stoichiometry, chemical reactions, modern terminology and nomenclature.

## 402 Techniques of Chemistry (2 credits in a given quarter or 3 credits in a given quarter) S

Primarily for high school teachers. Discussion and demonstration of fundamental techniques, determination of composition and structure, analysis and synthesis, separation and purification processes, electrochemical processes, use of stable and radioactive isotopes.

## 410, 410H Radiochemical Techniques and Radioactivity Measurements (3) W

An introductory general-service course for students planning further work in nuclear or tracer applications. Safety procedures, detection and measurement of nuclear radiations, radiochemical and tracer techniques. Prerequisites, 160, Mathematics 124, Physics 116, or permission.

## 415 The Chemical Bond (3) A

The nature of the chemical bond, complex compounds. Prerequisite, 457.

## 416 Inorganic Chemistry (3) W

Study of elements in relation to the periodic system. Prerequisite, 457.

## 418 Radiochemistry (3) Sp

Natural radioactivity, nuclear systematics and reactions, radioactive decay processes, decay laws, statistical considerations, applications of radioactivity. Prerequisites, 170 and 456, or permission.

## 419 Radiochemistry Laboratory (2) Sp

Safe handling and quantitative measurement of radioactivity, radiochemical separations, preparation of radioactive tracers, nuclear fission. Prerequisites, 410, 418, which may be taken concurrently, or permission.

## 425 Quantitative Analysis (3) Sp

ROBINSON

Special analytical methods. Prerequisites, 221, 455, or permission.

## 426 Instrumental Analysis (3) W

CRITTENDEN

Introduction to electrical and optical methods of analysis. Prerequisites, 221 and 458.

## 427 Advanced Quantitative Theory (3) Sp

CRITTENDEN

Theoretical principles of analytical chemistry. Prerequisites, 221, 232 or 337, 457, or permission.

## 428 Chemical Microscopy (3) A

ROBINSON

Theory of the polarizing microscope and its application to chemistry. Prerequisite, 457 or permission. (Offered 1967-68.)

## 429 Microquantitative Analysis (3) A

ROBINSON

Principles and techniques. Prerequisite, 425 or permission. (Offered 1968-69.)

## 445, 445H Qualitative Organic Analysis (3) A, A

Identification and characterization of simple organic compounds. Prerequisite, 347 or permission.

## 446 Advanced Organic Analysis and Synthesis (3) W

Advanced techniques of isolation, identification, and characterization of organic compounds. Prerequisite, 445 or permission.

## 455, 455H Physical Chemistry (3) A

Introduction to quantum chemistry, statistical mechanics, kinetic theory of gases. Prerequisites, 160, Mathematics 126, and college physics.

## 456, 456H Physical Chemistry (4) W

Thermodynamics, phase equilibria, colligative properties of solutions, electrolytes, and electrochemistry. Prerequisites, 455 and Mathematics 126.

## 457, 457H Physical Chemistry (3) Sp

Chemical kinetics, transport properties, molecular structure, the solid state, surfaces, and macromolecules. Prerequisite, 456.

## 458 Physical Chemistry Laboratory (4) ASp

Prerequisites, 457, which may be taken concurrently, or 350, 351, and 455.

## 499, 499H Undergraduate Research (\*, max. 12) AWSpS

For qualified chemistry majors in the prescribed curriculum, especially those planning graduate work. Prerequisites, permission, and a chemistry grade-point average above 3.00.

## Courses for Graduates Only

### 510 Current Problems in Inorganic Chemistry (2, max. 12)

CADY, MEYER, RITTER, ROSE

For doctoral candidates in inorganic chemistry. Current topics, e.g., acid-base theory; halogens; hydrides; groups III and IV; interstitial, chelate, and high-temperature chemistry; inorganic free radicals.

### 513 Advanced Nuclear Chemistry (2, max. 6) A

FAIRHALL, VANDENBOSCH

Nuclear reactions, fission, complex radioactive decay, low-level techniques, geochemistry, cosmochemistry, chemistry of the synthetic elements. Prerequisite, 418 or permission.

### 520 Current Problems in Analytical Chemistry (2, max. 12) AWSp

CRITTENDEN, ISENHOUR, ROBINSON

For doctoral candidates in analytical chemistry. Current topics, e.g., electrochemistry, trace analysis, methods of data treatment, analytical instrumentation theory.

### 526 Advanced Instrumental Analysis (3) A

CRITTENDEN

Absorption and emission spectroscopy, polarography, potentiometry, and dielectric properties as applied to problems in analytical chemistry. Prerequisite, 426 or permission. (Offered alternate years; not offered 1967-68.)

### 530 Advanced Organic Chemistry (3) A

DAUBEN

Electronic mechanisms in organic chemistry. An introduction to the theory of organic reactions. Prerequisite, 337 or equivalent.

### 531 Advanced Organic Chemistry (3) W

ANDERSON

Discussion of the principal reactions of synthetic organic chemistry, with emphasis on practical methods. Transformation of functional groups. Prerequisite, 530 or permission.

**532 Advanced Organic Chemistry (3) Sp**

POCKER, SCHUBERT

Kinetics and equilibria as related to the mechanisms of organic reactions. Absolute Rate Theory. Stereochemistry and the steric course of reactions. Prerequisite, 531 or permission.

**533 Advanced Organic Chemistry (3)**

DAUBEN

Advanced modern synthetic reactions, with particular emphasis on formation of carbon-carbon bonds. Prerequisite, 531 or permission.

**540 Current Problems in Organic Chemistry (3, max. 18) AWSp**

ANDERSON, CHILTON, DAUBEN, POCKER, SCHUBERT, STOUT, WOODMAN

For doctoral candidates in organic chemistry. Discussions of topics of current interest and importance, e.g., nonclassical aromatic compounds; small ring heterocycles (Anderson); carbohydrates, amino acids, peptides (Chilton); resonance, aromatic character, and electron transfer processes, radical reactions in solution, radical intermediates, bio-organic mechanisms, quantum physical-organic and bio-organic chemistry (Dauben); catalytic action, enzyme and model-enzyme catalysis, molecular rearrangements, kinetic deuterium isotope effects (Pocker); acid-base catalysis, solvent and substituent effects (Schubert); natural products, biosynthesis, application of physical methods to structural problems (Stout); heterocyclic compounds, peptide syntheses (Woodman). See the *Time Schedule* for instructor and the Department for instructor and topic during any particular quarter.

**550, 551 Introduction to Quantum Chemistry (3,3) A,W**

Solutions of the Schrödinger equation for simple systems; approximate methods; angular momentum and spin; electronic structure of atoms; group theory; electronic, vibrational, and rotational levels in molecules; spectroscopic selection rules. Prerequisite, 455 or permission for 550 (Mathematics 324 recommended); 550 or permission for 551.

**552, 553 Statistical Mechanics (3,3) W,Sp**

General theorems of statistical mechanics; relation of the equilibrium theory to classical thermodynamics; quantum statistics; theory of imperfect gases; lattice statistics and simple cooperative phenomena; lattice dynamics and theory of solids; liquids, solutions, and polymers; time-dependent phenomena and mechanisms of interaction. Prerequisites, 455, 456 (concurrent registration permitted) or their equivalent for 552; 552 for 553.

**559 Chemical Kinetics (3)**

RABINOVITCH

Modern experimental methods and fundamental theories of reaction rates. Role of vibrational excitation in unimolecular and bimolecular reactions. Energy transfer. Non-equilibrium systems and microscopic rate parameters. Prerequisite, 457 or 552, or permission.

**560 Current Problems in Physical Chemistry (3, max. 18) ASp**

DAVIDSON, EGGERS, GOUTERMAN, SLUTSKY, VINCOW

For doctoral candidates in physical chemistry. A discussion of topics selected from active research fields, e.g., electronic structure of molecules, electron correlation, density matrices, semi-empirical methods (Davidson, Gouterman); vibrational and rotational analysis of molecular spectra including applications of symmetry, normal coordinates, force constants, interaction of rotation with vibration, anharmonic effects (Eggers); lattice dynamics, chemistry of the solid state (Slutsky); current problems in electron spin resonance spectroscopy (Vincow). See the *Time Schedule* for instructor and the Department for instructor and topic during any particular quarter.

**581 Topics in Inorganic Chemistry (3, max. 18) AWSp**

Open only to students accepted for doctoral work in chemistry.

**582 Topics in Analytical Chemistry (3, max. 18) AWSp**

Open only to students accepted for doctoral work in chemistry.

**583 Topics in Organic Chemistry (3, max. 18) AWSp**

Open only to students accepted for doctoral work in chemistry.

**585 Topics in Physical Chemistry (3, max. 18) AWSp**

Open only to students accepted for doctoral work in chemistry.

**590 Seminars in General Chemistry (1, max. 18) AWSpS****591 Seminars in Inorganic Chemistry (1, max. 18) AWSpS****592 Seminars in Analytical Chemistry (1, max. 8) AWSpS****593 Seminars in Organic Chemistry (1, max. 18) AWSpS****595 Seminars in Physical Chemistry (1, max. 18) AWSpS****600 Research (\*) AWSpS****700 Thesis (\*) AWSpS****702 Degree Final (6) AWSpS**

Limited to students completing a nonthesis degree program.

*CHINESE—See Far Eastern and Slavic Languages and Literature*

**CIVIL ENGINEERING****Courses for Undergraduates****201 Civil Engineering Projects I (2) AWS**  
HORWOOD

Economic, sociopolitical, and planning considerations in the conception and design of public works. Prerequisite, sophomore standing in civil engineering.

**202 Civil Engineering Projects II (3) WSpS**  
HENNES

Layout, site location, and preliminary design of a comprehensive project including components from hydraulic, sanitary, structural, and transportation engineering. Prerequisite, 201.

**216 Geometronics (4) SpA**  
COLCORD

Introduction to geodetic and photogrammetric concepts and their application to engineering surveys. Errors. Measurement of position with modern techniques including use of tachometric, optical, and electronic instruments. Reduction to plane coordinates and analysis of measurements. Prerequisites, 202, General Engineering 115, and Mechanical Engineering 215 or equivalent (may be taken concurrently).

**291 Dynamics (3) AWSpS**  
MILLER

A general treatment of the dynamics of particles and rigid bodies using vector analysis. Kinematics, kinetics, momentum and energy principles for particles and rigid bodies. Euler's equations of motion. Prerequisites, General Engineering 112, Mathematics 126, Physics 121 or 217.

**292 Mechanics of Materials I (3) AWSpS**  
HARTZ

An introduction to the mechanics of solids. Strain and deformation, stress, stress-strain relationships; torsion, stresses due to bending. Prerequisites, General Engineering 112, Physics 121 or 217; Mathematics 126 (may be taken concurrently).

**293 Mechanics of Materials II (3) AWSpS**  
HARTZ

A continuation of the study of mechanics of solids. Additional topics in beam bending, deflections of beams; stability of columns; virtual work and strain energy methods. Prerequisites, 292; Mathematics 224 (may be taken concurrently).

**310 Forest Highway Location and Design (5) Sp**  
SAWHILL

Reconnaissance, preliminary, and location surveys for forest highways. Earthwork computations, with and without use of electronic computers. Testing of road constructional materials and subgrade soils. Design of roadway elements. Not to be taken for credit by civil engineering majors. Prerequisites, General Engineering 121 and Mathematics 125.

## CIVIL ENGINEERING

### 320 Transportation Engineering I (4) AW EKSE, COLCORD, SAWHILL

Route selection, alignment and grade of the traveled way. Relationship of design elements to vehicle and driver characteristics. Use of electronic computer in design computations. Prerequisite, 216.

### 341 Hydraulics (3) W CHENOWETH

Liquid properties, hydrostatics; continuity, energy, and momentum; flow in open and closed conduits, flow measurements; hydraulic machinery and models. Not to be taken for credit by civil engineering majors. Prerequisites, Mathematics 124 and Physics 114.

### 342 Fluid Mechanics I (4) AWSpS NECE

Elementary mechanics of incompressible fluids. Hydrostatics. Continuity, energy, and momentum equations. Introduction to potential flow. Resistance phenomena for laminar and turbulent flows. Dynamic similitude. Prerequisites, 291, 292, Mathematics 224 or 238.

### 345 Fluid Mechanics II (3) AWSp RICHEY

Analysis of fluid flows of particular interest in civil engineering. Conduit resistance, similitude, open channel flow, hydraulic machinery. Prerequisite, 342.

### 350 Sanitary Engineering I (3) ASp

Man's needs, uses, production, and environmental associations with water, waste water, air, and solid wastes; their properties as materials; significance of these properties; their change on use; and how the properties are measured.

### 363 Constructional Materials I (3) AW MILLER

Physical properties of structural metals and woods. Effects of static and dynamic loads on structural components. Testing, inspection, and selection of materials. Prerequisites, 293, Materials Engineering 250.

### 364 Constructional Materials II (3) WSp MITTET, SHERIF

Physical properties of nonmetallic mineral constructional materials. Design of Portland cement and bituminous concrete mixes. Prerequisite, 363.

### 366 Soil Mechanics I (3) ASp HENNES, MEESE

Mechanical properties of soils. Theoretical mechanics and engineering practice in the evaluation of lateral earth pressures, bearing capacity, and settlement of foundations. Underground exploration and sampling techniques. (Formerly, 466.) Prerequisite, 364 or permission.

### 380 Basic Structural Engineering (2) AW MATTOCK, NICHOLLS, WESSMAN

Planning, design, and construction aspects of structural projects. Criteria for structural adequacy applied to typical structures. Analysis of primary stresses in trusses. Prerequisite, 293.

### 381 Structural Analysis I (3) WSp MITTET, NICHOLLS, WESSMAN

Primary stresses and deflections of suspensions, trusses, and space frames. Deflections of beams and girders. Influence lines for statically determinate structures. Analysis of statically indeterminate structures by energy methods. Prerequisite, 380.

### 382 Structural Analysis II (3) SpA MATTOCK, MITTET, NICHOLLS, WESSMAN

Stresses and deflections of continuous and rigid frame structures. Influence lines for statically indeterminate structures. Theory of strength and deflection of reinforced concrete, steel, and wood members. Prerequisites, 364 and 381.

### 405 Critical Path Methods of Project Scheduling (3) SpW HORWOOD

Precedence analysis of project activities. The Critical Path Method (CPM) and time-cost algorithms. Program Evaluation and Review Techniques (PERT). Project exercises and computer applications. Prerequisite, Mathematics 105.

### 410 Traffic Engineering—Fundamentals (2) A SAWHILL

General review of scope and functions of traffic engineering including its relation to urban planning, municipal engineering, motor vehicle registration, safety, and administration. Prerequisite, senior standing in engineering, or urban planning, or permission.

### 415 Photogrammetry (3) A COLCORD

Geometrical characteristics of photographs and photogrammetric equipment, flight planning and control considerations for photogrammetric mapping, stereoscopy, parallax measurement and computations, mosaicking, tilt determination, consideration of accuracies and error sources. Prerequisite, 216 or permission.

### 417 Cadastral Surveys (2) W COLCORD

Boundaries; the system of public lands; riparian rights; subdivision. Prerequisite, senior standing in civil engineering, or permission.

### 419 Celestial Methods in Geodesy (3) Sp COLCORD

Concepts of time and the celestial sphere. Methods of determination of time, latitude, longitude, and azimuth for geodetic purposes with emphasis on application to control surveys. Sources of error and instrumental techniques. Introduction to satellite observations and methods. Prerequisite, senior standing in civil engineering, or permission.

### 421 Transportation Engineering II (3) WSp EKSE, HENNES

Physical elements of transportation facilities: roadbed, drainage, pavement, railways, runways, waterways, and other design components of transportation systems. Prerequisites, 320, 345, and 364.

### 424 Highway Pavement Design (3) Sp EKSE

Current rational pavement design procedures. Viscoelastic behavior of flexible pavements. Layered systems. Elastic slab theory, considering such factors as temperature and warping stresses. Other elements of highway design. Prerequisite, 421.

### 430J Map Projections (3) Sp VERES

Classification of projections, theory of distortion. Projection from ellipsoid to sphere. Theory of conformal projections (Lambert, Mercator, Stereographic). Equal area projections. Polyconic and other projections. Offered jointly with the Department of Geography. Prerequisite, permission.

### 441 Intermediate Fluid Mechanics (3) W CHENOWETH, RICHEY

Theory of models as applied to problems in hydraulic engineering. Practical methods of establishing similitude. Illustration of analog and digital computers in mathematical modeling of hydraulic phenomena. Prerequisites, 345, General Engineering 115, or permission.

### 445 Hydraulic Machinery (3) A NECE, STRAUSSER

Application of hydraulic principles to the design and function of hydraulic machinery, with emphasis on turbine design and pump analysis. Topics include: head, speed, power, type, shape, losses; details of runner, shaft, guides, bearing casing governor, auxiliaries, etc.; pumps and other hydraulic devices. Prerequisite, 342.

### 446 Hydraulic Engineering (3) AW RICHEY

Application of fluid mechanics principles to problems in hydraulic engineering occurring in the study of surface and ground water hydrology, hydraulics, and stability of dams, economic studies, etc. Prerequisites, 345 and 451 (to be taken concurrently).

### 447 Applied Hydrology (3) W CAMPBELL, RICHEY

Surface water, subsurface, and ground-water hydrology, hydrograph analysis, hydrologic systems. Prerequisite, senior or graduate standing.

### 448 Open-channel Engineering (3) Sp CAMPBELL, STRAUSSER

The transportation of water by gravity flow. Analysis and design of canals, transitions, energy dissipators, and similar structures. Analysis of surface profiles and effect of nonlinear alignment on flow. Design-oriented problems in open-channel hydraulics. Prerequisite, 446.

### 451 Sanitary Engineering II (5) AW BOGAN, CARLSON, SYLVESTER

Design criteria for water supply and waste collection systems. Political, social, and economic considerations in the development of these systems. Design of ground water and surface water supply systems; design of domestic sewage and storm water collection systems. Prerequisites, 350, 446 taken concurrently.

**455 Sanitary Biology (3) ASp**

OGLESBY

Fundamental principles of microbiology, population dynamics, and ecology as applicable to nutrient-rich environments and certain biological aspects of public health. Prerequisite, senior or graduate standing.

**456 Process Chemistry for Sanitary Engineers (4) ASp**

CHRISTMAN

An introduction to the chemistry of treatment operations and processes of interest to the sanitary engineer. Laboratory applications dealing with processes of stoichiometry, ion exchange, chemical coagulation, ORP, and gas transfer. Prerequisite, one year of general chemistry or equivalent.

**457 Instrumentation for Water and Air Analysis (3) W**

CHRISTMAN

Theory and application of instrumentation used in water and air quality measurement, research, and monitoring. Lecture and laboratory. Prerequisite, 350 or equivalent.

**458 The Chemistry of Air Pollution (3) W**

CHARLSON, ROSSANO

Lecture and laboratory sessions focussed on (a) the significance and testing of inorganic and organic atmospheric contaminants, (b) familiarization with sampling and analytical instrumentation. Prerequisites, Chemistry 160 or equivalent.

**459 Biological and Physical Agents of Air Pollution (3) W**

OGLESBY, ROSSANO

Occurrence, significance, collection, identification, and quantification of aeroallergens, airborne microorganisms, and inert particles. Prerequisite, 350 or equivalent.

**467 Soil Mechanics II (3) A**

MEESE

Fundamental principles of soil mechanics, with emphasis on problems involving plastic equilibrium and seepage forces. Prerequisite, 366.

**481 Bridge Design (3) Sp**

CLANTON, RHODES

The design of highway bridges. Characteristics of various types. Prerequisite, 483.

**482 Advanced Reinforced and Prestressed Concrete (3) Sp**

BIRKLAND, MATTOCK, MITTET

Analysis, design, and construction of reinforced and prestressed concrete structures. Prerequisite, 382.

**483 Structural Design I (3) AW**

CLANTON, RHODES, MATTOCK, VASARHELYI

Introduction to the design of steel, wood, and concrete members and connections. Prerequisite, 382.

**484 Structural Design II (3) WSp**

CLANTON, MATTOCK

Design of structural systems of buildings including roofs, floors, walls, columns, and foundations. Prerequisite, 483.

**485 Applied Structural Analysis (3) W**

CLANTON

Theory of statically indeterminate structural assemblies, including rigid frames and continuous trusses. Curved members and members of nonuniform section. Moment-area, moment-distribution, and strain-energy methods. Matrix formulation of structural analysis by force and displacement methods. Prerequisite, 382.

**494 Introduction to the Mechanics of Continuous Media (3) W**

HARTZ

A rigorous development of the basic equations of motion of elastic solids and Newtonian fluids through the use of vectors and cartesian tensors, mechanical behavior of materials, problems in linear elasticity and fluid statics and dynamics. Prerequisites, 291, 292, 342 or Aeronautics and Astronautics 300, or permission.

**498 Special Topics (1-5) AWSp**

Special topics in civil engineering offered as course with lecture and/or laboratory. Students should register for H (hydraulics), M (mechanics), S (structures), T (transportation), or W (sanitary). Prerequisite, permission of Department Chairman.

**499 Special Projects (2-5, max. 15 in one field) AWSp**

Individual undergraduate research projects. Students should register for H (hydraulics), M (mechanics), S (structures), W (sanitary), or T (transportation). Prerequisite, permission of Department Chairman.

**Courses for Graduates Only**

**504 Transportation Finance, Policy, and Programming (2) W**

HENNES, HORWOOD

The planning, development, and financing of public transport facilities at different levels of government. Problems and issues in the integrating of transport systems.

**505 Economic Analysis of Public Works (2) A**

HENNES, HORWOOD

The use of benefit cost ratio, rate of return, and maximization of benefits as criteria in project justification, cost allocation, and selection among engineering alternatives in the design and construction of public works.

**510 Traffic Engineering—Analysis (2) A**

SAWHILL

Measurement and evaluation of characteristics of vehicular volume, speed, travel time, and delay. Analysis of roadway and intersection capacity. On-street parking studies, analysis of traffic accidents, signal timing, and signal systems. Prerequisite, 410 or permission.

**511 Traffic Engineering—Administration and Safety (2) W**

SAWHILL

Comprehensive review of Uniform Vehicle Code and Manuals on Uniform Vehicle Control Devices. Warrants and uses of signs, signals, markings, and channelization. Traffic engineering administration, federal, state, county, and municipal. Prerequisite, 410 or permission.

**512 Traffic Engineering—Planning (2) Sp**

SAWHILL

Application of origin and destination studies, traffic assignment and trip generation models to limited and comprehensive traffic studies. Traffic engineering functions in arterial street systems planning. Downtown traffic planning and traffic facilities location. On- and off-street parking and characteristics of terminal facilities. Prerequisite, 410 or permission.

**513 Traffic Engineering—Design (3) Sp**

SAWHILL

Factors and elements in the geometric design of arterials, freeways, intersections, interchanges, and parking facilities. Special design studies and reports. Prerequisite, 410 or 512 or permission.

**515 Stereo-Photogrammetry (3) W**

VERES

Theory of orientation; mathematical concept of relative and absolute orientation for vertical and convergent photography. Error propagation and corrections. Accuracy element of orientation. Critical surfaces. Standard residual Y-parallaxes. Prerequisites, 415, 530.

**516 Analytical Photogrammetry (3) W**

VERES

Basic principle of analytical photogrammetry. Stereo comparators and the analytical plotter. Reduction of plate coordinates. Perspective. Colinearity, coplanarity, space coordinate systems, transformations. Space intersection and resection and their adjustment. Solutions using high speed electronic computers. Prerequisites, 415 and 530.

**518 Aerial Triangulation (3) Sp**

VERES

Radial aero-triangulation; instrumental aerial triangulation by independent pairs, aero-polygon, aero-leveling, and independent geodetic control methods. Semi-analytical aero-triangulation. Mathematical strip and block adjustment. Analytical aero-triangulation methods. Prerequisites, 515 and 516.

**520 Seminar (1, max. 6) AWSp**

Students should register for H (hydraulics), M (mechanics), S (structures), T (transportation), or W (sanitary). Prerequisite, permission.

**521 Seminar in Urban Transportation Planning (2) Sp**

HORWOOD, SAWHILL

Prerequisite, graduate standing in civil engineering or urban planning, or permission.

## CIVIL ENGINEERING

### 522 Transportation Systems (3) A

EKSE, HENNES

Interregional highways, state trunk lines and local roads; their functions and appropriate standards of design. The characteristics of road, rail, water, and air transport in relation to selection and design of the facility. Pipeline and conveyor transportation. Prerequisite, 421.

### 523 Transportation Terminals (3) W

EKSE, HENNES

Coordination of transportation facilities. Port and harbor installations. Airports. Rail belt lines and terminals. Prerequisite, 421.

### 524 Rapid Transit (3) Sp

EKSE, HENNES

Engineering problems in the mass movement of people in metropolitan areas. Demand in relation to level of service. Equipment. Route selection. Running time. Station spacing. Prerequisite, graduate standing in engineering or permission.

### 527J Information Systems for Planning and Research (3) A

HORWOOD

Computer programming technology and data systems designed for large scale data inputs. Machine editing, data manipulation and retrieval, laboratory problems adapted to special interests of students. No previous computer programming experience required. Offered jointly with the Departments of Geography and Urban Planning.

### 528J Automated Mapping and Graphing (3) W

HORWOOD

Problem-oriented computer languages for statistical and areal analysis. Laboratory problems adapted to specialized interests of students. Offered jointly with the Departments of Geography and Urban Planning. Prerequisite, basic statistics, 527J, or permission.

### 529J Computer Applications to Urban and Regional Analysis (3) Sp

HORWOOD

Simulation models and automated systems for the study of land use and related economic and demographic data. Machine methods of planning analysis and feedback review. Laboratory projects. Offered jointly with the Departments of Geography and Urban Planning. Prerequisite, 528J or permission.

### 530 Adjustment Computations (4) A

COLCORD

Two- and multi-dimensional distributions and concept of errors, variances, co-variances, weight and error propagation. Least square adjustment by variation of parameters and condition methods. Solution of normal equations. Types of adjustments for hybrid systems. Matrix inversion by high speed computers. Prerequisite, permission.

### 531 Geodesy (3) A

COLCORD

Introduction to problems of gravimetric and geometric geodesy. Potential attraction, gravity observation and reduction. Properties of the ellipsoid and geoid and computations of geodetic position and distances. Prerequisite, permission.

### 537 Electronic Surveying I (3) W

HARRISON

Fundamentals of electronics. Receivers, antennae, radar equation, lasers, circular, hyperbolic and other methods. Radar, linescan radar, radio and laser altimeters. Theory of geodimeter, tellurometer, electrotape, and other electronic surveying equipment. Prerequisites, 216, Electrical Engineering 303, or permission.

### 538 Electronic Surveying II (3) Sp

VERES

Relation of doublepath propagation to phase measuring technique. Curvature of ray path. Propagation velocity. Distance reduction. Long-line measurement. Control point extension. Trilateration adjustment. Hydrographic surveying applications. Prerequisites, 530 and 537.

### 542 Hydrodynamics I (3) AW

NECE, RICHEY

Fundamentals of fluid potential motion. Two- and three-dimensional flow examples, including free surface flows. Conformal mapping, other solution techniques. Prerequisite, 342 or equivalent.

### 543 Hydrodynamics II (3) Sp

NECE, RICHEY

Fundamentals of the flow of a real fluid. Viscous flows; the Navier-Stokes equations, and some exact solutions. Boundary layer theory. Introduction to turbulence and diffusion. Prerequisite, 542.

### 544 Coastal Hydraulics (3) Sp

RICHEY

The mechanics of waves, their prediction and interaction with coastlines, estuaries, and engineering installations. Prerequisite, major in engineering or physical sciences.

### 547 Advanced Hydrology (3) Sp

CAMPBELL, RICHEY

Statistical hydrology and economic implications. Correlations, frequency distributions, stochastic treatments. Prerequisite, graduate standing.

### 549 Experimental Hydrodynamics (3) W

NECE

Experimental studies of steady and unsteady flow phenomena. Model tests as used in hydraulic design. Instrumentation and experimental techniques. Prerequisite, 441 or permission.

### 550 Sanitary Engineering Unit Operations I (3) W

CARLSON

Physical and biological operations involved in treatment of water. Biological population control, solid-liquid separation, material and energy balances, design of biological operations. Prerequisite, 455 or permission.

### 551 Sanitary Engineering Unit Operations II (3) W

BOGAN

Design of chemical operations employed in the treatment of water and wastes including solids separations, chemical coagulation, ion exchange, and gas transfer. Theoretical development of design parameters and evaluation of functional performances, reaction rates, mass balances, and power requirements. Prerequisite, 456 or permission.

### 552 Treatment Process and Systems Design (3) Sp

BOGAN, CARLSON

Functional design of processes and systems for treatment of water and waste water to meet specific situations. Comprehensive design of specific process including selection and design of equipment and control elements, plant layout and site development, and cost studies. Introduction to use of systems analysis methods and mathematical description of process performance. Prerequisites, 550, 551.

### 553 Advanced Sanitary Biology (3) W

OGLESBY

Impoundment, estuarine and stream environments; normal biota and ecological changes resulting from introduction of pollutants, study of laboratory microcosms before and after addition of organic wastes. Prerequisites, 455 and 456.

### 554 Advanced Process Chemistry for Sanitary Engineers (3) W

CHRISTMAN

Properties of colloidal systems, natural, and synthetic organic materials encountered in water and waste water treatment, and laboratory methods for their analysis. Prerequisite, 456 or permission.

### 555 Topics in Analysis and Design of Sanitary Systems (3) A

BOGAN

Mathematics of treatment processes and systems of interest to the sanitary engineer. Use of analog and digital computers for simulating multi-use river systems, treatment processes and operations, and water distribution networks. Computer programming for design optimization and system control. Prerequisite, one year graduate study or permission.

### 556 Bioengineering Aspects of Waste Treatment (3) Sp

CARLSON

Sanitary engineering problems relating to biological and biochemical systems influencing man's environment. Biological treatment of industrial wastes and advanced waste treatment processes. Prerequisite, 550 or permission.

### 557 Water and Waste-Water Treatment (3) Sp

BOGAN, CARLSON, SYLVESTER

Objectives of water and waste-water treatment; associated physical, chemical, and biological phenomena; design of common treatment systems. Prerequisite, 451 or permission.

**558 Water Quality Management (3) W**  
SYLVESTER

Water quality control objectives, methods and philosophies; effect of various uses on water quality; receiving water characteristics; dispersion and behavior of pollutants; treatment required for various water usages. Prerequisites, 455, 456, or permission.

**559 Water Resource Management (3) A**  
SYLVESTER

Engineering, social, and economic factors involved in water resource development and management; water policies, programs and administration. Use relationships and conflicts. Considerations for regional water resource systems.

**560 Topics in Environmental Health for Engineers (3) W**  
OGLESBY, ROSSANO

Survey of environmental health practices and problems with emphasis on the role of sanitary engineering.

**561 Air Resources Engineering I (3) ASp**  
ROSSANO

Relation between air pollution sources, atmospheric variables, and effect on receptors. Detection, analysis, and control of air pollution. Prerequisite, 350 or permission.

**562 Air Resources Engineering II (3) W**  
ROSSANO

Fundamental and applied air resource engineering; physics and chemistry of the atmosphere; biological and economic effects of air pollution; design of air pollution control systems. Prerequisite, 561 or permission.

**563 Air Resources Management (3) Sp**  
ROSSANO

The atmosphere as a vital natural resource. Administrative and legal aspects of air conservation; quality criteria and emerging problems. Prerequisite, 561 or permission.

**564A Aerosol Science and Technology I (3) W**  
CHARLSON

Topics related to suspended particulate matter in a gaseous medium. Statistics, mechanics, and physical chemistry of aerosols. Particular reference to particulate matter in air and to experimental and engineering methods. Prerequisite, permission.

**564B Aerosol Science and Technology II (3) Sp**  
CHARLSON

A continuation of 564A; light scattering, Brownian motion, diffusion and coagulation of aerosols. Prerequisite, permission.

**565 Airphoto Interpretation in Engineering (3) W**  
COLCORD

Use of aerial photographs and remote sensing for terrain evaluation in soil mapping and materials surveys, route location, urban planning, traffic studies, environmental engineering and water resources, and site location. Prerequisites, 415, Geology 310, or permission.

**566 Engineering Properties of Clay (3) A**  
MEESE, SHERIF

Shearing strength, consolidation characteristics, structural concepts, and related properties of clay. Prerequisite, 366.

**567 Stresses in Earth Masses (3) W**  
SHERIF

Stress function. Stress-strain analysis within elastic range with emphasis on soil/water systems. Groundwater hydrodynamics. Stress distribution under various loadings. Relaxation methods. Prerequisites, 467 and Mathematics 324, or permission.

**568 Seepage and Slope Stability (2) W**  
HENNES

Control of landslides; effect of seepage and porewater pressure on the stability of earth masses. Prerequisite, 467.

**569 Applied Soil Mechanics (3) Sp**  
HENNES, MEESE

Soil mechanics in engineering practice; the application of theory to the analysis of footings, piling, retaining walls, tunnels, and other substructures. Prerequisites, 366 and graduate standing.

**570 Advanced Mechanics of Materials I (3) A**  
SERGEV

Torsion of noncircular and hollow members, open and closed sections. Membrane stresses in shells. Introduction to the theory of elasticity, Airy's stress function. Beam columns. Thick-walled cylinders. Prerequisite, 382 or graduate standing.

**571 Advanced Mechanics of Materials II (3) W**  
SERGEV

Beams on elastic foundations. Bending of circular and rectangular plates. Introduction to bending theory of shells. Prerequisite, 570 or permission.

**572 Advanced Mechanics of Materials III (3) Sp**  
SERGEV

Theory of elastic stability. Columns. Buckling of frameworks. Lateral and torsional buckling of beams. Stability of plates and shells. Prerequisite, 571 or permission.

**573 Structural Mechanics I (3) A**  
HARTZ

Matrix methods in structural mechanics. Review of basic structural theory. Principle of virtual work. Development of basic matrix force (flexibility) and displacement (stiffness) methods of structural analysis. Prerequisite, graduate standing or permission.

**574 Structural Mechanics II (3) W**  
HARTZ

Dynamic response of structures using mode superposition and matrix methods. Lumped and distributed parameter systems. Application to earthquake, moving and blast loads. Approximate and numerical methods. Prerequisite, 573 or permission.

**575 Structural Mechanics III (3) Sp**  
HARTZ

Variational and energy methods in structural and solid mechanics. Application of calculus of variations and minimal principles of mechanics to nonlinear structural analysis, elastic stability, theory of elasticity, plates and shells, and vibrations. Prerequisite, 574 or permission.

**576 Theory of Plates and Shells (3) A**  
SERGEV

General methods and advanced topics in the bending of thin plates. General theory for the deformation of thin shells. Boundary conditions. Approximate theories. Translational shells and shells of revolution. Prerequisite, 571 or permission.

**577 Finite Element Methods in Structural Mechanics (3) Sp**  
HARTZ

Extension of the matrix methods of structural analysis to the solution of elasticity, plate and shell problems by use of finite element approximations. Discussion of convergence and bounding and extension to investigation of stability and finite deformations. Prerequisite, 573 or permission.

**580 Strain Measurements (3) A**  
VASARHELYI

Experimental determination of strain under static and dynamic loads; mechanical, optical, and electrical strain gauges; transducers for displacement, velocity and acceleration; photoelasticity, strain rosette, brittle coating and other methods; problems of instrumentation, and analysis of data. Prerequisite, graduate standing or permission.

**581 Advanced Structures I (3) A**  
VASARHELYI

Review of the theory of flexure of members of non-uniform section. Analysis of rigid frames. Slope deflection, moment distribution, stiffness matrix. Formulation for computer analysis. Prerequisite, graduate standing in civil engineering or permission.

**582 Advanced Structures II (3) W**  
VASARHELYI

Analysis of trussed structures. Deflections and secondary stresses. Influence lines. Strain energy theorems, flexibility matrix, specialized computer programs. Prerequisite, 581 or permission.

**583 Advanced Structures III (3) Sp**  
VASARHELYI

Curved members and arches. Approximate and rigorous methods. Strain energy methods, elastic center. Influence lines. Model methods of structural analysis with demonstrations. Prerequisite, 582 or permission.

**584 Plastic Design of Steel Structures (3) W**  
VASARHELYI

Plastic (inelastic) behavior of structural steels. Applications to the design of structural members and systems. Upper- and lower-bound theorems, minimum weight design. Limitations and economy of the procedure. Prerequisite, 581 or permission.



# CIVIL ENGINEERING

## 586 Structural Materials and Design (3) W MITTET

A critical review and discussion of the mechanical properties of structural steel, structural aluminum alloy, and reinforced concrete which affect structural design. Fatigue and impact in metal structures. Failure of structures and structural members. Prerequisite, graduate standing in civil engineering.

## 587 Advanced Design of Steel Structures (3) Sp VASARHELYI

Broad review of the factors influencing the function of a structure, such as material properties and fabrication methods. Welded, riveted and bolted connections. Particular problems of welded structures. Design projects. Prerequisite, 586 or permission.

## 588 Behavior of Concrete Members (3) A MATTOCK

Behavior of structural concrete members subject to long- or short-term loading by axial force, bending, shear, and torsion. Prerequisite, 484.

## 589 Behavior of Concrete Structures (3) W MATTOCK

Behavior under load of concrete structures; continuous beams, frames and slabs. Effect of creep and shrinkage on the behavior of structures. Prerequisite, 588.

## 590 Structures Under Wind (3) EVANS

Fundamental principles governing the static or dynamic response of suspended structures, transmission lines, tall stacks, and other flexible structures subject to deflection, overturning, or oscillation as a result of wind action. Prerequisite, graduate standing in engineering.

## 591 Theory of Elasticity I (3) Sp EVANS

Elementary formulation of plane elasticity theory. Airy's stress function. Polynomial solutions. Series solutions in rectangular and polar coordinates. Saint-Venant's theory of torsion. Solution by energy methods. Prerequisite, graduate standing in engineering.

## 592 Theory of Elasticity II (3) A EVANS

Formulation of classical theory in terms of cartesian tensors. Complex representation of Airy's stress function. Solution by application of conformal mapping and Cauchy integrals. Prerequisite, 591 or Aeronautics and Astronautics 530 or Mechanical Engineering 551, or permission.

## 593 Theory of Elasticity III (3) Sp HARTZ

Invariant formulation of nonlinear theory including effects of large displacements, finite rotations, and finite deformations. Stability of equilibrium configurations. Linear problems for three-dimensional isotropic and anisotropic bodies. Prerequisites, 592, Aeronautics and Astronautics 580.

## 594 Wave Propagation in Solids (3) S HARTZ

Dynamic formulation of the theory of elasticity; elastic waves in two- and three-dimensional solids; elastic waves in rods, beams, and plates; plastic and viscoelastic wave propagation in solids. Prerequisites, 574 or equivalent, and 592, or permission.

## 599 Special Topics (2-5, max. 15 in one field) AWSpS

Special topics under the direction of staff members. Students should register for H (hydraulics), M (mechanics), S (structures), T (transportation) or W (sanitary). Prerequisites, permission of instructor and Department Chairman.

## 600 Research (\*) AWSpS

Special investigations by graduate students under the direction of staff members. Students should register for H (hydraulics), M (mechanics), S (structures), T (transportation), or W (sanitary). Prerequisite, permission of Department Chairman.

## 700 Thesis (\*) AWSpS

## 702 Degree Final (6) AWSpS

Limited to students completing a nonthesis degree program.

# CLASSICS

## Courses for Undergraduates

### ARABIC

#### 101-102, 103 Elementary Arabic (5-5,5)

A,W,Sp

HEER

101-102: an intensive study of grammar, with oral and written drill, and reading of simple texts; 103: reading of selected texts in literary Arabic.

#### 201, 202, 203 Intermediate Arabic (5,5,5)

A,W,Sp

ZIADEH

Reading of selected texts in literary Arabic. Prerequisites, 103 for 201; 201 for 202; 202 for 203.

#### 401, 402, 403 Advanced Arabic (3,3,3)

A,W,Sp

HEER, ZIADEH

Reading of selected Arabic literary texts. Prerequisite, 203.

#### 490 Supervised Study (3-6, max. 18) AWSp

HEER, ZIADEH

Special work in literary texts for graduates and undergraduates. Prerequisite, 203 or equivalent.

### GREEK

#### 101-102, 103 Elementary Greek (5-5,5)

A,W,Sp

101-102: an intensive study of grammar, with reading and writing of simple Attic prose; 103: reading of selections from classical Greek literature.

## 201 Xenophon (3) A

Selections from Xenophon's *Anabasis* and other works. Prerequisite, 103.

## 202 Plato: Shorter Dialogues (3) W

Selections from the Socratic dialogues. Prerequisite, 201.

## 203 Homer (3) Sp

Selections from the *Iliad* or *Odyssey*. Prerequisite, 202.

## 207, 208 Grammar and Composition (2,2) A,W

Systematic review of grammatical principles; exercises in prose composition. To be taken concurrently with 201 and 202.

## 209 Survey of Greek Literature (2) Sp

A brief history of Greek literature, with an introduction to the materials and methods of classical scholarship. Prerequisite, 202.

## 300, 301 Greek Language, Accelerated (3,3) A,W

WYATT

Intensive introduction to Homeric Greek. Not accepted as upper-division credit toward a major in Greek or Classics. Prerequisites, for 300, junior standing and permission; 300 for 301.

## 309 Advanced Grammar and Composition (1, max. 4) AWSp

Prerequisite, 208.

## 413 The Pre-Socratic Philosophers (3) A

MCDIARMID

(Offered alternate years; not offered 1967-68.)

## 414 Plato (3) W

MACKAY

(Offered alternate years; not offered 1967-68.)

## 415 Aristotle (3) Sp

MCDIARMID

(Offered alternate years; not offered 1967-68.)

## 420 Greek Epic (3) A

(Offered alternate years; offered 1967-68.)

## 422 Herodotus and the Persian Wars (3) W

EDMONSON

(Offered alternate years; offered 1967-68.)

## 424 Thucydides and the Peloponnesian War (3) Sp

EDMONSON

(Offered alternate years; offered 1967-68.)

## 442, 443, 444 Greek Drama (3,3,3) A,W,Sp

MCDIARMID

(Offered alternate years; offered 1967-68.)

## 451 Lyric Poetry (3) A

(Offered alternate years; not offered 1967-68.)



**453 Pindar: The Epinician Odes (3) W**  
MCDIARMID  
(Offered alternate years; not offered 1967-68.)

**455 Hellenistic Poetry (3) Sp**  
MACKAY  
(Offered alternate years; not offered 1967-68.)

**490, 490H Supervised Study (3-6, max. 18)**  
AWSp, AWSp  
Special work in literary and philosophical texts for graduates and undergraduates.

**499 Undergraduate Research (\*, max. 15)**  
AWSp

## LATIN

**101-102, 103 Elementary Latin (5-5,5)**  
A,W,Sp

101-102: an intensive study of grammar, with reading and writing of simple Latin prose; 103: reading of selections from classical Latin literature.

**201 Intermediate Latin: Introduction to Latin Literature (3) A**

Readings in prose and poetry from various Latin authors. Prerequisite, two years of high school Latin or 103.

**202 Intermediate Latin: Cicero and Ovid (3) W**

Readings from the orations of Cicero and the elegiac verse of Ovid. Prerequisite, 201.

**203 Intermediate Latin: Vergil (3) Sp**  
Selections from the first six books of the *Aeneid*. Prerequisite, 202.

**206, 207, 208 Grammar and Composition (2,2,2) A,W,Sp**

Systematic review of Latin vocabulary, forms, and grammatical principles; exercises in prose composition. To be taken concurrently with 201, 202, and 203. Prerequisites, two years of high school Latin or 103; 206 for 207; 207 for 208.

**300, 301 Latin Language, Accelerated (3,3) W,Sp**

Intensive introduction to classical Latin. Not accepted as upper-division credit toward a major in Latin or Classics. Prerequisites, for 300, junior standing and permission; 300 for 301.

**305, 306, 307 Survey of Latin Literature (3,3,3) A,W,Sp**  
READ

Survey of Latin literature from its origins to the end of the second century A.D. 305, Republic; 306, Augustan Age; 307, Silver Age. Prerequisite, four years of high school Latin or 203.

**309 Advanced Grammar and Composition (1, max. 4) AWSp**  
Prerequisite, 208.

**401 Medieval Latin (3) Sp**  
PASCAL  
Prerequisite, permission.

**412 Lucretius (3) A**  
GRUMMEL  
(Offered alternate years; offered 1967-68.)

**413 Cicero's Philosophical Works (3) W**  
GRUMMEL  
(Offered alternate years; offered 1967-68.)

**414 Seneca (3) Sp**  
GRUMMEL  
(Offered alternate years; offered 1967-68.)

**422 Livy (3) A**  
VIGNOLI  
(Offered alternate years; not offered 1967-68.)

**423 Cicero's Orations (3) W**  
VIGNOLI  
(Offered alternate years; not offered 1967-68.)

**424 Tacitus (3) Sp**  
EDMONSON  
(Offered alternate years; not offered 1967-68.)

**430 Latin Novel (3) A**  
PASCAL  
(Offered alternate years; offered 1967-68.)

**442 Roman Drama (3) A**  
PASCAL  
(Offered alternate years; not offered 1967-68.)

**451 Roman Satire (3) W**  
VIGNOLI  
(Offered alternate years; offered 1967-68.)

**455 Catullus (3) W**  
GRUMMEL  
(Offered alternate years; not offered 1967-68.)

**456 Horace (3) Sp**  
VIGNOLI  
(Offered alternate years; not offered 1967-68.)

**458 Roman Epic (3) Sp**  
(Offered alternate years; offered 1967-68.)

**475LJ Improvement of Teaching: Latin (3) S**  
READ  
Examination and evaluation of the various methods of teaching Latin; audio-visual aids; testing materials; textbooks; relation of Latin to other languages; Latin derivatives in English vocabulary. Offered jointly with the College of Education.

**475XJ Caesar for High School Teachers (3) S**  
READ  
Interpretation of Caesar's works in the light of their historical, political, literary, and geographical background, with special reference to the problems of high school teaching. Offered jointly with the College of Education. Prerequisite, teaching experience or permission.

**490, 490H Supervised Study (3-6, max. 18)**  
AWSp, AWSp

Special work in literary and philosophical texts for graduates and undergraduates.

**499 Undergraduate Research (\*, max. 15)**  
AWSp

## CLASSICS COURSES IN ENGLISH

**101 Latin and Greek in Current Use (2)**  
AWSp

Designed to improve and increase English vocabulary through a study of the Latin and Greek elements in English, with emphasis on words in current literary and scientific use. No knowledge of Latin or Greek required.

**210 Greek and Roman Classics in English (5)**  
AWSp  
EDMONSON, GRUMMEL, MACKAY,  
MC DIARMID, PASCAL, READ,  
VIGNOLI, WYATT

An introduction to classical literature through a study of the major Greek and Latin authors in modern translation. Lectures will be given by various members of the staff.

**422 Greek Historians and Philosophers in English (3)**

The development of Greek writing from mythical and poetic formulations to logical argument and scientific classification; based on a study of Hesiod, Hippocrates, the Pre-Socratic philosophers, Herodotus, Thucydides, and Plato's *Republic*.

**426 Greek and Roman Epic in English (3) A**  
A study of the *Iliad*, the *Odyssey*, the *Aeneid*, and selections from other ancient epics.

**427 Greek and Roman Tragedy in English (3) W**  
MCDIARMID

The origin and development, with particular emphasis on philosophical attitudes and structural principles of the major dramatists.

**428 Greek and Roman Comedy in English (3) Sp**  
PASCAL

Readings from the comedies of Aristophanes, Menander, Plautus, and Terence.

**430 Greek and Roman Mythology (3) AWSp**  
GRUMMEL, PASCAL  
The principal myths found in classical and later literature.

**435 The Ancient Novel (3) Sp**

A study of the origins, growth, and tradition of the romantic novel in Greek and Latin antiquity.

**440 Greek and Roman Critics in English (3)**  
GRUMMEL  
Problems of literary criticism as considered by Plato, Aristotle, Longinus, and other major classical writers.

## CLASSICS

### NEAR EASTERN LITERATURE IN ENGLISH

#### 420 Islamic Religious Literature in English (3) A

HEER

Readings in Islamic law, theology, and mysticism.

#### 422 Islamic Philosophical and Scientific Literature in English (3) W

HEER

Readings in philosophy, the physical sciences, and medicine.

#### 424 Islamic Society in Its Literature in English (3) Sp

HEER

Aspects of life in the Islamic world as depicted by various Arab and Persian writers.

#### 430 Classical Islamic Institutions in English (3) A

ZIADEH

Readings concerning Islam's principal political, administrative, religious, and educational institutions.

#### 432 Islamic Literature on Jurisprudence and Law in English (3) W

ZIADEH

The origins of the *shari'ah*, its development throughout the Islamic period, and the modern reform of this law.

#### 434 Islamic Literary Genres in English (3) Sp

ZIADEH

Literary genres; literary theory; principal literary authors and their works.

### CLASSICAL ARCHAEOLOGY

#### 341J Greek Archaeology and Art (2) A

EDMONSON

A survey of the major art forms from the Mycenaean to the Hellenistic period, with special attention to modern archaeological methods and excavations, illustrated by slides. Offered jointly with the School of Art.

#### 342J Roman Archaeology and Art (2) W

PASCAL

A survey of the major art forms, with special attention to modern archaeological methods and excavations, illustrated by slides. Offered jointly with the School of Art.

#### 402J Greek and Roman Pottery (3) A

EDMONSON

Shapes, fabrics, and decorations from the Neolithic period to the sixth century A.D. Offered jointly with the School of Art. (Offered alternate years; not offered 1967-68.)

#### 404J Greek and Roman Sculpture (3) W

EDMONSON

History and development of Greek sculpture and sculptors, their Roman copyists, and Roman portraits and sarcophagi. Emphasis on Greek sculpture of the fifth century B.C. Offered jointly with the School of Art. (Offered alternate years; not offered 1967-68.)

#### 406 Greek Architecture (3) Sp

EDMONSON

A detailed study of Greek architecture from its beginnings, with special emphasis on the Periclean building program in fifth-century Athens. (Offered alternate years; not offered 1967-68.)

### Courses for Graduates Only

#### GREEK

##### 520 Seminar (3, max. 27) AWSp

##### 599 Graduate Reading (\*, max. 18) AWSp

Supervised reading in selected fields.

##### 600 Research (3-5, max. 15) AWSp

##### 700 Thesis (\*) AWSp

##### 702 Degree Final (6) AWSp

Limited to students completing a nonthesis degree program.

#### LATIN

##### 520 Seminar (3, max. 27) AWSp

##### 599 Graduate Reading (\*, max. 18) AWSp

Supervised reading in selected fields.

##### 600 Research (3-5, max. 15) AWSp

##### 700 Thesis (\*) AWSp

##### 702 Degree Final (6) AWSp

Limited to students completing a nonthesis degree program.

### CLASSICAL ARCHAEOLOGY

#### 511 Mycenaean Archaeology (3) A

EDMONSON

The art, architecture, and culture of Greece in the late Bronze Age, with emphasis on recent archaeological and linguistic discoveries. (Offered alternate years; offered 1967-68.)

#### 513 Athenian Topography (3) W

EDMONSON

Detailed consideration of the topography and monuments of ancient Athens from the beginning through the Roman period. (Offered alternate years; offered 1967-68.)

#### 515 Attic Epigraphy (3) Sp

EDMONSON

Study of Athenian inscriptions with emphasis on their historical value. The classification and editing of inscriptions, epigraphical techniques, and special problems are treated in detail. (Offered alternate years; offered 1967-68.)

### CLASSICAL LINGUISTICS

#### 501 Comparative Phonology of Greek and Latin (3) A

WYATT

The phonological developments of Greek and Latin from Indo-European to the classical periods of both languages. (Offered alternate years; offered 1967-68.)

#### 503 History of the Greek Language (3) W

WYATT

The morphological and syntactical development of the Greek language from Homer through the New Testament; the development of prose and poetic style. (Offered alternate years; offered 1967-68.)

#### 505 History of the Latin Language (3) Sp

WYATT

The morphological and syntactical development of the Latin language; the development of Latin as a literary language. (Offered alternate years; offered 1967-68.)

#### 506 Italic Dialects (3) A

WYATT

The principal remains of the non-Latin languages and dialects of ancient Italy. (Offered alternate years; not offered 1967-68.)

#### 508 Greek Dialects (3) W

WYATT

The non-Attic dialects of ancient Greek, based on a study of inscriptions and the literary remains. (Offered alternate years; not offered 1967-68.)

#### 510 Mycenaean Greek (3) Sp

WYATT

A study of the Linear-B tablets found in Crete and on the Greek mainland. (Offered alternate years; not offered 1967-68.)

## COMMUNICATIONS

### Courses for Undergraduates

#### COMMUNICATIONS

##### N100 Communications Orientation (0) AW

Introduction to Communications faculty, educational goals, career opportunities, curriculum options, and facilities for instruction and advising. Required for all new Communications majors in first or second quarter.

##### 201 Communications Today (2) AWSpS

An elementary course in theory, including analysis of the communications process and a survey of contributions of the various disciplines as applied to mass media news, advertising, and editorial interpretations. A critical study of language use. Open to lower-division nonmajors.

##### 202 History of the Press in America (2) AWSpS

SMITH

A study of the men and ideas which shaped the development of the press in America. Open to nonmajors.

##### 203 The Press in Contemporary America (2) AWSpS

AMES, SCHNEIDER

A study of responsibility of the mass media in relation to the political and economic spheres of society. Special emphasis on ethics of journalism. Open to nonmajors.

**226 Introduction to Advertising (3) AWSpS**  
Economic and social aspects; organizational structure; comparison of major media; and the elements of creating and producing advertising. Open to nonmajors by permission.

**302 The Role of the Magazine in America (3) W**  
SMITH

The significance of specialized periodicals as vehicles of popular expression.

**303 Public Relations (3) AWSpS**  
BRIER

Principles and practice of public relations in business, industry, government, and social agencies; policy and conduct as fundamentals in good relationships. Open to nonmajors.

**310 Introduction to Mass Communications Research (3) AWSp**  
CLARKE, RUGGELS

Recent developments in the study of mass communications content and audience, with emphasis on the printed media. Open to nonmajors. Prerequisite, Sociology 110 or 310.

**312 Communications Theory (3) Sp**  
Analysis of the factors affecting communication and its results, including relevant research in psychology, sociology, linguistics, and anthropology, together with significant studies in mass communications. Prerequisite, 201 or permission.

**316 Contemporary Affairs (3) W**  
Background and significance of international, national, and local newsworthy events. Primarily a discussion course.

**320 Legal Aspects of Communications (5) ASp**  
BENSON  
Regulations governing publication in the mass media.

**402 Government and Mass Communication (3) W**  
YERXA  
The Anglo-American concept of freedom of communication; its evolution under U.S. federal and state constitutions; present tension areas; judicial decisions; statutes and administrative regulations affecting publishing, broadcasting, etc. Open to nonmajors. Prerequisite, 320 or permission.

**403 Problems in Public Relations (3) W**  
BRIER  
Group application of principles to the field problems of local business or agencies, with reports and recommendations. Open to nonmajors. Prerequisite, 303 or permission.

**406 Social Control of the Mass Media (3) AW**  
CLARKE  
An analysis of relationships between the social structure, political power, and the mass media, and the influence of the media on popular culture.

**408, 409, 410 Communication Research (3,3,3) A,W,Sp**  
RUGGELS, SAMUELSON

Development of the rationale and methods of behavioral science in the context of communication research and theory. Prerequisites, Psychology 301 or Sociology 223 for 409; Psychology 345 for 410.

**414 History of Mass Communications (3) A**  
AMES

Growth and development of the press, with emphasis on journalism in the United States, its social, political, and ethical responsibilities. Open to nonmajors. Prerequisites, 202 and 5 or more credits in American history or permission.

**415 Comparative Communication Systems (3) W**  
EDELSTEIN

The structure and functions of communication systems. The role of communication in social change, e.g., politicization, modernization, and other forms of social and political development. Country and regional studies of the structure, control, content, audiences, and effects of communication. Open to nonmajors.

**443 The Social Functions of Advertising (2½) S**  
GOODER

An analysis of the economic, cultural, and ethical aspects of advertising in modern society both here and abroad, with special attention to its position in business enterprise and its relationship to the media of mass communication. Open only to nonmajors.

**470 Theory and Criticism of Broadcasting (3) A**  
SHADEL

The development of social, economic, and critical standards of broadcasting and the function of radio-television in the mass communications process. Prerequisite, Radio-Television 250. Open to nonmajors.

**474 The Educational Role of the Mass Media (2½) S**  
AMES

A critical study of the role the mass media have served in providing the individual with the information necessary for fulfillment of his major responsibilities as a citizen, as an economic unit, as a moral force, and as a cultural entity. Open only to nonmajors.

**480 Public Opinion and Propaganda (3) ASpS**  
EDELSTEIN

The analysis of public opinion and propaganda as a communication process. An integration of behavioral, historical, and political concepts of public opinion, propaganda, and communication. Open to nonmajors.

**495H, 496H, 497H Honors Seminar in Communications (3,3,3) A,W,Sp**  
AMES, CLARKE

Analysis of the contributions to communications of the behavioral sciences (first quarter) and the humanities (second quarter) in preparation for the writing of an honors thesis in Communications 497H. Prerequisite, senior honors standing.

**498 Problems of Communications (1-5, max. 10) AWSpS**

Research and individual study. Prerequisite, permission of director and staff.

## ADVERTISING

**333 Layout and Production (3) ASp**

Theory and problems in the design and production of advertisements for printed media. Prerequisites, Communications 201, 226, and Journalism 300.

**340 Advertising Procedures (3) Sp**

Fundamentals of copywriting, layout, and mechanical production in the creation of printed advertising. Open only to nonmajors. Prerequisites, Communications 226 or Marketing 391. (Not offered 1967-68.)

**341 Basic Advertising Copy (2) ASp**  
GOODER, WINTER

Principles of copywriting and layout and their interdependence; problems in the preparation of copy and layout. Prerequisites, Communications 201, 226, and Journalism 300.

**342 Media Representation (4) AWSp**

Supervised field assignments in the analysis of advertising problems of specific businesses and in the servicing of advertising accounts for the University Daily.

**440 Advertising Campaigns (5) WSp**  
GOODER, WINTER

Planning and execution of national and local campaigns; research, keynote ideas, budgets; media selection, and merchandising. Prerequisite, 445 or permission of instructor.

**445 Special Copy Applications (3) AW**  
GOODER, WINTER

Analysis of principles and techniques of national advertising copy; problems in the preparation of trade, industrial, and consumer copy and layouts. Prerequisites, 333 and 341.

**446 Problems of Communication in Advertising (2-6) AWSp**

Individual study, research, and discussion of selected problems. Open to senior and graduate students. Prerequisite, permission of instructor. (Not offered 1967-68.)

**448 Advertising Research (3) W**  
WINTER

The application of standard survey methods and behavioral science techniques to creative concepts and media measurement, with special emphasis on secondary research potentialities.

# COMMUNICATIONS

## JOURNALISM

### 291 Photography (3) AWSp

Elementary news photography, photo processing, and picture editing. Open only to majors in the School of Communications.

### 300 News Writing (4) AWSpS

Structure of news and feature stories. Open to nonmajors by permission. Reasonable proficiency in the use of the typewriter required. (Formerly 200.)

### 301 Copy Editing (3) AWSp

Editing news copy, writing cutlines, captions, and headlines; newspaper makeup. Open to nonmajors. Prerequisite, 300.

### 317 Reporting Legal Procedures (2) A

An advanced reporting course concerned with pleadings, testimony, and procedural matters in trial and appellate courts. Open to nonmajors by permission.

### 318 Reporting Contemporary Affairs (3) ASp

YERXA

Reporting of contemporary news scene with special emphasis on national affairs.

### 319 Reporting Public Affairs (3) AWSp

SCHNEIDER, WILLIAMS

Covering the principal news beats for the press; operations of local governing institutions; supplementary city assignments.

### 375J The Teaching of Journalism (3) Sp

BRIER

For teachers in high schools and junior colleges, or for education students taking first or second teaching areas in journalism. Offered jointly with the College of Education.

### 404 Magazine Article Writing (3) W

BRIER

Nonfiction writing for national magazines and for specialized publications. Open to nonmajors. Prerequisite, permission.

### 405 Short Story Writing (3) Sp

BRIER

Fiction writing for national magazines. Open only to upper-division students, by permission, and limited to twenty students. Open to nonmajors.

### 413 Editorial Writing, Policies, and Research (3) ASp

YERXA

Concepts of editorial responsibility; outstanding editorial pages; research for preparing editorial page material, including analytical, interpretive, and persuasive writing.

### 475J Journalism Teaching in the Secondary School (2½) S

SAMUELSON

Advanced course in teaching high school journalism for experienced publications advisers. No credit if Education or Journalism 375J has been taken. Offered jointly with the College of Education.

## RADIO-TELEVISION

### 250 Survey of Radio and Television (3) AWSp

SHADEL

History of the media; organization and regulation of the industry; commercial aspects; educational use; programming. Open to lower-division nonmajors.

### 251 Broadcast Performance (3) ASp

Problems of performance, including techniques of demonstration and interviewing.

### 260 Radio Production (3) AWSp

CRANSTON

Studio and microphone setups; timing, use of sound effects and incidental music; performance.

### 270 Elements of Radio Writing (3) AWSp

RYAN

Principles of writing for listeners. Reasonable proficiency in the use of the typewriter required.

### 350, 351 Laboratory Work on KUOW (3,2) AWSp

Supervised practice in the various departments of the University's FM radio station. Work during the second quarter is on the production of projects for broadcast over KUOW.

### 352 Radio and Television Advertising (5) AW

CRANSTON

Principles of broadcast media as they apply to advertisers; planning a radio or television campaign; writing commercial copy. Prerequisite, Communications 226.

### 373 Television Writing (3) Sp

CRANSTON

Principles and techniques of writing material for television production. Practice in writing live and film presentations, with consideration of camera, direction, and production problems. Prerequisite, one approved university writing course.

### 376 Radio and Television News Writing (3) AWSp

KINKEL

Gathering, writing, editing, and programming news for the broadcast media, including visual treatment for television and film. Prerequisite, Radio-Television 270 or Journalism 300.

### 377 The Documentary (3) Sp

CRANSTON

Development of the documentary. Background aims and creative aspects. Function of documentary in mass media. Open to nonmajors.

### 450 Broadcast Programming (3) WSp

RYAN

A critical study of the nature, range, and structure of broadcast programming and of the forces that shape it.

### 455 Television Film Techniques (2) W

KINKEL

A study of the use of film in news, public affairs, historical and feature programming with emphasis on editing and writing to film; development of rudimentary skills in the use of the film camera. Prerequisite, permission.

### 459J Television in the Schools (3) S

Television programs to supplement classroom work; the development of the American system of broadcasting; the development and significance of educational television, and the contribution schools can make to broadcasting. Offered jointly with the College of Education.

### 461 Television Production (3) AWSp

RYAN

The tools and crafts of production of television programs, culminating in closed-circuit presentation and recording of student-created programs subject to critical evaluation. Prerequisite, permission.

### 463J Television Production Workshop for Teachers (2½) S

RYAN

Working in University studios, under laboratory conditions involving production and on-camera methods, teachers learn to present instructional subject matter through television. Especially for those who expect to work with television as instructors or as supervisors of school-oriented television activities. Offered jointly with the College of Education.

### 465 Television Workshop Laboratory (2-4, max. 8) AWSp

RYAN

Laboratory under on-air conditions, at educational station, assignments and duties increasing in complexity as student's growth indicates. Prerequisites, 461 and permission.

### 476 Radio-Television News Editing (2, max. 6) AWSp

SHADEL

Writing and editing news for radio under broadcast conditions. Prerequisites, 376 and permission.

### 477 Seminar in Broadcast Problems (3) W

The current problems of the broadcast industry, projected against basic legal, ethical, social, and economic principles of station operation.

## Courses for Graduates Only

## COMMUNICATIONS

### 502 Seminar in Government and Mass Communication (3) Sp

Directed independent research into, and analysis of, legal problems in mass communications, institutional and media operations. Open to nonmajors. Prerequisite, Communications 402 or permission.

**506 Seminar in Functions of Mass Media (3) Sp**

CLARKE

Use of current documents and data in examining and evaluating the functions of the press. Open to nonmajors. Prerequisite, Communications 406 or permission.

**507 Computer Applications in Communication Research (3) W**

RUGGELS

A course designed to acquaint the communication research student with both the potentialities and the use of the electronic digital computer in the behavioral sciences. Prerequisites, elementary programming and elementary statistics.

**511 Seminar in Mass Communications Research (3) AW**

CLARKE, SAMUELSON

Advanced individual projects in quantitative research. Open to nonmajors. Prerequisites, Communications 408 and a course in statistics, or permission.

**512, 513, 514 Seminar in History and Communications (3,3,3) A,W,Sp**

AMES, SMITH

The development of the historical approach to communications research. Study of historical method, bibliography, and criticism.

**515 Seminar in Comparative Communication Systems (3) Sp**

EDELSTEIN

Directed readings and research.

**570 Seminar in the Theory and Criticism of Broadcasting (3) W**

SHADEL

Evaluation and criticism of the function and operation of broadcasting in the mass communications process. Use of primary sources, including data gathering and analysis. Prerequisite, Communications 470 or permission.

**580 Seminar in Public Opinion and Propaganda (3) W**

EDELSTEIN

Directed reading and research in the analysis of public opinion and propaganda.

**598 Selected Readings (1-5, maximum 5) AWSpS**

Open to qualified graduate students by permission of Director and staff.

**600 Research (3-5) AWSpS**

Open to qualified graduate students by permission of Director and staff.

**700 Thesis (\*) AWSpS**

**COMPARATIVE LITERATURE**

**Courses for Undergraduates**

**300 World Classics of Western Europe (5) A**

Great works of English, French, Italian, and Spanish poetry, drama and fiction, from the Middle Ages to the twentieth century, read in English and taught by specialists in English and Romance literature. Prerequisite, junior standing.

**301 World Classics of Germany, Russia, and Scandinavia (5) W**

Great works of Danish, German, Icelandic, Norwegian, Russian, and Swedish poetry, drama and fiction, from the Middle Ages to the twentieth century, read in English and taught by specialists in German, Scandinavian, and Slavic literature. Prerequisite, junior standing.

**302J World Classics of the Orient (5) Sp**

MCKINNON

Great works of Chinese, Indian, Japanese, and Korean literature and thought, read in English and taught by specialists in Far Eastern literature. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, junior standing.

**400 Heroic Poetry (5) W**

Ancient, medieval, and Renaissance epic poems, read in English. The Gilgamesh epic; selections from Homer, Virgil, and Ovid; *The Song of Roland*; Wolfram, *Parzival*; Tasso, *Jerusalem Delivered*. Prerequisite, junior standing.

**401 Modern European Drama (5) A**

Selected plays by Büchner, Musset, Pirandello, Brecht and others, read in English, representing Romanticism, Symbolism, Surrealism, and other movements that have shaped the modern European theater. Prerequisite, junior standing.

**480 Modern European Poetry (5) Sp**

Selected work, read in English, by French, German, Italian, and Spanish poets from the Romantic period to the present. Extended study of Rilke and Rimbaud. Prerequisite, junior standing.

**Courses for Graduates Only**

A fuller description of the graduate programs in Comparative Literature may be found in a brochure, obtainable from the Graduate Program Advisers in Comparative Literature and in the Departments of Classics, English, Germanic, Romance, and Scandinavian Languages and Literature.

**510 Theories and Methods of Comparative Literary History (5, max. 10) A**

Lectures on comparative theory and practice from Vico to the present; seminar papers on comparative topics relevant to the student's fields of concentration.

**511 The Art of Translation (5, max. 10) W**

Lectures on principles of translating literary works into readable English. Students present and comment on translations made by them and give seminar papers on problems of translation in theory and practice.

**522, 523 Existentialism and Literature: Form and Content (3,3) A,W**

KERN

A study of the effects of existential and phenomenological thought on literary themes and techniques. Prerequisite, graduate standing.

**525 The Baroque in Criticism and Literature (3) Sp**

KERN

A study of a number of essays, written by representative scholars in French, German, Spanish, Italian, and English, which contribute to an understanding of the origin and significance of this critical term, followed by a study of works of literature which manifest baroque traits, such as Calderon's *La vida es sueno*, Rotrou's *Saint Genest*, Cervantes' *Don Quixote*, Racine's *Phedre*, and lyric poems of France, Germany, and Spain. Prerequisite, graduate standing.

**530 Comparative Study of French and German Courtly Epic (3) Sp**

HRUBY

Three major works of the German and French courtly epic, *Erec*, *Perceval*, and *Tristan*, will be systematically compared. Prerequisite, permission.

**592, 593, 594 The European Romantic Movement (3,3,3) A,W,Sp**

BEHLER

Analysis of the chief works of the Romantic movement in England, Germany, and France, and their repercussions in America. Prerequisite, permission.

**600 Research (\*) AWSpS**

**700 Thesis (\*) AWSpS**

**702 Degree Final (6) AWSpS**

Limited to students completing a nonthesis degree program.

**CONJOINT COURSES**

**316, 317-318 Introductory Anatomy and Physiology (2,5-5) A,W,Sp**

LANDAU

Human physiology with anatomical demonstrations. An elementary course integrating anatomy, histology, physiology, and biochemistry of the human body. Offered by the Departments of Biological Structure and Physiology and Biophysics. For nursing and dental hygiene students; others by permission only.

## CONJOINT COURSES

### 490 Human Anatomy and Physiology (6 or 9) A

SKAHEN

An advanced course integrating anatomy, histology, physiology, and biochemistry of the human body. Designed to meet the needs primarily of graduate students in psychology, physiology and biophysics, and bioengineering, who have no background in histology, anatomy, and physiology. Offered jointly by the Departments of Biological Structure and Physiology and Biophysics. Prerequisite, permission.

### 409 Basis of Neurology (3, 5, or 8) Sp

EVERETT, PATTON

An advanced course in the anatomy of the central nervous system, and its correlation with neurophysiology. Offered jointly by the Departments of Biological Structure and Physiology and Biophysics. Prerequisite, permission for graduate students.

### 426-427 Introduction to Physical Diagnosis (\* , max. 4- \* , max. 9) WSp

Introduction to clinical medical sciences. The student is taught the techniques of interview, how to take complete histories and perform general physical examinations. Knowledge acquired in the basic medical sciences is used to explain the mechanism of development of cardinal symptoms and the signs of major diseases. Offered by the Departments of Medicine, Obstetrics and Gynecology, Pediatrics, Physical Medicine and Rehabilitation, Radiology, Psychiatry, and Surgery. Required for second-year medical students.

### 454 Laboratory Procedures (2) A

HOUGIE, SHERRIS, KAPLAN

A practical course which provides an opportunity for the student to become familiar with those laboratory tests used frequently in medical practice. Required for third-year medical students.

### 585 Surgical Anatomy (1-3, max. 12) AWSp BASSETT

A course in guided dissection of selected regions supplemented by conferences. Offered by the Departments of Surgery and Biological Structure. Prerequisite, permission.

## CONJOINT B.A. HONORS SEMINAR

### Course for Undergraduates

### 475 Conjoint Honors Colloquium (5, max. 15) AWSp

Investigation of selected topics relevant to business and its environment; their consideration from the viewpoint of all departments and cognate social science disciplines. By invitation.

## CONJOINT COURSES IN DENTISTRY

### N361 Clinical Orientation (0) A

A course for third-year students prior to the beginning of Autumn Quarter. It is designed

to familiarize the student with clinical equipment and procedures and initiates the transition of thought from technical and laboratory methods to clinical application of them. It includes student exercises on each other in prophylaxis, rubber dam applications, and local anesthetic injections in preparation for treatment of patients.

### 402 Applied Therapeutics and Prescribing (2) Sp

NATKIN

A lecture course designed to reacquaint the senior student with the pharmacologic action and therapeutic use of the antibiotics, analgesics, sedatives and tranquilizing agents. Lecturers from the Departments of Microbiology, Pharmacology, Medicine, Oral Surgery, and Periodontics and Endodontics present the background and clinical application of drugs in this fast-moving field.

### 532, 533, 534 Basic Science (3,4,4)

OGILVIE, SREBNY, NATKIN

Seminars on clinical pathologic phenomena with their basic causal factors discussed from interdisciplinary viewpoints.

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*CZECH—See Far Eastern and Slavic Languages and Literature*

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## DANCE

*(Other courses in dance are listed under Physical and Health Education in this section of the Catalog.)*

### 251, 252, 253 Intermediate Contemporary Dance Technique (3,3,3) A,W,Sp

JONSON

Amplification of basic foundation; examination of concepts; analysis of techniques; practice of established techniques. Prerequisites, Physical Education 153 for 251; 251 for 252; 252 for 253, or permission.

### 256, 257, 258 Intermediate Ballet Technique (3,3,3) A,W,Sp

BORIS

Amplification of basic foundation; increased vocabulary, terminology refinements; *adage, allegro, pirouettes, tours, batti, tours de force*. Prerequisites, Physical Education 158 for 256; 256 for 257; 257 for 258, or permission.

### 351, 352, 353 Advanced Ballet and Contemporary Dance Techniques (5,5,5) A,W,Sp

BORIS, JONSON

Introduction to unified technique; exploration of interaction between techniques. Prerequisites, 253 and 258 for 351; 351 for 352; 352 for 353, or permission.

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*DANISH—See Scandinavian Languages and Literature*

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## DENTAL HYGIENE

### 300 Dental Procedures (3) A

WAGNER

Lectures and demonstrations in dental procedures, dental specialties; emphasis on the role of auxiliary personnel.

### 331 Dental Anatomy (4) A

HODSON

Morphology of permanent and primary teeth; sketching and carving of essential units.

### 332 Dental Materials (2) W

HODSON

Survey of the physical and chemical properties of dental materials, with laboratory experience in their manipulation.

### 333 Oral Radiographic Technique (3) A

ANDERSON, VORIS

Physical and clinical aspects of X-ray procedures, with orientation to anatomy of the oral cavity and completion of acceptable full mouth surveys on patients.

### 334 Oral Histology (3) A

TAMARIN

Development and microscopic anatomy of structures of the oral cavity.

### 335 Oral Prophylaxis (2) W

DINIUS, VORIS

Objectives and principles of oral hygiene; instrumentation and procedure of oral prophylaxis, topical fluoride application, oral inspection, and dental health instruction.

### 349 Clinical Oral Prophylaxis (4) Sp

DINIUS, VORIS

Clinical experience in the performance of oral prophylaxis, topical application of fluoride, and dental health instruction for patients.

### 401 Office Procedure and Ethics (2) Sp

VORIS

Dental office and clinic procedure: dental and dental hygiene ethics. professional interrelationships.

### 402 Community Dental Health (3) W

FALES, WELLS

Application of educational principles to dental health teaching; instruction in planning for community dental health programs including actual dental survey experience; evaluation of dental health teaching materials.

### 403, 404 Principles of Dental Hygiene Practice (1,1) W,Sp

WELLS

Presentation and analysis of dental health problems, with emphasis on advanced dental health instruction; experience in presentation of dental health material to groups.

## 405, 406 Oral Pathology (1,1) A

SREEBNY

Study of diseases and abnormalities of the hard and soft tissues of the oral cavity. Prerequisite, 405 for 406.

## 407, 408 Principles of Periodontology (1,1) A,W

HEINS

Classification, etiology, and principles of treatment of periodontal diseases and the relationship of these to dental hygiene practice. Prerequisite, 407 for 408.

## 446 Field Practice (2) WSp

FALES, VORIS

Advanced dental hygiene practice, including work in the University Child Health Center, in a public health department, hospitals, clinics, and schools.

## 447 Dental Hygiene Practice (4) A

DINIUS

Clinical procedures in all phases of dental hygiene; varied clinical experiences under close supervision.

## 448 Dental Hygiene Practice (4) W

ANDERSON

Continued clinical procedure with expansion to include dental hygiene services to patients requiring special considerations.

## 449 Dental Hygiene Practice (4) Sp

ANDERSON

Supervised opportunity to attain experience, knowledge, and skill so that each student may develop operative dental hygiene techniques commensurate with her ability.

## 491 Seminar in Dental Hygiene (2) AWSp

FALES

Study of professional education, accreditation, legislation, organization, and literature. Responsibilities of the dental hygienist to the community.

## 492 Readings in Current Literature in Dental Hygiene and Preventive Dentistry (2) AWSp

FALES

Discussion of reported readings and survey of background material, with emphasis on dental research and its application to dental health education.

## 493 Problems in Dental Hygiene (2-4) AWSp

WELLS

Problems for study directed toward increased understanding in the selected field of practice. Presentation of background, objectives, program, and evaluation.

## 494 Principles of Teaching in Dental Hygiene (2) AWSp

FALES

Application of principles of learning to teaching methods and techniques effective in dental hygiene, with opportunity for course planning, demonstration, and practice teaching. Prerequisite, certificate in dental hygiene.

## OTHER COURSES REQUIRED FOR DENTAL HYGIENE STUDENTS

### Conjoint (Medical) 316, 317-318 Introductory Anatomy and Physiology (2,5-5) A,W,S

LANDAU

Human physiology with anatomical demonstration. An elementary course integrating anatomy, histology, physiology, and biochemistry of the human body. Offered by the Departments of Biological Structure, and Physiology and Biophysics. For nursing and dental hygiene students; others by permission only.

### Education 305 Adolescence and Youth (3) A

EVANS, HAUCK

A survey of the problems of adolescence with analysis and discussion of their educational and social complications.

### Education 309 Introduction to Educational Psychology (3) W

EVANS, FEA, HAUCK

The basic undergraduate course in psychology of education for prospective teachers. Principles from the various areas of psychology are applied to the practical problems of teaching. Major emphasis is on learning. Prerequisites, 302 for elementary emphasis; 305 for secondary emphasis; if necessary, 308 may be taken concurrently.

### Home Economics 319 Family Nutrition (4) A

MONSON

Chemistry and metabolism of the nutrients essential for the maintenance of health. Normal nutritional needs of individuals at various age levels. Nutritional value of foods. Simple dietary modifications as appropriate to medical or dental fields.

### Microbiology 301 General Microbiology (5) S

NESTER

A one-quarter lecture and laboratory course designed to acquaint students in the physical and biological sciences with microorganisms and their activities. Emphasis is on understanding of basic biological concepts elucidated through investigations of microorganisms. Topics include microbial cell structure and functions, metabolism, and microbial genetics, as well as relationship of these aspects of cell activity to disease, immunity, and other important applied areas. Laboratory exercises cover a variety of microbiological techniques and experiments are designed to illustrate the major concepts discussed in lecture. Prerequisite, two quarters of chemistry (a course in a biological science is desirable but not required).

### Pathology 310 General Pathology (2) A

WEIGENSTEIN

Study of causes, processes, and effects of important diseases. Lectures, demonstrations, and discussions. A reasonable knowledge of anatomy, histology, and physiology is required. For students of dental hygiene, physical therapy, and medical technology; others by permission.

## Pedodontics 200 Preventive Dentistry (1) A

MOORE, SCHUMACHER

Etiology and control of dental caries. Physiology and composition of saliva, ecology of the mouth, chemical composition of teeth, degradation of carbohydrates, systemic factors in the caries process, enzyme inhibitors, fluorides, and caries susceptibility tests.

## Pharmacy 352 Pharmacy and Therapeutics (3) Sp

J. FLEIN

Principles of pharmacy; mathematics of pharmacy; pharmacological and therapeutic action of drugs. For nonmajors.

## Preventive Medicine 323 Introduction to Public Health: Principles and Practices (3) AWSps

WILKEY

Public health organization and activities; introduction to health education. For public health majors and students of nursing and dental hygiene; others by permission.

## Psychiatry 450 Principles of Personality Development (2) A

KAUFMAN

Discussion of the principles of personality development and the problems most commonly met. Consideration will be given to the physiologic, psychologic, and cultural factors from infancy through adolescence. For nonmedical students. Prerequisite, senior or graduate standing.

## Psychiatry 451 Principles of Personality Development (2) W

HEILBRUNN

Continuation of 450. Consideration will be given to the physiological, psychological, and cultural factors from maturity through old age. For nonmedical students. Prerequisite, 450 or permission.

## DENTAL SCIENCE AND LITERATURE

### 100 Orientation (1) W

LEWIS

Dentistry as a health profession: its scope, responsibilities, and contacts with other vocations; qualities and traits which lead to high attainment and social usefulness in the profession; purposes, correlation, and development of the various phases of dental education, meaning and value of the scientific method, the critical point of view in the field, and the Code of Ethics of the American Dental Association.

### 131 Dental Materials (4) A

Physical and chemical properties of dental materials.

### 200 Dental History (1) W

MEHUS

Origin and progress in dentistry: beginnings of the scientific study of the teeth and related parts; integration of the developments of the profession in all its phases—professional, technical, and scientific.

# DENTAL SCIENCE AND LITERATURE

## N300, N301 Dental Medicine (1,0) Sp,Sp

Systemic conditions and diseases, with special reference to their oral manifestations or implications. Consideration of some aspects of dermatology and syphilology, diabetes, the blood dyscrasias, endocrine gland and nutritional disturbances, and other conditions.

## 302 Technical Composition (2) Sp

ANDERSON

Technique of using the library, with discussions of availability and source of scientific literature. Procedure and technique of writing scientific papers and preparing them for publication in scientific journals. Techniques of communication.

## 401 Applied Dental Science (2) W

Correlation of preclinical basic medical science and other preclinical study with clinical procedures and requirements. New findings and practices are submitted so that senior students may utilize such information.

## 403 Jurisprudence (1) A

WILSON

Legal problems and obligations incident to the practice of dentistry: state dental laws, contracts, malpractice, and dentists as expert witnesses.

## 431, 432, 433 Dental Ethics and Office Management (2,1,1) A,W,Sp

ANDERSON, KLEIN

Office location, arrangement, furnishings, equipment, and personnel; patient and financial records, taxes, patient-dentist relationships; credit, collections, and fees; banking and accounting; Code of Ethics of The American Dental Association and its application.

*DENTISTRY—See Graduate and Certificate Dental Students Only*

## DRAMA

### Courses for Undergraduates

#### 101 Introduction to the Theatre (5) AWSp FALLS

An introduction to the theatre as an art form. The role of the various theatre artists: actors, directors, designers, and playwrights. Types of theatre structures. Required attendance at one or more performances. Lecture and discussion groups. For nonmajors.

#### 146, 247, 248 Theatre Voice and Speech (3,2,2) AWSp, AWSp, WSp

CARR, GALSTAUN, GRAY, ROSS

Stage vocal techniques and exercises in practical application: 247 focuses on styles of speaking for realistic acting; 248 on poetic drama, Greek, and Shakespeare. Open to nonmajors. Prerequisites, 146 for 247; 247 for 248.

#### 151, 152, 253 Acting (3,3,3) AWSp, AWSp, AWSp

CARR, GALSTAUN, GRAY

Theory and practice of fundamentals: 151, analysis and practice in aptitudes necessary in acting (focus, recall, imagination, characterization) through improvisation, production participation required; 152, analysis and practice in rhythm, theory, stage deportment; 253, analysis and practice in styles for modern realistic acting. Prerequisites, 146 and 151 for 152; 152 and 247 for 253.

#### 210, 211, 212 Theatre Technical Practice (4,4,4) AW, AWSp, ASp

CRIDER, DAVIS, LOUNSBURY

Intensive lecture, laboratory course in basic theories, techniques and equipment of stage scenery, lighting, costumes and scene painting; 210, scene construction and scene painting; 211, costumes; 212, lighting and technical stage procedures. Crew work required in addition to scheduled class hours.

#### 230 Introduction to Children's Drama (2) W

CARR, HAAGA, SIKS, VALENTINETTI

Survey of the history and development of children's drama with emphasis on philosophies and practices. Includes children's theatre, creative dramatics, and puppetry. Open to nonmajors.

#### 298, 498 Theatre Production (½-1, max. 1; 1, max. 3) AWSp, AWSp

A laboratory course for students participating in School of Drama productions. Prerequisites, 151 for 298, 253 for 498.

#### 310 Rendering for the Theatre (2) AWSp

DAVIS

An elective course for students with design emphasis who do not have sufficient technical preparation in drawing and rendering in water color and other media to pursue scene or costume design courses. Prerequisites, 210, 211, 212, or permission.

#### 316 Theatrical Make-Up (2) AWSp

DAVIS

Basic principles, with intensive practice in application of make-up for use on proscenium and arena stages. Open to nonmajors.

#### 324 Children's Theatre (3) WSp

CARR

Theory and techniques using adult and child casts, play selection and analysis, and rehearsal procedures. For nonmajors only.

#### 325, 326 Play Production (5,5) Sp,W

CONWAY, GRAY

A course for nonmajors only. 325: fundamentals of scenery, lighting and costume design and construction; 326: fundamentals of directing, especially for high school, with some acting.

#### 331 Puppetry (3) AWSp

VALENTINETTI

Introduction to puppetry; construction and use of simple puppets as a visual aid in education, recreation, and therapy. For nonmajors.

#### 338 Creative Dramatics (3) AWSp

HAAGA, SIKS

Analysis of basic principles and techniques of the creative process in informal drama; observation of children and youth.

#### 349 Advanced Stage Speaking (2) Sp

GALSTAUN

Intensive study through practice of the fundamentals of speech, styles of speech necessary for the comedy of manners, and a comprehensive study of dialects. Prerequisite, 248.

#### 411 Advanced Stage Costume Construction (2) W

CRIDER

Techniques of costume construction, including study of fabrics, color, and fundamentals of pattern making and draping for historic clothing reconstruction. Prerequisite, 211 or permission.

#### 413 Advanced Scene Construction (3) W

LOUNSBURY

Special problems in scene construction and rigging with laboratories in working drawings and scenic models. Prerequisite, 210 or equivalent.

#### 414 Scene Design (2, max. 4) AW

DAVIS

Theory, practice, and rendering of scene designs. Repeat of course involves intermediate designs, models, etc. Prerequisite, 210.

#### 415 Stage Costume Design (2, max. 4) ASp

CRIDER

Theory, practice and rendering of costume designs for the theatre. Repeat of course involves intermediate designs. Prerequisites, 211; 411 for repetition.

#### 416 History of Theatrical Costume (2) A

CRIDER

Survey of costumes worn on stage from the Attic theatre through the nineteenth century, and their relationship to historic costume; drama, opera, ballet, musicals, and a brief history of Oriental clothing. Open to nonmajors. Prerequisite, 211 or equivalent or permission.

#### 418 Scene Painting (2) A

DAVIS

Pigments, color mixing, and techniques of application to stage scenery. Prerequisites, 210 or permission.

#### 419 Stage Lighting (2) Sp

CONWAY, LOUNSBURY

Theories and methods of lighting with emphasis on lighting plots. Laboratories consist of practical experience in lighting current productions. Prerequisite, 212 or equivalent.

#### 431 Fundamentals of Puppetry (2) AWSp

VALENTINETTI

Puppetry as a theatre art; construction and use of puppets and marionettes for formal presentations; basic principles of playwriting and staging. Majors only. Prerequisites, 152 and 230.



**432 Advanced Puppetry (2, max. 4) AWSp**  
VALENTINETTI

Projects and participation in formal theatre productions or field work in hospitals, clinics, and special schools. Prerequisite, 331 or 431 or permission.

**435, 435L Children's Theatre Directing and Laboratory (2,1) W, AWSp**

CARR

Theory and technique, using adult and child casts, play selection and analysis, and rehearsal procedures. Practical experience in the laboratory. Prerequisites, 461 for 435; 435 and 461L for 435L.

**438, 438L Creative Dramatics and Laboratory (2,1) ASp, AWSp**

HAAGA, SIKS

Application of basic principles and techniques of creative dramatics through leadership experience within the class; 438L, practical leadership with children and youth. Open to nonmajors. Prerequisites, 338 for 438; 438 and permission for 438L.

**451, 452 Advanced Acting (3,3) A, W**

Theory and practice of period styles, especially Shakespeare. 451, tragedy; 452, comedy, especially Restoration. Prerequisites, 253 and 248 for 451; 253 and 451 for 452.

**453 Acting Projects (2) Sp**

CARR, GALSTAUN, ROSS

Style; mime; musical; individual. Prerequisite, 452.

**455 Historic Manners and Movement (2) ASp**

CRIDER

A laboratory course on the fundamentals of body movement for the stage and a survey of historic manners and movement, with particular attention to the interrelationship with historic costume. Open to nonmajors. Prerequisites, 253 and 211 or permission.

**461, 461L Theory and Fundamentals of Directing and Laboratory (2,1) ASp, AWSp**

HARRINGTON

Lectures and required reading on the principles of dramatic directing. Practical application in the laboratory. Prerequisites, 253 for 461; 461 for 461L.

**462 Musical Comedy Direction (3) Sp**

CARR

Lectures and practical exercises dealing with the staging problems related to the components of drama, dance, and music in the musical-comedy form, and a brief history of the development of the American musical. Prerequisite, 461.

**463 Intermediate Projects in Directing (2) AWSp**

HARRINGTON

Prerequisites, 461L, 451, 452.

**471, 472, 473 History of World Theatre and Drama (5,5,5) A,W,Sp**

JOSEPH

471: Classic and Oriental. 472: Medieval and Renaissance. 473: Modern. Great playwrights and dramatic literature correlated with the history and development of world theatre, the physical playhouse, and methods of production. Open to nonmajors.

**474 History and Aesthetics of the Motion Picture (3) Sp**

GALSTAUN

Lectures and exhibition of important and representative films, foreign and American, illustrating the evolution of this art form. Open to nonmajors. Prerequisite, senior standing.

**475 History of Far Eastern Theatre and Drama (5) A**

CONWAY

An inquiry into the origins and history of theatre and drama of India, China, and Japan and the conventions of their production. Classic and modern dramas will form the basis of the study.

**476 History of the American Drama (5) Sp**

A study of American drama and theatre from colonial to modern times.

**482J Music in Theatre (2, max. 14) W**

BERGSMA

Open to majors and nonmajors who are conductors, composers, playwrights, or stage directors. Survey of representative examples of musical theatre; collaborative creation and production. Prerequisite, 461, or English 374, or Music 464 or 486 or 491. Offered jointly with the School of Music.

**490 Special Studies (1-5, max. 5) AWSp**

Prerequisite, permission.

**492 Playwriting (3, max. 9) AWSp**

A professional course. Prerequisites, English 374, 375, and permission.

**495J Special Studies in the Theatre Arts of Asia (3, max. 9) AWSp**

MCKINNON AND VISITING ARTISTS

Fundamentals in the theory and practice of the theatre arts of Asia. The study of a given form or tradition of theatre art in any one quarter will depend on the visiting artists and the idioms of their choice. Offered jointly with the Far Eastern and Russian Institute.

**497 Theatre Organization and Management (2) Sp**

FALLS

Personnel, box-office procedures, advertising, production costs, royalties, and executive policies. Prerequisite, senior standing.

**499 Undergraduate Research (1-5, max. 10) AWSp**

Prerequisite, permission.

**Courses for Graduates Only**

**501 Nature of Graduate Study in Drama (2) A**

FALLS

Prerequisite, graduate standing.

**510 Seminar in Production (3) WSp**

CONWAY, CRIDER, DAVIS, LOUNSBURY

Discussion of aesthetic unity and the potential of physical space in the problems of theatrical production and the limitation of representative types of stages and their supporting equipment and facilities. Prerequisite, senior or graduate standing.

**513 Technical Direction (3) AWSp**

LOUNSBURY

Prerequisites, 210, 413, and permission.

**514 Advanced Scene Design (3) AWSp**

CONWAY

Prerequisite, 4 credits in 414 or equivalent.

**515 Advanced Stage Costume Design (3) AWSp**

CRIDER

Prerequisite, 4 credits in 415 or equivalent.

**530 Seminar in Children's Drama (3) W**

CARR, HAAGA, SIKS

Prerequisites, 435, 438, and permission.

**551-552-553 Teaching of Acting (2-2-2) AWSp, WSp, Sp**

HARRINGTON

Prerequisites, 451, 452, and permission.

**561 Advanced Directing (5) W**

HARRINGTON

Theories and problems of advanced directing with special emphasis on pre-modern plays. Prerequisites, 451, 452, 455, 463, or permission.

**562 Advanced Directing Projects (3, max. 6) AWSp**

HARRINGTON

Prerequisite, 561 and permission.

**575, 576, 577 Seminar in Theatre History (3,3,3) A,W,Sp**

CONWAY

History of theatre: architecture, designers, companies, actors, etc., chronologically. Prerequisites, 471, 472, 473.

**581, 582, 583 Seminar in Drama (3,3,3) A,W,Sp**

JOSEPH

Seminar concerned with intensive readings in dramatic literature and criticism, following a general chronological pattern from prehistoric times to the contemporary theatre. Prerequisites, 471, 472, 473.

**599 Advanced Studies in Theatre Arts (1-5, max. 10) AWSp**

Independent projects or group study of specialized aspects of theatre arts. No more than 5 credits in any emphasis area. Prerequisite, permission.

## DRAMA

**600 Research (\*) AWSp**  
Prerequisite, permission.

**700 Thesis (\*) AWSp**

## ECONOMICS

### Courses for Undergraduates

#### INTRODUCTORY COURSES

**200 Introduction to Economics (5) AWSp**  
BUECHEL, WORCESTER

Organization, operation, and control of the American economy; problems of inflation, unemployment, taxation, the public debt, monopoly, trade unions, and international trade. American capitalism compared with communism and socialism.

**201 Principles of Economics (5) AWSp**

Operation of the American economy, with emphasis on prices, wages, production, and distribution of income and wealth; problems of the world economy. Prerequisite, 200 or equivalent, or permission.

**211 General Economics (3) AWSp**  
HUBER

Survey of basic principles of economics: determination of national income, price analysis, and allocation of resources. Primarily for engineering and forestry students. Other students by permission. No credit if 201 has been taken.

**260 American Economic History (5) AWSp**  
MORRIS

An analysis of American economic growth and change interpreted as part of the general expansion of the North Atlantic economy, 1500 to the present. Stresses the historical background to contemporary American economic problems. Not open to those having taken 160.

**312 Current Economic Problems (5) S**

Designed primarily for secondary school teachers of social studies with limited knowledge of economics. Emphasis on analysis of major economic problems and policies relevant to high school courses in contemporary social problems. Prerequisite, 200 or equivalent, or permission.

#### GENERAL THEORY

**300 Intermediate Price Theory (5) AWSp**

Fundamental concepts and principles. Demand, supply, markets, market price, and the determination of price under competitive and monopolistic conditions; relationships between price and costs; income and its functional distribution in capitalistic society. Prerequisites, 201 and Mathematics 105, or equivalent, or permission.

**301 National Income Analysis (5) AWSp**

Analysis of the determinants of the aggregate level of employment, output, and income of an economy. Prerequisites, 201 and Mathematics 105, or equivalent, or permission.

**306 Development of Economic Thought (5) W**

From the early modern period to the present, with some discussion of its relation to natural science and other social sciences. The main subjects treated will be Adam Smith and the classical school, Karl Marx, later Marxism, and the transition to J. M. Keynes. Prerequisites, 200, 201, or equivalent, or permission.

**400 Fundamentals of Micro-theory (3) A**

Fundamentals of micro-theory with emphasis on applications to public policy. Designed primarily for graduate students majoring in fields other than economics. No credit if Economics 300 has been taken for credit.

**401 Fundamentals of Macro-theory (3) W**

Fundamentals of macro-theory with emphasis on applications to public policy. Designed primarily for graduate students majoring in fields other than economics. No credit if Economics 301 has been taken for credit.

**410, 411, 412 Introduction to Mathematical Economics I, II, III (3,3,3) A,W,Sp**  
JOHNSON, LIND, GLUSTOFF

Applications of elementary functions to the economic theory of markets. Prerequisites, Economics 300, 301, Mathematics 105.

**416J Regional Income Analysis (5) W**  
TIEBOUT

Analysis of determinants of level of regional economic activity with special reference to the Pacific Northwest. Offered jointly with the Department of Geography. Prerequisite, 301 or equivalent.

#### MONEY, BANKING, AND CYCLES

**320 Money and Banking (5)**

Nature and functions of money; the banking system, other credit-granting institutions, and the relationship of money and bank deposits to the economy. Prerequisites, 200 and 201, or permission.

**421 Money, Credit, and the Economy (5) W**  
CRUTCHFIELD

Supply and the use of money, bank deposits, and bank reserves. Relationship of Treasury, Federal Reserve, and commercial bank policies, and the value of money. Factors generating flows of money income. Prerequisites, 300, 301, and 320 or equivalent, or permission.

#### GOVERNMENT REGULATION AND INDUSTRIAL ORGANIZATION

**330 Government and Business (5) AWSp**  
MUND

Development in the United States of public policy with respect to business. Federal anti-trust legislation and its application to mergers, business concentration, and restrictive business practices. Government control of prices; regulation of public utilities; public ownership; economic planning. Prerequisite, 200 or equivalent, or permission.

**404 Advanced Price Analysis (5) A**  
CRUTCHFIELD

Study of selected market structures. Directed toward developing more precise predictive techniques and more adequate bases for analysis of public policy. Prerequisite, 300 or equivalent, or permission.

**435 Natural Resource Utilization and Public Policy (5) W**  
CRUTCHFIELD

Special emphasis on elements of economic theory relating to resource-oriented industries. Case studies in the theory and practice of resource management dealing with both stock and flow resources. Benefit-cost analysis and the evaluation of multipurpose resource projects. Prerequisites, 200 and 201, or permission.

#### LABOR ECONOMICS

**340 Labor Economics (5) AWSp**  
GILLINGHAM, HOPKINS

Trade unionism, collective bargaining, labor-management relations, public policy; economic effects of unionism and collective bargaining; manpower utilization and related labor market problems. Prerequisites, 211 or 200 and 201, or permission.

**346 Economics of Health Care (3) W**  
MC CAFFREE

Economic analysis of the health care sector of economy: organization; demand and supply factors; pricing practices; financing mechanisms, public versus private; impact of third party, insurance and prepayment; health and economic development. Prerequisite, 200, or equivalent, or permission.

**441 Union-Management Relations (5) ASp**  
GILLINGHAM, HOPKINS, MCCAFFREE

The collective-bargaining process, with special reference to economic implications. Prerequisites, 201 and 340, or equivalent, or permission.

**442 The American Labor Movement (5) S**  
GILLINGHAM

Analysis in historical perspective of the American labor movement, its organizational structure, ideology, programs, and policies. Comparison with labor movements in other countries. Prerequisite, 200 or equivalent, or 211, or permission.

**443 Labor Market Analysis (5) W**  
MCCAFFREE

Factors which determine wage rates and employment levels in the firm, industry, and economy. Emphasis upon the union in the labor market. Prerequisite, 300 or equivalent, or permission.

**445 Social Security (5) W**  
HOPKINS

Problems arising from economic hazards confronting individuals, including old age, unemployment, illness, and disability. Social institutions designed to meet these problems, with emphasis on economic effects. Prerequisites, 200 and 201, or permission.

**446 Socio-Economic Gerontology (2)**

HOPKINS

Social and economic problems arising out of the increasing proportion of aged persons in the population.

**PUBLIC FINANCE AND TAXATION****350 Public Finance and Taxation (5) AWSp**

BORCHERDING, LIND, SCHOEPLIN

Principles and practices of taxation including the economic effects of alternative taxes and public expenditures including fiscal and budget policy. Prerequisite, 201 or equivalent, or permission.

**450 Economics of Federal Taxation (5) W**

BORCHERDING, LIND, SCHOEPLIN

Selected topics relating to the economic effects of federal fiscal instruments and budgetary policy. Concentrated study of different facets of the federal taxes, federal fiscal policy, and the national debt. Prerequisites, 300, 301, and 350, or equivalent, or permission.

**451 State and Local Fiscal Economics (5)**

SCHOEPLIN, TIEBOUT

Fiscal economics of state and local government. Prerequisites, 300 and 301, 350, or equivalent, or permission.

**ECONOMIC HISTORY****460J Economic History of Europe (5) A**

MORRIS, THOMAS

The origins of the modern European economy: an historical analysis of economic change and growth from medieval times. Offered jointly with the Department of History. Economics 200, 201 recommended.

**462 Economic History of the United States to the Civil War (5) W**

NORTH, THOMAS

A systematic study of the changing pre-Civil War economic conditions and the consequences of these changes for the American society. Prerequisite, 201 or equivalent, or permission.

**463 Economic History of the United States from the Civil War to the Present (5) Sp**

NORTH, THOMAS

A systematic study of the changing economic conditions since the Civil War and the consequences of these changes for the American society. Prerequisite, 201 or equivalent, or permission.

**465 Economic History of South Asia (5) Sp**

MORRIS

Historical analysis of economic growth and stagnation in the region and an examination of the impact of imperialism and the international economy on the area in the nineteenth and twentieth centuries. Economics 200, 201 recommended.

**INTERNATIONAL TRADE****370 Economic Principles of Foreign Trade (5) AWSp**

FLOYD, HUBER, MAH, PETERS

Introduction to international trade theory. Analysis of the gains from trade, concept of

balance of payments, international monetary adjustments, commercial and monetary policies, economic growth, and international trade. Prerequisite, 201 or permission.

**471 International Economics (5) AW**

FLOYD, HUBER, HYNES, MAH

Income and price theory applied to international trade and finance. Analysis of balance of payments adjustments and alternative international monetary and commercial policies. Role of foreign trade and investment in economic growth. Prerequisites, 300, 301, or permission.

**COMPARATIVE SYSTEMS AND DEVELOPMENT****390 Comparative Economic Systems (5) W,Sp**

WORCESTER

The economic structure and operating principles of the American, Russian, and other selected modern economies as responses to fundamental economic and political problems. Marxian doctrine as related to these problems. Prerequisite, 200 or equivalent, or permission.

**391 Economic Development (5) W**

EYSENACH, PETERS

Theoretical aspects; basic problems and critical appraisal of current theories of growth; special emphasis on undeveloped areas. Prerequisite, 201 or equivalent, or permission.

**493J Economy of Modern China (5) W**

MAH

Economic development of contemporary China, with special emphasis on the objectives, performance, and problems of the mainland Chinese economy under the Communist regime. Offered jointly with the Far Eastern and Russian Institute. Prerequisites, 200 and 201.

**495 The Economy of Soviet Russia (5) A**

THORNTON

Analytical survey of operating principles, organization, and performance of the Soviet economy; historical and ideological backgrounds, industry, agriculture, labor, resources, trade, transportation, finance, problems in planning and rapid industrialization. Prerequisite, 201 or equivalent, or permission.

**STATISTICS AND ECONOMETRICS****281 Introduction to Economic Statistics (5) A**

DOWDLE

Basic statistical concepts; characteristics of economic data; statistical analysis of economic data. Prerequisites, 200 and 201.

**481 Economic Statistical Analysis (5) W**

BARZEL, DOWDLE, LIND

Applications of statistical techniques to economic problems. Prerequisites, 201 and 281, or equivalent, or permission.

**482 Advanced Economic Statistical Analysis (5) Sp**

BARZEL, DOWDLE, LIND

Advanced applications of statistical techniques to economic problems. Prerequisite, 481 or equivalent, or permission.

**JOINT OFFERINGS****408J Problems of Peace and Conflict Resolution (3) W**

BRASS

Study of factors involved in conflict and in conflict resolution; application to international and other problems. Lectures, discussions and readings in social psychology, political science, and economics. Offered jointly with the Department of Political Science. Prerequisite, permission.

**416J Regional Income Analysis (5) W**

TIEBOUT

Analysis of determinants of level of regional economic activity with special reference to the Pacific Northwest. Offered jointly with the Department of Geography. Prerequisite, 301 or equivalent.

**440J Manufacturing (3 or 5)**

THOMAS

Analysis of linkages, structure, and distribution of manufacturing; study of selected industries focusing attention on factors which influence their development and location. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor. Offered jointly with the Department of Geography. (Not offered 1967-68.)

**460J Economic History of Europe (5) A**

MORRIS, R. THOMAS

The origins of the modern European economy: an historical analysis of economic change and growth from medieval times. Offered jointly with the Department of History. Economics 200, 201 recommended.

**493J Economy of Modern China (5) W**

MAH

Economic development of contemporary China, with special emphasis on the objectives, performance, and problems of the mainland Chinese economy under the Communist regime. Offered jointly with the Far Eastern and Russian Institute. Prerequisites, 200 and 201.

**GENERAL****496H Honors Seminar (5) A**

MCCAFFREE

Honors and other superior students will be given opportunity to develop research techniques, pursue topics in breadth and depth and apply their tools of economic analysis to selected topics in economic theory and to current issues of national and international economic policy. To be taken in the senior year.

**497H Honors Directed Study (5) W**

Students will individually arrange for independent study of selected topics in economic theory and its application under the direction of a member of the economics faculty. The research paper, if accepted, will be the student's senior thesis.

**499 Undergraduate Research (3, max. 6) AWSp**

May not be applied toward an advanced degree. Prerequisite, permission.

# ECONOMICS

## Courses for Graduates Only

### GRADUATE CORE PROGRAM

#### 500 Micro-Economic Analysis I (3) AW

Partial equilibrium analysis including demand theory, theory of the production function and of cost. Theory of price. Prerequisites, 300, 301. Mathematics 105, or permission. One quarter of calculus is recommended.

#### 501 Micro-Economic Analysis II (3) WSp

Continuation of 500 with emphasis upon the theory of distribution. Prerequisite, 500.

#### 502 Macro-Economic Analysis I (3) AW

Analysis of theories of income, employment, and output under static conditions; quantity theory of money; relation of monetary and "real" theories; stability and instability of income over time; growth of the economy. Prerequisites, 300 and 301, or permission.

#### 503 Macro-Economic Analysis II (3) WSp

Recent developments. Prerequisite, 502 or permission.

#### 504 Economic History and Economic Development (3) ASp

EYSENBACH, NORTH, THOMAS

Analysis of determinants of long-run development; theoretical issues in the long-run supply and efficiency of productive factors; consideration of case studies in relation to theoretical issues.

#### 507 History of Economic Thought (3) Sp

SHAPIRO

Classical and neo-classical economics with emphasis upon the latter.

### ECONOMIC THEORY AND HISTORY OF ECONOMIC THOUGHT

#### 507 History of Economic Thought (3) Sp

(See Graduate Core Program.)

#### 510 Value and Distribution Theory (3) Sp

MUND

Systematic review of theories of value, price, costs, and supply. The capital concept. Income and its functional distribution.

#### 511 Advanced Micro-Economic Theory—Selected Topics (3, max. 12)

Seminar in advanced micro-theory. Selected topics of special interest and significance. Prerequisites, 500 and 501.

#### 512 Advanced Macro-Economic Theory—Selected Topics (3, max. 12)

Seminar in advanced macro-theory. Selected topics of special interest and significance. Prerequisites, 502 and 503.

#### 516J Research Seminar: Regional Economics (3) Sp

TIEBOUT

Selected topics dealing with aggregative regional economic tools with special attention to empirical testability. Offered jointly with the Department of Geography. Prerequisites, 300 and 301.

### GOVERNMENT REGULATION AND INDUSTRIAL ORGANIZATION

#### 530 Public Control of Industry (3) A

MUND

Public policy in the United States on industrial combinations, pricing practices, and monopoly control. Recent issues in public control of business. Prerequisite, permission.

#### 532 Public Utilities (3)

Critical consideration of recent developments in the study of public utilities. Emphasis on electrical utilities and public power projects of federal and local governments.

#### 533 Price Policy and Industrial Organization (3) Sp

CRUTCHFIELD

Advanced analysis of market structures and industry performance; selected empirical studies; principles of conservation and benefit-cost analysis; issues in public policy. Prerequisite, 500 or permission.

#### 535 Economics of Natural Resources (3) Sp

CRUTCHFIELD

Pricing, allocation, and utilization of natural resources; technological relationships; alternative strategies of public decision making; benefit cost analysis; case studies. Prerequisites, 400 or 500 or permission.

### LABOR ECONOMICS

#### 541 Labor Economics (3) W

GILLINGHAM

Selected topics in labor economics. Prerequisite, permission.

#### 542 Labor Economics (3) A

HOPKINS

Prerequisite, permission.

### PUBLIC FINANCE AND TAXATION

#### 550 Public Finance I (3)

SCHOEPLIN, TIEBOUT

Fiscal policy instrumentalities and comparative effects on income and employment; limitations of fiscal policy; review of current literature. Prerequisite, permission.

#### 551 Public Finance II (3) Sp

BORCHERDING, LIND, SCHOEPLIN

Special problems in the fields of taxation and public debt; review of current literature. Prerequisite, permission.

#### 553 Economic Analysis and Government Programs (3) Sp

MC CAFFREE, TIEBOUT

Applications of economic analysis to public enterprises and programs. Prerequisite, 400, 401, or equivalent.

### ECONOMIC HISTORY

#### 504 Economic History and Economic Development (3) ASp

(See Graduate Core Program.)

#### 561 European Economic History (3) W

MORRIS

Emphasis on the period since 1750. Prerequisite, permission.

#### 562 American Economic History (3) Sp

NORTH

Emphasis on theoretical issues involved in American economic development.

### INTERNATIONAL TRADE

#### 571 International Trade Theory I (3) W

FLOYD, HYNES, MAH

Modern developments in national income theory and welfare economics, with relation to international trade. Prerequisite, permission.

#### 572 International Economic Theory II (3) Sp

Problems of foreign trade and exchange controls, and international monetary policies. Prerequisite, permission.

### ECONOMIC SYSTEMS AND DEVELOPMENT

#### 590 Theory and Practice of Economic Planning (3) W

THORNTON

Theoretical issues, criteria, techniques and applications of planning in the allocation of economic resources. Prerequisite, permission. (Offered alternate years; offered 1967-68.)

#### 591 Theoretical Issues in Economic Development (3) W

EYSENBACH

Exploration and analysis of theoretical issues in economic development; for advanced students. Prerequisite, 504.

#### 595J Soviet Economics (3) A

THORNTON

Analysis of problems of economic measurement, economic development, optimum resource allocation, national income, and planning in the Soviet Union. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, permission. (Offered alternate years; not offered 1967-68.)

### STATISTICS AND ECONOMETRICS

#### 580 Econometrics I (3) A

BARZEL

Study of empirical significance of economic theory and related methodological problems.

#### 581 Econometrics II (3) W

BARZEL

Advanced study of econometric methods and techniques. Prerequisites, 481, 482, and 580.

### GENERAL

#### 600 Research (\*) AWSp

Prerequisite, permission.

#### 700 Thesis (\*) AWSp

#### 702 Degree Final (6) AWSp

Limited to students completing a nonthesis degree program.

## EDUCATION

(For scheduling, students should check current Time Schedule.)

## Courses for Undergraduates

**126J, 127J French for the Elementary School (3,3)**

Training in basic French grammar, pronunciation, and intonation with practical techniques for using French in the elementary classroom; organization of study units, songs, dialogues, and dramatizations. Open to those with little or no background in French. Offered jointly with the Department of Romance Languages and Literature.

**128J, 129J Spanish for the Elementary School (3,3)**

Training in basic Spanish grammar, pronunciation, and intonation with practical techniques for using Spanish in the elementary classroom; organization of study units, songs, dialogues, and dramatizations. Open to those who have little or no background in Spanish. Offered jointly with the Department of Romance Languages and Literature.

**180, 181 Industrial Education: Sketching and Technical Drawing (3,3)**

BAILY

Freehand sketching; orthographic projection; pictorial representation; dimensioning; lettering; developments; working drawing and blueprint reading. Prerequisite for 181, 180 or General Engineering 101. (Offered alternate years; offered 1967-68.)

**182 Industrial Education: General Shop (5)**

BAILY

Introduction to industrial education; the common tools, materials, processes, and products of industry.

**280 Industrial Education: Fundamentals of Woodwork (3)**

BAILY

Hand-tool processes; elementary machine operations; methods of assembling and fastening; simple wood finishing. Prerequisite, 180.

**281 Industrial Education: General Metalwork (3)**

BAILY

Tools, materials, and processes used in sheet metal, forging, casting, bench metal, ornamental iron work, welding, machining, and finishing of metal. Prerequisite, 181 or equivalent.

**288 Introduction to Teaching (1)**

BOROUGH, FOSTER

Designed to provide an over-all introduction to preparation for teaching on the elementary and secondary school levels. School and classroom visits are arranged.

**289 Introduction to Classroom Procedures: Laboratory (3)**

BOROUGH, FOSTER

Opportunity is provided for participation in classroom organization and management. Assignment is for 10 hours a week in a specific school situation, level as requested. Prerequisite, 288.

**\*301 Elementary Survey of Educational Research (3)**

POWERS

An introduction to basic concepts and principles of the scientific approach in the educational phases of behavioral science and to the contemporary literature of educational research. Prerequisites, 2.75 grade-point average, 10 credits in education, special permission.

**302 Child Study and Development (3)**

HAUCK

An overview of the field of child development designed primarily for prospective elementary school teachers. Methods and techniques of child study are examined. The physical, cognitive, emotional, and social aspects of development are studied with an emphasis on understanding children's behavior and implications for educational practice. Prerequisites, 288 and 2.50 cumulative grade-point average.

**305 Adolescence and Youth (3)**

EVANS, HAUCK

The basic undergraduate course in adolescence for prospective secondary teachers. Intellectual, physical, emotional, and social development patterns and processes are examined. Prerequisites, 288, 2.50 cumulative grade-point average.

**308 Evaluation in Education (3)**

CLARK, LANGEN, SAX

Fundamentals of measurement, construction of achievement tests, selection and administration of standardized tests and scales, and evaluation and application of test results.

**309 Introduction to Educational Psychology (3)**

EVANS, FEA, HAUCK

The basic undergraduate course in psychology of education for prospective teachers. Principles from the various areas of psychology are applied to the practical problems of teaching. Major emphasis is on learning. Prerequisites, 302 for elementary emphasis; 305 for secondary emphasis; if necessary, 308 may be taken concurrently.

**318 Fundamentals of Kindergarten-Primary Teaching (3)**

MACDONALD

A course in methods, materials, and professional practices relevant to teaching young children. Recommended for students planning to teach in the kindergarten and primary grades. Prerequisite, 374E.

**319 Elementary Art Education (2)**

JOHNSON

A study of the art of the young child as related to creative and mental growth in the various stages of development. Lectures, discussions, and demonstrations.

\*Course to be dropped after Spring Quarter, 1967.

**320 The Teaching of Art (3)**

JOHNSON

Prerequisites, 309, 370S.

**321 The Teaching of Biology (2)**

OLSEN

Prerequisites, 309, 370S, 25 credits in biology.

**322 The Teaching of Chemistry (3)**

RITTER

Prerequisites, 309, 370S, at least 20 credits in college chemistry, with a grade-point average of 3.00.

**323 The Teaching of Civics (2)**
**324 The Teaching of Business Education: Bookkeeping and General Business (2)**

BRIGGS

Prerequisites, 309, 370S, 9 credits in accounting.

**325 The Teaching of Business Education: Typewriting, Shorthand, and Transcription (2)**

BRIGGS

Prerequisites, 309, 370S, Secretarial Studies 112.

**326 The Teaching of English (3)**

SMITH

Designed to draw together the student's previous background in English literature, language, and composition, the course focuses on the techniques and materials for teaching English in junior and senior high schools. Prerequisites, 309, 370S.

**327 The Teaching of Trade and Industrial Education (3)**

BAILY

To acquaint prospective industrial education teachers with teaching aids, classroom procedures, and problems in the teaching of industrial education courses. Prerequisites, 309, 370S.

**329E, X, S The Teaching of French (3,3,3)**

SIMPSON, CREORE

Elementary, elementary and junior high, and secondary emphases. Prerequisites, 309, 370S, and demonstration of language proficiency.

**330 The Teaching of German in Secondary Schools (3)**

RABURA

Prerequisites, 309, 370S, German 303, or permission.

**331 The Teaching of History (2)**

Application of educational principles and methods to the teaching of history on the junior and senior high school levels. Prerequisites, 309, 370S.

**332 The Teaching of Home Economics (5)**

MCADAMS

(Credits count: 2 as education and 3 as home economics.) Prerequisites, 309, 370S, 25 credits in home economics.

# EDUCATION

## 333 Methods of Teaching for Institution Administration Students (3)

MCADAMS

Prerequisites, junior standing and 25 credits in home economics, including Home Economics 307.

## 334 The Teaching of German in Elementary Schools (3)

FISCHER

Objectives and methods of the FLES (Foreign Languages in Elementary Schools) program in German. Prerequisites, 309, 370S, German 303, or permission.

## 336 The Teaching of Secondary School Mathematics (3)

DUBISCH

Emphasis is upon a critical understanding of subject matter; supplementary topics include teaching aids and classroom problems. Credits count: 2 as education and 1 as mathematics.) Prerequisites, 309, 370S, Mathematics 224 or equivalent.

## 337 The Teaching of Junior High School Mathematics (3)

KINGSTON

Emphasis is upon a critical understanding of junior high school subject matter; supplementary topics include teaching aids and classroom procedures. Not open to students having credit for Education 336. Prerequisites, 309, 370S, Mathematics 101 or equivalent.

## 338 Health in the Elementary School (2)

GAINES, MILLS, REEVES

Health procedures and techniques for meeting health needs and problems of elementary school children, including screening, observation, emergency care, etc.

## 339 The Teaching of Physical Education For Men (2)

PEEK

Prerequisites, 309, 370S, Physical Education 363.

## 340 The Teaching of Health and Physical Education for Women (2)

FOX

Prerequisites, Physical Education 356, 372, 363, 364, Health Education 453, Education 371E, X, or S taken concurrently.

## 341 The Teaching of Russian (2)

KONICK

Prerequisites, 309, 370S.

## 342 The Teaching of Speech (3)

NELSON

A special methods course in the teaching of speech at the secondary level. Prerequisites for majors in speech, 309, 370S, at least 20 credits in speech; for nonmajors, permission.

## 343E, X, S The Teaching of Spanish: Elementary Emphasis, Elementary and Junior High Emphasis, Secondary Emphasis (3,3,3)

SIMPSON

Elementary, elementary and junior high, and secondary emphases. Prerequisites, 309, 370S, demonstration of language proficiency.

## 344 The Teaching of Scandinavian (Norwegian, Swedish) (2)

ARESTAD, JOHNSON

Special methods in the teaching of Norwegian and Swedish to acquaint prospective teachers with materials, methods, and problems. Prerequisites, 309, 370S, permission.

## 346J The Teaching of Secondary School Music (3)

NORMANN

Offered jointly with the School of Music; 2 credits count as education and 1 as music. Prerequisites, 309, 370S, Music 384B.

## 360 Introduction to Curriculum Development (3)

HUNKINS

Designed to acquaint the student with current curriculum practices, with particular emphasis upon the role of the classroom teacher in curriculum development. Prerequisite, 309.

## 370S Teaching in the Secondary School (2)

BOROUGHES, BRIGGS

An orientation to secondary school teaching. Prerequisite, 309.

## 371K, E Student Teaching: Kindergarten; Elementary School (Grades 1 through 6) (5-15, 5-15)

FOSTER

All student teaching is done in the public schools, and a full day from 8 a.m. to 4 p.m. must be left free for an assignment. Assignments are made by the Director of Student Teaching the first day of each quarter. Prerequisites, 309, Speech 101, completion of required portion of the elementary education minor, 2.00 grade-point average in professional education, 2.50 cumulative grade-point average, 120 minimum credits, permission; 15 credits required for certification.

## 371X, S Student Teaching: Junior High School; Senior High School (5-15; 5-15)

FOSTER

All student teaching is done in the public schools, and a full day from 8 a.m. to 4 p.m. must be left free for an assignment. Assignments are made by the Director of Student Teaching the first day of the quarter. Prerequisites, Speech 101; 370S, if required; 120 minimum credits; 2.00 grade-point average in professional education; 2.50 cumulative grade-point average; permission; 15 credits required for certification.

## 374E Reading in the Elementary School (3)

MONSON, SEBESTA

A basic course in methods, techniques, and materials used in the teaching of reading

from the readiness period in the kindergarten-primary area through the study-techniques of the intermediate grades. Prerequisite, 309.

## 374S Reading in the Secondary School (3)

FEA

A basic course in the methods, techniques, and materials used in the teaching of reading from the intermediate grades through the study-techniques of high school. Prerequisite, 309.

## 375H Language Arts in the Elementary School (3)

KITTELL, MONSON

A basic course in planning and teaching elementary language arts: listening and speaking, handwriting, spelling, creative and practical writing. Prerequisite, 309.

## 375J The Teaching of Journalism (3)

BRIER

For teachers in high schools and junior colleges, or for education students taking first or second areas in journalism. Offered jointly with the School of Communications. Prerequisites, 309, 370S, Journalism 300 and 301.

## 375M Social Studies in the Elementary School (3)

FOSTER, JAROLIMEK

A basic course in the planning and teaching of social studies in the elementary school. Prerequisites, 309 and Geography 100.

## 375S Science in the Elementary School (3)

OLSTAD

A basic course in the teaching of science in the elementary school with special emphasis on the nature of science as a process of inquiry. Prerequisites, 309 and 5 credits in an approved course in science.

## 376 Art in the Elementary School (3)

JOHNSON

For students majoring in elementary education. A study of the art of children with emphasis on stages of creative growth and development. Experiences in working with various materials used in art, and ways of organizing them for work in the classroom. Prerequisites, 302 and a minimum of 2 credits in an approved art course.

## 377 Music in the Elementary School (3)

EICHENBERGER, HEFFERNAN

Teaching music in the elementary school, with emphasis upon organization of materials and experiences in singing, listening, reading, and creating. Prerequisites, 302 and Music 104.

## 378 Physical Education in the Elementary School (3)

HORNE, PEEK

Special methods and procedures for planning and conducting the physical education program in the elementary schools (grades 1-6). Consideration of the physical activities which are appropriate for children and which contribute to their motor efficiency and physical fitness. Prerequisite, 302.

**379 Mathematics in the Elementary School (3)**

VOPNI

An examination of the learning and teaching of elementary mathematics (grades 1-6), in light of recent theoretical and pedagogical developments. Prerequisites, 309, and Mathematics 170.

**380 Industrial Education: Tools and Materials (2)**

BAILY

Sources, specifications, and costs of shop materials and equipment. Care, repair, and sharpening of hand and machine tools. (Offered alternate years; offered 1967-68.)

**381W Trade and Industrial Education Workshop (3)**

BAILY

A survey is made of the various types of instructional aids relevant to trade and industrial education. The course will include the construction and use of films, slides, models, mock-ups, charts, blackboard drawings, and other devices. Students will be expected to develop knowledge and skill in the methods of using instructional aids, the operation of audio-visual equipment, and method of evaluating instructional aids.

**383-384 Industrial Education: Woodworking Technology (3-2)**

BAILY

Design, construction, and finishing of projects in wood, involving machine operations. Prerequisites, 280 for 383; 383- for 384.

**386 Industrial Education: Home Planning (4)**

BAILY

Consumer knowledge and information in the problems involved in purchasing, planning, financing, and building a home are emphasized. Students draw plans and write specifications for a complete set of house plans. Prerequisites, 180, 181, or equivalent. (Offered alternate years; not offered 1967-68.)

**387 Special Problems in Industrial Education (1-5, max. 5)**

BAILY

The student works on an individual basis, conferring with the staff as needs arise, on one or more problems of special interest to him in industrial education. An outline and an organized plan of procedure are to be presented to the staff.

**388 Selection and Organization of Industrial Education Subject Matter (3)**

BAILY

Problems, techniques, and procedures in the selection and organization of teaching content for industrial education; preparation of instructional units and evaluative devices for industrial education teachers.

**389 Industrial Education for Elementary Teachers (5)**

BAILY

Planning and preparing a representative unit in some area of the elementary school pro-

gram, with particular emphasis upon those parts which involve construction activity. Development of basic skills in the use of common hand tools. Related information about industrial technology and its place in our society is included.

**391 Interpretation of Educational Data (2)**

An introduction to methods of describing and analyzing educational data. Course content includes basic descriptive statistics and an introduction to inferential statistics.

**401 Advanced Educational Psychology (3)**

CLARK, FEA, SAX

Consideration of the major topics in the psychology of learning as applied to the teacher-learner environment. Prerequisite, 309 or equivalent.

**402 Human Development and Education (3)**

EVANS

An advanced course in the psychology of human growth and development with a focal concern for the educational implications of developmental psychology. Prerequisite, at least one of the following or equivalent, 302, 305, 309.

**403 Education of the Emotionally Disturbed (3)**

HARING

Classroom instruction and measurement of emotionally disturbed children; modification of classroom behavior. Prerequisites, 401, 404.

**404 Exceptional Children (3)**

HAYDEN, HUNT

Atypical children studied from the point of view of the classroom teacher. Prerequisite, 309.

**405 Educating the Mentally Retarded (3)**

HUNT

A basic course for students preparing to teach the educable mentally retarded; organization of programs, curriculum planning, and instructional procedures and materials. Prerequisites, permission of instructor and 404, or equivalent.

**406 Teaching Reading to the Slow Learner (3)**

Curriculum adjustment and procedures for developing reading skills for the pupil of below-average ability. Prerequisites, permission of instructor and 374E, 477, or equivalent.

**407 Teaching the Gifted Child (3)**

FREEHILL

The role of the teacher and the school in the identification and development of the special abilities and talents of gifted children. Prerequisite, teaching experience.

**408 Mental Hygiene for Teachers and Administrators (3)**

SALYER

Principles of mental health; normal personality development and functioning; relation of school environment to mental health of stu-

dents, teachers, and administrators. Background in educational psychology is recommended, but is not a prerequisite.

**409 Mental Retardation (3)**

HUNT

An introductory course on the subject of mental retardation and the problems it presents to parents, the mentally retarded, the community, the schools, and society. Prerequisites, permission of instructor and 404, or equivalent.

**X409AJ Training of the Mentally Retarded (5)**

Practical problems on the care and training of mentally retarded children including those with multiple handicaps. Organization of classes for these children, regulations for state aid, and records needed will be studied. Prerequisites, 309 and Psychology 100 or equivalent, and permission of Chairman, Special Education. (Extension credit only.)

**X409BJ Psychology of the Mentally Retarded (5)**

The study of characteristics and development of mentally retarded children including multiple disabilities, with the aim of developing understanding of the place these children occupy in their homes, schools, and community, and the challenges they present in each sphere of living. Prerequisites, 309 and Psychology 100 or equivalent, and permission of Chairman, Special Education. (Extension credit only.)

**409FJ The Teaching of Speech to the Deaf (6)**

Study of principles and techniques used in developing the formation of English sound by the analytical method; introduction of speech by the whole word method; major emphasis on development of speech in the preschool and school age deaf child. Prerequisite, permission of Chairman, Special Education.

**409GJ The Teaching of Language to the Deaf (6)**

Study of principles and techniques of teaching language to the preschool and school deaf. Leading systems of teaching language to the deaf will be reviewed and a step-by-step development of at least one language system will be covered. Prerequisite, permission of Chairman, Special Education.

**409H Elementary School Methods for the Deaf (6)**

This course covers the principles and methods of teaching the following subjects to deaf children at the primary and intermediate levels: (1) reading, (2) arithmetic, (3) social studies, (4) science. Will also cover use of visual aids in classes for the deaf.

**409I History, Education, and Guidance of the Deaf (3)**

Consideration of problems of deaf from social, economic, and educational point of view; history of deaf education.

# EDUCATION

## 410 Educational Sociology (3)

GROSS

An examination of roles, small and large groups, as they affect the school as a social system. Current sociological theory is modified or extended to explain school events and interrelationships. Field experience included.

## 411 Learning Disabilities (3)

HARING

An analysis of learning and behavior; program development and classroom management of children with learning disabilities. Prerequisite, 404.

## 412 Foundations of Freedom and Education (3)

MORRIS

Emphasis on the principles, processes, and content of constitutional law in an effort to provide new insights and new tools with which school administrators and teachers may examine questions involving political and civil rights in the United States, especially as these affect the conduct of education.

## 415 Principles of Safety Education (3)

BAILY

Designed primarily for teachers and administrators interested in developing a school safety program in elementary, junior, and senior high schools. Special emphasis is placed on the need for a safe school environment and the role of the teacher in promoting safety.

## X415A Principles of Safety Education: Driver Education, Introductory (3)

BAILY

An introductory course to develop and improve knowledges, attitudes, and skills related to the teaching of the driving tasks in the secondary school. (Extension credit only.)

## X415B Principles of Safety Education: Driver Education, Advanced (3)

BAILY

To build and develop new and broader competencies in traffic safety, including research, engineering, school transportation, traffic law and enforcement, current teaching methods, scheduling and administration. Prerequisites, 415A, permission. (Extension credit only.)

## 417 Adult Education (3)

A survey and analysis of the aims and objectives of professional adult education in America.

## 420 Theory and Practice of Kindergarten and Primary Teaching (3)

MAC DONALD

A systematic treatment of the content, teaching processes, and learning resources appropriate to kindergarten and primary education with particular emphasis on current research and developments. Prerequisite, teaching experience.

## 421 Remedial Education (3)

THALBERG

Experience in and study of analysis of difficulties in school subjects with special refer-

ence to language arts and mathematics. Experience in and study of appropriate remedial instruction. Analysis and instruction will be that which is both feasible and practical for the teacher working with individuals or with a group.

## 422 Reading Disability Clinic (3-5)

THALBERG

Supervised practicum in diagnosing and teaching children with reading disabilities. Prerequisites, 425A or 425B, and permission of instructor.

## 425A Reading Disability: Etiology and Diagnosis (5)

THALBERG

Theory and basic concepts underlying appraisal techniques and causality. Lectures and clinical practicum in administering, scoring, and evaluating each technique, and in interpreting and communicating results. Prerequisites, 374E or equivalent, permission of instructor.

## 425B Reading Disability: Remedial Techniques (3)

THALBERG

Discussion and evaluation of methods for minimizing reading retardation. Descriptions of in-class and clinical procedures supplemented by classroom observations. Prerequisites, 374E or equivalent, permission of instructor.

## 430 Public School Administration (3)

An introduction to theories and practices of administering public schools, designed for persons who are not majoring in educational administration. Structure of school organizations, supervision of personnel, planning problems encountered at various levels, school buildings, finance.

## 439 Pupil Personnel and Progress Reporting (3)

To aid teachers, counselors, and administrators in developing purposeful reports of student progress and in utilizing practical techniques of pupil personnel accounting for assistance in evaluation and interpretation of educational objectives and achievements in teacher-pupil-parent and school-community relationships.

## 444 Supervision of Trade and Industrial Education (3)

BAILY

Principles, problems, techniques, and methods of supervision; planning and organizing a supervisory program, equipment and instructional materials; relationship of supervisors to administrators and teachers; evaluation of programs. Prerequisite, permission of the instructor.

## 445 Principles and Objectives of Vocational Education (3)

BAILY

Survey of vocational education, aims, objectives, and types of programs. Relationship to general and practical arts education.

## 446 Organization and Administration of Vocational Education Programs (3)

BAILY

Administrative problems involved in organizing and operating vocational schools and classes. This class is designed for superintendents, principals, vocational directors, supervisors, or other persons with direct responsibility for the administration or supervision of vocational programs.

## 447 Principles of Guidance (3)

FORSTER, STOTT

A study of guidance programs in elementary and secondary schools. Attention will be given to the roles of guidance specialists with emphasis upon the role of the classroom teacher in school guidance programs. This course is designed for teachers, administrators, and prospective teachers. Prospective guidance specialists should see 543E, 543H, and 543S.

## 448J Introduction to Vocational Rehabilitation (2)

Oriented toward the role of a rehabilitation counselor as a professional worker. The history, background, scope, and trends of vocational rehabilitation services will be studied. Field trips will be utilized extensively to acquaint the student with resources serving the disabled in the immediate community. Offered jointly with the Department of Physical Medicine and Rehabilitation in the School of Medicine.

## 449 Workshop on Student Personnel Services (3)

Special studies for counselors, teachers, administrators, and others concerned with student personnel services in schools. The course focuses on special topics which have either local or contemporary significance. (Not offered every year; check current *Time Schedule*.)

## 450 Introduction to the Study of Higher Education (3)

MADSEN

An examination of the American college and university with special reference to the character of the contemporary collegiate culture, the academic profession, and certain aspects of student personnel problems.

## 455 Introduction to Learning Resources in Teaching (3)

TORKELSON

A study of the factors influencing the utilization of audio-visual resources for the enhancement of learning procedures and the improvement of instruction.

## 456 Practicum in Learning Resources (3)

TORKELSON

Preparation and presentation of visual and auditory materials appropriate to learner levels and subject-matter areas. Students provide own materials for projects. Prerequisite, 455 or equivalent.



**457 Still Photography in Education (3)**

TORKELSON

Theory and practice in producing still photographs and slides for teaching purposes; working with common cameras; film materials and darkroom techniques. Producing photographic materials to meet specific learning problems. Prerequisite, 455 or permission.

**458A Educational Motion Pictures (3)**

Theory and practice in preparing script and shooting educational motion pictures, both 8 and 16 mm. Prerequisite, 455 or permission.

**458B Educational Motion Pictures (3)**

Theory and practice in editing and in sound for educational motion pictures, both 8 and 16 mm. Prerequisite, 455 or permission.

**459J Television in the Schools (3)**

Television programs to supplement classroom work; the development of the American system of broadcasting; the development and significance of educational television and the contribution schools can make to broadcasting. Offered jointly with the School of Communications.

**460J Field Training in Health Education (5)**

MILLS, REEVES

Four and one-half weeks of full-time supervised work experience in the health education division of a local official health agency. Offered jointly with the Department of Preventive Medicine. Prerequisite, permission.

**461 Elementary School Curriculum (3)**

HUNKINS, JAROLIMEK, KITTELL

Description and analysis of current curriculum practices with particular emphasis upon the interrelationships and dimensions of content, organization, methods, evaluation, trends, and issues. Prerequisite, teaching experience.

**462 Junior High School (3)**

An historical, philosophical, and functional analysis of junior high school education with particular emphasis upon curriculum and teaching procedures.

**463J Television Production Workshop for Teachers (2½)**

RYAN

Working in University studios under laboratory conditions involving production and on-camera methods, teachers learn to present instructional subject matter through television. For those especially who expect to work with television as instructors or as supervisors of school-oriented television activities. Offered jointly with the School of Communications.

**465 Secondary School Curriculum (3)**

ANDERSON

A systematic description and analysis of current curriculum practices with particular emphasis upon the factors and forces affecting secondary school curriculum.

**466 Workshop in Curriculum Development (1-15, max. 15)**

HUNKINS

Individual or group work on curriculum development projects in elementary and secondary schools. Prerequisite, 467.

**467 Principles and Procedures of Curriculum Development (3)**

Intensive study of the basic principles and procedures utilized in the development of curriculums. Prerequisite, teaching experience.

**471E, X, S Practicum in Teaching: Elementary; Junior High; Senior High (4-16, 4-16, 4-16)**

BOROUGH, FOSTER

This series of courses (471E, X, and S) provides professional experience in the public schools beyond initial certification requirements for those desiring specialized training. Assignments are approved by the Director of Student Teaching the first day of the quarter. Prerequisites, teaching experience and permission of Director of Student Teaching.

**474 Workshop in Instructional Improvement (2-6, max. 6)**

Individual or group study projects on the improvement of instruction.

**474G The Teaching of Foreign Language: German (3)**

RABURA

Designed to improve the teaching of German through study of the latest teaching methods and materials and their use in the classroom and laboratory; observation and discussion of demonstration classes.

**475 Improvement of Teaching (3)**

To help teachers (1) understand the physical, psychological, emotional, and social needs of children, (2) adapt instruction to the needs of children, (3) select the approaches and instructional resources which will provide the soundest learning experiences, and (4) in the appraisal of themselves and their work. (Offered only by special arrangement with school districts.)

**475A Improvement of Teaching: Secondary School Mathematics (5)**

An exploration of some modern mathematical concepts for the purpose of improving the teaching of secondary school mathematics. Prerequisite, teaching experience.

**475B Improvement of Teaching: Elementary School Mathematics (3)**

VOPNI

Designed for elementary teachers grades (1-6). Emphasis is placed on the contributions of research to the improvement of the teaching of mathematics in the elementary school. Prerequisite, teaching experience.

**475DJ, 475EJ The Teaching of Foreign Literature (3, max. 6; 3, max. 6)**

KELLER

The methodology of teaching a foreign literature, with demonstrations by the instructor and practice by students; preparation of lectures; study of discussion techniques. Offered jointly with the Department of Romance Languages and Literature. Prerequisites, senior standing and permission.

**475FJ Improvement of Teaching: Home Economics (3, max. 6)**

MC ADAMS, GRANBERG

Identification of goals, concepts, and generalizations in home economics units at the secondary level with emphasis on teaching techniques, evaluation, and use of resources. Offered jointly with the School of Home Economics. Prerequisite, teaching experience in home economics or permission.

**475GJ Geography in the Social Studies Curriculum (5)**

BACON

A discussion of the concepts and content of geography essential to effective social studies curricula. Offered jointly with the Department of Geography.

**475H The Language Arts: Instructional Problems and Practices in the Elementary School (3)**

KITTELL, SEBESTA

A study of important and recent research in elementary school language arts and a consideration of its practical implications for teaching. Prerequisite, teaching experience.

**475I Improvement of Teaching: Industrial Education (3)**

BAILY

An analysis of the types of teaching instructional materials, and evaluation devices used in industrial education, with emphasis upon the improvement of existing methods and techniques.

**475J Journalism Teaching in the Secondary School (2½)**

SAMUELSON

Advanced course in teaching high school journalism. For experienced publications advisers. No credit if Education or Journalism 375J has been taken. Offered jointly with the School of Communications.

**475K Improvement of Teaching: Elementary School Music (3)**

Advanced studies in the teaching of music in the elementary school.

**475LJ Improvement of Teaching: Latin (3)**

Examination and evaluation of the various methods of teaching Latin; audio-visual aids, testing materials, textbooks; relation of Latin to other languages; Latin derivatives in English vocabulary. Offered jointly with the Department of Classics.

# EDUCATION

## 475M Social Studies Education: Elementary School Programs and Practices (3)

JAROLIMEK

Stresses curriculum patterns, instructional procedures, resource materials, and the selection of content in social studies. For elementary and junior high school teachers. Prerequisite, teaching experience.

## 475P Improvement of Teaching: Junior High School Mathematics (5)

An exploration of some modern mathematical concepts for the purpose of improving the teaching of junior high school mathematics. Prerequisite, Mathematics 101 or equivalent.

## 475S Improvement of Teaching: Elementary School Science (3)

OLSTAD

Designed for classroom teachers with reference to the teaching and learning of science from kindergarten through grade six. Emphasis is placed on objectives, methods, and materials as related to the concepts and processes of science. Prerequisite, teaching experience.

## 475T Improvement of Teaching: Secondary School Science (3)

OLSTAD

Survey of the status and potential role of science in education; trends and their implications for the teaching of both biological and physical sciences in the junior and senior high schools; representative curricula and related teaching procedures; the psychology of concept formation and problem-solving; and organization of science programs. Prerequisite, teaching experience.

## 475XJ Caesar for High School Teachers (3)

READ

Interpretation of Caesar's works in the light of their historical, political, literary, and geographical background, with special reference to the problems of high school teaching. Offered jointly with the Department of Classics.

## 475Y Social Studies Education: Secondary School Programs and Practices (3)

Stresses curriculum patterns, instructional procedures, resource materials, and a selection of content in social studies for junior and senior high school teachers. Prerequisite, teaching experience.

## 476D Materials and Methods of Teaching Typewriting (3)

BRIGGS

Procedures and materials for developing skills in beginning and advanced typewriting. Demonstration and participation in drill techniques; testing and grading; evaluation of recent research findings in the development of speed and accuracy; classroom organization.

## 476E Materials and Methods of Teaching Office and Clerical Practice (3)

BRIGGS

Objectives and content of office practice and general clerical practice courses; plans for organizing classes and methods of teaching specific machines and subject matter; laboratory study of new inventions in office machines.

## 476G Selection and Organization of Distributive Education Subject Matter (3)

Problems, techniques, and procedures in the selection and organization of teaching content for distributive education. Prerequisite, permission.

## 476I Principles and Problems in Distributive Education (3)

Concerned with improvement of instruction, maintenance of high standards in work stations, and special techniques used by experienced coordinators in the solution of common problems.

## 476K Coordination of Distributive Education and Diversified Occupational Programs (2-3, max. 3)

Stresses fundamentals, records and reports, the use of advisory committees, course titles, qualifications, coordinating activities, course content, and work training stations.

## 476L Materials and Methods of Teaching Gregg Shorthand and Transcription (3)

BRIGGS

Recent research and experimentation in teaching shorthand and transcription are emphasized. Psychology of skill development; comparison of the various methods of teaching shorthand; evaluation of teaching materials; consideration of standards, objectives, and teaching techniques. An advanced course for experienced teachers.

## 476M Principles and Problems of Business Education (3)

BRIGGS

Objectives, history, trends, and issues of business education; federal participation in vocational education; economic, occupational, and population trends and their implications in business education; leaders in business education; research and problems.

## 476N Materials and Methods of Teaching Bookkeeping and General Business Subjects (3)

BRIGGS

Techniques of teaching bookkeeping and general business subjects; relationship to the curriculum; standards to be achieved; content and organization of the subject matter; tests and teaching materials; new trends in the field; motivational devices; visual aids.

## 477 The Teaching of Reading (3)

FEA, SEBESTA

The teaching of reading in the elementary and intermediate grades of the elementary school, including comprehension and speed, reading in the content fields, and motivation of voluntary reading. Students will work intensively in one area of special interest. Prerequisite, teaching experience.

## 478J Programs in Elementary Physical Education (Men and Women) (2½)

HORNE

Progress and problems in modern programs. Offered jointly with the Department of Physical and Health Education for Women.

## 479 Crucial Issues In Education (3)

GROSS

A course designed to consider in some detail certain of the most significant and critical problems of educational policy.

## 480 History of Educational Thought (3)

BURGESS

Survey of educational theory and practice in Western culture.

## 481 Workshop in Industrial Education (3-10, max. 10)

BAILY

Individual or committee work on problems in the field of instructional materials of industrial education. Application of new materials and techniques to existing materials.

## 482 Planning the Industrial Educational Facilities (3)

BAILY

A study of the fundamental concepts and principles in planning industrial education areas to produce safe, efficient, and effective teaching-learning situations. An analysis of the problems encountered in the selecting, purchasing, locating, and installing of equipment, tools, materials, and services.

## 483 Organization and Administration of Industrial Education (3)

BAILY

Types of programs of vocational-industrial education and industrial arts; organization and administration of these programs, the relationships between them, and their place in public school programs.

## 484 Field Experience in Industrial Practices (2-10, max. 10)

BAILY

Study of the problems of industry such as employment practices, job requirements, materials handling and processing, plant organization and management that would assist industrial arts teachers interpret industrial practices. Prerequisites, teaching experience in industrial education and permission of instructor.

## 485 Industrial Education: Advanced General Shop (3)

BAILY

An advanced general shop course in industrial education involving a study of the tools, materials, processes, and products of industry. Prerequisite, 182 or equivalent.

## 486 History of Industrial Education (3)

BAILY

A study of the leaders, agencies, movements, experiments, and publications that have contributed to the development of industrial education, with special attention to the economic, social, and philosophical factors which have motivated and influenced this development in America.

**487 Instructional Analysis for Industrial Education Teachers (3)**

BAILY

A study of the techniques and procedures used in analyzing instructional areas into their basic elements, and an arrangement of the elements into a teaching plan and sequence for industrial arts and vocational industrial education course.

**488 Philosophy of Education (3)**

TOSTBERG

Consideration of the major philosophic questions that underlie educational theory.

**489 Current Problems in Vocational and Industrial Arts Education (3)**

BAILY

A study of the current events and problems in industrial education and their application in the field.

**490 Basic Educational Statistics (5)**

KLINE, LANGEN

Frequency distributions, measures of central tendency and variability, linear correlation, probability, binomial and random sampling, normal distributions, Chi square, significance of means and correlations, zero order regression and prediction.

**492 History of European Education Through the Reformation (3)**

BURGESS

Development of European education in cultural context: Greece, Rome, Middle Ages, Renaissance, and Reformation.

**493 History of European Education Since the Reformation (3)**

BURGESS

Development of European education in cultural context: Pedagogical reformers, national systems, and recent trends.

**494 History of American Education to 1865 (3)**

BURGESS

Development of American education in cultural context: colonial period, influence of Enlightenment, and common school movement.

**495 History of American Education Since 1865 (3)**

BURGESS

Development of American education in cultural context: progressive education, recent criticism, continuing issues and trends.

**496 Comparative Education (3)**

The school systems of England, Germany, France, Italy, and the Soviet Union; an interpretation in terms of the political philosophy of each country. World trends in education. (Formerly 484.)

**497J Special Topics in Mathematics for Teachers (2-5, max. 15)**

Algebra and geometry for junior high school teachers of mathematics. Offered jointly with the Department of Mathematics.

**498 Educational History and Utopian Thought (3)**

BURGESS

Selected studies of education as a key to the good society.

**499 Undergraduate Research (2-5)**

For undergraduates. Registration must be accompanied by a study prospectus on a special form provided by the Office of the Dean endorsed by the faculty adviser, most appropriate for the project proposed, and the Dean of the College. Students developing studies under this rubric should be advised that a report or paper setting forth the results of their investigations should be regarded as a basic part of the program.

**Courses for Graduates Only****500 Field Study (3 or 6, max. 6)**

Individual study of an educational problem in the field, under the direction of a faculty member. Prerequisites, approved plan of study and permission of instructor.

**501A Seminar in Educational Psychology: Concepts and Problem Solving (3)**

FEA

The psychology of children's thinking. Course will emphasize study of research results in concept development and problem solving with application to classroom learning situations. Prerequisite, 401 or equivalent.

**501B Seminar in Educational Psychology: Critical and Creative Thinking (3)**

FEA

The psychology of children's thinking. Course will emphasize study of research results in critical thinking and creative thinking with application to classroom learning situations. Prerequisite, 401 or equivalent.

**502A Educational Issues in Human Learning (3)**

FREEHILL

A study of contemporary problems in learning with emphasis on historical antecedents to modern views, methodological problems in the solution of the issues, relevant studies and phenomenological observation, implications and application of conclusions. Prerequisite, at least 20 quarter credits of previous work in educational psychology and/or psychology.

**502B Instructional Theory (3)**

An examination of the contribution of psychology to teaching and an evaluation of selected elements in instructional strategies. Prerequisite, 502A. (Not offered every year; check current *Time Schedule*.)

**503 Dissertation Seminar in Educational Psychology (3)**

Seminar in advanced educational psychology. A critical appraisal of current research. Each student is expected to be developing a thesis. Prerequisite, advanced degree candidate in educational psychology.

**504A Psychology of Reading (3) W**

FEA

Reading and perception, word recognition, concept development and meaning in reading: psychology of reading interests and skills.

**504B Verbal Instruction (3)**

FEA

A study of the psychological implications of verbal behavior as applied to classroom instruction and learning. Prerequisite, 504A. (Not offered every year; check current *Time Schedule*.)

**506 Internship in Special Education (2-10, max. 10) AWSp**

HAYDEN, HUNT

Supervised experiences in special education for advanced students. Ordinarily reserved for post-master's students. Prerequisite, permission of Chairman, Special Education.

**507 Reading Disability, Clinical Supervision (3, max. 6)**

THALBERG

Practicum in supervising diagnostic activities and remedial reading therapy. Prerequisites, 422, 425A, 425B, and permission of instructor.

**509 Seminar in Mental Retardation (3)**

HUNT

An interdisciplinary approach to the advanced study of selected research topics in mental retardation. Designed for teachers, psychologists, social workers, and related professional personnel. Prerequisites, 409 or equivalent and permission of instructor.

**510 Seminar in Educational Sociology (3)**

GROSS

Application of sociological principles to school problems; individual problems and investigations. For teachers, administrators, and those using educational sociology as a field for advanced degrees.

**519 Management of Learning Resources Programs (3)**

A study of factors relating to the effective management of educational programs involving production, storage, distribution, and use of visual and auditory materials and equipment. Prerequisites, 455, 456, or permission. (Formerly 457.)

**520 Seminar in Learning Resources (3)**

TORKELOSON

Advanced analysis of learning resources (aural-visual materials and technology, verbal and nonverbal symbols), related characteristics, research, and other factors affecting instruction. Prerequisite, 455 or permission of instructor.

**525 Seminar in Elementary Education (3)**

KITTELL

An exploration into the philosophy, history, purposes, curriculum, methods, school organization and evaluation in elementary education, with emphasis upon individual research. Prerequisites, elementary school teaching experience, 401 and 461.

# EDUCATION

## 526 Seminar in School Supervision (3)

ANDERSON

Theory of the process of supervising school personnel, including an analysis of the techniques of supervision, theory of leadership and group process, interpersonal relations, and evaluation of teacher effectiveness. Prerequisite, master's degree in Educational Administration or equivalent.

## 527, 528, 529 Educational Administration and Supervision (3,3,3)

ANDERSON, PURRINGTON, STRAYER

Theories, issues, and practices of administering public schools. Includes legal, extra-legal, political, and organizational framework; management and financial practices; instructional, social, and supervisory problems. Prerequisites, graduate standing and one year of teaching experience.

## 530 Seminar in Educational Decision Making (3)

BOLTON

Analysis of nature of decisions in educational setting. Consideration of theory of decisions, social and psychological constraints, and application in simulated situations. Prerequisite, master's degree in Educational Administration or equivalent.

## 531 Seminar in Administration: Finance (3)

STRAYER

Current problems in school finance, including costs, ability to support schools, and financial implications of educational principles. The economics of public education. Problems of state and local school support. Financing capital outlay, research, and public relations. Prerequisite, master's degree in Educational Administration or equivalent.

## 532 Seminar in Human Relations in Education Administration (3)

ANDERSON, BOLTON

Analysis of factors involved in human relations problems related to operation of public schools. Motivation, perception, communication, role analysis, and dynamics of groups will be studied through use of cases and simulated situations. Prerequisite, master's degree in Educational Administration or equivalent.

## 533 Seminar in Administration: School Buildings (3)

SCHNEIDER

Planning procedures; school building surveys; preparation of educational specifications; relationships with architects; types of school buildings and special areas; special problems related to heating, ventilation, acoustics, illumination, and use of site; maintenance and modernization; financing the school plant program. Prerequisite, master's degree in Educational Administration or equivalent.

## 534 Seminar in Educational Planning and Organization (3)

STRAYER

Application of principles utilized in planning and organizing public schools. Formation of

policy and procedures; formal and informal organization; power, authority, and responsibility; utilization of people, time, and space. Prerequisite, master's degree in Educational Administration or equivalent.

## 535 Research Seminar: Educational Administration and Supervision (3, max. 6)

BOLTON, STRAYER

Critical analysis of current research results and methods will be used as background to evaluate student's independent research in seminar discussion. May be repeated by permission. Prerequisites, 9 quarter credits in Educational Administration and research topic approved by instructor.

## 536 Internship in Educational Administration (1-6, max. 6)

ANDERSON, PURRINGTON, STRAYER

Recommended for all candidates preparing for administrative positions except those having sufficient experience as administrators. Half-time work in a school district or districts in close proximity to the University of Washington for one, two, or three quarters, depending upon the student's previous experience. Supervision by staff members of the College of Education and the superintendent of schools or school principal in the selected school district. Prerequisite, completion of all other requirements for administrator's credential.

## 537 Special Problems in Educational Administration and Supervision (3, max. 9)

ANDERSON

Readings, lectures, and discussions of topics of special and current interest to school administrators or supervisors. Reports on new developments in research. Topics will vary each year. Prerequisites, master's degree and permission.

## 538 Public Relations for Public Schools (3)

PURRINGTON

Relationship between the public schools and the public, the school board, administrators, and advisory groups. Pupil, parent, and community attitudes; proven techniques and media; special problems, such as school finance and building programs. Prerequisite, master's degree in Educational Administration or equivalent.

## 539 The Law and Education (2½)

A course designed for educators and administrators to alert them to some of the commonly encountered areas which involve legal problems. Prerequisite, master's degree in Educational Administration or equivalent.

## 540 Individual Testing (5)

BROWN

A study of intelligence testing with supervised experience. The emphasis is on the Stanford Binet and the Wechsler Intelligence Scale for Children. Prerequisites, 308 and permission of instructor.

## 541 Student Appraisal (5)

STOTT

Emphasis on the utilization of objective measures for purposes of guidance. Prerequisite, 490 or equivalent.

## 542 Information Services (3)

SALYER

Emphasis on educational and vocational guidance. Prerequisite, 447.

## 543E Student Personnel Services in the Elementary School (3)

A study of philosophy and practice appropriate to elementary school service. (Not offered every year; check current *Time Schedule*.)

## 543H Student Personnel Services in Higher Education (3)

BRAMMER

A survey and critical study of the philosophy and practice of student personnel work in American colleges and universities.

## 543S Student Personnel Services in the Secondary School (3)

A study of philosophy and practice appropriate to secondary school service. (Not offered every year; check current *Time Schedule*.)

## 544 Counseling (3)

BRAMMER, FORSTER

Emphasis on the theory and practice of student counseling. Prerequisite, 447 or equivalent.

## 545A Practicum in Counseling (3-6, max. 6)

BRAMMER

Supervised practice in counseling school and college students. Prerequisites, 541, 544, and permission of instructor.

## 545B Practicum in Counseling and Casework (3)

FREEHILL

Supervised practice in counseling, primarily with children and parents. Specifically designed for elementary counselors and school psychologists. Prerequisites, 544 and permission of instructor.

## 546 Internship in Student Personnel Services (2-8, max. 8)

BROWN, STOTT

Supervised practice in student personnel activities for advanced students. Prerequisite, permission of instructor.

## 547 Organization and Administration of Student Personnel Programs (3)

Basic considerations in planning, organizing, and operating school student personnel programs; analysis of issues and problems encountered in formulating policy and evaluating services. Prerequisite, minimum of 9 credits in guidance courses. (Not offered every year; check current *Time Schedule*.)

**548 Educational Implications of Personality Theory (5)**

FREEHILL

A study of personality development and personality theories with continuous attention to the meaning of these in educational practice, testing, and counseling. Prerequisites, 15 credits of psychology and educational psychology.

**549 Seminar in Student Personnel Work (3)**  
BROWN

Individual problems in the areas of organization, supervision, and administration of student personnel programs at school and college levels. Prerequisite, master's degree or equivalent.

**550 Development and Organization of Higher Education (3)**

MADSEN

Higher education from the standpoint of the new instructor; history of administrative organization.

**551 College Problems (3)**

MADSEN

Current problems in the philosophy and organization of American higher education, with special emphasis upon the curriculum and student personnel services. Prerequisites, doctoral candidacy, 550, and 558.

**552 Improvement of College Teaching (3)**

An analysis of the type of teaching applicable to the college level, with special reference to lectures, assignments, use of textbooks, student reports, quiz techniques, panel discussions, the use of visual aids, syllabi, and bibliographies. (Not offered every year; check current *Time Schedule*.)

**553 Seminar in the Administration of Junior Colleges (3)**

GILES

For students preparing for administrative positions in junior colleges. Principles and practices in organization and administration of junior colleges. Prerequisite, 555.

**555 The Junior College (3)**

GILES

A study of the history, development, role, objective, and organization of the junior college and of the problems and issues confronting the two-year college.

**556 Internship in Higher Education (3-10)**

GILES, MADSEN

Field study and experience in college teaching and administration, planned by the College of Education in cooperation with selected colleges. Prerequisite, permission of instructor.

**558 History of American Higher Education (3)**

MADSEN

An examination of the historical development of the American higher educational enterprise.

**559 Seminar in Higher Education (3, max. 6)**  
GILES, MADSEN

Intensive study of selected problems and proposals for research in higher education. Prerequisites, doctoral candidacy in higher education, and permission of instructors.

**560 Seminar in Curriculum: Curriculum Theory (3)**

HUNKINS

A study of problems relating to curriculum design, organizing principles, and curriculum decision making. Prerequisite, 467.

**561 Seminar in Curriculum: Current Research and Development (3)**

HUNKINS

Study, analysis, and evaluation of curriculum changes, including both experimental and developmental projects. Prerequisite, 467.

**562 Internship in Curriculum (3-9, max. 9)**  
HUNKINS

Recommended for all doctoral candidates preparing for positions as curriculum directors in public school systems. Half-time work in a school district or districts in close proximity to the University of Washington for one, two, or three quarters, depending upon the student's previous experience. Supervision by staff members of the College of Education and the Assistant Superintendent in Charge of Curriculum in the selected school district. Prerequisite, 467.

**565 Personality Appraisal (5)**

FREEHILL

Study of personality evaluation with a supervised laboratory emphasizing work with children and their families. Prerequisites, 540, 548, and permission of instructor.

**566 Case Study Seminar (1, max. 2)**

BROWN, FREEHILL, STOTT

Study and experience in the case method integrating the work of specialties with emphasis on school and child problems. Prerequisite, permission of instructor.

**568 Seminar in Secondary Education (3)**

Research and study in secondary education. Prerequisite, 462 or 465.

**569 Seminar in Business Education (3)**

BRIGGS

Analysis of selected problems in Business Education; current research in Business Education; evaluation of work experience programs; developments in vocational Business Education. Prerequisites, 476D, 476N.

**570 Seminar in Theories of Instruction (3)**  
HUNKINS

An exploration of the literature concerning classical and current theories of instruction. Particular emphasis is given to the construction of theoretical models for instruction in selected teaching fields. Prerequisites, teaching experience and 401.

**571 Seminar in Strategies of Instruction (3)**  
HUNKINS

An exploration of the various media and types of organization relevant to the implementation of strategies based on theoretical models constructed in 570. Prerequisite, 570.

**572J, 573J Romance Language Teachers' Seminar (3,3)**

SIMPSON

The teaching of foreign languages. Conducted as a workshop. Offered jointly with the Department of Romance Languages and Literature.

**575E,S Seminar in Reading and Language Arts: Elementary Emphasis; Secondary Emphasis (3 each emphasis)**

FEA, KITTELL, SEBESTA

Study of recent research in listening, oral language, reading, and written language, emphasizing psychological and interrelated aspects. Sections offer elementary and secondary emphasis alternately. Prerequisite, permission of instructor.

**576E,S Seminar in Science Education: Elementary Emphasis; Secondary Emphasis (3 each emphasis)**

OLSTAD

Investigation of curriculum and instruction in science at elementary (or secondary) school levels; with particular emphasis on current literature and research. Prerequisite, 475S, or equivalent.

**577E,S Seminar in Mathematics Education: Elementary Emphasis; Secondary Emphasis (3 each emphasis)**

VOPNI

Investigation of curriculum and instruction in mathematics at elementary (or secondary) school levels; review of research and preparation of proposals. Prerequisite, 475B, or equivalent.

**578E,S Seminar in Social Studies Education: Elementary Emphasis; Secondary Emphasis (3 each emphasis)**

JAROLIMEK

Intensive study of the social studies curriculum with particular emphasis on current literature and research. Prerequisite, 475M or equivalent.

**579 Seminar in Industrial Arts and Vocational Technical Education (3)**

BAILY

Intensive study of current events, problems and research studies in industrial arts education, vocational and technical education. Prerequisite, permission of instructor.

**580 Seminar: Research in History of Education (3, max. 6)**

BURGESS

Study of the literature, bibliography, sources, and critiques of history of education. Research methods analyzed and demonstrated in seminar papers. Prerequisites, graduate standing and permission of instructor.

## EDUCATION

### 582 Seminar in Philosophy of Education: Modes of Inquiry (3, max. 6)

TOSTBERG

Study of the various ways in which philosophers of education have conducted their inquiries and presented their findings. Prerequisite, 488 or equivalent.

### 583 Seminar: Research in Educational Sociology (3)

GROSS

Theory, concept, and method of sociological inquiry as applied to problems in education. Prerequisite, permission of instructor.

### 586 Seminar in Educational Classics (3)

LEE

Analysis in depth and in the context of the relevant history of several major works in educational thought from Plato to Dewey. Registration open only to advanced doctoral candidates with several years of teaching experience. Prerequisite, permission of instructor.

### 587 Seminar in Philosophy of Education (3)

TOSTBERG

Open to all advanced degree candidates.

### 588 Seminar in Philosophy of Education (3)

TOSTBERG

Intended for doctoral candidates. Prerequisite, 587.

### 589 Seminar in Philosophy of Education (3)

TOSTBERG

Intended for advanced degree candidates majoring in history and philosophy of education. Prerequisites, 587, 588, and permission of instructor.

### 590 Advanced Statistics (5)

KLINE

Reliability of statistics, reliability of differences, analysis of variance and covariance, scaling methods, multiple correlation, measure of association, nonparametric methods, and an introduction to factor analysis. Prerequisite, 490 or Psychology 301 or equivalent.

### 591 Methods of Educational Research (3)

CLARK, SAX

An introduction to educational research. Primary focus upon problem and hypothesis development, with secondary emphasis upon use of controls, data analysis and interpretation and writing of research reports. Required of candidates for advanced degrees. Prerequisite, 490.

### 592 Advanced Educational Measurements (3)

LANGEN

Theory of tests and measurement; an examination of assumptions involved in classical test theory, errors of measurement, factors affecting reliability and validity, and problems of weighting. Prerequisites, 308, 490 or Psychology 301, or equivalent.

### 595 Seminar: Dissertation Research in Philosophy of Education (3)

TOSTBERG

Development, presentation, and critique of dissertation. Prerequisite, permission of instructor.

### 600 Research (\*)

Registration must be accompanied by a study prospectus endorsed by the appropriate faculty adviser for the work proposed. A report or paper setting forth the results of the investigation is required. Prerequisites, 591 and permission of Graduate Program Adviser in Education.

### 700 Thesis (\*)

Registration for thesis is provided to facilitate advanced degree research for students working on the master's thesis or doctoral dissertation. Such registration requires the permission of the faculty supervisor and the endorsement of the Graduate Program Adviser. A student may enroll in *Thesis* while the proposal is being developed for a maximum of 6 quarter credits at the master's and 12 quarter credits at the doctoral level. Work may be done *in absentia* by special permission of the Graduate School. Prerequisite, 591 or equivalent.

### 702 Degree Final (6)

Limited to students completing a nonthesis degree program.

## ELECTRICAL ENGINEERING

### Courses for Undergraduates

#### 231 Introductory Linear Systems I (5) AWSp

Basic concepts of linear systems. Formulation of system equations. Network topology. Loop and node analysis. Classical solution of ordinary linear differential equations with constant coefficients. Response of first- and second-order systems. Analogy and duality. Complex algebra, phasor transform, and complex impedance. Prerequisites, General Engineering 111, Mathematics 125; corequisites Mathematics 126, General Engineering 115, and Physics 122.

#### 233 Introductory Linear Systems II (4) AWSp

Active, reactive, and complex power. Series and parallel resonance. Equivalent networks and network theorems; superposition, reciprocity, substitution, Thevenin's, Norton's and maximum power transfer theorems. Solution of network equations. Driving point and transfer admittance and impedance. Introduction of network equations. Driving point and transformers. Three-phase power systems. To be taken concurrently with 234. Prerequisite, 231.

#### 234 Electrical Engineering Laboratory I (1) AWSp

One three-hour laboratory each week, covering fundamental electrical measurements. To be taken concurrently with 233. Prerequisite, 231.

#### 235 Introductory Linear Systems III (4) AWSp

Fourier Analysis of system response. Fourier Series and Fourier integral transform. Introduction to Laplace transform method. Initial value theorem, final value theorem, and other properties of Laplace transform. Partial fraction technique and inverse Laplace transform. Two-port characterization. Network functions and pole-zero plots. S-plane and frequency response plots. To be taken concurrently with 236. Prerequisite, 233.

#### 236 Electrical Engineering Laboratory II (1) AWSp

One three-hour laboratory each week covering measurements of electromechanical systems; the response of instruments to various wave forms and different frequencies; statistical error analysis. To be taken concurrently with 235. Prerequisite, 234.

#### 303 Elements of Electrical Engineering (5) AWSp

Short course in the analysis of direct- and alternating-current circuits with an introduction to electronics. Includes one three-hour laboratory each week. For nonelectrical engineering majors. Prerequisites, Physics 122 and Mathematics 224.

#### 305 Electrical Machinery (5) AWSp

Theory, performance, and analysis of poly-phase circuits, transformers, synchronous machines, induction motors, direct-current machines, and electrical power distribution. For nonelectrical engineering majors. Prerequisite, 303.

#### 311 Introductory Linear Systems IV (4) AWSp

A brief review of circuit analysis techniques. Signals and systems. Application of linear system analysis techniques to engineering problems. To be taken concurrently with 312. Prerequisites, 235 and Mathematics 238 or 438.

#### 312 Electrical Engineering Laboratory III (1) AWSp

One three-hour laboratory each week covering Fourier analysis of complex wave forms, measurements of feedback systems. Individual project for investigation. To be taken concurrently with 311. Prerequisite, 236.

#### 321 Electromagnetic Fields and Waves I (4) AWSp

Study of electric and magnetic fields and their application to problems in electrical engineering. Development of techniques for the solution of field problems. Derivation of Maxwell's equations. To be taken concurrently with 322. Prerequisites, 235 and Mathematics 238 or 438.

#### 322 Electromagnetic Fields and Waves Laboratory I (1) AWSp

A four-hour laboratory on alternate weeks. To be taken concurrently with 321.

**323 Electromagnetic Fields and Waves II (4) AWSp**

Application of Maxwell's equations to topics in electromagnetic energy transmission. Plane and spherical wave propagation. Guided waves with particular emphasis on transmission lines and wave guides. To be taken concurrently with 324. Prerequisite, 321.

**324 Electromagnetic Fields and Waves Laboratory II (1) AWSp**

A four-hour laboratory on alternate weeks. To be taken concurrently with 323.

**325 Electromagnetic Fields and Waves III (4) AWSp**

Maxwell's equations in time-varying fields; plane wave propagation in lossless and dissipative media, normal and oblique incidence; guided waves; impedance and radiation field of electric dipole, dipole arrays. To be taken concurrently with 326. Prerequisite, 323.

**326 Electromagnetic Fields and Waves Laboratory III (1) AWSp**

Field theory as related to laboratory practice, behavior of plane waves at boundaries, measurement of impedance, properties of lossy media, antenna radiation patterns. A four-hour laboratory on alternate weeks. To be taken concurrently with 325.

**343 Introduction to Electromechanical Energy Conversion (5) AWSp**

Physical aspects and energy relationships in electromechanical devices. Frequency-power relationships in rotating machines. Commutator, synchronous, and induction machines. Field theory in rotating machines. Includes a 4-hour laboratory on alternate weeks. Prerequisite, 321.

**361 Physical Electronics (4) AWSp**

Basic ideas underlying the operation of semiconductor and vacuum-tube devices. Introduction to quantum mechanics and statistical mechanics, elementary band theory of solids, electron emission, semiconductors, the p-n junction and junction transistor. Prerequisites, 321, Physics 320.

**363 Electronic Devices and Circuits (4) AWSp**

Characteristics of electron tubes and semiconductor devices; equivalent circuits; vacuum tube and transistor amplifier fundamentals. To be taken concurrently with 364. Prerequisite, 361.

**364 Electronics Laboratory I (1) AWSp**

A 3-hour laboratory each week in physical electronics. To be taken concurrently with 363.

**365 Electronic Circuits (4) AWSp**

Continuation of 363, including study of amplification, feedback, oscillation, and modulation. To be taken concurrently with 366. Prerequisite, 363.

**366 Electronics Laboratory II (1) AWSp**

A 3-hour laboratory each week in electronic circuits. To be taken concurrently with 365.

**400 Vacuum Tubes and Electronics (5) AWSp**

Principles of operation and application of electronic tubes, transistors, and circuits in the fields of instrumentation, control, and communication. Includes one 3-hour laboratory weekly. For nonelectrical engineering majors. Prerequisite, 303.

**433 Transistor Circuit Engineering (3) ASp**

Application of semiconductor devices to amplifiers, oscillators, and switching or control elements. Prerequisite, 365.

**441 Linear System Analysis (3) AWSp**

Frequency and time domain properties of signals. Fourier methods used for determining the response of linear systems. Transform methods and operational properties. Comparison of Fourier and Laplace transform methods. Prerequisite, 311.

**445 Nonlinear Systems Analysis (4) W**

Linear, time-varying systems. First-order nonlinear systems; exact and approximate solutions. Second-order nonlinear systems; phase-plane, approximate solutions of Ritz and Kryloff-Bogoliuboff, forced vibrations, stability. Analog and digital computer methods. Prerequisite, senior standing in electrical engineering.

**449 Electrical Machinery I (6) W**

Unbalanced polyphase circuits, symmetrical components, transformers, transients in transformers, core materials. Introduction to saturable reactors and magnetic amplifiers. Synchronous machines, transients in synchronous machines, short-circuit calculations, polyphase induction motors. Includes one 4-hour laboratory per week. Prerequisite, 343.

**450 Electrical Machinery II (6) Sp**

Electrodynamics of synchronous machines; single-phase induction motors; other single-phase motors; conversion of a.c. to d.c.; motor control with rectifiers; inversion; introduction to transmission lines and power transmission; short-circuit calculations in networks. Includes one 4-hour laboratory per week. Prerequisite, 449.

**451 Dynamics of Electromechanical Systems (3) W**

Energy principles and applications to electromechanical systems; circuit-theory methods; matrix transformations of voltage and force equations; elementary applications of field theory to analysis of electromechanical systems. Prerequisite, 343 or permission.

**453 Electric Power Systems (3) Sp**

ROBBINS

Theoretical, analytical engineering study of complete electrical power systems under steady state, faulted, and transient conditions

using data computer, system analyzer, and symmetrical components methods; utility management, control, operation, and protection. Weekly laboratory with field trips to existing installations including nuclear plant. Prerequisite, 343 or permission.

**463 Control System Components and Measurements (3) Sp**

Study of control system components and formulation of their mathematical models. Amplifiers, servomotors, synchros, gyroscopes, and fluid-power devices. Experimental determination of dynamic parameters. Includes one 3-hour laboratory per week. Prerequisite, 343.

**469 Fields and Waves (4) ASp**

Fundamentals of fields and electromagnetic wave theory as applied to radio wave propagation, microwave devices, and optical radiation. Topics from current literature. Prerequisite, 325.

**473 Pulse Circuits (5) AW**

Wave-shaping circuits, including clipping circuits, square-wave generators, differentiator and integrator circuits, d-c restoration, and clammers. Free-running and driven trigger circuits. Linear sweep generation; multivibrators; counters. Applications to high-frequency circuits including television and radar. Includes one 4-hour laboratory on alternate weeks. Prerequisite, 365.

**475 Digital Circuits (4) Sp**

Digital circuits, transmission gates, voltage comparators, time modulation and measurement, pulse and digital systems. Includes one 4-hour laboratory on alternate weeks. Prerequisite, 473.

**477 Principles of Digital Computers (4) AWSp**

Fundamentals of digital computer operation and application. Number systems, Boolean algebra, and general types of computer storage, control, and organization. Contemporary topics; e.g., non-numeric and heuristic programming, computer languages, programming systems. Prerequisites, General Engineering 115, senior standing, or permission.

**479 Fundamentals of Automatic Control (4) AWSp**

Linear servomechanism theory and design principles. Pole-zero analysis, stability of feedback systems by root-locus and real-frequency response methods. Design methods of Bode and Nichols. Introduction to advanced topics in automatic control theory. Prerequisite, 311.

**481 Fundamentals of Microwaves (4) Sp**

Microwave circuit elements, waveguides and resonators; microwave measurement techniques; high frequency triodes, klystrons, and other transit-time devices; beam-type and solid-state amplifiers. Includes one 3-hour laboratory per week. Prerequisites, 323, 365.



# ELECTRICAL ENGINEERING

## 482 Antennas and Propagation (3) A

Theory of radiation; radiation patterns and impedance characteristics of antennas and arrays; theory of tropospheric and ionospheric propagation. Prerequisite, 321.

## 483 Introductory Communication Theory (3) Sp

Frequency analysis; modulation; mathematical concepts of Fourier Integral and probability theory; correlation techniques; elementary study of noise and communication theory. Corequisite, 365.

## 485 Solid State Electronics (4) AW

Elements of band theory in solids, including Kronig-Penney model and band structure of real solids. Electron and hole motion in periodic solids. Physics of p-n junctions. Dynamic behavior of p-n junction diodes. Development of small signal transistor models. Elements of stimulated emission devices, including masers, lasers, and parametric amplifiers.

## 493 Guidance and Control (3) Sp

Analysis and design problems in attitude control and flight-path guidance of aerospace vehicles. Principles of inertial instruments and navigation systems. Prerequisite, 479.

## 499 Special Projects (2-5, max.10) AWSp

Assigned construction or design projects carried out under the supervision of the instructor. Prerequisite, permission of Department Chairman.

## Courses for Graduates Only

### 501 Computer Languages (3) A

GOLDE

Discussion of computer languages: machine language, assembly language, problem-oriented languages. Manipulation of symbols and strings. Formal definition of computer languages. Prerequisite, working knowledge of one procedure-oriented language (FORTRAN, ALGOL) and one assembly language (FAP, MAP).

### 502 Programming Systems (3) W

GOLDE

Basic concepts and design of interpreters, assemblers, compilers, and operating systems for digital computers. Prerequisite, 501.

### 505 Analysis of Random Processes (3) AW

LYTLE, METZ

Probability theory; discrete and continuous random variables; stochastic processes. Spectral analysis of random signals and noise. Corequisite, 441.

### 510 Introductory Network Theory (5) AW

Mathematical concepts applicable to network theory. Mesh and nodal formulations in matrix form, linear transformations, and quadratic forms. Elements of complex variables including conformal transformations and complex potential applied to fields and networks. Contour integration and evaluation of residues. Corequisite, 441.

### 511, 512 Network Synthesis I, II (3,3) W,Sp

LEWIS

Network representations in the complex frequency domain, realizability criteria, synthesis of driving point and transfer impedance and coupling networks for prescribed transfer characteristics, canonical forms, and network equivalents, frequency and time domain aspects of approximating response functions. Prerequisites, 510 for 511; 511 for 512.

### 514 Power System Analysis (5) A

BERGSETH

Methods of analysis of power systems, with emphasis on the interrelations between generation, transmission, and distribution; symmetrical components; evaluation of system parameters and sequence networks; fault studies; transient and steady-state behavior of systems; elements of system protection. Prerequisite, 343. (Offered when adequate enrollment develops prior to close of advance registration.)

### 515 Measurements and Circuit Components (2) A

COCHRAN

Measurements of circuit components from zero to 1000 megacycles, impedance and phase measurements at audio through UHF; use of electronic counters and precision frequency measuring equipment; noise figure measurements. Prerequisite, 323.

### N520-N521-522 Seminar (0-0-2)

### 531 Solid State Electronics I (4) W

BJORKSTAM

Matrix formulation of quantum theory; perturbation theory. Dirac notation; introduction to many-body techniques. Lattice vibrations; phonons. Transport theory. Irreversible thermodynamics. Dielectric and magnetic properties of materials. Some aspects of superconductivity. Prerequisite, 361; corequisite, 485 or permission.

### 532 Solid State Electronics II (4) Sp

BJORKSTAM

Devices and phenomena of current interest. Makes use of the current literature. Content depends, to some extent, on interests of instructor and students. Commonly includes such topics as ferrite, stimulated emission semiconducting and superconducting devices.

### 535 Semiconductor Circuit Analysis (4) Sp

LAURITZEN

Topics in transistor characterization relating to high-frequency and switching behavior. Analysis and design of discrete and integrated semiconductor circuits. An important part of the course is a laboratory assignment. Prerequisite, 485 or permission.

### 541 Microwave Circuit Techniques (4) A

PEDEN

Microwave theory as related to experimental practice, representation and precision measurement of microwave circuits in terms of transformer theorem, scattering coefficients, T and pi networks. Network properties of 3-and 4-port microwave junctions; microwave properties of ferrites. Prerequisite, graduate standing or permission.

### 545 Linear Control System Analysis (3) A

BERGSETH, CLARK

Linear continuous system theory applied to feedback control systems. Block diagrams and signal flow graph representations. Steady-state errors and performance. Stability and dynamic response by root-locus, Nyquist, and Bode techniques. Prerequisite, graduate standing.

### 546 Advanced Topics in Control System Theory (3) Sp

Topics of current interest in automatic control system theory, for advanced graduate students having adequate preparation in linear and nonlinear system theory. Prerequisite, advanced graduate standing.

### 551 Power System Protection (3) W

BERGSETH

Protection of power systems and equipment against both overvoltages and overcurrents; includes power circuit breakers, fuses, relays, lightning arrestors, expulsion tubes, and the influence of neutral grounding methods on overvoltages. Prerequisite, 514 or permission. Offered when adequate enrollment develops prior to close of advance registration.

### 560 Wave Phenomena (4) Sp

ROGERS

Solution of ordinary differential equations as applied to the vibrations of lumped systems; vector analysis and the solution of the partial differential equations of continuous systems; Fourier series, Bessel's functions, and orthogonality; solution of the field equations for wave guides and radiating systems. Prerequisite, 325. Offered when adequate enrollment develops prior to close of advance registration.

### 563 Noise in Electron Devices (3) W

LAURITZEN

The physical mechanisms of noise generation in electronic devices: thermal noise, quantum noise, shot noise, flicker noise. Characterization of noise: noise figure, noise temperature, noise measurements. Application of noise theory to optimum circuit and device design with primary emphasis on solid state devices: transistors, lasers, etc. Prerequisites, 485, 505, or permission.

### 566 Microwave Measurements (2) W

HARRISON

Measurement of characteristics and parameters of microwave devices utilizing waveguide techniques. Experiments designed for the needs of individual students. Problems based on laboratory work. Includes one 3-hour laboratory per week. Prerequisites, 323 and 365.

### 567 Microwave Vacuum Tubes (4) Sp

HARRISON

Theory of microwave vacuum tubes, including triodes, klystrons, traveling wave tubes, and magnetrons, and their modulation characteristics. Oscillator theory is considered in detail, with klystron oscillators used to illustrate general principles. Prerequisites, 469, 566, or permission.



**568 Microwave Electronics (3) A**

GOLDE

A selection of topics applicable to the study of microwave tubes. Formation and focusing of electron beams. Application of various theories to the interaction of electron beams with electromagnetic fields. Prerequisite, 469.

**570 Antenna Theory (3) W**

REYNOLDS, SWARM

Theory of radiation; impedance characteristics and radiation patterns of thin linear antenna elements; antenna arrays; pattern synthesis; field intensity calculations. Prerequisite, graduate standing or permission.

**572 Microwave Network Theory (4) W**

ISHIMARU, PEDEN, SIGELMANN

Theory of uniform and nonuniform waveguides, radial and spherical waveguides. Eigenfunctions and Green's functions. Closed and open structures. Slow and leaky waves. Periodic structures. Discontinuities in waveguides. Anisotropic media. Prerequisite, 469.

**574 Microwave Antennas (4) Sp**

ISHIMARU, SIGELMANN

Microwave antennas on cylindrical, spherical, and other structures. Excitation of trapped surface waves and leaky waves. Green's functions for a continuous spectrum. Saddle point method. Watson transform. Radar cross section. Geometrical and physical optics. Variational principles. Prerequisite, 572.

**575 Microwave Propagation (4) A**

ISHIMARU, SIGELMANN

Excitation and propagation of waves in layered media. Trapped surface wave, leaky wave, and Sommerfeld poles. Poles near saddle points. Lateral waves. Anisotropic media. Diffraction by obstacles and slits. Rayleigh and Kirchhoff approximations. Wiener-Hopf techniques. Partially coherent electromagnetic waves. Prerequisite, 574 or permission.

**576 Communication Theory I (3) W**

LYTLE, METZ

Mathematical theory of communication. Information theory for discrete and continuous systems. Channel capacity and coding. Prerequisite, 505 or permission.

**577 Communication Theory II (3) Sp**

LYTLE, METZ

Communication in the presence of noise. Analysis of systems with random inputs. Optimum linear systems, statistical detection of signals, decision theory. Statistical analysis of nonlinear system. Prerequisite, 505 or permission.

**578 Radio Propagation I (3) W**

REYNOLDS, SWARM

Theory of electromagnetic propagation over a finite conductive earth and in a horizontally stratified media; theory of scattering in random medium with applications to the troposphere. Prerequisite, graduate standing.

**579 Radio Propagation II (3) Sp**

ROGERS, SWARM

Theory of electromagnetic propagation in ionized medium with application to the ionosphere. Theory of ionospheric scattering, meteor reflection, and auroral propagation. Prerequisite, graduate standing.

**580 Electroacoustics (4) Sp**

ROGERS, HILL

Vibration of strings, bars, and membranes; acoustical wave equation and solutions; electric, acoustic, and mechanical analogs; acoustical networks and measurements; architectural acoustics; properties of hearing; loudspeakers, microphones, and sound reproduction. Includes one 4-hour laboratory on alternate weeks. Prerequisite, 323. Offered when adequate enrollment develops prior to close of advance registration.

**582 Analytical Design of Control Systems**

(3) W

CLARK, HSU

Synthesis of linear automatic control systems to satisfy analytical performance criteria. Performance measures and minimization techniques. Optimal control of systems having stochastic signals and noise using frequency-domain and time-domain methods. Introduction to optimal control using variational methods. Prerequisites, 505, 545.

**583 Nonlinear Control Systems (3) Sp**

NOGES

Dynamic analysis of nonlinear control systems. Analytical, graphical, numerical and simulation techniques for solving nonlinear servomechanism problems. Lyapunov functions, phase space, and describing functions. Prerequisite, 545.

**584 Sampled-Data Control Systems I (4) W**

ALEXANDRO, HSU

Z-transform and modified Z-transform analysis; random signal and its characterization; statistical analysis of sampled-data systems; difference equation and matrix method; state variables; state space and state transition analysis. Prerequisites, 510, 545 or equivalent, and Mathematics 427.

**585 Sampled-Data Control Systems II (4) Sp**

ALEXANDRO, HSU

Digital control of multivariable process; controllability and observability; vector-matrix differential equation and the control law; optimization using calculus of variation; the Maximum Principle of Pontryagin; Bellman's Principle of Optimality; dynamic programming; optimum estimation of state variables; optimum quantized systems. Prerequisite, 584 or permission.

**586 Digital Computer Applications and Communications I (4) A**

JOHNSON, HOLDEN, GOLDE

Theory and practice of number systems, logical analysis, digital computer system organization. Numeric and non-numeric techniques and processes. Algorithmic and heuristic applications by various representative languages. Prerequisites, FORTRAN and graduate standing.

**587 Digital Computer Applications and Communications II (4) W**

JOHNSON

Evaluation and application of computational methods in solution of typical systems problems. Optimization, error analysis, stochastic and statistical methods, computer learning, pattern recognition. Prerequisite, 586.

**588 Logical Design of Digital Computers I (3) Sp**

JOHNSON

Number systems, error detect-correct, Boolean algebra. Optimization of logical systems under various criteria. Topological methods of optimization and synthesis. Sequential logic, memory input, and application equations. Application of logical techniques to digital systems. Prerequisite, graduate standing.

**589 Logical Design of Digital Computers II (3) A**

JOHNSON

Analysis and synthesis of digital systems from logical models. Time-independent and sequential logic, multi-function logic. Boolean matrix synthesis, partitioning, weighting, cellular implementation. Threshold logic theory. Evaluation of various analysis and synthesis methods in logical systems. Prerequisite, 588.

**590 Advanced Topics in Digital Computers (2-5, max. 15) AWSp**

GOLDE, HOLDEN, JOHNSON

Lectures or discussions of topics of current interest in the field of digital computers. Subject matter may vary from year to year. Prerequisite, permission.

**595 Advanced Topics in Communication Theory (3, max. 9) A**

LYTLE, METZ

Extension of 576, 577. Material will differ each year, covering such topics as: coding, decision theory, game theory, adaptive communication systems, nonlinear random processes, etc. Prerequisites, 576, 577, or permission.

**599 Selected Topics in Electrical Engineering (\*) AWSp**

Prerequisite, permission of Department Chairman.

**600 Research (\*) AWSp**

Prerequisite, permission of Department Chairman.

**700 Thesis (\*) AWSp**

Registration for thesis is provided to facilitate advanced degree research. Such registration requires the permission of the faculty supervisor. Work may be done *in absentia* by special permission of the Graduate School.

## ENGLISH

## Courses for Undergraduates

The lists of names under various literature courses indicate the kind of material covered, but are neither comprehensive nor exclusive of other significant figures.

# **BASIC REQUIRED COURSES**

## **XN50 Fundamentals of English (Preparatory) (0)**

Required for students who fail English qualifying tests. Basic composition course, with review of fundamentals designed to improve the level and correctness of writing. Students who pass XN50 are eligible for 101. See *Evening Classes Bulletin*.

## **101, 102, 103 Introductory English (3,3,3) AWSp, AWSp, AWSp**

Courses to be counted toward Freshman English requirement; may not be counted toward a major in English. Emphasis upon interpretive and analytical writing, based upon selected readings from world literature. Exemption granted to qualified students who demonstrate unusual maturity in composition.

## **101H, 103H Composition—Honors (3,3) A,W**

Writing courses, with reading designed to parallel the content of 257, 258, and 259. Exemption from 102 granted. Open to students who qualify by high performance on the English portion of the Pre-College Testing Program or the Advanced Placement Test of the College Entrance Board.

# **COURSES FOR FOREIGN STUDENTS**

*(These courses are administered by the department of linguistics.)*

## **150 Elementary English for Foreign Students (5) AW**

## **151 Intermediate English for Foreign Students (5) AWSp**

## **303 Advanced English for Foreign Students (3) AWSp**

# **LOWER-DIVISION COURSES FOR NONMAJORS**

*(These courses may be elected by students majoring in English but may not be counted toward the major.)*

## **110 Introduction to Literature**

(See Humanities 101, under "General and Interdepartmental" heading in this section.)

## **210 Introduction to European Literature**

(See Humanities 101, under "General and Interdepartmental" heading in this section.)

## **257 Introduction to Poetry (5) AWSp**

Poetic techniques; readings from nineteenth- and twentieth-century English and American poets.

## **258 Introduction to Fiction (5) AWSp**

Fictional techniques; analysis of short stories and novels.

## **259 Introduction to Modern Drama (5) AWSp**

Dramatic techniques; analysis of twentieth-century plays.

# **LOWER-DIVISION COURSES FOR MAJORS AND NONMAJORS: SURVEY COURSES**

## **264 English Masterpieces: Beginnings through Shakespeare (to 1600) (5) AWSp**

Readings in principal works and authors, with examples of romances, ballads, and drama.

## **265 English Masterpieces: Donne through Blake (1600-1800) (5) AWSp**

Includes Milton, Restoration plays, Pope, Swift, Fielding, Johnson, and others.

## **266 English Masterpieces: Wordsworth through Hardy (1800-1900) (5) AWSp**

Includes Romantic and Victorian poets, novelists, and essayists.

## **267 American Masterpieces: Beginnings to 1900 (5) AWSp**

Includes Edwards, Franklin, Thoreau, Hawthorne, Melville, Twain.

# **WRITING COURSES FOR MAJORS AND NONMAJORS**

## **271, 272 Expository Writing (3,3) AWSp, AWSp**

Practice in writing information and opinion papers to develop easy and effective expression. 272 is somewhat more advanced. Prerequisite, freshman composition requirement or equivalent for 271; 271 for 272.

## **274, 275, 276 Verse Writing (5,5,5) A,W,Sp**

Prerequisite, freshman composition requirement or equivalent.

## **277, 278 Beginning Short Story Writing (3,3) AWSp, AWSp**

Prerequisites, freshman composition requirement or equivalent for 277; 277 or permission for 278.

# **Upper-Division Courses**

To register in 300 and 400 courses in English and American Literature a student must have upper-division standing or the permission of the Chairman, Undergraduate Programs. (In general, permission will be granted only if the student has completed the freshman composition requirement and one lower-division course in literature.) All 300 and 400 courses are for majors and nonmajors unless otherwise specified.

# **PERIOD COURSES**

## **321 The Renaissance (5) W**

Wyatt and Surrey, Spenser, the Humanists, Elizabethan prose. Alternates with 322.

## **322 Elizabethan and Jacobean Drama (5)**

Marlowe, Greene, Webster, Jonson, and others. Alternates with 321; offered 1967-68.

## **324 Shakespeare (5) AWSp**

Introduction to plays of various types.

## **325 Shakespeare (5) AWSp**

Comedies and histories. Prerequisites, 324.

## **326 Shakespeare (5) WSp**

Tragedies and romances. Prerequisite, 324.

## **331 Literature: 1600-1660 (5) A**

Donne, Herbert, Marvell, Bacon, Browne, Burton.

## **332 Milton (5) AWSp**

Major poems and selected prose.

## **335 Restoration Literatures: 1660-1700 (5) W**

Restoration plays, Dryden, diarists, essayists. (Offered alternate years; not offered 1967-68.)

## **336 Early Eighteenth-Century Literature (5) AWSp**

Swift, Pope, Defoe, Addison, and Steele.

## **337 Later Eighteenth-Century Literature (5) WSp**

Johnson, Boswell, dramatists, novelists, pre-romantic poets.

## **341 Romantic Poets (5) AWSp**

Blake, Wordsworth, Coleridge.

## **342 Romantic Poets (5) AWSp**

Keats, Shelley, Byron.

## **344 Victorian Poets (5) A**

Tennyson, Browning, and others.

## **347 Nineteenth-Century Prose (5) W**

Lamb, Hazlitt, Carlyle, Mill, Ruskin, Morris, Newman, Huxley.

## **348 Modern British Poetry: A Survey (5) Sp**

Housman, Bridges, Yeats, Eliot, Auden, Thomas.

## **361 American Literature: Beginnings to 1800 and the Transcendentalists (5) AWSp**

Including Taylor, Edwards, Franklin, Emerson, Thoreau.

## **362 American Literature: 1800-1860 (5) AWSp**

Including Irving, Cooper, Poe, Hawthorne, Melville.

## **363 American Literature: 1860-1900 (5) AWSp**

Including Whitman, Twain, Dickinson, James, Howells, Henry Adams.

# **NONPERIOD COURSES FOR MAJORS AND NONMAJORS**

## **374, 375 Beginning Playwriting (3,3) AWSp, AWSp**

**387 English Grammar (5) AWSp**

Word forms, structures, and usages in the present-day English sentence.

**388 Current English Usage (3)**

Principles for deciding what constitutes good English in an individual's speech and writing.

**390 The Bible as Literature (5) ASp**

For nonmajors; English majors may use as elective beyond the 50 specified credits.

**LITERARY TYPES****410 Types of Dramatic Literature: Comedy (5) W**

Analysis of dramatic structures.

**411 Types of Dramatic Literature: Tragedy (5) Sp**

Analysis of dramatic structures.

**413, 414, 415 Types of Contemporary Poetry (5,5,5) A,W,Sp****417 The English Novel (5) AWSp**

Eighteenth century: Swift, Defoe, Richardson, Fielding, Smollett, Sterne.

**418 The English Novel (5) AWSp**

Early and middle nineteenth century: Scott, Austen, Brontes, Dickens, Thackeray, Trollope.

**419 The English Novel (5) AWSp**

Later nineteenth century: Eliot, Meredith, Hardy, the Naturalists, Conrad.

**423 Romances and Folk Literature (5) W**

Alternates with 424; not offered 1967-68.

**424 The Popular Ballad (5) W**

Extensive reading of the English and Scottish popular ballads. Origins, transmission, themes, and music of the ballad form. Alternates with 423; offered 1967-68.

**PERIODS AND OTHER TOPICS****425 Chaucer (5) AWSp**

Reading in the *Canterbury Tales* and other major works.

**426 Utopias and Social Ideals (5)**

More, *Utopia*; Bellamy, *Looking Backward*; Mill, *On Liberty*; Huxley, *Brave New World*, etc. (Offered alternate years; offered 1967-68.)

**430 English Literature: 1900-1930 (5) ASp**

Joyce, Lawrence, Forster, Woolf, Huxley, Shaw, O'Casey, selected poets. Because of the large number of writers, content will vary, but those who achieved prominence before 1930 come in this course. No credit for students who took English 406 prior to Autumn Quarter, 1962.

**431 English Literature: Since 1930 (5) W**

Exploration of developments and individual talents. As with 430, content will vary, but includes important figures from each decade plus meaningful ones chosen from the period at large. Possibilities are Greene, Bowen, Orwell, Waugh, Cary, Greene, Powell, Green, Murdoch, Auden, Thomas. No credit for students who took English 406 prior to Autumn Quarter, 1962.

**434 American Literature: 1900-1930 (5) AWSp**

The Naturalists (Norris, Crane, Dreiser), Anderson, Lewis, Cather, Robinson, O'Neill, Frost, Pound, Eliot, Cummings, Hemingway, Fitzgerald. Because of the large number of writers, content will vary, but those who achieved prominence before 1930 come in this course. No credit for students who took English 466 prior to Autumn Quarter, 1962.

**435 American Literature: Since 1930 (5) AWSp**

Exploration of developments and individual talents. As with 434, content will vary, but includes important figures from each decade plus meaningful ones chosen from the period at large. Possibilities are Faulkner, Steinbeck, Miller, Hart Crane, Stevens, Warren, Tennessee Williams, Bellow, Lowell. No credit for students who took English 466 prior to Autumn Quarter, 1962.

**437 Modern European Literature (5) AWSp**

Fiction, poetry, and drama from the development of modernism to the present. Because of the large number of writers and nationalities, content will vary. Possibilities are Mann, Proust, Kafka, Gide, Hesse, Rilke, Valery, Lagerqvist, Pirandello, Moravia, Sartre, Camus, Beckett, Robbe-Grillet.

**LANGUAGE AND WRITING****447 History of the English Language (5) ASp**

Growth and development of the English language from Anglo-Saxon times to the present. Open to sophomores.

**449 English Prose Style (5)**

Analysis of the traits of language that contribute to the effects of writings in prose.

**451 Advanced Expository Writing (5) A**

Work in nonfiction, including short biographies, historical narrative, opinion articles. Prerequisite, 271 or 272, or permission.

**453, 454, 455 Advanced Verse Writing (5,5,5) A,W,Sp**

Prerequisite, 276 for 453, or permission.

**457, 458 Advanced Short Story Writing (5,5) AWSp, AWSp**

Prerequisite, 277, 278, or permission.

**461, 462, 463 Novel Writing (5,5,5) A,W,Sp**

Prerequisite, permission.

**480, 481, 482 Current Developments in English Studies: Conference (5,5,3)**

Emphasis on composition, practical criticism, language study, and selected readings in literature. Open only to teachers and teaching cadets. Prerequisite, teaching experience.

**490, 491 Major Conference (3,3) AWSp, AWSp**

Individual study by arrangement with instructor.

**493, 494 Advanced Writing Conference (3-5, 3-5) AWSp, AWSp**

Revision of manuscripts. Preliminary work on writing projects should be completed before entrance. Prerequisite, permission.

**499 Special Studies in Literature (5, max. 10) AWSp**

To be offered occasionally by visitors or resident faculty. To be utilized in honors program.

**Courses for Graduates Only**

Graduate standing in English, or permission, is required for registration in courses numbered above the 400 level.

**505 Graduate English Studies (5) A****506 Studies in Literary Genres (5, max. 15) W****507, 508 Literary Criticism (5,5) A,W****509 Methods of Contemporary Criticism (5) AWSp****510, 511, 512 The Renaissance and Spenser (5,5,5) A,W,Sp****513 Shakespeare's Dramatic Contemporaries (5) Sp****515, 516 Chaucer (5,5) A,Sp****517, 518, 519 Shakespeare (5,5,5) Sp,A,W****521, 522, 523 Seventeenth-Century Literature (5,5,5) A,W,Sp****524, 525, 526 American Literature (5, max. 10 each) Sp, A, W****527, 528 Studies in Medieval Literature (5,5) W****530 The English Language (5) Sp****531 Introductory Reading in Old English (5) A****532 Advanced Reading in Old English (5) W****533 Foundations of American English (5)**

- 534 American English Dialectology (5) Sp**
- 538, 539, 540 Early Nineteenth-Century Literature (5, 5, 5) W, Sp, A**
- 541, 542, 543 Victorian Literature (5, max. 10 each) W, A, Sp**
- 544, 545, 546 Eighteenth-Century Literature (5,5,5) A,W,Sp**
- 547 Rhetoric (5)**
- 548 Twentieth-Century Literature (5) Sp**
- 553 Current Rhetorical Theory (5)**
- 561 English Literature, Beginnings to 1500 (5) Sp**  
Graduate survey of English literature, beginnings to 1500, for first-year graduate students.
- 562 English Literature, 1500-1660 (5) A**  
Graduate survey of English literature, 1500-1660, for first-year graduate students.
- 563 English Literature, 1660-1780 (5) A**  
Graduate survey of English literature, 1660-1780, for first-year graduate students.
- 564 English Literature, 1780-1900 (5) A**  
Graduate survey of English literature, 1780-1900, for first-year graduate students.
- 565 American Literature, Beginnings to 1900 (5) W**  
Graduate survey of American literature from the beginnings to 1900, for first-year graduate students.
- 566 Anglo-American Literature, Twentieth Century (5) W**  
Graduate survey of Anglo-American literature of the twentieth century for first-year graduate students.
- 586 Graduate Writing Conference (5) AWSp**
- 599 Special Studies in Literature (5, max. 15) AWSp**
- 600 Research (\*) AWSp**
- 700 Thesis (\*) AWSp**
- 702 Degree Final (6) AWSp**  
Limited to students completing a nonthesis degree program.

## FAR EASTERN AND RUSSIAN INSTITUTE

### Courses for Undergraduates

- 110 The Far East in the Modern World (5) AWSp**  
DULL, GASSTER, SCHWARZ, TAYLOR, WILLISTON  
Social, economic, and political problems of China, Japan, Korea, and Southeast Asia. In-

cludes development of Russia as an Asiatic power, as well as the role of Western powers in the Far East. For freshmen and sophomores; juniors and seniors should take 310 rather than 110. Credits cannot be received for both 110 and 310.

### 220 Introduction to Russian and East European Studies (5) A

BOBA  
Geographic setting, ethnic composition, religions, cultural pattern, economic problems, social and political institutions of Eastern Europe in the past and present.

### 240 Chinese Civilization (5) Sp

SHIH  
China's material civilization—including fine arts, literature, religion, and thought—in relation to general development of Chinese society.

### 242 Korean Civilization (3) A

WILLISTON  
Korea's material civilization—including fine arts, literature, religion, and thought—in relation to general development of Korean society.

### 243 Russian Civilization (5) AWSp

SPECTOR  
Russia's material civilization, including fine arts, literature, religion, and history; political, social, and legal institutions; and thought, in relation to the general development of Russian society.

### 280J Ancient Indian Civilization (5) A

SPELLMAN  
An introductory course dealing with the religions, literature, philosophy, politics, arts, and history of India from earliest times to the Muslim invasion. Offered jointly with the Department of History.

### 281J Modern Indian Civilization (5) W

SPELLMAN  
An introductory course dealing with the Islamic impact, British conquest, and contemporary India. Emphasis on the rise of nationalism, social organization, and contemporary life and history. Offered jointly with the Department of History.

### 290 History of China (5) A

WILLISTON  
From earliest times to the present; emphasis on development of Chinese society.

### 292 History of Korea (5) W

WILLISTON  
From earliest times to the present; emphasis on the modern period.

### 295J Introduction to Japanese Civilization (5) Sp

PYLE  
Survey of Japan's political, social, and cultural development from early times to the present. Offered jointly with the Department of History.

### 302J World Classics of the Orient (5) Sp

MC KINNON  
Great works of Chinese, Indian, Japanese, and Korean literature and thought, read in English and taught by specialists in Far Eastern literature. Offered jointly with the Department of Comparative Literature. Prerequisite, junior standing.

### 305J Eastern Europe (5) W

VELIKONJA  
*Geography.* An analysis of the physical, historical and socio-economic characteristics of Eastern Europe. Offered jointly with the Department of Geography.

### 310 The Far East in the Modern World (5) AWSp

DULL, SCHWARZ, TAYLOR, WILLISTON  
Social, economic, and political problems of China, Japan, Korea, and southeast Asia. Includes development of Russia as an Asiatic power, as well as the role of Western powers in the Far East. Juniors and seniors should take this course in place of 110. Credit cannot be received for both 310 and 110.

### 313J East Asia (5) W

KAKIUCHI  
*Geography.* Nature and geographic setting of Far Eastern civilization with reference to origins, development, and present outlines of settlement; cultures, resource use, and economic structures in China, Japan, and Korea. Offered jointly with the Department of Geography.

### 314J Peoples of Central and Northern Asia (3)

FAIRSERVIS  
Offered jointly with the Department of Anthropology. Prerequisite, major standing in Anthropology or Far Eastern, or permission. (Offered alternate years; not offered 1967-68).

### 316 History of Southeastern Asia (5) W

WILLISTON  
Impact of India, China, and the West upon native cultures of Southeast Asia. Evolution of social, political, and economic institutions.

### 324 Survey of Soviet Society (5) A

SWAYZE  
A survey of the political, economic, and social institutions, and the literature and fine arts of the Soviet Union.

### 329 Russia and the Muslim World (5) ASp

SPECTOR  
The land and peoples, religion, culture, customs, and historical background, with emphasis on the Near and Middle East and on Russian relations with the Muslim world from 1453 to the present.

### 332J Islands of the Pacific (3)

*Geography.* Analysis of major islands and groups with respect to resources, settlement, population composition; role in modern transportation and communications; current political status. Offered jointly with the Department of Geography.

**333J The Soviet Union (5) AW**

JACKSON

*Geography.* The structure and trends of geographic development with particular emphasis on the distribution of population, the spatial structure of the economy and regional interaction. Offered jointly with the Department of Geography.

**335J Japanese Foreign Policy in Asia (3) Sp**

HELLMANN

Analysis of modern Japanese political, diplomatic, and economic impact on Asia; and contemporary problems. Offered jointly with the Department of Political Science.

**340 Survey of Tibetan Cultural History: Dynastic Period (3) A**

WYLIE

Political, religious, and cultural history of the royal dynastic period: earliest times to the ninth century.

**341 Survey of Tibetan Cultural History: Hegemonic Period (3) W**

WYLIE

Political, religious, and cultural history of the sectarian hegemonic period: ninth to the seventeenth century.

**342 Survey of Tibetan Cultural History: Theocratic Period (3) Sp**

WYLIE

Political, religious, and cultural history of the theocratic period: seventeenth century to the present.

**343J Government and Politics of Southeast Asia (5) A**

SMITH

Analysis of the organization and functioning of government and politics in the countries of Southeast Asia, with attention given to the nature of the social and economic environments which condition them. Offered jointly with the Department of Political Science. Prerequisite, 201; 203 recommended.

**344J Chinese Government (5) A**

SCHWARZ

Imperial government; transition period; national government; present forms of local government; constitutional draft; present political situation. Offered jointly with the Department of Political Science. Prerequisites, 110 or 310 and junior standing.

**345J Japanese Government (5) A**

HELLMANN

Characteristics from 1868 to 1945; governmental changes since 1945. Offered jointly with the Department of Political Science.

**378 Russia in Asia (3) Sp**

BOBA

Relations of tsarist Russia and the Soviet Union with eastern Asia.

**385J Problems of Modern India (5)**

SPELLMAN

An analysis of the problems in the fields of social life, international and domestic politics, education, economics, and other areas that confront India today and which may determine her future. Offered jointly with the Department of History.

**401, 402 Marxism-Leninism and the Thought of Mao Tse-tung (5, 5) W, Sp**

SWAYZE

401: Doctrines of Marx, Engels, and Lenin. 402: Marxism-Leninism in the USSR and China: Stalin and successors and Mao. Prerequisite, modern Chinese or Russian history or politics, or Political Science 413, or permission.

**405J Problems of Eastern Europe (3 or 5) W**

VELIKONJA

Analysis of selected geographical aspects of Eastern Europe. Natural and human resource base, social and political organization. Their relationships and interdependencies. Lectures, 3 credits; independent study, 2 additional credits. Offered jointly with the Department of Geography. Prerequisite, 305J or permission.

**412J Indian Philosophy (3)**

GEROW

A survey of the leading Indian traditional schools of philosophy and theology, with emphasis on the origins and growth of Vedānta. Offered jointly with the Department of Philosophy.

**414J Chinese Political Thought (5) Sp**

HSIAO

Theories of the Oriental state as exhibited in the writings of statesmen and philosophers. Offered jointly with the Department of Political Science. (Offered alternate years; offered 1967-68.)

**415J History of Chinese Philosophy (5) A**

SHIH

Development of Chinese philosophy from the sixth century to modern times. Emphasis on Confucianism, Mohism, Taoism, Legalism, the Dialecticians, Buddhism, and Neo-Confucianism; re-evaluation of them in the light of new trends of thought after contact with the West. Offered jointly with the Department of Philosophy.

**416J Neo-Confucianism (5) W**

SHIH

Systematic study of Neo-Confucianism, its background and development with emphasis on the Rationalistic school of Ch'eng-Chu and the Idealistic school of Lu-Wang. Offered jointly with the Department of Philosophy. Prerequisite, 415J or permission.

**420J Foreign Relations of the Soviet Union (5) W**

RESHETAR

Ideological, historical, and strategic components of Soviet foreign policy; Comintern, Cominform, and international Communist

movement; Soviet policy in foreign trade, international law and organization, and in specific geographic areas. Offered jointly with the Department of Political Science.

**421J Kievan and Muscovite Russia, 850-1700 (5) A**

SZEFTEL

Development of Russia from earliest times to the reign of Peter the Great. Offered jointly with the Department of History. Prerequisites, History 101, or Social Science 101 and 102, or permission.

**422J Imperial Russia, 1700-1900 (5) W**

SZEFTEL, TREADGOLD

Development of Russia from Peter the Great to Nicholas II. Offered jointly with the Department of History. Prerequisites, 421J or History 102, or Social Science 101 and 102, or permission.

**423J Twentieth-Century Russia (5) Sp**

TREADGOLD

Russia and the USSR from Nicholas II to the present. Offered jointly with the Department of History. Prerequisites, 422J or History 102, or Social Science 102 and 103, or permission.

**424J Modern Russian Intellectual History (5)**

TREADGOLD

Development of Russian social and political thought and philosophy from the seventeenth century to the Revolution of 1917. Offered jointly with the Department of History.

**426 Origins of the East European States (5) Sp**

BOBA

Analysis of social, cultural, and political development among the Slavs and other peoples of Eastern Europe leading to the emergence of national states of the Middle Ages. Prerequisites, Social Science 102 and 103, or History 102, or permission.

**427J- Eastern Europe, 1772-1918 (5-) A**

SUGAR

Poland, Czechoslovakia, Hungary, Rumania, Yugoslavia, Bulgaria, and Albania, from the first partition of Poland to the end of World War I. Offered jointly with the Department of History.

**-428J Eastern Europe Since 1918 (-5) W**

SUGAR

Poland, Czechoslovakia, Hungary, Rumania, Yugoslavia, Bulgaria, and Albania, from the end of World War I to the present. Offered jointly with the Department of History.

**429 The Soviet Union and the Muslim World (5) W**

SPECTOR

Soviet-Muslim relations from the Russian Revolution of 1917 to the present, with emphasis on the Soviet impact on Turkey, Iran, Afghanistan, Pakistan, Indonesia, and the Arab States.

# FAR EASTERN AND RUSSIAN INSTITUTE

## 430 Survey of Mongol Culture (3) A

POPPE

Nomadic culture and tribal organization in ancient times; present state and cultural life of Mongolia. (Offered alternate years; offered 1967-68.)

## 432J American Foreign Policy in the Far East (5) W

TAYLOR

Relationship to diplomacy, trade, and internal politics. Offered jointly with the Department of Political Science.

## 433J Geographic Problems in Soviet Development (3 or 5) A

JACKSON

*Geography.* Selected problems posed by a dynamic society and a conditionally limited resource base. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor. Offered jointly with the Department of Geography. Prerequisite, 333J or permission.

## 434J Problems in the Geography of Southeast Asia (5)

Analysis of regional and political structures; resources, economic activities, and problems of development; overseas and internal relationships. Offered jointly with the Department of Geography. (Not offered 1967-68.)

## 435J Problems in the Geography of China (5) A

Origins and development of Chinese civilization in its geographic base and areal spread; political China and the Chinese sphere; physical base and resources; problems of agriculture, population, industrialization, urbanization, transportation, and contemporary development; communist China. Offered jointly with the Department of Geography.

## 437J Problems in the Geography of Japan (5) Sp

KAKIUCHI

Regional structure of Japanese urban, industrial, and agricultural geography. Analysis of contemporary patterns considering cultural and physical factors and selected aspects of their historical development. Offered jointly with the Department of Geography.

## 441J Political Institutions of the Soviet Union (5) A

RESHETAR

Ideological and historical bases of Soviet politics; Leninism-Stalinism; Communist Party organization and membership; administrative agencies; the policy and army; law and the judiciary; Soviet federalism and nationality policy. Offered jointly with the Department of Political Science.

## 443 Chinese Social Institutions (5) W

HSIAO

General survey of traditional institutions and their changes in modern times. (Offered alternate years; offered 1967-68.)

## 444-445-446 Survey of Vietnamese Cultural History (3-3-3) A,W,Sp

Vietnam's material civilization—including fine arts, literature, religion, and thought—in relation to general development of Vietnamese society.

## 448J History of Russian Culture to 1800 (5) W

SZEFTTEL

The development of religion, political ideas, philosophical and literary theories, art, architecture, drama, and music from Kievan times to the end of the eighteenth century. Offered jointly with the Department of History. Prerequisites, 421J or History 101, or Social Science 101 and 102, or permission. (Offered alternate years; offered 1967-68.)

## 449J Russian Historiography (5) Sp

SZEFTTEL

Offered jointly with the Department of History. Prerequisites, 421J or 448J, or Social Science 101 and 102, or History 101, or permission.

## 450 Survey of Turkic Culture of Central Asia (3) Sp

BOBA

Nomadic culture of the Turks of Central Asia, their history, social organization, present state and cultural life under Soviet Russia's or China's dominance. Prerequisites, 110 or 310, Anthropology 202, or permission.

## 451J The Modernization of Japan (5) A

PYLE

Historical approach to social, political, economic and psychological problems of modernization in Japan. Offered jointly with the Department of History.

## 452J History of Early Japan (5) A

PYLE

Political, social, economic, and cultural development of Japan to the beginning of the Tokugawa period (17th century). Offered jointly with the Department of History.

## 453J History of Tokugawa Japan (5) W

PYLE

Political, social, economic, and cultural development of Japan from the beginning of the Tokugawa period (17th century) to the present. Offered jointly with the Department of History.

## 454J History of Modern Japan (5) Sp

PYLE

Political, social, economic, and cultural development of Japan from the late Tokugawa period to the present, with special emphasis on the cultural impact of the West. Offered jointly with the Department of History.

## 456J Japanese-American Relations (5)

BUTOW

The confrontation between Japan and the United States from Perry to MacArthur, with emphasis on the period from 1905 to 1945.

Offered jointly with the Department of History. Prerequisite, permission.

## 461, 462, 463 Studies in Buddhism (5,5,5) A,W,Sp

CONZE, HURVITZ

461: the principal religious and philosophical ideas of pre-Buddhist India as well as fundamental Hinayana and Mahayana ideas. 462: the growth of Buddhism in China. 463: the history of Japanese Buddhism after its transmission from China. Prerequisite, permission.

## 465J Chinese History: Earliest Times to 221 B.C. (5) A

DULL, WILHELM

Pre-imperial China. Offered jointly with the Department of History. (Offered alternate years; not offered 1967-68.)

## 466J Chinese History: 221 B.C. to A.D. 906 (5) W

DULL, WILHELM

Development of the imperial Chinese state. Offered jointly with the Department of History. (Offered alternate years; not offered 1967-68.)

## 467J Chinese History: A.D. 906 to A.D. 1840 (5) Sp

DULL, WILHELM

The Wu Tai, Sung, Yuan, Ming, and early Ch'ing periods. Offered jointly with the Department of History. (Offered alternate years; not offered 1967-68.)

## 468J Modern Chinese History (5) Sp

SCHWARZ

Modern Chinese society from 1840 to 1949. Offered jointly with the Department of History.

## 469, 470 History of Korea (5,5) A,W

KOH

A survey of Korean history from earliest times to the modern period. Prerequisite, permission. (Last offered 1966-67.)

## 472 Introduction to Buddhism (3) AWSp

CONZE

The basic doctrines: I. The Conditioned World. II. Its Origins. III. The Unconditioned World. IV. The Path Which Leads From One World to the Other and The Persons Who Use It.

## 473 Readings in the Prajnaparamita Literature in English (5) W

CONZE

Study of texts in the following sequence: *The Heart of Sutra*, *The Diamond Sutra*, selected passages from *The Large Sutra on Perfect Wisdom*. Prerequisite, permission.

## 478J Introduction to Southeast Asian Linguistics (3) A

LI, THOMPSON

Survey of language families of Southeast Asia. Typology and relationships. Research needs and problems. Prerequisites, Linguistics 452J, 462J. Offered jointly with the Department of Linguistics.

**482J History of India: Earliest Times to A.D. 647 (5) W**

SPELLMAN

India in ancient times; emphasis on forms of political organizations and economic life, social organizations and cultural developments. Offered jointly with the Department of History. Prerequisite, 280J or permission.

**483J History of India: A.D. 647 to A.D. 1525 (5)**

SPELLMAN

Medieval India; emphasis on forms of political organizations and economic life, social organizations, and cultural developments. Offered jointly with the Department of History.

**484J History of India: A.D. 1525 to the Present (5) Sp**

SPELLMAN

Modern India; emphasis on forms of political organizations and economic life, social organizations and cultural developments. Offered jointly with the Department of History. Prerequisite, 281J or permission.

**485J Ancient Indian Politics (3) A**

SPELLMAN

Emphasizes the role of kingship, administration of justice, principles of statecraft, economic aspects, and the role of society within the political framework. Offered jointly with the Department of History. Prerequisite, 280J or permission.

**489 Russian and East European Bibliography (5) W**

BOBA

Analysis of problems of bibliography in the social sciences and humanities concerning Russia and Eastern Europe. For seniors and graduate students interested in these fields. Prerequisite, one East European language or German.

**493J Economy of Modern China (5) W**

MAH

Economic development of contemporary China, with special emphasis on the objectives, performance, and problems of the mainland Chinese economy under the Communist regime. Offered jointly with the Department of Economics. Prerequisites, Economics 200, 201.

**495J Special Studies in the Theatre Arts of Asia (3, max. 9) AWSp**

MCKINNON AND VISITING ARTISTS

Fundamentals in the theory and practice of the theatre arts of Asia. The study of a given form or tradition of theatre art in any one quarter will depend on the visiting artists and the idioms of their choice. Offered jointly with the School of Drama.

**496H The Thought and Arts of Russia (5) W**

SWAYZE

Honors Program seminar. Prerequisite, permission of Arts and Sciences Honors Program adviser.

**499 Undergraduate Research (3-5, max. 15) AWSp**

For Far Eastern majors. Prerequisite, permission.

## Courses for Graduates Only

**500 Research Seminar in Asian Arts (3-5, max. 15)**

MCKINNON, ROGERS

An interdisciplinary inquiry into the history, aesthetics, and forms of Asian Arts. Prerequisite, permission.

**501 Seminar on Buddhist Terminology (5) A**

CONZE

The meaning of Buddhist technical terms will be determined chiefly from authoritative commentaries.

**505J Research Seminar: China and Northeast Asia (3, max. 6) Sp**

*Geography.* Offered jointly with the Department of Geography.

**506J Research Seminar: Southeast Asia (3, max. 6)**

*Geography.* Offered jointly with the Department of Geography.

**507J Research Seminar: Soviet Union (3, max. 6) WSp**

JACKSON

*Geography.* Offered jointly with the Department of Geography.

**509J Research Seminar: Japan (3, max. 6) W**

KAKIUCHI

*Geography.* Offered jointly with the Department of Geography.

**510 Seminar in Soviet Literary Politics (5) Sp**

SWAYZE

Examination of literary policies of the Soviet regime and their impact on Soviet belles-lettres. Prerequisites, History 423J or Political Science 441J, Russian 421, or permission. Reading knowledge of Russian desirable.

**516J Field Course in Chinese History: Traditional Period (3-6) Sp**

DULL

To introduce students to western language materials on traditional China in order to give the students bibliographical and other assistance in preparing for examinations in this field in history. Offered jointly with the Department of History.

**519J Seminar on Asia (3, max. 6) Sp**

FAIRSERVIS

The large cultural regions of the continent are studied in succession, with special reference to ethno-historical problems. Offered jointly with the Department of Anthropology. (Offered alternate years; not offered 1967-68.)

**520J Seminar on the Foreign Policy of the Soviet Union (3) Sp**

RESHETAR

Selected topics in the development, methods, and objectives of the foreign policy of the Soviet Union. Offered jointly with the Department of Political Science. Prerequisite, permission.

**521, 522, 523 Seminar on Modern Asian History (3,3,3) A,W,Sp**

TAYLOR

**525, 526 Seminar on Far Eastern Diplomacy (3,3) W,Sp**

WILLISTON

**528J History of Eastern Europe, 1772-1939 (5)**

SUGAR

A study of the East-Central European region: Poland, Czechoslovakia, Hungary, Rumania, and the Balkan countries, from their rebirth to World War II. Offered jointly with the Department of History. Prerequisite, reading knowledge of German, French, Russian, or one East European language.

**530 Seminar on China (3) W**

DULL, WILHELM

Problems of Chinese history. Prerequisite, permission.

**534J Modern Russian History (3-6) A**

TREADGOLD

Offered jointly with the Department of History.

**535J-536J-537J Seminar in Modern Russian History (3-6)-(3-6)-(3-6) A,W,Sp**

TREADGOLD

Seminar in modern Russian history. Offered jointly with the Department of History. Prerequisite, reading knowledge of Russian.

**539J Medieval Russian History (3-6) Sp**

SZEFTEL

Offered jointly with the Department of History. Prerequisites, 421J, 448J, or permission; Russian or French, and German.

**541J The Soviet Political System (4) A**

RESHETAR

Critical appraisal of the principal research methods, theories, and types of literature dealing with the government and politics of the Soviet Union. Offered jointly with the Department of Political Science. Prerequisite, permission.

**545J Seminar in Japanese Government and Diplomacy (3, max. 6) W**

HELLMANN

Offered jointly with the Department of Political Science.

# FAR EASTERN AND RUSSIAN INSTITUTE

## 546J-547J Seminar in Medieval Russian History (3-6)-(3-6) A,W BOBA, SZEFTTEL

Offered jointly with the Department of History. Prerequisites, reading knowledge of Russian and permission.

## 548J History of Eastern Europe, 1939 to the Present (5)

SUGAR

Prerequisite, reading knowledge of one major European language or one East European language. Offered jointly with the Department of History. (Offered alternate years; offered 1967-68.)

## 549J Japan in the Twentieth Century (3-6) Sp BUTOW

Field course. Prerequisite, permission. Offered jointly with the Department of History.

## 550J-551J-552J Seminar in War and Diplomacy: The Totalitarian Challenge, 1931-45 (3-6)-(3-6)-(3-6) A,W,Sp BUTOW

The diplomacy of the Second World War with particular reference to the confrontation between the United States and the Axis Powers. Offered jointly with the Department of History. Prerequisite, permission.

## 556J-557J-558J Seminar in Chinese History: Traditional Period (3-6)-(3-6)-(3-6) A,W,Sp DULL

Offered jointly with the Department of History. Prerequisites, reading knowledge of Chinese and permission.

## 559J Japan in the Nineteenth Century (3-6) W PYLE

Field course. Offered jointly with the Department of History. Prerequisites, 453J, 454J, or permission. (Offered 1967-68.)

## 560J-561J-562J Seminar in Modern East European History (3-6)-(3-6)-(3-6) A,W,Sp SUGAR

Study and research involving special methods dealing with the histories of the East European countries in the modern period. Offered jointly with the Department of History.

## 567J-568J-569J Seminar in Korean History (3-6)-(3-6)-(3-6) A,W,Sp KOH

Selected topics in Korean history and historiography. Offered jointly with the Department of History. Prerequisite, permission. (Last offered 1966-67.)

## 578J Seminar in Southeast Asian Linguistics (3, max. 9) A LI, THOMPSON

Advanced consideration of specialized problems in Southeast Asian Linguistics. Reports

on individual research. Offered jointly with the Department of Linguistics. (Offered alternate years; offered 1967-68.)

## 587J Indian History (3-6) SPELLMAN

Offered jointly with the Department of History. Prerequisite, permission.

## 595J Soviet Economics (3) A THORNTON

Analysis of problems of economic measurement, economic development, optimum resource allocation, national income, and planning in the Soviet Union. Offered jointly with the Department of Economics. Prerequisite, permission. (Offered alternate years; not offered 1967-68.)

## 598 Inner Asia Research Colloquium (5, max. 15) AWSp LI, POPPE, WYLIE

A research seminar whose geographical focus is the area comprising Tibet, Mongolia, and Turkestan. Prerequisite, permission.

## 599 Colloquium on Chinese History Research (5, max. 15) AWSp DULL, GASSTER, HSIAO, MAH, SCHWARZ, SHIH, TAYLOR, WILHELM

A research seminar that deals with various aspects of Chinese society, modern and contemporary. Prerequisite, permission.

## 600 Research (\*) AWSp Prerequisite, permission.

## 611J-612J-613J Seminar in Chinese History: Modern Period (3-6)-(3-6)-(3-6) A,W,Sp GASSTER

Research seminar in modern Chinese history. Offered jointly with the Department of History. Prerequisites, reading knowledge of Chinese and permission.

## 614J Field Course in Chinese History: Modern Period (3-6) Sp GASSTER

Field course in modern Chinese history. Offered jointly with the Department of History.

## 700 Thesis (\*) AWSp

# FAR EASTERN AND SLAVIC LANGUAGES AND LITERATURE

## Courses for Undergraduates

### BULGARIAN

## 401, 402 Elementary Bulgarian (5,5) A,W MICKLESEN

Introduction to Bulgarian phonology and grammar in terms of the modern spoken language. Writing conventions of literary Bulgarian. Prerequisite, Russian 305 or 310, or permission. (Alternates with Serbo-Croatian 401, 402; offered 1967-68.)

## 411 Readings in Bulgarian (5) Sp MICKLESEN

Reading in modern authors to increase student's command of grammar and vocabulary. Prerequisite, 402. (Alternates with Serbo-Croatian 411; offered 1967-68.)

### CHINESE

## 101 Chinese, Intensive AB (10) A LI

Introduction to sounds and structure of modern Chinese (Mandarin) by the inductive method. After acquiring a certain familiarity with the language, students are introduced to the written language.

## 150 Accelerated Chinese ABC (15) S

Introduction to sounds and structure of modern Chinese (Mandarin) by the inductive method. After acquiring a certain familiarity with the language, students are introduced to the written language. This course is especially recommended for students (particularly graduates) who plan to devote more time to other subjects during the regular academic year.

## 200 Chinese, Non-Intensive D (5) A LAO

Continuation of 150. Prerequisite, 150 or permission.

## 201 Chinese, Intensive CD (10) W LI

Continuation of 101. Prerequisite, 101 or equivalent.

## 250 Chinese, Non-Intensive E (5) W LAO

Continuation of 200. Prerequisite, 200 or permission.

## 300 Chinese, Non-Intensive F (5) Sp LAO

Continuation of 250. Prerequisite, 250 or permission.

## 301 Chinese, Intensive EF (10) Sp LI

Continuation of 201. Rapid learning of Chinese characters and reading of texts. Students should learn about 1,500 characters by the end of the year. Prerequisite, 200 or 201.

## 302, 303, 304 Intermediate Modern Chinese (5,5,5) A,W,Sp YEN

Selected readings in modern Chinese literature, philosophy, history, and political science (including newspaper materials). Prerequisite, 300 or 301, or equivalent.

## 315 Advanced Chinese Conversation (1-3, max. 9) AWSp YEN

Participation in the program of the Chinese House or attendance at a noon-hour session supervised by a language informant. Prerequisite, 300 or 301, or equivalent.



# FAR EASTERN AND SLAVIC LANGUAGES AND LITERATURE

**350 Third-Year Accelerated Chinese (15) S**  
Prerequisite, 300 or 301, or equivalent.

**401, 402, 403 Chinese Dialects (5,5,5) A,W,Sp**  
LI, YEN

Introduction to the sound and structure of one of the following Chinese dialects: (A) Cantonese, (B) Foochow, (C) Amoy, and (D) Shanghai. Prerequisite, 304. (Not offered 1967-68.)

**405, 406, 407 Classical and Documentary Chinese (5,5,5) A,W,Sp**  
SERRUYS

Syntactical analysis, translation from literary Chinese into English and vice versa. To be taken in sequence only. Prerequisite, 300 or 301, or equivalent.

**408 Chinese Reference Works and Bibliography (3) Sp**  
WILHELM

Introduction to the methodology of Sinology. Prerequisite, 300 or 301, or equivalent. (Offered alternate years; offered 1967-68.)

**412 Conventions in Chinese Poetry (5) A**  
HUDDLESTON

A survey of important conventions in the genres of traditional Chinese poetry, from earliest times to the end of the Sung dynasty. Where possible, comparisons will be drawn with reference to Western poetic usage. Open to majors and nonmajors. Knowledge of Chinese language not required.

**430 Readings in Chinese Philosophical Texts (5) W**  
SHIH

Prerequisite, permission.

**451, 452, 453 Structure of Chinese (3,3,3) A,W,Sp**  
YEN

Practical phonetics with special application to the problem of articulation improvement. Morphology with application to vocabulary building, use of particles and syntax. Prerequisite, 304.

**455, 456, 457 Chinese Literature (5,5,5) A,W,Sp**  
WILHELM

455: lectures on Chinese literature from earliest time to the end of Han. 456: lectures on Chinese literature from the end of Han to the end of T'ang. 457: lectures on Chinese literature since T'ang times. Prerequisite, 300 or 301, or equivalent. (Offered alternate years; offered 1967-68.)

**458 Modern Chinese Fiction (5) A**  
SHIH

Studies of representative works of major Chinese fiction writers from 1918 to 1949. Prerequisite, 304 or permission.

**461, 462, 463 Advanced Contemporary Chinese (5,5,5) A,W,Sp**  
YEN

Selections from Communist publications where a large amount of new terminology is introduced and a great number of abbreviated characters used. Prerequisite, 304.

**499 Undergraduate Research (3-5, max. 15) AWSp**

For Far Eastern majors. Prerequisite, permission.

## CZECH

**401, 402 Elementary Czech (5,5) A,W**  
MICKLESEN

Introduction to the essentials of spoken and written Czech. Prerequisites, Russian 305, 310, or permission. (Alternates with Polish 401, 402; offered 1968-69.)

**411 Readings in Czech (5) Sp**  
MICKLESEN

Modern Czech prose, leading to a command of the language as a research tool and providing an adequate basis for further study. (Alternates with Polish 411; offered 1968-69.)

## HUNGARIAN

**301, 302, 303 Elementary Hungarian (5,5,5) A,W,Sp**  
LEHTINEN

Introduction to spoken Hungarian pronunciation, basic grammar, conversation. Limited reading and writing in 301 and 302. More extensive reading and writing in 303.

## JAPANESE

**101-102, 103 First-Year Conversational Japanese (5-5,5) A,W,Sp**

Introduction to spoken Japanese, pronunciation, oral composition, and grammar; reading of romanized Japanese; conversation, composition, and grammar; introduction to modern written Japanese in 103.

**150 Accelerated Japanese ABC (15) S**  
TATSUMI

A beginning course covering the same ground as Japanese 101-102, 103. Introduction to spoken Japanese, pronunciation, oral composition, and grammar; reading of romanized Japanese; conversation, composition, and grammar; introduction to modern written Japanese.

**201, 202, 203 First-Year Reading Japanese (5,5,5) A,W,Sp**  
NIWA

Reading and translation of modern Japanese. Also oral work in Japanese. Prerequisites, 101-102, 103 or equivalent.

**301, 302, 303 Second-Year Reading Japanese (5,5,5) A,W,Sp**  
HIRAGA

Reading and translation of modern Japanese. Also oral work in Japanese. Prerequisite, 203 or equivalent.

**311, 312, 313 Accelerated Japanese Language Program (15,15,15) A,W,Sp**  
MATSUDA, NIWA

311: oral-aural approach to modern Japanese. Requires full-time commitment by the student. Attendance at language laboratory hours required in addition to regular five-hour day. 312: first-year reading Japanese. Reading and translation of modern Japanese. Classes conducted principally in Japanese. Prerequisite, 311 or permission. (Same material covered as in 201, 202, 203.) 313: second-year reading Japanese. Reading and translation of modern Japanese. Classes conducted principally in Japanese. Prerequisite, 312 or permission. (Same material covered as in 301, 302, 303.)

**314 Modern Japanese Composition (5) S**  
MATSUDA

Class conducted in Japanese. Especially recommended for students (particularly graduates) who plan to study 401, 402, 403. Prerequisites, 303, 313, or equivalent.

**401, 402, 403 Third-Year Reading Japanese (5,5,5) A,W,Sp**  
MATSUDA

Reading of newspapers and other modern materials. Discussions in Japanese in class. Prerequisites, 303, 313, or permission.

**451, 452, 453 Japanese for China Specialists (5,5,5) A,W,Sp**  
HURVITZ

Enables student with reading knowledge of Chinese to read Japanese high-school level material on China. Prerequisite, permission.

**460 Readings in Modern Japanese Literature (3-5, max. 15)**  
MCKINNON

Close reading and discussion of representative works of twentieth century poetry, fiction, and drama in the original text. Prerequisite, permission. (Offered alternate years; not offered 1967-68.)

**499 Undergraduate Research (3-5, max. 15) AWSp**

For Far Eastern majors. Prerequisite, permission.

## KOREAN

**211-212, 213 Elementary Korean (5-5,5) A,W,Sp**  
LUKOFF

Introduction to the modern standard Korean spoken and written language.

**311, 312, 313 Intermediate Korean (5,5,5) A,W,Sp**  
LEE, LUKOFF

Systematic expansion of vocabulary and grammatical forms of standard Korean; introduction of Chinese characters in mixed script. Prerequisite, 213 or equivalent.

# FAR EASTERN AND SLAVIC LANGUAGES AND LITERATURE

**411, 412, 413 Readings in Contemporary Korean (5,5,5) A,W,Sp**  
LUKOFF

Reading in a variety of modern standard styles, with oral and written practice. Prerequisite, 313 or equivalent.

**465, 466, 467 Readings in Korean Documents (5,5,5) A,W,Sp**  
SUH

465: Korean bibliography and references. Prerequisite, 413 or permission. 466, 467: Primarily for students in the social sciences majoring in the Korean field. Prerequisite, 465 or permission.

## MONGOLIAN

**302 Introduction to Mongolian (5) A**  
POPPE, YIDEMJAB  
Beginner's grammar, easy texts.

**303 Modern Mongolian Literary Language (5) W**  
POPPE, YIDEMJAB

Grammar, syntax, and styles of modern Mongolian based on colloquial and Cyrillic alphabet. Prerequisite, 302.

**304 Colloquial Mongolian (5) Sp**  
POPPE, YIDEMJAB

Grammar of the spoken language in Outer and Inner Mongolia. Reading of colloquial texts, translation into English, conversation in Mongolian. Prerequisite, 303.

**305 Classical Mongolian (5) Sp**  
POPPE

Grammar, syntax, styles of the Mongolian written language of the seventeenth to twentieth centuries. Prerequisite, 304.

**402, 403, 404 Intermediate Mongolian (5,5,5)**  
POPPE, YIDEMJAB

Selected readings in modern Mongolian literature, history, political science, and newspaper materials. Prerequisites, 304 and 305, or equivalent.

**499 Undergraduate Research (3-5, max. 15) WSp**  
POPPE

For Far Eastern majors. Prerequisite, permission.

## POLISH

**401, 402 Phonetics, Grammar, and Vocabulary (5,5) A,W**  
MICKLESEN

Acquaints the student with the principal morphological and syntactic features of the Polish language through the medium of a basic vocabulary. Prerequisite, Russian 305 or 310, or permission. (Alternates with Czech 401, 402; offered 1967-68.)

**411 Readings in Polish (5) Sp**  
MICKLESEN

Designed to enlarge the student's general vocabulary by the reading of short texts selected from Polish authors of the nineteenth and twentieth centuries. Prerequisite, 402. (Alternates with Czech 411; offered 1967-68.)

**451, 452, 453 Polish Literature (5,5,5) A,W,Sp**  
MICKLESEN

Continuation of 401, 402, 411 to provide introduction to Polish literature through selected readings of the main works from nineteenth and twentieth centuries. The course also reinforces the student's basic knowledge of vocabulary, grammatical patterns, and conversation. (Offered 1968-69.)

## ROMANIAN

**411J-412J Intensive Phonetics, Grammar, Vocabulary (5-5) A,W**  
AUGEROT

A comprehensive introduction to both spoken and literary Romanian. Offered jointly with the Department of Romance Languages and Literature.

**413J Readings in Romanian (5) Sp**  
AUGEROT

Designed to increase the student's vocabulary and enhance his knowledge of grammar through the reading of short fictional material in modern Romanian. Offered jointly with the Department of Romance Languages and Literature. Prerequisites, 411J-412J.

## RUSSIAN

**100-105 Russian A-B (5-5) A,W**  
DIXON

Introduction to Russian. Extensive oral practice to afford assimilation of basic structural features. Introduction to reading and composition. One hour weekly: lectures on pronunciation, grammar, and writing; opportunities for student questions (conducted in English). Four hours weekly: practice sessions conducted entirely in Russian. (See also 110.) For continuation, see 200.

**110 Intensive Russian AB (10) A**  
GROSS

Covers material of 100-105 in one quarter. Two hours weekly: lectures on pronunciation, grammar, and writing (conducted in English). Eight hours weekly: practice sessions conducted entirely in Russian. For continuation, see 210.

**130 Scientific Russian (5) AWSp**  
GERSHEVSKY

Introduction to written Russian as a research tool for science students. Readings in chemistry and physics, etc. Not counted for Russian major language credit.

**150 Accelerated Russian ABC (15) S**  
HAGGLUND

Covers material of 100-105, 200 in one quarter. Recommended for students who want to acquire rapidly a considerable proficiency. For continuation, see 205 or 250, 300, 305.

**200 Russian C (5) ASp**  
TRACY

Continuation of 100-105. Prerequisite, -105 or 110, or permission.

**205 Russian D (5) A,W**  
TRACY

Sequel to 200. For continuation, see 300, 305. Prerequisite, 150 or 200, or permission.

**210 Intensive Russian CD (10) W**  
GROSS

Continuation of 110. Covers material of 200, 205 in one quarter. For continuation, see 310. Prerequisite, 110 or -105, or permission.

**230 Scientific Russian, Intensive (10) S**  
GERSHEVSKY

Introduction to written Russian as a research tool for science students only. Readings in chemistry and physics. Not counted for Russian major language credit.

**250 Accelerated Russian DEF (15) S**  
HAGGLUND

Continuation of 150. For Summer Quarter students who wish to complete a second 15 credits of Russian. Prerequisite, 150, 200, or permission.

**300, 305 Russian E, F (5,5) W,Sp**  
TRACY

Continuation of 205. Prerequisite, 205 or 210, or permission.

**310 Intensive Russian EF (10) Sp**  
GROSS

Continuation of 210. Covers material of 300, 305 in one quarter. Prerequisite, 205 or 210, or permission.

**311, 312, 313 Intermediate Russian A, B, C (5,5,5) A,W,Sp**  
HOLDSWORTH

Oral and writing practice based on Russian prose readings. Intensive review and supplementation of structural knowledge. One hour weekly conducted in English, four hours weekly in Russian. Prerequisite, 305 or 310, or permission.

**315 Intermediate Russian Conversation (2-3, max. 9) AWSp**  
TRACY

Participation in the program of the Russian House, supervised by a member of the Department in weekly conferences. Prerequisite, 305 or 310, or equivalent.

**330 Scientific Russian Readings (5, max. 10) AWSp**  
GERSHEVSKY

Reading and translation of Russian scientific articles, mainly in the fields of chemistry and physics. Prerequisite, 130 or 230, or permission. Not counted for Russian major language credit.

**350 Intermediate Intensive Russian (10) S**  
GRIBANOVSKY

Oral and writing practice based on Russian prose readings. Intensive review and supplementation of structural knowledge of Russian. Prerequisite, 310, 250, or 205.

**411, 412, 413 Advanced Conversation and Composition A, B, C, (5,5,5) A,W,Sp**  
GRIBANOVSKY, VINCOV  
Class conversation and composition based on reading. Prerequisites, 313 for 411; 411 for 412; 412 for 413.

**451, 452, 453 Structure of Russian (3,3) A,W,Sp**  
AUGEROT  
Descriptive analysis of the phonology and morphology of contemporary standard Russian. Prerequisites, 313 or equivalent for 451; 451 for 452; 452 for 453, or permission.

**455 History of Russian Standard Language (5) Sp**  
MICKLESEN  
An outline of phonological, morphological, and lexical developments of the Russian literary language from earliest literary documents to the present. Prerequisite, 452 or permission.

**461, 462 Introduction to Russian Literature (3,3) A,W**  
HAGGLUND  
Discussion and analysis of Russian prose, poetry, and drama in Russian. Prerequisite, 313 or permission of instructor.

**464 The Russian Symbolist Movement (3) Sp**  
IVASK  
A study of Russian poetry and prose of the "Symbolist" period (1895-1910). (Offered alternate years; offered 1967-68.)

**465 Modern Russian Poetry (Acmeism and Futurism) (3) A**  
IVASK  
A study of Russian poetry in its renaissance, from 1890 to 1925. Prerequisite, 413 or equivalent. (Offered alternate years; offered 1967-68.)

**467 Soviet Literature Since Stalin (3) W**  
SWAYZE  
Prerequisites, 421, reading knowledge of Russian.

**468 Contemporary Russian Literary Criticism (3) Sp**  
SWAYZE  
Recent trends in the Russian study of literature.

**470 Russian Versification (3) Sp**  
IVASK  
Russian versification and poetic language with a brief survey of bibliography pertaining to Russian literary studies. Prerequisite, 465 or permission.

**499 Undergraduate Research (3-5, max. 15) AWSp**  
For Far Eastern majors only. Prerequisite, permission.

**SANSKRIT**  
**301, 302, 303 Introduction to Sanskrit (3,3,3) A,W,Sp**  
GEROW  
Intensive study of the basic grammatical structure of the classical language; reading of elementary texts from the epic and classical periods.

**401, 402 Intermediate Sanskrit (3,3) A,W**  
GEROW  
Advanced classical grammar; rapid reading of a kāvya text or texts, ordinarily a drama or major prose work. Prerequisite, 303.

**403 Introduction to Vedic Study (3) Sp**  
GEROW  
Reading of selected Vedic hymns, with extensive linguistic and historical analysis; problems of comparative grammar in relation to Sanskrit. Prerequisite, 402.

**SERBO-CROATIAN**  
**401-402 Phonetics, Grammar, and Vocabulary (5-5) A,W**  
MICKLESEN  
A comprehensive introduction to both spoken and written literary Serbo-Croatian. Prerequisite, Russian 305 or 310, or permission. (Alternates with Bulgarian 401, 402.)

**411 Reading in Serbo-Croatian (5) Sp**  
MICKLESEN  
Designed to increase the student's vocabulary and enhance his knowledge of grammar through the reading of short stories in the modern literary idiom. Prerequisites, 401-402. (Alternates with Bulgarian 411; offered 1967-68.)

**SLAVIC**  
**450 Introduction to Slavic Philology (3) A**  
GOVE  
Slavic languages and their geographical and dialectal distribution; Slavic civilization throughout prehistoric and early historic periods; principal phonological and morphological features of Slavic as a subgroup of the Indo-European family of languages.

**THAI**  
**301, 302, 303 Basic Thai (5,5,5) A,W,Sp**  
GREKOFF  
Introduction to the structure of modern spoken and written Thai. One hour lecture and five hours intensive oral practice (in Thai) per week. Prerequisites, none for 301; 301 for 302; 302 for 303.

**401, 402, 403 Intermediate Thai (5,5,5) A,W,Sp**  
GREKOFF  
Reading of more complicated material in preparation for classes conducted in Thai where material is discussed. Review of structure. Prerequisites, 303 or equivalent for 401; 401 for 402; 402 for 403.

**TIBETAN**  
**401, 402, 403 Colloquial Tibetan (5,5,5) A,W,Sp**  
NORNANG  
Introduction to phonology, morphology, and syntax of spoken Tibetan (Lhasa dialect) by the inductive method.

**404, 405, 406 Literary Tibetan (3,3,3) A,W,Sp**  
WYLIE  
Introduction to the phonology, grammar, and syntax of written Tibetan. Materials selected for rapid development of reading knowledge.

**414 Readings in Modern Tibetan (3, max. 9) AWSp**  
NORNANG, WYLIE  
Selections from various Tibetan materials including newspapers and magazines. Prerequisite, 406 or equivalent.

**421, 422, 423 Advanced Colloquial Tibetan (5,5,5) A,W,Sp**  
NORNANG  
Instruction and drill in advanced colloquial sentence patterns and syntactical constructions.

**499 Undergraduate Research (3-5, max. 15) AWSp**  
NORNANG, WYLIE  
For Far Eastern majors. Prerequisite, permission.

**TURKIC**  
**301, 302, 303 Yakut (3,3,3) A,W,Sp**  
Phonological, morphological, and syntactical analysis of Yakut as a representative Turkic language.

**311, 312, 313 Introduction to Osman Turkish (3,3,3) A,W,Sp**  
TUNA  
Osman Turkish as part of Osmanly, the literary classical Turkish. Linguistic analysis of the language. Reading of texts written in Latin and Arabic alphabets with the emphasis on the latter for preparatory basic knowledge, and understanding of the other early periods of the language. Prerequisites, 311 for 312; 312 for 313.

**321, 322 Intensive Modern Spoken Turkish (5,5) S**  
TUNA

**404 Survey of Turkic Languages (3) W**  
KALUZYSKI  
Linguistic outlines of modern Turkic languages. Brief phonetical, morphological, and syntactical analysis of selected materials. Of interest to students of Turkic, anthropology, and linguistics. (Offered alternate years; offered 1967-68.)

**VIETNAMESE**  
**301, 302, 303 Basic Vietnamese (5,5,5) A,W,Sp**  
Introduction to the structure of modern spoken and written Vietnamese. One hour lecture and five hours intensive oral practice (in Vietnamese) per week. Prerequisites, 301 for 302; 302 for 303.

# FAR EASTERN AND SLAVIC LANGUAGES AND LITERATURE

## 401, 402, 403 Intermediate Vietnamese (5,5,5)

Reading of more complicated material in preparation for classes conducted in Vietnamese where material is discussed. Review of structure. Prerequisites, 303 or equivalent for 401; 401 for 402; 402 for 403. (Offered alternate years; not offered 1967-68.)

## 461, 462, 463 Modern Vietnamese Literature (5,5,5) A,W,Sp

Survey of directions in modern Vietnamese literature. Analysis and discussion of typical texts. (Alternates with 471, 472, 473.) Prerequisite, 403 or equivalent.

## 471, 472, 473 Sino-Vietnamese (5,5,5)

Introduction to Sino-Vietnamese literature. Reading and discussion of typical texts. (Alternates with 461, 462, 463; not offered 1967-68.)

## LITERATURE COURSES IN ENGLISH

### Chinese 320 Chinese Literature in English (5) W

HUDDLESTON, SHIH

A general survey with special attention to historical, philosophical, and cultural background; emphasis upon modern literary movements stimulated by China's contact with the West. No knowledge of the Chinese language is required. (Offered alternate years; not offered 1967-68.)

### Indic 320 Indic Literature in English (5) W

GEROW

A general survey with special attention to historical, philosophical, and cultural background. No knowledge of the Sanskrit language is required. (Offered alternate years; not offered 1967-68.)

### Japanese 420 Japanese Literary Tradition (5) A

MCKINNON

A broad inquiry into the literary heritage of Japan through reading and discussion of representative works available in English in prose, poetry, and drama from early beginnings to mid-nineteenth century.

### Japanese 421 Modern Japanese Literature in English (5) W

MCKINNON

Discussion and analysis of representative works, especially of fiction, from the late nineteenth and twentieth centuries.

### Japanese 422 Studies in Japanese Poetry in English (5) Sp

MCKINNON

Traditions and techniques; systematic investigation of the major poetic forms, focusing on representative poets and their works.

### Japanese 423 Studies in Japanese Drama in English (5) Sp

MCKINNON

Principal forms, techniques, and theory of No, Kyogen, Joruri, and Kabuki; also the

contemporary theater. Aspects of the stage, costume, masks, and other accoutrements of the theater will be discussed along with its principal playwrights and performers.

### Korean 320 Korean Literature in English (5) Sp

SUH

Historical development of Korean literature. Special consideration to the relationship with Chinese and Japanese literature. (Offered alternate years; offered 1967-68.)

### Mongolian 320 Mongolian Literature in English (5) Sp

POPPE

(Offered 1967-68.)

### Russian 320 Russian Literature in English (5) A

HAGGLUND

Introduction, from 1782 to the present. Representative prose and poetical works of the foremost Russian and Soviet writers are discussed and analyzed.

### Russian 421 Contemporary Russian Literature in English (5) W

SWAYZE

From Gorky to Sholokov.

### Russian 422 Russian Plays in English (5) Sp

KONICK

From 1782 to 1948.

### Russian 426 The Russian Novel in English (5) W

KONICK

Goncharov, Tolstoy, Turgenev

### Russian 427 The Russian Novel in English (5) W

KONICK

Dostoevsky, Gogol

### Slavic 320 Polish Literature in English (5) Sp

Historical outline from the Middle Ages to our time, in English translation.

### Turkic 320 Eastern Turkish Literature in English (3) A

Covers both the historical (Chaghatai XV-XIX Centuries) and the modern (mainly Uzbek) periods of Eastern Turkish literature. History, types of literary works, and characteristic elements of prose and poetry will be presented by using selected material translated into English.

## Courses for Graduates Only

### CHINESE

#### 522, 523, 524 Readings in Classical Chinese (5,5,5) A,W,Sp

HUDDLESTON, SERRUYS

#### 526, 527, 528 Studies in Chinese Literature (5,5,5) A,W,Sp

SHIH

526: literature of the Chou and Han periods. 527: literature from Wei to T'ang times. 528: literature since the end of T'ang. (Offered alternate years; offered 1967-68.)

#### 529 Chinese Phonology (3) A

LI

#### 530 Studies in Chinese Prose (5) A

WILHELM

(Offered alternate years; offered 1967-68.)

#### 531 Studies in Chinese Poetry (5) W

SHIH

(Offered alternate years; not offered 1967-68.)

#### 532 Studies in Chinese Drama and Novel (5) Sp

SHIH

(Offered alternate years; not offered 1967-68.)

#### 534, 535 Introduction to Texts in Ancient Script (5,5) W,Sp

SERRUYS

Structure of Chinese characters. Development of Chinese script and related problems. Selected texts of inscriptions. Prerequisite, permission.

#### 536, 537, 538 Readings in Chinese Political Thought and Institutions (5,5,5) A,W,Sp

HSIAO

For students wishing to develop proficiency in using Chinese source material. Different texts each quarter, selected primarily on basis of students' needs. Prerequisite, permission. (Offered alternate years; not offered 1967-68.)

#### 550 Seminar on Chinese Literature (4, max. 8) Sp

SHIH

(Offered alternate years; not offered 1967-68.)

#### 555 Seminar on Chinese Linguistics (3, max. 9) WSp

LI

Advanced phonology, problems of archaic Chinese, dialectology; descriptive and historical treatment of Sinitic languages. For advanced students of Chinese or of linguistics. Prerequisite, permission.

#### 561, 562, 563 Modern Chinese Readings (5,5,5) A,W,Sp

LAO

Selections from learned journals and scholarly books in intermingled styles (colloquial and literary Chinese). Prerequisite, 304.

#### 600 Research (\*) AWSp

Prerequisite, permission.

#### 700 Thesis (\*) AWSp

# FAR EASTERN AND SLAVIC LANGUAGES AND LITERATURE

## JAPANESE

### 500 Readings in Bibliographical Materials (5) W

HIRAGA

Intensive reading and discussion of materials from principal bibliographical sources in the social sciences and the humanities pertaining to Asia. Reports on selected topics and problems. Prerequisite, 403 or permission.

### 522, 523, 524 Readings in Documentary Japanese (5,5,5) A,W,Sp

HIRAGA

Readings in documents of the Tokugawa and Meiji periods in the literary and epistolary styles; introduction to *kambun*. (Offered when demand is sufficient.) Prerequisite, permission.

### 550 Readings in Classical Japanese Literature (3-5, max. 15) A

MCKINNON

Readings in prose, poetry, and drama, antiquity to nineteenth century. Prerequisite, permission. (Offered alternate years; offered 1967-68.)

### 570 Seminar in Japanese Literature (3-5, max. 15) A,W,Sp

MCKINNON

Close examination of selected periods, writers, or genres, including problems of literary criticism in Japanese literature. Prerequisite, 15 credits in 460 or 550. (Offered alternate years; not offered 1967-68.)

### 600 Research (\*) AWSp

Prerequisite, permission.

### 700 Thesis (\*) AWSp

## KOREAN

### 501, 502, 503 Seminar in Korean (3-5, 3-5, 3-5) A,W,Sp

LUKOFF

(Offered alternate years; not offered 1967-68.)

### 506 Comparative Korean Linguistics (5) Sp

LEE

Korean dialects and tenetic relationship of Korean. Prerequisite, permission. (Last offered 1966-67.)

### 521, 522, 523 Modern Korean Literature (5,5,5) A,W,Sp

SUH

Readings in important works in Korean literature of the twentieth century. Prerequisite, 512 or equivalent. (Offered alternate years; offered 1967-68.)

### 531, 532, 533 Classical Korean Literature (5,5,5) A,W,Sp

SUH

Selected works, primarily in *Hangul* up to the twentieth century, including representative authors in prose, poetry, and drama. Prerequisite, 523 or permission. (Offered alternate years; not offered 1967-68.)

### 541, 542, 543 Readings in Hanmun Texts (5,5,5) A,W,Sp

SUH

Readings from representative authors from the fifteenth to the late nineteenth century. Prerequisite, Korean 413, Chinese 405 or Japanese 403, or permission. (Offered alternate years; offered 1967-68.)

### 550, 551, 552 Seminar in Korean Literature (3-5, 3-5, 3-5) A,W,Sp

SUH

Close examination of selected periods, writers, or genres, including literary criticism, in Korean literature. Prerequisite, 543 or 523, or permission. (Offered alternate years; not offered 1967-68.)

### 560-561 Linguistic Analysis of Middle Korean Texts (5-5) A,W

LEE

Middle Korean literature from the twelfth through the fifteenth century, especially from the point of view of the historical development of the language. Prerequisite, permission. (Last offered 1966-67.)

### 600 Research (\*) AWSp

SUH

Prerequisite, permission.

## MONGOLIAN

### 521 Ancient Mongol: hPhagspa Script (3) A

KALUZYNSKI, POPPE

Script and grammar of hPhagspa texts; reading and translation. Prerequisite, 305. (Offered alternate years; offered 1967-68.)

### 522 Mongol: Ancient Texts (3) W

KALUZYNSKI, POPPE

Grammar and reading of Mongol texts of the fourteenth to seventeenth centuries. Historical texts are emphasized. (Offered alternate years; offered 1967-68.)

### 579J Comparative Altaic Linguistics (3)

POPPE

Comparative phonology and morphology of Mongol and Turkic and other related languages. Offered jointly with the Department of Linguistics. Prerequisite, permission.

### 600 Research (\*) WSp

POPPE

Prerequisite, permission.

## RUSSIAN

### 551 Advanced Russian Syntax (3) Sp

MICKLESEN

Detailed structural analysis of sentence types in the Russian literary language, with emphasis on grammatical categories and word classes.

### 560 Studies in Early Russian Literature (4) W

IVASK

(Offered alternate years; offered 1967-68.)

### 561 Gogol (3) A

IVASK

Close analysis of Gogol's novels, plays and stories in Russian. (Offered alternate years; offered 1967-68.)

### 562 Tolstoy (5) W

KONICK

Analysis of the works of Leo Tolstoy. Prerequisite, graduate standing. (Offered alternate years; offered 1967-68.)

### 565 Russian Eighteenth-Century Literature (5) W

IVASK

Discussion of representative works of poetry, prose, fiction, and criticism in the formative period in history of Russian letters. (Offered alternate years; not offered 1967-68.) Prerequisite, 320 or permission.

### 566 Pushkin (4) A

IVASK, KONICK

Analysis of the works of Alexander Pushkin. (Offered alternate years; not offered 1967-68.)

### 567 Dostoevsky (4) W

IVASK

Close analysis of representative works of nineteenth-century prose fiction in original texts. (Offered alternate years; not offered 1967-68.)

### 568 Nineteenth-Century Russian Poetry Since Pushkin (3) Sp

IVASK

Discussion of the masters of nineteenth-century Russian lyric poetry since Pushkin. (Offered alternate years; offered 1967-68.)

### 570 Seminar in Russian Literature (3) A

IVASK

Examination and discussion of Russian masterpieces.

### 590 Seminar in Russian Literary History (4, max. 8) Sp

IVASK

Close examination of selected periods or figures. Prerequisite, 10 graduate credits in Russian literature.

### 600 Research (\*) AWSp

Prerequisite, permission.

### 700 Thesis (\*) AWSp

## SANSKRIT

### 550 Seminar on Indic Literature (3, max 9) AWSp

GEROW

Close examination of selected authors, periods or traditions, within the context of Indian literary history. Prerequisite, Sanskrit 402. (Offered alternate years; offered 1967-68.)

# FAR EASTERN AND SLAVIC LANGUAGES AND LITERATURE

## 555 Seminar on Indian Grammar (3, max. 6) WSp

GEROW

Selected problems relating to the history of the Sanskrit language; reading and critical examination of the methodology of Pāṇini's grammar. Prerequisite, 403 or permission; 550 recommended. (Offered alternate years; offered 1967-68.)

## SLAVIC

### 552 Phonetic Structure of Slavic Languages (3) A

MICKLESEN

A detailed analysis of the phonological evolution from earliest period of the Common Slavic language. Prerequisite, 450. (Offered alternate years; offered 1967-68.)

### 553 Morphological Features of Slavic Languages (3) W

MICKLESEN

Development of various grammatical forms of the Slavic languages from the Common Slavic period. Prerequisite, 552. (Offered alternate years; offered 1967-68.)

### 555 Old Church Slavonic (3) W

GOVE

Rise and development of earliest Slavic literary language and a descriptive study of its orthography, phonology, morphology, and syntax. (Offered alternate years; not offered 1967-68.)

### 556 Readings in Old Church Slavonic (3) Sp

GOVE

Reading and grammatical interpretation of a selected group of texts. (Offered alternate years; not offered 1967-68.)

## TIBETAN

### 500 Advanced Literary Tibetan (3, max. 9) AWSp

NORNANG, WYLIE

Reading of manuscripts and xylographs with emphasis on biographical, historical, and geographical material. Prerequisite, 406 or equivalent.

### 502, 503, 504 Comparative Study of Chinese, Mongolian, Tibetan, and Sanskrit Texts (5,5,5) A,W,Sp

HURVITZ, LABRANG, LI, NORNANG, POPPE, WYLIE

Prerequisite, permission.

### 534 Buddhistic Tibetan (2, max. 6) AWSp

NORNANG

Reading of Buddhist literature in translation and original Tibetan compositions. Prerequisite, 406 or equivalent.

### 544 Ancient Tibetan Documents (2, max. 6) AWSp

WYLIE

Reading of selections from ancient documents, inscriptions, and annals. Prerequisite, 406 or equivalent.

### 600 Research (\*) AWSp

LABRANG, NORNANG, WYLIE

Prerequisite, permission.

## VIETNAMESE

### 521, 522, 523 Survey of Vietnamese Literature (3,3,3) A,W,Sp

History of literary activities in Viet Nam. Analysis and discussion of typical texts. Prerequisite, 403 or equivalent. (Alternates with 531, 532, 533; offered 1967-68.)

### 531, 532, 533 Seminar in Vietnamese Literature (3,3,3) A,W,Sp

Intensive study of key topics in Vietnamese literature. Analysis and discussion of texts. (Alternates with 521, 522, 523; offered 1968-69.)

### 600 Research (\*) AWSp

Prerequisite, permission.

### 700 Thesis (\*) AWSp

## FINANCE

### Courses for Undergraduates

#### 320 Money, Financial Institutions, and Income (4) AWSpS

JOHNSON, PIGOTT

Nature and functions of money, debt and credit, and liquidity; financial institutions and the flow of funds in the economy; income and monetary theory; and introduction to money market analysis. Prerequisites, Economics 200.

#### 327 International Finance (3) Sp

HENNING

Practices, institutional operations, and problems in international finance; the balance of international payments; financing international trade and other transactions; foreign departments of banks; the foreign exchange market and exchange rates; the impact of international financial problems on business. Prerequisite, 320.

#### 350 Business Finance (4) AWSpS

BROSKY, JOLIVET, PAGE

Sources, uses, cost, and control of funds in business enterprises. Internal management of working capital and income sources and cost of long-term funds; financing of the growth and expansion of business enterprises; government regulation of the financial process. Prerequisite, 320.

#### 360 Investments (3) AWSpS

D'AMBROSIO, OLSEN

Designed both for students who expect to enter financial work and for those who desire a general knowledge of investments. Principles in the selection of investment media; determination of individual and institutional investment policies; analysis of industries and securities. Prerequisite, 350.

### 361 Investment Markets and Portfolios (3) W

OLSON

Functions and operations of the markets for securities with emphasis on the secondary markets; theoretical and operational considerations in the management of security portfolios. Prerequisite, 360.

### 420 Money Markets (3) AWSp

PIGOTT, JOHNSON

Analysis of interrelations of financial institutions in the short-term and long-term money markets. Attention to the effects on financial institutions and money markets of Treasury and Federal Reserve policies, and the manner in which legal requirements, portfolio policies, and sources of funds result in actions by financial institutions and affect money markets. Prerequisite, 350.

### 423 Commercial Banking (3) A

HALEY

The role of banking in the economy and management problems in banking—management of bank funds, internal organization, branch banking, and external problems, including relationships between banks and government agencies. Prerequisite, 320.

### 428 Credit Administration (3) W

KRUSE

Analysis of selected loan and investment cases, from the viewpoint of the loan officer, investment officer, or other credit administrator. Prerequisite, 350.

### 450 Problems in Corporation Finance (4) AWSp

JOLIVET

Case problems in corporate financial management. Includes cases on management of current assets, obtaining short-term loans, raising long-term capital, capital budgeting, and dividend policy. The management point of view is stressed. Prerequisites, 350 and Accounting 375.

### 453 Capital Allocation (3) W

PAGE

Methods of measuring the merit of competing demands for corporate capital; factors relating to the investment decision; cost of capital. Readings and case problems. Prerequisites, 350, Business Statistics 301.

### 461 Investment Analysis (3) ASp

OLSON

An advanced course primarily for students preparing for investment banking or for professional investment work. Principles and techniques of the analysis of securities, both corporate and governmental, and workable criteria for selection or rejection of issues are emphasized. Prerequisites, 360 and Accounting 375.

### 499 Undergraduate Research (3, max. 6) AWSp

Research in selected areas of business finance, money and banking, or investments. Prerequisites, 350 and permission.

## Courses for Graduates Only

### 500 Financial Institutions and Financial Management (5) WSpS

D'AMBROSIO

A course in which money, banking, and aggregative economic activity are developed as the financial environment within which the theory and management of business finance and financial decision-making within the firm are covered. Prerequisite, permission.

### 520 Seminar in Banking Problems (3) A

HENNING

Selected problems of contemporary and permanent significance in banking and related financial institutions. Prerequisite, 320 or 500 or permission.

### 521 Seminar in Money Markets (3) W

PIGOTT

Supply and demand for funds in short-term and long-term money markets; the influence of money supply, bank reserves, legal restrictions, institutional portfolio policies, and changing needs and instruments of corporation finance. Objective is to develop ability to analyze and appraise current money market developments. Prerequisite, 420 or permission.

### 527 Seminar in International Finance and Investments (3) A

JOHNSON

Study of selected problems in financing, international trade, investment, and foreign business operations; international aspects of money markets; problems of evaluation of foreign investments. Prerequisite, 320 or 500 or permission.

### 550 Business Financial Policy (3) ASp

BROSKY

Systematic coverage of the theory of financial management. Application of quantitative analysis to the financial problems of the firm. Examination of empirical studies on the financing of the modern corporation. Prerequisites, 320, and 350 or 500, or permission.

### 552 Seminar in Corporation Finance (3) WS

JOLIVET

A study of the financing of the corporation, including recent theoretical and institutional developments. Extensive reading and discussion in designated areas covering problems relating to financial management and to the social and economic implications of the financial process. Prerequisite, 550 or permission.

### 560 Seminar in Investments (3) Sp

D'AMBROSIO

Discussion and analysis of concepts, processes, and problems of investment in securities. Theory of investment media valuation, portfolio valuation, and portfolio construction and administration for individuals and institutions. Prerequisite, 360 or permission.

### 571-572 Research Reports (3-3) AWSpS

See Accounting for description.

### 604 Research (\*, max. 10) AWSpS

Prerequisite, permission.

### 700 Thesis (\*) AWSpS

### 702 Degree Final (6) AWSpS

Limited to students completing a nonthesis degree program.

## FISHERIES

### Courses for Undergraduates

#### 101 Introduction to Fisheries Science (5) A

Identification, distribution, and life histories of selected fish and shellfish; commercial and recreational fishing; utilization of fisheries products; problems faced in fisheries conservation and management. Recommended for nonmajors.

#### 240 Applications of Digital Computers to Biological Problems (3) W

BEVAN

Methods and procedure for processing biological data by means of digital computers; problem analysis, elementary programming, use of package programs for statistical analysis. Prerequisite, Mathematics 281.

#### 311 Biology of Fishes (3) Sp

Diversity in the structure, function, and habits of fishes viewed as an expression of variations in their biological and physical environment. Prerequisites, Biology 212 or Zoology 112.

#### 314 Methods and Instruments for Fishery Investigations (1, max. 3) AWSp

SALO

Theory and practice of instrumentation and sampling in Fisheries; shipboard experience with equipment, collecting and recording data from biological samples, and the physical environment. Prerequisites, 5 credits in Fisheries.

#### 379 Fisheries of the World (3) A

VAN CLEVE

Fishes in relation to the distribution, abundance, and productivity of fishes; exploitation and problems of development, conservation of aquatic resources.

#### 380 Principles of Fisheries Technology (3) W

LISTON, DOLLAR

Composition of fish; biochemical and microbiological changes in fish post-mortem, nature and effects of processing procedures, analytical control procedures; current technological developments. Prerequisite, Chemistry 102 or 160.

#### 401 The Comparative Anatomy and Classification of Fishes (5) ASp

WELANDER

The comparative anatomy, classification, identification, and distribution of fishes. Prerequisites, 311, Biology 212 or Zoology 112.

#### 405 Economically Important Mollusca (5) A SPARKS

Classification, life histories, distribution, methods of cultivation, and economic importance of oysters, clams, scallops, abalones, cephalopods, and other mollusca. Prerequisite, Zoology 112.

#### 406 Economically Important Crustacea (5) W SPARKS

Classifications, life histories, distribution, methods of capture, and economic importance of crabs, shrimps, lobsters, crayfish, and the smaller crustacea. Prerequisite, Zoology 112.

#### 410 Zoogeography of Freshwater Fishes (3)

Distribution of freshwater fishes with special emphasis on the historical and ecological factors governing present distribution. Prerequisite, 410, or Zoology 362, or permission.

#### 425 Life History of Marine Fishes (5) W DELACY

Fecundity, spawning, incubation, and hatching of marine fishes; identification and survival of larvae and juveniles; food and feeding of adults; migration; recognition of subpopulations. Prerequisite, 401 or 402. (Offered 1967-68.)

#### 427 Ecology of Marine Fishes (5) Sp DELACY

Effect of variations in hydrographic conditions, availability of food, geographic location, and other environmental conditions on distribution of fishes; their variation in abundance and availability to the fisheries; research techniques in this field. Prerequisite, 401 or 402. (Not offered 1967-68.)

#### 451 Reproduction of Salmonoid Fishes (5) A DONALDSON

Spawning and incubation; natural and artificial methods of hatching and rearing, rates of development; racial strains and selection; evaluation of procedures; design, structure, and maintenance of facilities. Prerequisites,

#### 452 Nutrition and Care of Fishes (5) W DONALDSON

Basic nutritional requirements of fish in natural and artificial environments; feeding and efficiency of diets; nutritional diseases; stocking policies; quality evaluation. Prerequisites, 401 or 402, and 10 credits in chemistry.

#### 453 Freshwater Fisheries Management: Biological (5) Sp DONALDSON

Creel census methods; stocking policies, lake poisoning; pond fish propagation; determination of the productive capacities of streams, lakes, and ponds and their suitability for particular kinds of fishes. Prerequisites, 402 and 10 credits in chemistry. (Not offered after Spring Quarter 1967.)

## FISHERIES

### 454 Communicable Diseases of Fishes (5) Sp SPARKS

Organisms causing diseases in fishes; prevention and known treatments of fish diseases. Prerequisites, 401 or 402 and Microbiology 301 or Fisheries 302. (Not offered 1967-68.)

### 456 Principles of Management of Natural Resources (3) W BEVAN

Concept of renewable resources; fundamentals of population dynamics; data collection, storage, retrieval, and processing. Practice with simulated resource utilization. Prerequisite, Mathematics 383.

### 457 Principles of Management of Natural Resources (3) Sp MATHISEN

Management alternatives; the relationship between research and management; case history studies of managed and mismanaged resources. Practice with computer simulation of resource utilization. Prerequisite, 456.

### 460 Water Management and Pollution Studies (5) Sp M. C. BELL

Stream flows and mechanics of freshwater environment, and other problems such as natural propagation; water flow measurement in streams and pipes; use of weirs; hatchery water requirements; screening of water diversions for protection of downstream migrants; nomenclature, water rights, and protective laws. Prerequisites, 401 or 402, Mathematics 105, and physics, or permission.

### 465 Problems in Fish Biology (6) S

Taxonomy, ecology, and life history of the fishes of the San Juan Islands and Northeast Pacific. (Offered at Friday Harbor Laboratories Summer Quarter only.) Prerequisite, permission.

### 471 Principles of Aquatic Radioecology (3) A SEYMOUR

The nature, detection, measurement, differential biological effects, and evaluation of the hazards of ionizing radiations. Prerequisites, 15 credits in chemistry, 10 credits in zoology, and permission.

### 472 Methods of Aquatic Radioecology (3) W SEYMOUR

Methods of radiobiological analyses, of accumulation and loss of radionuclides, and of radionuclides as tracers in aquatic organisms. Prerequisites, 15 credits in chemistry, 10 credits in zoology, and permission.

### 473 Radionuclides in the Aquatic Environments (3) Sp SEYMOUR

The distribution of natural and artificial radionuclides, the allowable concentrations and the biological cost of introducing radionuclides in aquatic environments. Prerequisites, 15 credits in chemistry, 10 credits in zoology, and permission.

### 495 Introduction to Fisheries and Food Science Literature (2, max. 4) AWSp

Directed training in searching bibliographic sources. Prerequisite, 15 credits in fisheries.

### 499 Undergraduate Research (1-3, max. 9) AWSp

Individual research within the College of Fisheries or on-the-job training in governmental or industrial fisheries organizations. Prerequisite, permission.

## Courses for Graduates Only

### 501 On-the-Job Training (1-3, max. 3 for M.S., 9 for Ph.D.) AWSp

Guided on-the-job training in governmental or industrial fisheries organizations. Prerequisite, permission.

### 503 Systematic Ichthyology (5) Sp WELANDER

Principles and procedures of ichthyological taxonomy demonstrated by current problems and research. Prerequisites, 401 or 402 and permission.

### 505 Research Techniques in Shellfish Biology (5) Sp SPARKS

A field and laboratory course dealing with research methods in the reproduction, growth, and mortality of oysters and clams.

### 506 Shellfish Sanitation (5) Sp SPARKS, MATCHES

Problems of the shellfish industry with emphasis on chemical and microbiological contamination and control during culture, harvest, and processing. Prerequisite, permission.

### 507 Topics in Fish Ecology (1-5, max. 15) AWSp

Selected topics in the ecology of marine and freshwater fish and shellfish; factors affecting survival and migration; definition and distribution of fish populations. Prerequisite, permission.

### 510 Fish Behavior (3) A FIELDS

Behavior related to sensory-motor equipment. Design of experiments emphasized for studies ranging from naturalistic observation to controlled laboratory and field experiments. Prerequisite, permission.

### 511 Fish Behavior Laboratory (2-3, max. 6) A FIELDS

Prerequisite, 510 or concurrent registration in 510.

### 515 Fish Physiology (3) W SMITH

A survey of the functions of the organic system of teleost fishes. Prerequisites, 5 credits zoophysiology, 5 credits biochemistry.

### 516 Fish Physiology Laboratory(2) W SMITH

Selected experimental techniques in fish physiology. Prerequisite, 515 or concurrent registration in 515.

### 520 Graduate Seminar (2, max. 6) AWSp

Training in methods of searching fisheries literature.

### 530 Biological Problems in Water Pollution (3) W

Biological and ecological changes in the aquatic environment resulting from domestic, industrial, radioactive, and agricultural wastes and methods for their evaluation. Prerequisite, permission.

### 540 Application of Digital Computers to Problems in Aquatic Ecology (3) A BEVAN, PAULIK

Laboratory problems adapted to special interests of the student. Consideration of the simulation of aquatic communities, analysis of aquatic populations, and ecological changes. Prerequisite, 240 or permission.

### 556 Introduction to Quantitative Population Dynamics (5) A PAULIK

Simple analytic approaches to population management; applications of parent-progeny models and logistic models; biological and economic yields of natural populations; analysis of population data on high-speed digital computers. Prerequisites, Mathematics 124, 125, 383 and permission.

### 557 Theoretical Models of Exploited Animal Populations (5) W PAULIK

Mathematical representation of basic population processes such as growth, mortality, natality, and mobility; application of optimization technique to yield models. Laboratory work on digital computer. Prerequisite, 556 or permission.

### 558 Estimation of Population Parameters (5) Sp PAULIK

Statistical analysis of population data; design and analysis of mark-recapture experiments on natural populations; laboratory work on digital computer. Prerequisite, 557 or permission.

### 600 Research (\*) AWSpS

### 604 Research (\*, max. 3 for M.S., max. 10 for Ph.D.)

### 700 Thesis (\*)

## FIXED PARTIAL DENTURES

### 231, 232, 233 Fixed Partial Denture Technic (4,4,4) A,W,Sp

WARNICK  
Fixed partial denture fundamentals; construction of selected cases on technic models.



**300, 301, 302 Fixed Partial Dentures (1,1,1) A,W,Sp**

Lectures on various phases of typical crown and fixed partial denture construction.

**346 Clinical Crowns and Fixed Partial Dentures (5) AWSp**

MORRISON

Construction of crowns and fixed partial dentures for clinical cases; instruction under close supervision, with cases assigned according to the student's knowledge and abilities.

**400, 401 Advanced Fixed Partial Dentures (1,1) A,W**

MORRISON

Lectures on refinements in technical procedures. Relatively difficult, atypical clinical cases are discussed and analyzed, with emphasis on diagnosis and treatment planning and on the relationship of this field to other forms of treatment.

**446 Advanced Clinical Crowns and Fixed Partial Dentures (8) AWSp**

MORRISON

Continuation and advancement of clinical experience, including clinical ceramics, with treatment of more difficult clinical cases under close supervision.

**Courses for Graduates Only****546 Oral Rehabilitation (4) W**

A clinical course dealing with complex restorative cases. Major emphasis is directed toward tissue response to stresses resulting from the demands of the restoration. (Formerly 561.)

**547 Oral Rehabilitation (4) Sp**

Continuation of 546 with the additional consideration of esthetics in complex restorative cases. (Formerly 562.)

**548, 549, 550, 551 Oral Rehabilitation (4,4,4,4) S,W,A,Sp**

Continuation of 546, 547.

**600 Research (\*) Sp**

YUODELIS

An investigative program in one of the clinical sciences, under the direction of one of the departmental faculty.

**700 Thesis (\*)**

An investigative program carried out under the direction of a member of the Department staff by a student working toward the degree of Master of Science in Dentistry. The problem may be in one of the basic sciences or may have a clinical application.

**FOOD SCIENCE****Courses for Undergraduates****481 Introduction to Food Technology (5) Sp LISTON**

Chemical and biological properties of foods; principles of processing, storage, distribution, and spoilage. Prerequisite, permission.

**482 Food Analysis I (3) A**

DOLLAR

Proximate analysis of foods by physical and chemical methods. Prerequisite, Biochemistry 442 or permission.

**483 Food Analysis II (3) W**

DOLLAR

Analysis of foods for vitamins, fatty acids, other biological substances and additives by physical, chemical, and microbiological methods. Prerequisite, 482.

**484 Principles of Food Processing I (5) A**

DOLLAR, LISTON

Unprocessed foods, their composition, nutritional availability, associated microorganisms, storage, and distribution. Prerequisite, 481 or permission.

**485 Principles of Food Processing II (5) W**

PIGOTT

Principles of food preservation by thermal processes, low temperature methods, chemical methods, irradiation, and other modern processes. Prerequisites, 482, 486 or permission.

**486 Deteriorative Processes in Foods (5) Sp**

DOLLAR, LISTON

Biochemical, microbiological, physical, and chemical changes occurring in foods. Prerequisites, 483, 485 or permission.

**487 Food Analysis III (3) Sp**

DOLLAR, LISTON

Quality assessment of foods including spoilage methods, rancidity methods, organoleptic and microbiological methods. Prerequisite, 483.

**490 Space Biology: Sealed Life-Support Systems (3) Sp**

Problems and proposed solutions for supporting human life in sealed environments. Emphasis on long-term space travel. Prerequisite, 10 credits in chemistry or biology, or permission.

**498 Undergraduate Thesis (2, max. 6) AWSp**

Prerequisite, permission.

**Courses for Graduates Only****504 Principles of Technological Research in Food (3, max. 6) AWSp**

LISTON

A lecture and laboratory course designed to familiarize graduate students with the methods used in technological research. Prerequisite, permission.

**521 Graduate Seminar in Food Science (1, max. 6) AWSp**

Lectures and discussions of current problems and current research in food science. Prerequisite, permission.

**604 Problems in Food Science (\*, max. 3 for M.S., max. 10 for Ph.D.) AWSp****700 Thesis (\*) AWSpS****FORESTRY****Courses for Undergraduates****101, 102, 103 Development of Forestry (1,1,1) A,W,Sp**

SCHAEFFER

History of forestry and its present status in the United States. Orientation course required of all freshman forestry students; not open to others.

**101H, 102H, 103H Development of Forestry (Honors) (1,1,1) A,W,Sp**

Honors sections of 101, 102, and 103. Prerequisite, acceptance in Honors Program.

**204 Dendrology (5) A**

BROCKMAN

Identification, classification, and distribution of trees of North America. Prerequisite, Botany 111.

**301 Survey of Forestry (3) W**

BROCKMAN

History of the development of forestry, its aims and objectives; interrelationship between forestry and other phases of land use. For nonmajors. Prerequisite, permission.

**306 Wood Anatomy (3) A**

LENEY

Familiarization with the development of wood as a plant tissue, and the relationship between wood structure and wood properties. Prerequisite, Botany 112.

**310 Forest Soils (5) A**

COLE

Physical, chemical, and biological properties of forest soils; soil development and classification; and soils in relation to use of forest resources. Prerequisite, Geology 205.

**320 Introduction to Forest Ecology (3) S**

SCOTT

An elementary study of the ecology of forest communities. Particular emphasis on field investigations of succession and development as related to different environments. Prerequisite, Botany 112. (Offered Term *a*, Summer Quarter only, at Pack Forest.)

**321 Silvics (3) W**

SCOTT, STETTLER

A study of forest ecology and the silvical characteristics of forest trees. Includes environmental and genetic factors, forest influences, the establishment, development, and general characteristics of trees and stands. Prerequisites, Botany 112 and permission.

# FORESTRY

## 322 Silvicultural Methods (3) Sp

SCOTT

The theory and technique of applying silvical knowledge in controlling establishment, composition, and growth of forest stands. Includes reproduction methods and intermediate cuttings. Prerequisites, 321, 361.

## 331 Introductory Forest Pathology (4) Sp

DRIVER

The study of typical forest diseases stressing significance of forest ecology on disease occurrence and control. Prerequisites, 310, 321, Botany 112.

## 340 Forest Surveying (3) S

STENZEL

Plane surveying with special emphasis on surveying and mapping forest areas, using compass, abney level, steel tape, trailer chain, pacing, transit, and level. Prerequisite, General Engineering 121. (Offered Term *a*, Summer Quarter only, at Pack Forest.)

## 341 Timber Harvesting (4) Sp

PEARCE

Timber harvesting systems and planning procedures; forest road engineering. Prerequisite, 340.

## 350 Wildlife Management (3) W

Interrelations between forests and wildlife; life histories and habits of animals involved. Prerequisites, junior standing and permission.

## 353 Range Management (3)

SCHAEFFER

Interrelations of plants, animals, and man on range lands. History of range-land use, principles and economics of proper use. One Saturday field trip required. Prerequisite, permission. (Offered alternate years; not offered 1967-68.)

## 360 Introduction to Forest Mensuration (3) S

TURNBULL

Elementary principles of measurement, estimation, and analysis of forest tree and stand parameters. Field techniques and practices. Prerequisite, Mathematics 105. (Offered Term *a*, Summer Quarter only, at Pack Forest.)

## 361 Forest Mensuration (4) W

TURNBULL

Forest tree and stand models. Studies of forest tree and stand parameters. Estimation processes. Growth and yield analysis. Prerequisite, 360, Mathematics 281, or permission.)

## 374 Wood Utilization (3) A

BRYANT

Nature of wood products industry; processing; demand and specifications for raw material and end products.

## 375 Wood Utilization Laboratory (2) A

BRYANT

Nature of wood products industry; processing; demand and specifications for raw material and end products.

## 380 Wood Machining (3) Sp

LENEY

Study of concepts of wood surface generation by separation of the wood structure in various methods of machining. Prerequisites, Physics 116 and Mathematics 124.

## 401 Fibrous Structure and Rheology I (4) W

A review of the synthetic and natural fibers and their chemical, physical, microscopic, and submicroscopic properties. Prerequisite, 488. (Offered 1968-69.)

## 402 Fibrous Structure and Rheology II (4) Sp

Fluid flow, sedimentation and other properties of fiber suspension, structure and rheology of paper board and textile webs; modification of these webs by plastic additives. Prerequisite, 401. (Offered 1968-69.)

## 403 Wood Structure (4) W

LENEY

Detailed study of gross, microscopic, and submicroscopic structure of the xylem tissue of various species for the purpose of understanding anatomical and morphological differences and relationship of structure to properties and usage. Prerequisite, 306 or permission.

## 404 Mechanical Behavior of Wood (4) A

JAYNE

The mechanical behavior of wood; its structural utilization as beams, columns, and panels; derivation of working stresses for wood. Prerequisite, junior standing.

## 405 Wood Physics (5) W

ERICKSON

Examination of physical factors which give wood its special behavior; demonstration by laboratory exercises of the measurement of wood properties and their relationships to various physical factors. Prerequisite, 306 or permission.

## 406 Microtechnique (3) A

LENEY

The technique of preparing, sectioning, staining, and mounting woody tissues and fibers for microscopic study. Prerequisite, 306 or permission.

## 407 Wood Chemistry (5) Sp

SARKANEN

Chemical and physical properties of cellulose, lignin, hemicellulose and extractives. Wood as a raw material for the chemical industry. Prerequisite, permission.

## 408 Wood Chemistry II (3) W

SARKANEN

A fundamental review of the chemistry and properties of wood and other plant lignins. Prerequisite, 407. (Offered 1968-69.)

## 409 Wood Extractives Chemistry (2) Sp

HRUTFIORD

The nature, origin, and occurrence of the extraneous components of wood, their in-

fluence on pulp and paper preparation and their utilization. Prerequisite, Chemistry 232.

## 410 Forest Soil Properties (3) W

COLE

A laboratory study of physical, chemical, and biological properties of forest soils. Prerequisite, 310.

## 411 Soil and the Forest Ecosystem (3) Sp

COLE

A study of soil in the field with emphasis on measurement of properties. Relationship of soils to forest vegetation. Prerequisite, 310.

## 424 Selected Topics in Silviculture (3) A

SCOTT

A detailed discussion of special problems or subjects in silviculture of interest to advanced students. Prerequisite, permission.

## 430 Forest Fire Control (3) Sp

SCHAEFFER

Presuppression; suppression; training methods; analysis of protection facilities; methods of slash disposal and hazard removal; fire behavior; organization for large fires.

## 433 Biology of Forest Diseases (5) W

DRIVER

Detailed studies on the biology of host-pathogen relationships exhibited by certain forest diseases. Prerequisites, 331, Botany 112, Chemistry 231. (Offered alternate years; not offered 1967-68.)

## 435 Forest Entomology (4) W

HEIKKENEN

Characteristics, life histories, ecological relations, prevention and control of forest insects. Prerequisite, Zoology 112.

## 436 Autecology of Forest Insects (4) A

HEIKKENEN

Host-insect interactions, approaches to forest insect problems, research technique, and pertinent forest entomological literature. Prerequisite, permission.

## 437 Population Dynamics of Forest Insects (4) A

HEIKKENEN

Advanced study of animal-plant interactions in the forest environment. Emphasis on individual search and interpretation of original research. Prerequisite, permission.

## 440 Construction (4) W

STENZEL

Design and construction of forest roads; earth-moving methods and costs, explosives, surfacing, drainage. Laboratory: design of timber bridges. Prerequisite, 404.

## 441 Forest Engineering (5) A

STENZEL

Logging planning: road projection, selection of landings and settings, logging cost control. Land surveying, subdivision, platting, and boundaries. Prerequisite, Civil Engineering 310.

**442 Logging Engineering (4) W**

PEARCE

Logging machinery and equipment: application problems, with emphasis on motor truck performance. Field trips to logging equipment factories. Prerequisite, 441.

**443 Safety Practices in Forest Industries**

(1) Sp

PEARCE

Accident costs and frequency rates; accident investigations; safety inspection; safety organization and program. Prerequisite, senior standing or permission. (Formerly 401.)

**446, 447, 448, 449 Logging Engineering Field Studies (3,5,5,3) Sp**

STENZEL

446: logging plans. 447: topographic and timber surveys. 448: road location. 449: cost estimates and reports. Development of a complete logging plan for a timber tract. Courses given consecutively in Spring Quarter. Prerequisite, 442.

**452 International Concepts of Nature Conservation (3) A**

BROCKMAN

Development of international interest in preservation of scenic and significant areas; varied concepts of establishment, policy, administration, and use compared to similar areas in the United States. Prerequisite, 456 or permission.

**455 Watershed Management (4) A**

WOOLDRIDGE

Fundamentals of watershed management and conservation of soil and water. Prerequisites, 310, 321, or permission.

**456 Recreational Use of Wild Lands (3) W**

BROCKMAN

Recreational needs, values, resources, and objectives; planning and development of outdoor recreational resources.

**457 Recreational Land Management Field Studies (2) W**

BROCKMAN

Investigation of administrative policies and procedures, problems and public use of varied public and private recreational lands; involves off-campus travel and preparation of report. Prerequisite, 456 or permission.

**460 Forest Management (5) W**

ROBERTSON

Economic and technical principles involved in the management of federal, state, and private forest lands. Emphasis is placed on principles of forest management applied to integrated use of all forest resources. Techniques used in timber inventories and management plans for continuous production of forest crops. Prerequisite, senior standing.

**461 Forest Economics (5) A**

DOWDLE

Position of forests in the economic structure; cost of growing timber; valuation of land for forest production; stumpage appraisal tech-

niques; problems of forest taxation. Prerequisite, Economics 200.

**462 Forest Policy and Administration (3) A**

SCHAEFFER

Development of the attitude of the federal government and the states toward forests, and the general methods of administering public interest in forests; the development of private forestry in the United States.

**463 Contemporary Problems in Forest Land Use (3) W**

DOWDLE

Current conflicts among competing uses for forest land; trends in forest land use; impact of public policy on growth and development of forest products industries. Prerequisite, permission.

**465 Forest Photo Interpretation (3) AW**

ROBERTSON

The use of aerial photographs in mapping vegetation types and estimating timber volumes. Construction of aerial photomosaics. Use of aerial photographs in fire control and range and timber management. Allocation of cut; logging road location; construction of planimetric and topographic maps from vertical photographs. Prerequisite, permission.

**466, 467, 468, 469 Senior Management Field Studies (5,5,4,2) Sp**

ROBERTSON

466: surveys, use of aerial photographs in mapping forest types and estimating timber volumes. Application of statistical methods to cruising. 467: forest and land inventory in pine and fir regions. 468: growth and yield studies, permanent sample plots. 469: reports and summary of work accomplished by field studies. Course leads to development of a working plan for a large operation. All four courses are taken during the same quarter, and the entire quarter is spent off campus. Prerequisite, 460.

**470 Wood Deterioration and Control (4) A**

ERICKSON

Wood and fiber destroying agencies, biological and physical, classification and manner of attack. Theory of toxicity and the important preservatives; pressure and nonpressure treatments. Fire retardant chemicals and treatments, coatings and impregnation.

**471 Timber Design (3) Sp**

BRYANT

Design of solid and laminated beams; design of trusses using timber connectors, bolts and other fastenings; column design; laminated arches. Prerequisite, 404.

**472 Wood Adhesion (3) W**

BRYANT

Theory of wood adhesion, chemical nature of wood adhesives, requirements of an adhesive relative to important wood and process variables. Prerequisite, senior standing in Wood Science and Technology.

**473 Gluing Process Technology (6) Sp**

BRYANT

Gluing technology as it relates to the important variables that affect the properties of plywood, particle board, hardboard, insulation board, and lumber laminates. Prerequisite, 472.

**475 Wood Drying Technology (3) Sp**

THOMAS

Analysis of wood drying; practical and experimental studies in the drying of processed wood in the form of lumber, veneer, particle, and fiber. Prerequisite, senior standing in Wood Science and Technology or permission.

**476 Pulp and Paper Technology (3) W**

GARDNER

Chemical and technological aspects of the manufacture of mechanical and chemical pulps, and of paper and paper products. Prerequisite, 407.

**477 Pulp and Paper Laboratory (2) Sp**

GARDNER

Laboratory experiments in the pulping of wood, fiber technology, and physical and chemical characteristics of paper and pulp. Prerequisite, 476.

**478 Advanced Wood Technology (5) W**

ERICKSON

The physical and chemical nature of wood; its colloidal properties as related to its physical and mechanical behavior in its solid and transmuted forms. Prerequisite, permission.

**481 Pulp and Paper Unit Operations (4) Sp**

GARDNER

Unit operations of particular interest in the pulp and paper industry in addition to those covered in Chemical Engineering 471 and 474. Prerequisite, Chemical Engineering 471. (Offered 1969-70.)

**482 Structure of Wood Products Industry (3) W**

WAGGENER

A case study of the evolving wood-products industry; history and early growth; market structure in relation to products; international, inter-regional, and intra-industry competition; industry problems. Prerequisite, 374.

**483 Plant Management and Design (4) Sp**

JOHANSON

The relationship of scientific and engineering principles to principles of finance, economics, profitability, design, and production. Prerequisites, 476, Chemical Engineering 471, Economics 211. (Offered 1968-69.)

**484 Forest Products Field Studies (1) Sp**

Two-week field study of the forest products industry of the Northwest. Prerequisite, senior standing in Wood Science and Technology.

**485 Senior Thesis (2) Sp**

A thesis based upon an undergraduate research or independent study project under the supervision of the faculty. Prerequisite, senior standing in Wood Science and Technology.

# FORESTRY

## 486 Pulp and Paper Seminar (1) W

Seminar lectures on pulp and paper processes. (Offered 1968-69.)

## 488 Polymer Chemistry (3) Sp

ALLAN

A fundamental review of synthetic and natural polymers, including kinetics of formation, molecular weight distributions, and solid state and solution properties. Prerequisite, Chemistry 232. (Offered 1968-69.)

## 490, 491, 492 Undergraduate Studies (1-5,1-5,1-5)

Individual tutorial study of topics for which there is not sufficient demand to warrant the organization of regular classes. The courses are offered in all quarters and credits can vary from 1 to 5, and, with the permission of the instructor, each course may be repeated for credit. Credits are individually arranged for each course. Prerequisite, permission.

## 495 Research Methods Seminar (3) A

TURNBULL

A study of methods of approaching research problems; statistical techniques that can be adapted to problems in forestry and forest products industry. Prerequisite, senior standing.

## 496 Industrial Forestry Analysis (3) W

BETHEL, TURNBULL

Principles and practices in optimization of supply, inventory, and products in forest industries. Principles and practice in control of quality of forest products. Prerequisite, 495 or permission.

## Prescribed Courses in Other Fields

### Courses for Undergraduates

#### ACCOUNTING

##### 210 Fundamentals of Accounting (3)

#### BOTANY

##### 111 Elementary Botany (5)

##### 112 The Plant Kingdom (5)

#### CHEMISTRY

##### 101 General Chemistry (5)

##### 102 General and Organic Chemistry (5)

##### 140 General Chemistry (3) and 151 General Chemistry Laboratory (2)

##### 150 General Chemistry (3)

##### 160 General Chemistry (3)

##### 170 Qualitative Analysis (3)

##### 221 Quantitative Analysis (5)

##### 231 Organic Chemistry (3) and 241 Organic Chemistry Laboratory (2)

##### 232 Organic Chemistry (3)

##### 350 Elementary Physical Chemistry (3)

##### 351 Elementary Physical Chemistry (3)

#### CHEMICAL ENGINEERING

##### 210 Material and Energy Balances (4)

##### 325 Thermodynamics (3)

##### 470 Chemistry of Wood (3)

##### 471 Pulp and Paper Technology (3) and 472 Pulp and Paper Technology Laboratory (2)

#### CIVIL ENGINEERING

##### 310 Forest Highway Location and Design (5)

##### 417 Cadastral Surveys (2)

#### ECONOMICS

##### 200 Introduction to Economics (5)

##### 211 General (3)

#### ENGLISH

##### 101, 102, 103 Composition (3,3,3)

#### GENERAL ENGINEERING

##### 104 Engineering Graphics (3)

##### 115 Introduction to Digital Computing (2)

##### 121 Plane Surveying and Measurements (3)

#### GEOLOGY

##### 205 Physical Geology (5)

#### HUMANISTIC-SOCIAL STUDIES

##### 270 Engineering Report Writing (2)

#### MATHEMATICS

##### 105 College Algebra (5)

##### 124, 125, 126 Calculus with Analytic Geometry (5,5,5)

##### 224 Intermediate Analysis (3)

##### 238 Elements of Differential Equations (3)

##### 281 Elements of Statistical Method (5)

#### MECHANICAL ENGINEERING

##### 415 Statistical Quality Control (3)

#### PHYSICS

##### 114, 115, 116 General Physics (4,4,4)

##### 117, 118, 119 General Physics Laboratory (1,1,1)

##### 121, 122, 123 General Physics (4,4,4)

##### 131, 132, 133 General Physics Laboratory (1,1,1)

#### POLITICAL SCIENCE

##### 202 American Government and Politics (5)

#### SPEECH

##### 327 Extempore Speaking (3)

#### ZOOLOGY

##### 112 General Zoology (5)

## Elective Courses for Undergraduates

The forestry curriculum provides for a considerable number of elective courses which are selected in consultation with faculty advisers to fit the individual student's educational objective. These may be offerings of the College of Forestry or of any other undergraduate unit of the University.

## Courses for Graduates Only

##### 500 Graduate Seminar (1, max. 2) AW

TURNBULL, STETTLER

Discussion of current issues and problems in forestry and forestry research. Required of all graduate students in their first year of residence. Prerequisite, permission.

##### 511 Forest Soils Seminar (2) W

GESSEL

Discussion of current topics in forest soils research and management. Prerequisite, permission.

##### 512 Soil Formation and Classification (3) W

GESSEL

A study of soil-forming factors and processes, and principles of soil classification primarily as applied to forested areas. Prerequisite, 310.

##### 513 Soil Survey and Mapping (4) Sp

GESSEL

Principally a study of soils of the Northwest; their properties and distribution. Prerequisites, 512 and permission. (Offered alternate years; offered 1967-68.)

##### 514 Forest Influences (4) S

GESSEL

A study of the effects of vegetation on climate, water, and soil. Special emphasis on the hydrologic cycle in forest ecosystems. Relationship of vegetation to water quantity and quality. Prerequisite, 310 and Atmospheric Sciences 329.

##### 521 Current Problems in Forest Ecology (3) W

SCOTT

A consideration of current literature and topics in forest ecology and tree physiology. Prerequisite, permission.

##### 522 Current Problems in Silviculture (3) Sp

SCOTT

A detailed study of the literature dealing with recent applications of silviculture in world forestry. Prerequisite, permission.

## 525 Research Methods in Forest Biology (2) A

GESSEL, SCOTT

Research philosophies and procedures as applied to forest biological problems. Required of all graduate students in forest biology in their first year of residence. Prerequisite, permission.

## 527 Forest Genetics (3) W

STETTLER

Tree-improvement breeding theory as related to elementary population genetics, variation in plant populations, and natural and artificial selection. Prerequisite, Genetics 451 or permission.

## 533 Investigations of Forest Diseases (5) W

DRIVER

Studies on concepts and experimental procedures used in forest microbiological research. Prerequisites, 433 and permission.

## 536 Advanced Forest Entomology (4) Sp

HEIKKENEN

A review and discussion of current problems in forest entomology. Emphasis on individual literature reviews, presentation, and research technique. Prerequisite, permission.

## 541 Advanced Forest Engineering (5) W

PEARCE

Logging organization and management; logging cost analysis and budgeting. Prerequisite, permission.

## 542 Advanced Logging Engineering (3) A

PEARCE

Detailed consideration of problems of logging planning and truck road engineering, including the preparation and field layout of logging plans; location, design, and construction of logging truck roads. Prerequisite, permission.

## 551 Current Problems in Recreational Management of Wildlands (3) Sp

BROCKMAN

Investigation, examination, and discussion of current problems of recreational management of wild lands. Prerequisite, graduate standing.

## 564 Advanced Forest Biometry (3 or 5) W

TURNBULL

Classical problems in analysis of forest populations and growth theory, and principles of parametric analysis and estimation processes in forest biometry. Prerequisite, permission.

## 571 Advanced Wood Preservation (3) W

ERICKSON

Permeability of wood; theory and factors affecting penetration, liquid movement in wood, chemical effects on wood. Prerequisite, permission.

## 572 Wood Chemistry and Analysis (3-5) WSp

ERICKSON

Techniques for analyzing the chemical constituents of wood; the relationships between chemical properties and the structural properties and uses of various species of wood. Prerequisite, permission.

## 573 Wood-Moisture Relations (2-3) A

ERICKSON

Theories and practice on relationships between wood and moisture over a range of moisture contents; effects of other polar and nonpolar compounds; capillarity, adsorption, and diffusion in wood. Prerequisite, permission.

## 574 Wood-Resin Relations (3) Sp

BRYANT

The technology of synthetic resins as wood adhesives, wood impregnants, binders, overlays, and surface coatings. Prerequisite, permission.

## 575 Forest Products Economics (3) A

THOMAS

Economic considerations in planning for utilization of the forest resource under a variety of circumstances. Prerequisite, permission.

## 576 Photomicrography of Woody Tissues (3) W

LENEY

Theory and method in microscopy and photomicrography of woody tissues. Prerequisite, permission.

## 590 Graduate Studies (1-5)

Study in fields for which there is not sufficient demand to warrant the organization of regular courses. Prerequisite, permission.

## 600 Research (\*)

## 700 Thesis (\*)

Tutorial study designed to meet individual requirements is available to graduate students in the Graduate Studies courses listed below. Such study may include literature review, field, and laboratory work. The courses are offered in all quarters and credits can vary from 1 to 5, and with the permission of the instructor, each course may be repeated for credit. Credits are individually arranged for each course. Prerequisites include graduate standing and permission of the instructor.

## 510 Graduate Studies in Forest Soils (1-5)

GESSEL

## 515 Graduate Studies in Forest Influences (1-5)

GESSEL, SCOTT

## 520 Graduate Studies in Silvics and Silviculture (1-5)

SCOTT

## 526 Graduate Studies in Forest Genetics (1-5)

STETTLER

## 530 Graduate Studies in Forest Fire Control (1-5)

SCHAEFFER

## 534 Graduate Studies in Forest Pathology (1-5)

DRIVER

## 535 Graduate Studies in Forest Entomology (1-5)

HEIKKENEN

## 540 Graduate Studies in Logging Engineering (1-5)

PEARCE, STENZEL

## 550 Graduate Studies in Forest Recreation (1-5)

BROCKMAN

## 555 Graduate Studies in Wildlife Management (1-5)

## 560 Graduate Studies in Forest History and Policy (1-5)

MARCKWORTH

## 563 Graduate Studies in Forest Mensuration (1-5)

TURNBULL

## 565 Graduate Studies in Forest Management (1-5)

ROBERTSON

## 566 Graduate Studies in Forest Photogrammetry (1-5)

ROBERTSON

## 568 Graduate Studies in Forest Economics (1-5)

DOWDLE

## 570 Graduate Studies in Forest Products (1-5)

ALLAN, BRYANT, ERICKSON, JAYNE, LENEY, THOMAS, SARKANEN

*FRENCH—See Romance Languages and Literature*

# GENERAL AND INTERDEPARTMENTAL

## Courses for Undergraduates

### Biology 101-102 General Biology (5-5) A,W

ILLG, KOHN, KRUCKEBERG, MEEUSE, ORIANI

Principles of living systems as viewed at levels from the subcellular to the community. Emphasis on structural and functional analysis of biological organization—its adaptedness, its genetic diversity, its energetics—leading to an evolutionary synthesis. The position of man in the biological world. For nonmajors and teaching majors in biology. (Credit will not be given for 101-102 if any two of the following courses or their equivalents [Zoology 111, 112; Botany 111, 112] have been taken previously.)

## GENERAL AND INTERDEPARTMENTAL

### **Biology 210, 211, 212 Introductory Biology (5,5,5) A,W,Sp**

CLELAND, DIXON, FARNER, GORBMAN, KELLY, SPOTTS

An introduction to the phenomena of life for students intending to go on to more advanced biology courses and into preprofessional programs. Emphasis is placed on features common to all living things: molecular and subcellular phenomena; cellular structure, metabolism and energetics; genetic regulation of development; the nature, functional properties, and evolution of plant and animal organisms and groups of organisms. Prerequisite, one year college chemistry or permission.

### **Comparative Literature 300 World Classics of Western Europe (5) A**

Great works of English, French, Italian, and Spanish poetry, drama, and fiction, from the Middle Ages to the twentieth century, read in English and taught by specialists in English and Romance literature. Prerequisite, junior standing.

### **Comparative Literature 301 World Classics of Germany, Russia, and Scandinavia (5) W**

Great works of Danish, German, Icelandic, Norwegian, Russian, and Swedish poetry, drama, and fiction, from the Middle Ages to the twentieth century, read in English and taught by specialists in German, Scandinavian, and Slavic literature. Prerequisite, junior standing.

### **Comparative Literature 302J World Classics of the Orient (5) Sp**

Great works of Chinese, Indian, Japanese, and Korean literature and thought, read in English and taught by specialists in Far Eastern literature. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, junior standing.

### **General Studies 300H Honors Colloquium (Humanities) (2, max. 6) W**

Discussion of selected topics in a variety of subject matter fields. Topics and reading material vary from year to year. Open to juniors and seniors in the College of Arts and Sciences Honors Program. Prerequisite, permission.

### **General Studies 301H Honors Colloquium (Social Science) (2, max. 6)**

Discussion of selected topics in a variety of subject matter fields. Topics and reading material vary from year to year. Open to juniors and seniors in the College of Arts and Sciences Honors Program. Prerequisite, permission.

### **General Studies 302H Honors Colloquium (Science) (2, max. 6)**

Discussion of selected topics in a variety of subject matter fields. Topics and reading material vary from year to year. Open to juniors and seniors in the College of Arts and Sciences Honors Program. Prerequisite, permission.

### **General Studies 391 Supervised Study in Selected Fields (\*, max. 6) AWSp**

Special supervised study in a field represented in the College of Arts and Sciences. Prerequisites, permission of major department, supervisor of study, and General Studies Office.

### **General Studies 455-456 Critical Problems of Our Culture (3-3) W,Sp**

Two interdisciplinary courses for seniors, in which about twenty professors from nearly as many departments (including representatives from Engineering, Medicine, and Law) discuss the critical problems of our culture as seen from their various specialties. A mimeographed book prepared anew each year by members of the staff is used as the basis of the discussions. Prerequisite, senior standing; juniors by permission.

### **General Studies 493 Senior Study (1-5) AWSp**

For General Studies majors only. Prerequisites, permission of supervisor of study and General Studies Office.

### **Humanities 101 Literature (5) AWSp**

An introduction to literary forms and techniques through analysis of representative examples of narrative and poetic art, with emphasis upon relationship of content and expression.

### **Humanities 102 The Arts (5) AWSp**

Painting, sculpture, music, architecture, the dance, and drama studied through example, discussion, and criticism.

### **Humanities 201 Literature (5) WSp**

Reading and critical discussion of some of the greatest works in world literature.

### **Liberal Arts 101 Introduction to Modern Thought (5) W**

LUTEY

Man's place in the universe; cosmic origins; origin and nature of life; mind and behavior; values.

### **Liberal Arts 111 Introduction to the Study of the Fine Arts (5) ASp**

LUTEY

Appreciation of masterpieces of architecture, painting, sculpture, and music; problems common to them; philosophy of art; relations of beauty, truth, and morality.

### **Social Science 101 History of Civilization: The Great Cultural Traditions (5) A**

BRIDGMAN, FERRILL, GRIFFITHS, HANKINS, KAMINSKY, KATZ, LEVY, SAUM, SPELLMAN, SUGAR, THOMAS, WILLIAMS

The historic foundation of civilizations—Mesopotamia, Egypt, India, China; economy; society, government, religion, and culture; the elaboration of culture and institutions in Greece, Rome, and the Orient; Christianity and the beginning of civilization in Western Europe; early medieval civilization in the West.

### **Social Science 102 History of Civilization: The Western Traditions in World Civilization (5) W**

BRIDGMAN, FERRILL, GRIFFITHS, HANKINS, KAMINSKY, KATZ, LEVY, SAUM, SPELLMAN, SUGAR, THOMAS, WILLIAMS

The beginning of modern civilization: the Renaissance; the Protestant Revolt, the state; commercial revolution and mercantilism; the rise of science; the "era of revolutions"; the Industrial Revolution and the rise of democracy.

### **Social Science 103 History of Civilization: The Contemporary World (5) Sp**

BRIDGMAN, FERRILL, GRIFFITHS, HANKINS, KAMINSKY, KATZ, LEVY, SAUM, SPELLMAN, SUGAR, THOMAS, WILLIAMS

The meeting of East and West: the "one-world" community in the twentieth century; imperialism, communism, fascism, democracy, internationalism; twentieth-century science; present-day philosophy; religion, literature, and art; the meaning of history for the citizen of the contemporary world.

## GENERAL BUSINESS

### **Courses for Undergraduates**

#### **101 Business: An Introductory Analysis (5) AWSp**

WHEELER

The role of business in a modern economy: its growth, structure, organization, and relationship to environment. Business firms: their objectives, functions, and management. Problems of organization, decision making, controls, and related aspects. Opportunities in business.

#### **361 Business History (3) ASp**

BERTRAM, WHEELER

Exploration and analysis of the development of the American business system, business enterprise and its management within the context of forces shaping the growth of the nation.

#### **439 Analysis of Business Conditions (4) AWSpS**

BOURQUE, CHAMBERS, SCOTT

Analysis of basic variations affecting general business conditions as a background for business and investment decisions; appraisal of proposals for controlling cycles and of forecasting techniques. Prerequisites, Finance 320 and Business Statistics 201 and 301.

#### **441 Managerial Economics (3) AWSp**

CHAMBERS

Analysis of factors affecting decisions within business firms. Motivation, interfirm relationships, cost and pricing policies, are among subjects examined. Prerequisite, Business Statistics 301.

#### **444 Business and Society (4) AWSpS**

LESSINGER, MONSEN, ROBINSON

The role of American business in modern society; business leadership in different social contexts; the changing framework of responsibilities facing both the company and its leaders; uses of behavioral science in business decisions.

**445 Comparative Enterprise Systems (5) Sp**  
GOLDBERG

Investigation of functions, modes of operation, and methods of coordinating business enterprises in various economic systems, ranging from the competitive to the highly centralized.

**499 Undergraduate Research (3, max. 9)**  
Prerequisites, 439 and permission.

**Courses for Graduates Only**

**570 Seminar in Business Research (3) W**  
LESSINGER

Research methods and methodology; philosophical aspects of scientific methodology and of the nature of human knowledge are studied as a foundation for research techniques and procedures in business. Prerequisite, permission.

**GENERAL ENGINEERING**

**Courses for Undergraduates**

**100 Engineering Orientation (1) AW**  
BONOW

Lectures, discussion, and reading assignments on the functions of engineering, the various fields of the profession, and on the College of Engineering.

**104 Engineering Graphics (3) AWSpS**  
COLLINS

Orthographic projection and orthogonal view relationships. Principles for solution of problems involving points, lines, and planes. Layout drawings, dimensioning, lettering, and standard practices on engineering and industrial drawings. Sketching and freehand pictorials. Introduction to basic steps in the engineering design process. Redesign project. Prerequisite, freshman standing or permission.

**105 Engineering Graphics (3) AWSpS**  
MESSER

Continuation of 104. Engineering graphics in analysis, research, and design. Systematic design procedure and comprehensive project. Prerequisite, 104.

**107 Applied Descriptive Geometry (2) AWSp**  
BOEHMER

Selected topics in descriptive geometry including: rotation, locus problems, intersection and transition of planes and solids, warped surfaces, forces in space, central projection, and mining and geology problems. Prerequisite, 105 or permission. (Formerly 103.)

**111 Engineering Problems (3) AWSpS**  
SEABLOOM

An introduction to some fundamental principles, including dimensional analysis, theory of measurements, and vector algebra. Designed to develop the ability to analyze and solve engineering problems. Instruction in effective methods of work and study, and in systematic

arrangement and clear workmanship. Prerequisites, high school physics, trigonometry, and Mathematics 105. Mathematics 105 may be taken concurrently.

**112 Statics (3) AWSpS**  
ALEXANDER

A fundamental and rigorous course in engineering statics using the vector notation. Prerequisites, 104, 111, and Mathematics 125. Mathematics 125 may be taken concurrently.

**115 Introduction to Digital Computing (2) AWSpS**  
CRANDALL

The language of Fortran applied to engineering problems. Flow charts, problem organization, and basic computer statements. Introductory problems solved on IBM 7094. Prerequisites, 111, Mathematics 124, which may be taken concurrently, or permission.

**121 Plane Surveying and Measurements (3) ASp**  
KONICHEK

Plane surveying methods; use of the engineer's level, transit, and tape; computations of bearings, plane coordinate systems, areas, stadia surveying; public land system. The theory of measurements and errors, and the applications of probability to engineering measurements. Prerequisites, 104 and trigonometry, or permission.

**351 Inventions and Patents (1) Sp**  
SEED

Law and procedures for patenting inventions, employer-employee relationship, and trademarks. Primarily for engineering students. Prerequisite, junior standing.

**390 Computer Applications in Engineering Problems (3) AWSp**  
DOUTHWAITE

The development and application of numerical methods and algorithms to solve problems in engineering. Simultaneous equations, curve fitting, ordinary and partial differential equations. Prerequisites, a knowledge of Fortran and Mathematics 238, which may be taken concurrently.

*GENERAL STUDIES—SEE General and Interdepartmental*

**GENETICS**

**Courses for Undergraduates**

**351 Human Genetics (3) W**  
GARTLER

For premedical students and those majoring in anthropology, psychology, and related fields dealing with human variation. Prerequisites, Botany 111 or Zoology 111, or equivalent, and junior standing.

**451 Genetics (3) ASp**  
SANDLER, STADLER, ROMAN

A general course recommended for majors in the biological sciences. Prerequisite, 10 credits in biological science.

**451L Genetics Laboratory (2) ASp**  
Must be accompanied by 451.

**452 Advanced Genetics (3)**  
SANDLER

A detailed discussion of chromosomal structure, mutation, chromosomal aberrations, and population genetics. Prerequisite, 451 or permission. (Offered alternate years; not offered 1967-68.)

**499 Undergraduate Research (\*) AWSp**  
Prerequisite, permission.

**Courses for Graduates Only**

**501 Introduction to Research Materials (3, max. 9) AWSp**

The student will be introduced to Neurospora, yeast, bacteria, viruses, and mammalian material, and to some of the techniques in which these are used for genetic research. Prerequisite, graduate standing in Department of Genetics, or permission.

**520 Seminar (1, max. 15) AWSp**  
Prerequisite, permission.

**531 Problems in Human Genetics (2) W**  
MOTULSKY

An advanced course in human genetics emphasizing modern aspects and research methods. Prerequisites, 351, 451, or permission. (Offered alternate years; offered 1967-68.)

**551 Genetics of Microorganisms (3) A**  
STADLER

The contributions of research with microorganisms are discussed in relation to basic genetic concepts. Prerequisite, 451 or permission.

**552 Molecular Genetics (3) W**  
HALL

Recent advances in our understanding of the molecular bases of heredity: the structure of DNA, bacterial transformation, biochemical studies of DNA replication, mutagenesis, and recombination. Prerequisite, 551 or permission.

**553 Gene Action (3) Sp**  
GALLANT

The expression of gene function, with emphasis on the biochemical mechanisms involved: transcription and translation of genetic information; regulation of gene function. Prerequisite, 552 or permission.

**554 Topics in Genetics (2, max. 6) AWSp**

Current problems and research methods. Prerequisite, permission.

**555 Bacteriophage Experiments (4) W**  
DOERMANN

A sequence of laboratory experiments to familiarize students with current materials and methods of investigating genetic structure, replication, recombination, and mutation in virulent bacteriophages. Prerequisite, permission.

## GENETICS

### 556 Bacteriophage Genetics (2) Sp

DOERMANN

Inheritance mechanics of bacteriophages and structure and function of their apparatus will be discussed. Molecular models derived from genetic data will be emphasized. Prerequisite, permission.

### 561 Chromosomal Behavior (3) W

SANDLER

Properties of chromosomes with special emphasis on recombination and segregation. Prerequisite, permission. (Offered alternate years; not offered 1967-68.)

### 562 Population Genetics (2) A

SANDLER

Mathematical and experimental approaches to the genetic aspects of organic evolution. Prerequisite, permission. (Offered alternate years; not offered 1967-68.)

### 600 Research (\*) AWSpS

### 700 Thesis (\*) AWSpS

## GEOGRAPHY

### Courses for Undergraduates

Prerequisites: In addition to specified prerequisites for individual courses, students should also meet the general course level requirements as indicated by the numbers except where they may have special preparation or background in geography or in related fields.

### INTRODUCTION TO GEOGRAPHY

#### 100 Introduction to Geography (5) AWSp

Major concepts and methods in the field; analysis of selected problems and types of regions. Honors sections available for honors students by permission.

### INTRODUCTION TO FIELDS IN GEOGRAPHY

#### 200 World Regional Geography (5)

FLEMING

A study of the world's regional structure; analysis and interpretation of the world's cultural, economic, and resource patterns. (Not offered 1967-68.)

#### 205 Physical Geography (5) ASp

Survey of character and location of different types of land forms, climates, soils, vegetation, minerals, and water resources; their significance to human occupation.

#### 207 Economic Geography (5) AWSp

BOYCE, MORRILL, THOMAS

World survey of extractive, manufacturing, and distributing activities; emphasis is placed on regional characteristics relating to the availability of resources and markets and the utilization of technological skills. Honors sections available for honors students, by permission.

### 258 Maps and Map Reading (2) AWSp

HEATH, SHERMAN

Categories of maps and aerial photographs and their special uses; map reading and interpretation.

### 277 Geography of Cities (5) Sp

BOYCE

Survey of the spatial and functional orderliness of cities; their location, distribution, function, and spread. Particular emphasis on current urban problems—sprawl, city decline, and metropolitan transportation.

### INTERMEDIATE AND ADVANCED COURSES

#### Systematic Fields

#### 325 Historical Geography of America (3) A

BACON

Exploration, migration routes, pioneer settlement, and the moving frontier in relation to geographical phenomena. Criteria for differential development of regional cultures.

#### 350 Intermediate Economic Geography (5) W

MORRILL

Spatial organization of society: theoretical and empirical approaches to the study of the location of settlement (rural and urban) and economic activities (agriculture, manufacturing, services); spatial structure (including regions); their spatial interrelationships (trade, migration, communication) and changes in organization (urbanization, economic development).

#### 370 Conservation of Natural Resources (5) ASp

COOLEY

Principles and practices in effective utilization of resources; public policies relating to conservation.

#### 375 Political Geography (5) A

VELIKONJA

A study of the spatial variations and interrelationships of political activities and systems.

#### 411J Geomorphology (4) Sp

PORTER

Sculptural evolution of varied rock terrains, mass wasting processes; geomorphology of arid, semi-arid, polar and alpine regions; sea floor morphology and sediments. Offered jointly with the Department of Geology. Prerequisites, senior standing in geography or geology, and permission. (Offered 1967-68.)

#### 416J Regional Income Analysis (5) W

TIEBOUT

Analysis of determinants of level of regional economic activity with special reference to the Pacific Northwest. Offered jointly with the Department of Economics. Prerequisite, Economics 301 or equivalent.

#### 440J Manufacturing (3 or 5)

THOMAS

Analysis of linkages, structure, and distribution of manufacturing; study of selected in-

dustries focusing attention on factors which influence their development and location. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor. Offered jointly with the Department of Economics. (Not offered 1967-68.)

#### 441 Geography and Industrial Change (3 or 5) A

THOMAS

Analyses of changes in the spatial and structural components of industrial activity patterns. Attention also focused on understanding the nature and influences of dominant forces affecting industrial change. Examples drawn primarily from North America and Western Europe. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor. (Not offered 1967-68.)

#### 442 Social Geography (3 or 5) Sp

MORRILL, VELIKONJA

Spatial patterns of population distribution and settlement; of migration and the spread of ideas; of social characteristics and social relations; social regions. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor.

#### 444 Geography of Water Resources (3 or 5) W

MARTS

Analysis and appraisal of water resources in land and industrial development; problems and policies of river basin planning with emphasis on the Pacific Northwest. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor.

#### 448 Geography of Transportation (3 or 5) W

FLEMING, ULLMAN

Circulation geography, principles of spatial interaction emphasizing commodity flow, the nature and distribution of rail and water transport, the role of transport in area development. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor.

#### 451J Regional Planning and Development (3 or 5) Sp

THOMAS

Emphasis placed primarily on the process of implementing regional development policies in economically advanced and lesser developed countries. Resultant changes which occur in the distribution and structure of economic activities and settlement patterns are also studied and evaluated. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor. Offered jointly with the Department of Urban Planning.

#### 475 Problems in Political Geography (3 or 5) W

VELIKONJA

Selected problems of spatial patterns and dynamic relationships. Geographical problems of regional, national, and international organization. Lectures, 3 credits; independent study, 2 additional credits. Prerequisite, 375 or permission.



**477 Urban Geography (3 or 5) A**

BOYCE, ULLMAN

Analysis of urban and other agglomerated settlements in terms of nature, economic base, principal functions, distribution, supporting areas, and internal structure. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor.

**REGIONAL FIELDS****301 Anglo-America (5)**

Examination of the United States-Canada resource base and geographical implications of economic activities. Geographical aspects of contemporary problems and the future development of both countries. (Not offered 1967-68.)

**302 The Pacific Northwest (3) AWSp**

Survey of the economy of the Pacific Northwest in the light of factors of location, resources, resource-oriented industries, and resource policies. An introduction to regional studies on a local scale.

**304 Western Europe (5) A**

FLEMING

An analysis of the physical and socio-economic characteristics of Western Europe. Contemporary political and economic integration trends are evaluated in their regional context.

**305J Eastern Europe (5) W**

VELIKONJA

An analysis of the physical, historical, and socio-economic characteristics of Eastern Europe. Offered jointly with the Far Eastern and Russian Institute.

**306 Africa (5)**

Historical and economic geography, emphasizing the role of natural resources in settlement and economic development; problems of colonization, the foundations of commercial agriculture, and trends in industrial development. (Not offered 1967-68.)

**307 Australia and New Zealand (5) W**

Pastoral and agricultural development; industrial potential; urbanization; immigration and trade policies; external economic and political relations.

**308 Latin America (5) W**

Present and future development and problems of Caribbean and South America in terms of their natural resources, economic activities, and ethnic and settlement patterns. (Not offered 1967-68.)

**313J East Asia (5) W**

KAKIUCHI

Nature and geographic setting of Far Eastern civilization with reference to origins, development, and present outlines of settlement; cultures, resource use, and economic structures in China, Japan, and Korea. Offered jointly with the Far Eastern and Russian Institute.

**332J Islands of the Pacific (3)**

Analysis of major islands and groups with respect to resources, settlement, population composition; role in modern transportation and communications; current political status. Offered jointly with the Far Eastern and Russian Institute.

**333J The Soviet Union (5) AW**

JACKSON

The structure and trends of geographic development, with particular emphasis on the distribution of population, the spatial structure of the economy and regional interaction. Offered jointly with the Far Eastern and Russian Institute.

**402 United States (5) Sp**

MORRILL

The spatial pattern of economic and social life in America—how it evolved, the role of the environment and resources; problems of regional inequality in development.

**404 Problems in the Geography of Western Europe (5) Sp**

FLEMING

Emphasis on problems stemming from contemporary political and socioeconomic changes underway in Europe. Topics include urbanization, regional development, economic integration, and patterns of trade.

**405J Problems of Eastern Europe (3 or 5) W**

VELIKONJA

Analysis of selected geographical aspects of Eastern Europe. Natural and human resource base, social and political organization. Their relationships and interdependencies. Lectures, 3 credits; independent study, 2 additional credits. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, 305J or permission.

**433J Geographic Problems in Soviet Development (3 or 5) ASp**

JACKSON

Selected problems posed by a dynamic society and a conditionally limited resource base. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, 333J or permission.

**434J Problems in the Geography of Southeast Asia (5)**

Analysis of regional and political structures; resources, economic activities, and problems of development; overseas and internal relationships. Offered jointly with the Far Eastern and Russian Institute. (Not offered 1967-68.)

**435J Problems in the Geography of China (5) A**

Origins and development of Chinese civilization in its geographic base and areal spread; political China and the Chinese sphere; physical base and resources; problems of agriculture, population, industrialization, ur-

banization, transportation, and contemporary development; communist China. Offered jointly with the Far Eastern and Russian Institute.

**437J Problems in the Geography of Japan (5) Sp**

KAKIUCHI

Regional structure of Japanese urban, industrial, and agricultural geography. Analysis of contemporary patterns considering cultural and physical factors and selected aspects of their historical development. Offered jointly with the Far Eastern and Russian Institute.

**CARTOGRAPHY****360 Principles of Cartography (5) AWSp**

HEATH, SHERMAN

Map scales, grid systems, symbolism, and map reproduction. Laboratory experience in application of these principles to map design and construction.

**361 Experimental Cartography (5) A**

HEATH, SHERMAN

Application of and experimentation with cartographic techniques and materials. Problems of relief representation, mapping of quantitative data, and their relation to reproduction processes. Prerequisite, 360.

**363 Aerial Photographs as Source Materials (3) A**

HEATH

Training in the use of aerial photographs as source materials in map compilation and other geographic purposes. Prerequisite, 360.

**430J Map Projections (3) Sp**

VERES

Classification of projections, theory of distortion. Projection from ellipsoid to sphere. Theory of conformal projections (Lambert, Mercator, Stereographic). Equal area projections. Polyconic and other projections. Offered jointly with the Department of Civil Engineering. Prerequisite, permission.

**458 Map Intelligence (3) W**

SHERMAN

Analysis and appraisal of United States and foreign maps and atlases; mapping agencies, coverage, organization, and indexing; symbolism, scales, projections, and military grids; map library problems and operation.

**462 Problems in Map Compilation and Design (5) Sp**

HEATH, SHERMAN

Application and analysis of map intelligence procedures as related to map compilation. Measurement and experimental study of psycho-physiological factors in design of map elements. Prerequisite, 360.

**464 Problems in Map Reproduction (3) W**

HEATH

Processes and photographic techniques applicable to cartographic and geographic presentations. Prerequisite, 360.

# GEOGRAPHY

## GEOGRAPHY AND EDUCATION

### 475GJ Geography in the Social Studies Curriculum (5) S

BACON

A discussion of the concepts and content of geography essential to effective social studies curricula. Offered jointly with the College of Education.

## INTRODUCTORY RESEARCH TECHNIQUES

### 426 Statistical Measurement and Inference (5) A

MORRILL

Identification of geographic problems and selection of data; tests of simple hypotheses; applications of uniequation, simultaneous equation, and variance models; evaluation of findings. Prerequisite, an introductory course in statistics or permission.

### 490 Field Research (6, max. 12)

Development and application of skills essential to geographic field investigations: (1) training in the use of field techniques and base materials; (2) evaluation of these in a variety of research situations; (3) analysis and interpretation of field data; and (4) presentation of results of field investigations.

### 499 Special Studies (\*, max. 15) A

Supervised reading programs, undergraduate and graduate library and field research; special projects for undergraduate honors students. Prerequisite, senior class or graduate standing by permission.

## Courses for Graduates Only

### 500 Contemporary Geographic Thought (3, max. 6) AW

### 501 Geographic Analysis (3) AWSp

### 502 Professional Writing in Geography (\*, max. 6) Sp

### 504 Research Seminar: Western and Eastern Europe (3, max. 6)

FLEMING, VELIKONJA

### 505J Research Seminar: China and Northeast Asia (3, max. 6) Sp

Offered jointly with the Far Eastern and Russian Institute.

### 506J Research Seminar: Southeast Asia (3, max. 6)

Offered jointly with the Far Eastern and Russian Institute.

### 507J Research Seminar: Soviet Union (3, max. 6) WSp

JACKSON

Offered jointly with the Far Eastern and Russian Institute.

### 508 Research Seminar: Historical Geography of Anglo-America (3, max. 6)

### 509J Research Seminar: Japan (3, max. 6) W

KAKIUCHI

Offered jointly with the Far Eastern and Russian Institute.

### 510 Research Seminar: Settlement and Urban Geography (3, max. 9) W

BOYCE, ULLMAN

### 516J Research Seminar: Regional Economics (3) Sp

TIEBOUT

Selected topics dealing with aggregative regional economic tools with special attention to empirical testability. Offered jointly with the Department of Economics. Prerequisites, Economics 300 and 301.

### 520 Research Seminar: Cartography (3, max. 6) Sp

HEATH, SHERMAN

### 526 Research Seminar: Quantitative Methods in Geography (3, max. 6) W

MORRILL

### 527J Information Systems for Planning and Research (3) A

HORWOOD

Computer programming technology and data systems design for large scale data inputs. Machine editing, data manipulation, and information retrieval. Laboratory problems adapted to specialized interests of students. No previous computer programming experience required. Offered jointly with the Departments of Civil Engineering and Urban Planning.

### 528J Automated Mapping and Graphing (3) W

HORWOOD

Problem-oriented computer languages for statistical and areal analysis. Laboratory problems adapted to specialized interests of students. Offered jointly with the Departments of Civil Engineering and Urban Planning. Prerequisites, basic statistics and 527J, or permission.

### 529J Computer Applications to Urban and Regional Analysis (3) Sp

HORWOOD

Simulation models and automated systems for the study of land use and related economic and demographic data. Machine methods of planning analysis and feedback review. Laboratory projects. Offered jointly with the Departments of Civil Engineering and Urban Planning. Prerequisite, 528J or permission.

### 530J Research Seminar: Geography and Development (3, max. 6) A

THOMAS

Offered jointly with the Department of Urban Planning. (Not offered 1967-68.)

### 538 Research Seminar: Geography of Transportation (3, max. 6)

ULLMAN

### 539 Research Seminar: Utilization of Water Resources (3, max. 6)

(Not offered 1967-68.)

### 540 Research Seminar: Industrial Geography (3, max. 6) Sp

THOMAS

(Not offered 1967-68.)

### 542 Research Seminar: Social and Population Geography (3, max. 6) W

MORRILL, VELIKONJA

Prerequisite, graduate standing.

### 570 Research Seminar: Natural Resource Analysis (3, max. 6) W

COOLEY

Prerequisite, graduate standing.

### 575 Research Seminar: Political Geography (3, max. 6)

VELIKONJA

### 577 Research Seminar: Internal Spatial Structure of Cities (3, max. 9) W

BOYCE

Prerequisite, 477 or permission.

### 600 Research (\*) AWSp

### 700 Thesis (\*) AWSp

## GEOLOGY

### Courses for Undergraduates

### 101 Physical Geology (5) AWSp

BARKSDALE, CHRISTENSEN, COOMBS, MC KEE, PORTER, WHETTEN

A survey of physical geology. This study deals with the identification and origin of rocks and minerals; the processes which have been important throughout geologic time, both on and beneath the surface, in giving the earth its present form; and the principles of scientific investigation that are used in interpreting geologic features. With laboratory. For nonscience majors.

### 103 Earth History (5) Sp

MALLORY, RENSBERGER

Geology through time, including the elements of stratigraphy and paleontology. With laboratory. For nonscience majors. Prerequisite, 101 or 205.

### 106 Geology in World Affairs (5) W

BARKSDALE

Geological occurrence, world distribution, and production of coal, petroleum, and the important industrial materials. With laboratory. For nonscience majors. Prerequisite, 101. (Formerly 102.)

### 205 Physical Geology (5) ASp

GRESENS, MC KEE

The origin and development of minerals, rocks, landforms, and earth structures. With laboratory. For science majors. Prerequisite, high school chemistry or permission. (Not open to students who have taken 101.)

**208 Geology of the Northwest (5) S**

MC KEE

The geologic history of Washington, Oregon, and Idaho. Emphasis to be on use of geologic principles in interpreting evidence found in landscape and rocks. Prerequisites, 101 or 205 or 310, or permission.

**220 Mineralogy (5) A**

CHENEY, CHRISTENSEN

A systematic study of the common minerals, with emphasis on mineral identification and the importance of atomic structure on the physical and chemical properties of minerals. Prerequisites, 101, 205, or 310, or permission, Chemistry 101 or 140, Mathematics 104 or permission.

**225 Igneous and Metamorphic Petrology (5) W**

GRESENS

Systematic study of igneous and metamorphic rocks. Prerequisites, 205 and 220.

**310 Geology for Engineers (4) W**

CHENEY, GRESENS

Elements of geology for civil engineers. Prerequisite, civil engineering major or permission. (Not open to students who have taken 101 or 205.)

**326 Sedimentary Petrology (5) Sp**

WHETTEN

Origin and classification of sedimentary rocks; emphasis on field identification. Prerequisite, 225.

**330 General Paleontology (5) A**

MALLORY

Systematic study of invertebrate fossils and the principles of paleontology. Prerequisite, 205 or permission.

**340 Structural Geology (5) W**

MCKEE

Interpretation of rock structures and their genesis. Prerequisites, 205, 225, or permission.

**361 Stratigraphy (5) A**

WHEELER

Systematic study of spatial relations of surface-accumulated rocks and their space-time implications. Prerequisites, 205, 220, 225, 326.

**362 Interpretation of Geologic History (5) W**

WHEELER

Regional and interregional integration of physical geology and biostratigraphy as basis for geologic history of North America. Prerequisites, 330 and 361.

**401-402 Field Course (8-7) Sp**

Advanced or field work in general geology. Prerequisite, permission.

**405J Introduction to Geophysics: The Earth (5) Sp**

BOSTROM, CROSSON

Solid material in space, internal structure of the earth, sources of forces and stresses, the

crust, tectonic cycles, correlations of rock types and structural setting. Offered jointly with Geophysics. Prerequisite, permission.

**411J Geomorphology (4) WSp**

PORTER

Sculptural evolution of varied rock terrains, mass wasting processes, geomorphology of arid, semi-arid, polar, and alpine regions, sea-floor morphology and sediments. Offered jointly with the Department of Geography. Prerequisites, senior standing in geology or geography, and permission. (Offered 1967-68.)

**412 Regional Geomorphology (3)**

PORTER

Regional geomorphology of principal geologic provinces. Prerequisites, 340, 361, 411J.

**413 Glacial and Pleistocene Geology (5) A**

PORTER

Basic principles of glaciology and glacial geology; Pleistocene stratigraphy and chronology of glaciated and nonglaciated regions. Prerequisites, 411, senior standing in geology, and permission. (Offered alternate years; offered 1967-68.)

**414 Photogeology (3) Sp**

PORTER

Geologic interpretation of aerial photographs with emphasis on solving field problems. Prerequisites, 361, 340, 411J, and permission. (Offered alternate years; offered 1967-68.)

**423 Optical Mineralogy (5) A**

VANCE

Petrographic microscope and recognition of common minerals in thin section. Prerequisites, 205 and 220.

**424 Petrography and Petrology of Igneous Rocks (5) W**

VANCE

Systematic study of igneous rocks and their origin, using the petrographic microscope.

**425 Petrography and Petrology of Metamorphic Rocks (5) Sp**

VANCE

Systematic study of metamorphic rocks and their origin, using the petrographic microscope. Prerequisite, 424.

**436 Micropaleontology (5) Sp**

MALLORY

Principles of paleontology as applied to micropaleontology; the systematic study of foraminifera. Prerequisites, 330 and permission. (Offered alternate years; not offered 1967-68.)

**437 History and Classification of the Vertebrates (4) W**

RENSBERGER

This course traces the major groups of vertebrate animals from their origins, as they are currently known, through geologic time. It discusses the major morphologic changes and relates these to classification. In the laboratory

the student learns to recognize groups by their skeletal structures as well as understand the adaptive meaning of modifications. Prerequisite, permission.

**443 Advanced Structural Geology (5) A**

MISCH

Analysis in space and time; genetic interpretation; principles of geotectonics. Prerequisite, 340.

**450 Techniques in Geophysics (3) A**

BOSTROM, CROSSON

Introduction to geophysics of the solid earth, outlining instruments, techniques, and interpretation. Prerequisites, senior standing in geology and permission.

**472 Elements of Geochemistry (4) A**

GRESENS

Introduction to the interpretation and understanding of geological processes from the chemical standpoint. Prerequisite, senior standing in geology or permission.

**474 Introduction to X-ray Emission Spectrography (2) W**

GRESENS

Principles of fluorescence analysis involving basic analytical techniques with X-ray unit. Prerequisite, permission.

**480 History of Geology (3) Sp**

BARKSDALE

A study of the contribution of individuals to the evolution of geological concepts. Prerequisites, senior standing in geology and permission.

**487 Ore Deposits (5) Sp**

CHENEY

Description and origin of metallic and non-metallic ore deposits, coal, petroleum, and water resources, and their importance in national and world affairs; four- or five-day field trip to neighboring mining region. Prerequisite, senior standing or permission. (Not open to students who have taken 102 or 106.)

**498 Undergraduate Thesis (5) AWSp**

The thesis must be submitted at least one month before graduation. Prerequisites, senior standing and permission.

**499 Undergraduate Research (\*, max. 5) AWSp**

Prerequisites, senior standing and permission.

**Courses for Graduates Only****500 Departmental Seminar (1) AWSp****510 Research in Geomorphology and Pleistocene Geology (\*, max. 10) AWSp**

PORTER

**511 Seminar in Geomorphology (\*) AWSp**

PORTER

## GEOLOGY

- 512 Seminar in Pleistocene Research (2) AWSp**  
PORTER
- 520 Advanced Studies in Mineralogy, Petrography, and Petrology (\*) AWSp**  
MISCH, VANCE, MC KEE, COOMBS, CHENEY
- 521 Metamorphic Minerals (5) W**  
MISCH  
(Offered alternate years; not offered 1967-68.)
- 522 Regional Metamorphism and Granitization (5) W**  
MISCH  
(Offered alternate years; not offered 1967-68.)
- 523 Advanced Mineralogy (3) Sp**  
MCKEE
- 524 Advanced Igneous Petrography and Petrology (3 or 5) Sp**  
VANCE  
(Offered odd-numbered years.)
- 526 Advanced Petrography and Petrology of Sedimentary Rocks (4) W**  
WHETTEN  
Prerequisite, Oceanography 552.
- 530 Advanced Studies in Paleontology (5) W**  
MALLORY, RENSBERGER  
(Offered alternate years; offered 1967-68.)
- 531 Biostratigraphy (5) W**  
MALLORY  
(Offered alternate years; offered 1967-68.)
- 540 Advanced Studies in Structural Geology (\*) AWSp**  
MCKEE, MISCH
- 545 Structure of Europe (5) Sp**  
MISCH  
(Offered alternate years; offered 1967-68.)
- 546 Structure of Asia and West Pacific Rim (5) Sp**  
MISCH  
(Offered alternate years; not offered 1967-68.)
- 547 Literature on Structural Geology (3 or 5) W**  
MISCH
- 550 Studies in Geophysics (\*, max. 9) AWSp**  
BOSTROM, CROSSON
- 560 Advanced Studies in Stratigraphy (\*) AWSp**  
MALLORY, WHEELER
- 563 West Coast Cenozoic Stratigraphy (5) W**  
MALLORY  
(Offered alternate years; not offered 1967-68.)

- 565 Paleozoic Stratigraphy (5) Sp**  
WHEELER  
(Offered alternate years; offered 1967-68.)
- 568 Mesozoic Stratigraphy (4) Sp**  
WHEELER  
(Offered alternate years; not offered 1967-68.)
- 570 Advanced Studies in Geochemistry (\*) AWSp**  
GRESENS
- 571 Engineering Geology (3) W**  
COOMBS
- 573 Topics in Advanced Geochemistry (4) Sp**  
GRESENS
- 574 Seminar in Geochemistry (2) W**  
GRESENS
- 580 Advanced Studies in Economic Geology (\*) AWSp**  
CHENEY, COOMBS
- 590 Seminar (\*) AWSp**
- 600 Research (\*) AWSp**
- 700 Thesis (\*) AWSp**
- 702 Degree Final (6) AWSp**  
Limited to students completing a nonthesis degree program.

## GEOPHYSICS

- 403J Introduction to Geophysics: The Atmosphere (5) W**  
BUSINGER, FLEAGLE  
The atmosphere in its relation to the environment, gravity, geomagnetism, composition, transfer processes, motions, clouds, signal phenomena. Offered jointly with the Department of Atmospheric Sciences. Prerequisites, Mathematics 325, Physics 371, or equivalent.
- 404J Introduction to Geophysics: The Ocean (5) A**  
COACHMAN  
Composition and character of sea water; physical, chemical and geological properties and processes; dynamics; waves. Primarily for majors in the geophysical sciences. Offered jointly with the Department of Oceanography. Prerequisites, Mathematics 324, Physics 371, Chemistry 170, or permission.
- 405J Introduction to Geophysics: The Earth (5) Sp**  
BOSTROM, CROSSEN  
Solid material in space, internal structure of the earth, sources of forces and stresses, the crust, tectonic cycles, correlation of rock types and structural setting. Offered jointly with the Department of Geology. Prerequisite, permission.

- 536J Geomagnetism (3) W**  
SUGIURA

Description and theory of earth's permanent magnetic field. Secular variations. Solar and lunar magnetic variations. Atmospheric tides. Dynamo theory. Ionosphere. Solar-terrestrial relationships. Magnetic storms. Offered jointly with the Department of Atmospheric Sciences. Prerequisites, Physics 483 or Aeronautics and Astronautics 567, or permission.

- 537J Magnetosphere I (3) Sp**  
SUGIURA

Adiabatic invariants. Radiation belts. Solar wind. Interaction between solar wind and the earth's magnetic field; the boundary of the magnetosphere. Offered jointly with the Department of Atmospheric Sciences. Prerequisite, Physics 483 or Aeronautics and Astronautics 567, or permission.

- 538J Magnetosphere II (3) A**  
SUGIURA

Plasma waves. Propagation of very low frequency and hydromagnetic waves in the magnetosphere. Interactions between plasma waves and particles. Offered jointly with the Department of Atmospheric Sciences. Prerequisite, 537J.

- 600 Research (\*) AWSp**

- 700 Thesis (\*) AWSp**

## GERMANIC LANGUAGES AND LITERATURE

### Courses for Undergraduates

- 101-102, 103 First-Year German (5-5,5) A,AW,AWSp**

The methods and objectives are primarily oral-aural.

- 121, 122 First-Year Reading German (5,5) S,S**

A special beginning course devoted exclusively to the reading objective; 122 continuation of 121. For graduate students only.

- 201 Basic Second-Year German (5) AWSp**

Readings and oral practice in German, plus grammar review. Prerequisite, 103 or equivalent.

- 202 Intermediate Second-Year German (5) AWSp**

Continuation of 201. Prerequisite, 201 or equivalent.

- 203 Advanced Second-Year Reading (3) AWSp**

Majors and minors take concurrently with 207. Prerequisite, 202 or equivalent.

- 207 Advanced Second-Year Conversation (2) AWSp**

Discussion of general topics to develop oral fluency. Prerequisite, 202 or equivalent.

**260 Lower-Division Scientific German (3) Sp**  
Prerequisite, 202 or equivalent.

**290, 291, 292 Survey of German Tradition (3,3,3) A,W,Sp**

The interrelations of political, social, and economic developments in literature and the arts, middle ages through the twentieth century. Course offered in English. For majors and minors only.

**301, 302, 303 Grammar and Conversation (3,3,3) AW,WSp,Sp**

The materials used aim not merely at an increase in ability to speak, write, and understand German, but also at broadening the student's understanding of the culture of German-speaking countries. Primarily for majors and minors. Prerequisites, 15 credits in second-year German.

**307 Third-Year Composition (5) S**

Not open for credit to those who have had 301, 302, 303.

**310, 311 Introduction to the Classical Period (3,3) WS,SpS**  
SAUERLANDER

Lessing, Schiller, Goethe. Prerequisite, 15 credits in second-year German.

**312 Introduction to the German Novelle (3) A**  
SAUERLANDER

Representative writers, such as Keller, Meyer, and Storm; theory of the Novelle. Prerequisite, 15 credits in second-year German.

**330 Conversational German (5) S**

For participants in the Living-Language Group program only. Not open for credit to those who have had 301, 302, 303. Prerequisite, 207 or permission.

**401, 402, 403 Grammar and Composition (3,3,3) A,W,Sp**

Primarily for majors and minors. Prerequisites, 301, 302, and 303.

**404 History of the German Language (5) Sp**  
MEYER

From early Germanic to the present. Open to junior majors.

**405 Linguistic Analysis of German (3) A,Sp**  
VOYLES

Prerequisite, third-year German, or permission.

**407 Advanced Composition (5) S**

Not open for credit to those who have had 401, 402, 403.

**410, 411, 412 Survey of Modern German Literature and Culture (3,3,3) A,W,Sp**  
IMMERWAHR, HERTLING, LOEB

Literature since 1800, with special consideration of its cultural background and political

significance. Prerequisite, 15 credits of third-year German or permission.

**413, 414, 415 Survey of Older German Literature and Culture (3,3,3) Sp,W,A**  
HRUBY, HERTLING

Literature before 1800, with special consideration of its cultural background. Prerequisite, 15 credits of third-year German or permission.

**430 Advanced Conversational German (5, max. 10) S**

For participants in the Living-Language Group program only. Not open for credit to those who have had 401, 402, 403. Prerequisite, 330 or permission.

**490H Contemporary German Literature (2) A**

Interpretation of selected works by contemporary German authors. A senior colloquium for honors majors. Prerequisite, permission.

**491H Introduction to Literary Analysis (2) W**

An introduction to various methods of interpretation and to their practical application. For senior honors majors. Prerequisite, permission.

**492H History of Germanic Philology (2) Sp**

An introduction to the works of outstanding scholars in the field of Germanics. For senior honors majors. Prerequisite, permission.

**497 Studies in German Literature (1-5, max. 15) AWSpS**

**498 Studies in the German Language (1-5, max. 15) AWSpS**

# COURSE IN ENGLISH

**464 Thomas Mann in English (3) Sp**  
REY

## Courses for Graduates Only

**500 Methodology (3) W**  
(Offered alternate years; not offered 1967-68.)

**501 Bibliography (3) A**  
VON KRIES

**502 History of German Criticism (3) W**  
BEHLER  
(Offered 1967-68.)

**503 Modern Poetry (3) Sp**  
(Offered 1967-68.)

**506 German Syntax and Semantics (3) S**  
VOYLES

Advanced structural analysis of German grammar, with special emphasis on the application of descriptive techniques. (Offered Summer Quarter, 1969.)

**510, 511, 512 German Civilization (3,3,3) S,S,S**

Aesthetic and historical presentation of modern German civilization with due emphasis on its cultural, political, and social aspects. Prerequisite, permission. (Offered in consecutive Summer Quarters beginning with 512 in Summer, 1967.)

**515 Romanticism (3) Sp**  
BEHLER

**516 Nineteenth-Century Drama (3) Sp**  
SAUERLANDER

**517 Nineteenth-Century Prose (3) W**  
STRUC

**518 Twentieth-Century Literature (3) Sp**  
REY

**521 Seminar in the Literature of the Reformation and Renaissance (3) Sp**  
HRUBY  
(Offered 1967-68.)

**522 Seminar in Baroque (3) Sp**  
(Offered alternate years; not offered 1967-68.)

**524 Seminar in Eighteenth-Century Literature (3) A**  
HERTLING  
(Offered 1967-68.)

**525 Seminar in Romanticism (3) Sp**  
BEHLER  
(Offered 1967-68.)

**526 Seminar in Nineteenth-Century Drama (3) Sp**  
SAUERLANDER  
(Offered alternate years; not offered 1967-68.)

**527 Seminar in Nineteenth-Century Prose (3) A**  
STRUC  
(Offered 1967-68.)

**528 Seminar in Twentieth-Century Literature (3) A**  
BAUMGAERTEL  
(Offered alternate years; not offered 1967-68.)

**531 Lessing (3) A**  
LOEB

**534 Goethe I (3) A**  
LOEB

**535 Goethe II (3) W**

**538 Schiller (3) W**  
BAUMGAERTEL

**544 Seminar in Goethe (3) W**  
(Offered alternate years; not offered 1967-68.)

# GERMANIC LANGUAGES AND LITERATURE

## 550 Gothic (3) A

VOYLES

(Offered 1967-68.)

## 552 Old High German (3) W

(Offered 1967-68.)

## 555 Old Saxon (3) A

(Offered alternate years; not offered 1967-68.)

## 556 Middle High German (3) A

MEYER

## 557 Middle High German Literature I (3) W

HRUBY

## 558 Middle High German Literature II (3) Sp

HRUBY

## 560 Modern Dialects (3) W

(Offered 1966-67, 1968-69.)

## 564 Early Middle High German Literature (3) A

A comprehensive presentation of early Middle High German literature in the original. (Offered 1967-68.)

## 565 Seminar in Courtly Epic (3) W

Aspects and methods of literary analysis pertaining to the study of medieval courtly epics. (Offered 1967-68.)

## 566 Late Middle High German Narrative (3) Sp

Study of the evolution of the Middle High German novelistic narrative. (Offered 1967-68.)

## 567 Late 'Minnesang' (3) A

VON KRIES

A comprehensive study of the various developments of Middle High German lyric poetry from 1215 to the fifteenth century (Walther von der Vogelweide to Oswald von Wolkenstein). (Offered alternate years; not offered 1967-68.)

## 568 Seminar in Heroic Epic (3) Sp

Literary and historic problems of the German heroic epic, with special emphasis on the *Nibelungenlied* and the *Dietrichsepik*. (Offered alternate years; not offered 1967-68.)

## 569 Didactic and Religious Medieval Literature (3) W

VON KRIES

A comprehensive study of Middle High German religious and didactic poetry from the twelfth to the fifteenth century. (Offered alternate years; not offered 1967-68.)

## 574 Introduction to Methods of Teaching German (3) S,A

Developments in the methods of teaching German, curriculum and programs on the

elementary and secondary level; qualifications of a foreign language teacher are discussed. (Offered Summer, 1968.)

## 575 Teaching Advanced German Language and Literature on Secondary Level (3) S

Teaching of German language and literature on the advanced level in secondary schools. Coordinated six-year program and the preparation for advanced college work. (Offered Summer Quarter, 1969.)

## 576 Modern Methods and Materials in Teaching German (3) Sp,S

The audio-lingual method and its application; planning, organization, and use of a foreign language laboratory; tests and measurements; evaluation of teaching materials. (Offered Summer Quarter, 1967.)

## 590 Seminar in Literary History (1-5) A

## 591 Seminar in Literary History (1-5) W

## 592 Seminar in Literary History (1-5) Sp

## 595, 596, 597 Seminar in Germanic Philology (1-5, 1-5, 1-5) AWSp

## 600 Research (\*) AWSpS

## 700 Thesis (\*) AWSpS

## 702 Degree Final (6) AWSpS

Limited to students completing a nonthesis degree program.

## GRADUATE AND CERTIFICATE DENTAL STUDENTS ONLY

*These courses include subject material applicable to all phases of dentistry and may be applied toward the major requirement for the degree of Master of Science in Dentistry.*

### DENTISTRY

#### 416 Scientific Methodology in Dental Research (3)

Principles of scientific methodology and basic statistics. Problem definition. Principles of classification. Collection of data. Techniques of analysis. Formation of hypothesis. Search of the literature. Experimentation. Sampling techniques. Graphic presentation of material. Ordering of quantitative data. Phenomena of distributions of biological data. Tests of significance and their interpretation.

#### 417 Scientific Methodology in Dental Research (3)

Advanced biometric techniques. Analysis of variance and covariance. Linear and curvilinear regression. Multiple regression and analysis of variance. Orthogonal polynomials. Experimental designs: general principles, precision, replications. Randomized blocks and Latin squares. Incomplete block designs.

## 510 Applied Osteology and Myology of the Head and Neck (2)

MOORE

Detailed study as a background for the study of the growth and development of the head and for cephalometric roentgenogram interpretation. (Department of Orthodontics)

## 511 Roentgenographic Cephalometry (2)

MOORE

Basic principles, history, and techniques of roentgenographic cephalometry. (Department of Orthodontics)

## 512, 513 Growth and Development (2,2)

MCNEILL, MOORE

Review of the various methods of studying human growth, with special emphasis upon growth of the head, and study of the development of the dentition from birth through maturity; analysis of the factors that produce normal occlusion and malocclusion. Prerequisite, 512 for 513. (Department of Orthodontics)

## 514 Genetics and Its Applications to Dental Problems (2)

MOFFETT

Genes and the nature of genic action. Significance of mitosis and meiosis. Hereditary syndromes involving cranial structures. Introduction to population genetics. Genetics of the blood groups and their medico-legal implications. Hereditary aspects of the human dentition.

## 515 Morphogenesis of Skeletal Tissue (3)

Review of development of connective tissue, cartilage, bone and joints, including the differentiation, growth, remodeling, aging, and degenerative changes.

## 518 Scientific Methodology in Dental Research (2)

Critical review of dental literature. Application of principles learned in 416 and 417 to selected monographs and papers in dentistry and related fields of the basic sciences.

## 535 Oral Microbiology (3)

## 563 Minor Tooth Movement (2)

MOORE

A lecture-clinic course dealing with minor tooth movement necessary to successful periodontal therapy. Prerequisite, permission.

## 580 Gnathodynamics (2)

A seminar devoted to a comprehensive review of the temporomandibular joint and its associated structures. Thorough review of the anatomy and growth processes of the head and oral mechanism, with special emphasis upon the functional aspect of the human denture. Study of the instruments designed to imitate jaw movement and their effectiveness, together with the pathologies of the temporomandibular joint. (Departments of Orthodontics and Prosthodontics)

**581 Restorative Treatment Planning (4)**

MORRISON

Coordinated application of knowledge gained from both graduate and undergraduate courses to the diagnosis and treatment of the more complicated cases. (Department of Operative Dentistry)

**582 Cast Metal Restorations (4)**

MORRISON

Metallography of cast metals; physical properties of waxes and investments. Control of shrinkage. Interrelationships of physical properties of metals and physiology of oral tissues; thermal conductivity and pulpal response; galvanism; tissue tolerance in respect to various metals. Direct and indirect technics. Principles of cavity preparation that apply specifically to cast restorations. (Department of Operative Dentistry.)

**588, 589, 590 Seminar in Occlusion (2,2,2)**

MORRISON, MOORE, YUODELIS

Seminars in the physiology of occlusion. For other graduate course offerings see individual departmental listings.

**COURSES INCLUDED IN SCHOOL OF DENTISTRY PROGRAMS****Biological Structure 405-406 Microscopic and Submicroscopic Anatomy (4-4)**

Essentials of microscopic, submicroscopic, and chemical anatomy. Required for first-year medical students. Prerequisite for nonmedical students, permission.

**Biochemistry 440, 441, 442 Biochemistry (3,3,3)**

Lectures and conferences in the first quarter cover the fundamentals of biochemistry. The second quarter emphasizes metabolism in man. Laboratory exercises are introduced in the second quarter. Required for first-year medical students; open to a limited number of students with allied interests. Prerequisites, Chemistry 242 for 440; 440 and permission for 441; 441 for 442.

**Pathology 440-General Pathology (3-4)**

ROSS, SREEBNY

This course covers in brief form the basic work covered in detail in General Pathology 441-442-443. A reasonable knowledge of gross and microscopic anatomy, physiology, and biochemistry is essential to understand the principles underlying the fundamental alterations in tissues and organs in disease processes and the results of these changes. Open to graduate students by permission.

**Pathology-444-General Pathology (-2-)****Pediatrics 505 Physical Growth of the Well Child (2)**

LIMBECK

Nine weekly seminars (18 hours). Presentation by departmental staff of relationships between growth and development and diseases as they pertain to dental health. For twenty graduate students in dentistry. Prerequisite, permission.

**Preventive Medicine 472 Applied Statistics in Health Sciences (3)**

BENNETT

Application of statistical techniques to biological and medical research; design and interpretation of experiments.

**Psychiatry 400 Human Personality Development and Behavior (\*, max. 3) W**

Emotional and personality development from infancy through old age; the adaptation of the individual to his environment, with attention to the roles of heredity, constitution, physical changes, and family and social relationships as determinants in psychodynamics. Comparative personality development is illustrated by animal and human behavior. Required for first-year medical students; restricted to medical students.

**Psychiatry 430 Psychopathology (2)**

BAKKER, BROWNSBERGER, CHRIST, HAMPSON, RIPLEY, SPOERL, PATTISON

Abnormalities of behavior, thinking, and feeling, and the structural and psychological factors that produce them. Anxiety, depression, elation, withdrawal, repression, compensation, projection, and other personality reactions are discussed. Required for second-year medical students; restricted to medical students.

**Psychiatry 450 Principles of Personality Development (2) A**

KAUFMAN

Discussion of the principles of personality development and the problems most commonly met. Consideration will be given to the physiologic, psychologic, and cultural factors from infancy through adolescence. For non-medical students. Not open to students who have taken 267. Prerequisite, senior or graduate standing.

For other graduate course offerings see individual departmental listings.

**GREEK—See Classics****HEALTH EDUCATION—See Physical and Health Education****HISTORY****Courses for Undergraduates****INTRODUCTORY COURSES****Social Science 101 History of Civilization: The Great Cultural Traditions (5) A**

BRIDGMAN, CONNELLY, FERRILL, GRIFFITHS, KAMINSKY, LEVY, MOSHER, SPELLMAN, SCHOLZ, SOLBERG, THOMAS

The historic foundation of civilizations—Mesopotamia, Egypt, India, China; economy, society, government, religion, and culture; the elaboration of culture and institutions in

Greece, Rome, and the Orient; Christianity and the beginning of civilization in Western Europe; early medieval civilization in the West.

**Social Science 102 History of Civilization: The Western Tradition in World Civilization (5) W**

BRIDGMAN, CONNELLY, FERRILL, GRIFFITHS, KAMINSKY, MOSHER, SCHOLZ, SOLBERG, SPELLMAN, SUGAR, THOMAS

The beginning of modern civilization: the Renaissance; the Protestant Revolt; the state; commercial revolution and mercantilism; the rise of science; the "era of revolutions"; the Industrial Revolution and the rise of democracy. (Not open to students who have taken History 305.)

**Social Science 103 History of Civilization: The Contemporary World (5) Sp**

BRIDGMAN, CONNELLY, FERRILL, GRIFFITHS, KAMINSKY, MOSHER, SCHOLZ, SOLBERG, SPELLMAN, SUGAR, THOMAS

The meeting of East and West: the "one-world" community in the twentieth century; imperialism, communism, fascism, democracy, internationalism; twentieth-century science; present-day philosophy; religion, literature, and art; the meaning of history for the citizen of the contemporary world. (Not open to students who have taken either History 306 or 307.)

**101 Medieval European History (5) ASP**

KAMINSKY, LYTLE, MOSHER

Europe from the disintegration of the Roman Empire to 1500. The evolution of the basic values and institutions of Western civilization. (Not open to students who have taken History 305.)

**102 Modern European History (5) ASP**

BRIDGMAN, EMERSON, FARRAR, LYTLE, SUGAR

Political, social, economic, and cultural history of Europe from 1500 to the present, including the evolution of nationalism, democracy, and imperialism and their interrelationship with the Industrial Revolution. (Not open to students who have taken History 306 or 307.)

**201, 202 Ancient History (5,5) WSp**

FERRILL

Political, social, economic, and cultural development of the ancient Near East, Greece, and Rome; the elements of ancient civilization that contributed vitally to medieval and modern civilization.

**241 Survey of the History of the United States (5) AWSp**

PEASE, PRESSLY, SAUM, SCHOLZ

Supplies the knowledge of American history which any intelligent and educated American citizen should have. Object is to make the student aware of his heritage of the past and more intelligently conscious of the present.

**271-272, 273 English Political and Social History (5-5,5) A,W,Sp**

COSTIGAN

England from the earliest times to the present, stressing the origins of American institutions and social patterns.

# HISTORY

## ANCIENT HISTORY

### 201, 202 Ancient History (5,5) W,Sp

FERRILL

See Introductory Courses.

### 400 Early Greece (3) A

FERRILL

A study of the political, institutional, and cultural history of early Greece, with emphasis on the origins of Greek civilization.

### 401 Greece in the Age of Pericles (3) Sp

EDMONSON

A study of the political, institutional, and cultural history of classical Greece, with special emphasis on the legacy of Greece to Western civilization. (Offered alternate years; not offered 1967-68.)

### 402 Alexander the Great and the Hellenistic Age (3) Sp

EDMONSON

Political, social, economic, and cultural history of the Greco-Oriental world from Alexander to the Roman conquest, with special emphasis on the change from city-state to world-state and the fusion of Greek and Oriental cultures. (Offered alternate years; offered 1967-68.)

### 403 The Early Roman Republic (3) A

FERRILL

Political, social, economic, and cultural history, with emphasis on the development of the constitution and territorial expansion.

### 404 The Late Roman Empire (3) Sp

FERRILL

Political, social, and cultural history with special emphasis on the period of Cicero and Caesar.

### 405 The Early Roman Empire (3)

FERRILL

Political, social, economic, and cultural history with emphasis on the Julio-Claudians.

### 406 The Late Roman Empire (3)

FERRILL

Political, social, economic, and cultural history with emphasis on the decline of ancient civilization.

### 410 The Byzantine Empire (5)

Political, institutional, and cultural history of the Eastern Roman Empire from the fourth to the fifteenth centuries, with emphasis on its relations with the Latin West and the Slavic and Moslem areas.

## EUROPEAN HISTORY

### Medieval Period

### 101 Medieval European History (5) ASp

KAMINSKY, LYTLE, MOSHER

See Introductory Courses.

### 408 Church and State in the Middle Ages (5) W

BOBA, KAMINSKY

Changing theories and realities of relationship between religious and secular elements of medieval civilization.

### 410 The Byzantine Empire (5)

See Ancient History.

### 411 Medieval Europe, 500-1100 (5) W

KAMINSKY, MOSHER

The dark ages, feudalism, emergence of the medieval order of civilization, and the development of Romanesque culture.

### 412 Medieval Europe, 1100-1300 (5) Sp

KAMINSKY, MOSHER

Europe in the High Middle Ages: culture of cathedrals and universities, formation of national states, development of urban society.

### 413 Medieval Europe, 1300-1500 (5)

KAMINSKY

The disintegration of the medieval order under the impact of the national state, the secularization of society, and the decline of the Church. Movements of reform and revolution. The culture of late Gothic Europe.

### 426 Central Europe in the Middle Ages (5) Sp

BOBA, KAMINSKY

Origins and medieval history of Germany, Austria, Bohemia, and Poland, considered as a region within the sphere of Western European civilization. (Not offered 1965-66.)

### Early Modern Period

### 305 Early Modern European History, 1450-1648 (5) A

BRIDGMAN, EMERSON, GRIFFITHS, LEVY

Political, social, economic, and cultural history from the Late Renaissance to the Peace of Westphalia.

### 414 Culture of the Renaissance (5) A

GRIFFITHS

Art, literature, politics, philosophy, science, and religion in Italy from 1300 to the death of Michelangelo.

### 415 The Reformation (5) Sp

GRIFFITHS

The origins of the disunity of Europe in the crisis of sixteenth century with special emphasis upon the relations between religion and politics.

### 421J Kievan and Muscovite Russia, 850-1700 (5) A

SZEFTTEL

Development of Russia from earliest times to the reign of Peter the Great. Offered jointly with the Far Eastern and Russian Institute. Prerequisites, 101, or Social Science 101 and 102, or permission.

### 429 France, 1429-1789 (5) A

LYTLE

Political and cultural history, from Joan of Arc to the eve of the French Revolution. (Villon, Rabelais, Montaigne, Molière, Voltaire, Rousseau, de Tocqueville.)

### 448J History of Russian Culture to 1800 (5) W

SZEFTTEL

The development of religion, political ideas, philosophical and literary theories, art, architecture, drama, and music from Kievan times to the end of the 18th century. Offered jointly with the Far Eastern and Russian Institute. Prerequisites, 421J or 101, or Social Science 101 and 102, or permission. (Offered alternate years; offered 1967-68.)

### 495 Formation of the Spanish Nation (5) A

CONNELLY

A study of the major political, economic, and cultural events leading to the creation of the Spanish nation under Ferdinand and Isabel.

### Modern Period

### 102 Modern European History (5) AWSp

BRIDGMAN, EMERSON, FARRAR, LEVY, SUGAR

See Introductory Courses.

### 306 Modern European History, 1648-1815 (5) W

BRIDGMAN, EMERSON, SUGAR

Political, social, economic, and cultural history from the Peace of Westphalia to the fall of Napoleon.

### 307 Contemporary European History Since 1815 (5) Sp

BRIDGMAN, EMERSON, FARRAR, SUGAR, TREADGOLD

Political, social, economic, and cultural history from the fall of Napoleon to the present.

### 422J Imperial Russia, 1700-1900 (5) W

SZEFTTEL, TREADGOLD

Development of Russia from Peter the Great to Nicholas II. Offered jointly with the Far Eastern and Russian Institute. Prerequisites, 421J or 102, or Social Science 101 and 102, or permission.

### 423J Twentieth-Century Russia (5) Sp

TREADGOLD

Russia and the USSR from Nicholas II to the present. Offered jointly with the Far Eastern and Russian Institute. Prerequisites, 422J or 102, or Social Science 102 and 103, or permission.

### 424J Modern Russian Intellectual History (5)

TREADGOLD

Development of Russian social and political thought and philosophy from the seventeenth century to the Revolution of 1917. Offered jointly with the Far Eastern and Russian Institute.

### 427J- Eastern Europe, 1772-1918 (5-) A

SUGAR

Poland, Czechoslovakia, Hungary, Rumania, Yugoslavia, Bulgaria, and Albania, from the first partition of Poland to the end of World War I. Offered jointly with the Far Eastern and Russian Institute.



**-428J Eastern Europe Since 1918 (-5) W**  
SUGAR

Poland, Czechoslovakia, Hungary, Rumania, Yugoslavia, Bulgaria, and Albania, from the end of World War I to the present. Offered jointly with the Far Eastern and Russian Institute.

**430 The French Revolution and Napoleonic Era, 1789-1815 (5) W**

LYTLE

The transformation of France under the Revolution of 1789; the Reign of Terror and Napoleon; the impact of the Revolution and Napoleon upon Europe.

**431 Europe, 1814-1870 (5) A**

BRIDGMAN, LYTLE, SUGAR

The development of Europe during the age of Metternich, the revolutions of 1848, and the emergence of new national states.

**432 Europe, 1870-1914 (5) Sp**

SUGAR

The impact of population increase and technological change on European society; stresses and strains in European life and outlook.

**433 Europe, 1914-1945 (5) Sp**

EMERSON

The politics and society of Europe in the age of the concentration camp.

**434 Europe Since 1945 (5) Sp**

CONNELLY

Political, economic, and military developments in Europe under the impact of the cold war.

**436 Germany, 1648-1914 (5) W**

BRIDGMAN, EMERSON

A survey of the society, economy, and political problems of Central Europe from the Thirty Years' War to the First World War, with particular emphasis on the nineteenth century. (Offered alternate years; not offered 1967-68.)

**437 Germany, 1914-1945 (5)**

BRIDGMAN, EMERSON

Politics and society from the collapse of the Bismarckian empire to the collapse of Hitler's empire.

**438- History of the Near East, 622-1789 (5-) A**

SUGAR

The Arab countries (Turkey, Iran), from the emergence of Islam to the accession of Sultan Selim III.

**-439 History of the Near East, 1789-1959 (-5) W**

SUGAR

The Arab countries (Turkey, Iran), from the first westernizing reform movements to the present.

**444 France Since 1815 (5) Sp**

PINKNEY

Political, economic, and social history since the Congress of Vienna. Special emphasis will be

laid upon the continuity of the revolutionary tradition.

**448J History of Russian Culture to 1800 (5) W**

SZEFTTEL

The development of religion, political ideas, philosophical and literary theories, art, architecture, drama, and music from Kievan times to the end of the eighteenth century. Offered jointly with the Far Eastern and Russian Institute. Prerequisites, 421J or 101, or Social Science 101 and 102, or permission. (Offered alternate years; offered 1967-68.)

**449J Russian Historiography (5) Sp**

SZEFTTEL

Offered jointly with the Far Eastern and Russian Institute. Prerequisites, 101 or 421J or 448J, or Social Science 101 and 102, or permission.

**460J Economic History of Europe (5) A**

MORRIS, R. THOMAS

The origins of the modern European economy; an historical analysis of economic change and growth from medieval times. Offered jointly with the Department of Economics. Economics 200, 201 recommended.

**476J Western Influence in Russian and Chinese Intellectual History (4) Sp**

TREADGOLD

Comparative analysis of stages of Western impact on Russian (1492-1917) and Chinese (1582-1949) thought previous to proclamation of Marxism-Leninism as official ideology. Offered jointly with the Far Eastern and Russian Institute. (Not offered 1966-67.)

**493A Diplomacy of Early Modern Europe (5) W**

FARRAR

Relations between European States during period of French predominance, 1648-1870.

**493B Diplomacy of Modern Europe (5) Sp**

FARRAR

Relations between European states during period of German predominance, 1870-1945.

**496 Spain in the Modern World**

CONNELLY

A study of the political, economic, and cultural attempts of Spain to adjust to capitalism, liberalism, and secularism.

**UNITED KINGDOM, BRITISH EMPIRE, AND COMMONWEALTH HISTORY****271-272, 273 English Political and Social History (S-5,5) A,W,Sp**

COSTIGAN

See Introductory Courses.

**365 Intellectual History of Modern England (3) Sp**

LEVY

This course will relate the changes in political theory, philosophy, science, and literature to the historical events of the period 1500 to the present.

**469 England in the Sixteenth Century (5) A**  
LEVY

Political, administrative, and social history from Henry VII to Elizabeth I, with emphasis on the Reformation and its effects and on conditions of life in Elizabethan England.

**470 England in the Seventeenth Century (5) W**

LEVY

Political, administrative, and social history from the accession of James I to the Glorious Revolution.

**471 England in the Eighteenth Century (5) Sp**

COSTIGAN, LEVY

A study of political, social, economic, and cultural developments. Parliamentary government; rise of the British Empire; aristocratic culture.

**472 England in the Nineteenth Century (5) W**

COSTIGAN

Political, social, and cultural development; the agrarian, industrial, and French revolutions; the rise of parliamentary democracy; the Victorian age; political thought from Utilitarianism to Fabianism; Irish Home Rule.

**473 England in the Twentieth Century (5) Sp**

COSTIGAN

From the Boer War to the present; conservatism, liberalism, and socialism; England in two world wars; the decline of British imperialism.

**474 Modern Irish History (5)**

COSTIGAN

Growth of Irish national feeling in the nineteenth century through the Home Rule and Sinn Fein movements; establishment of the Irish Free State and the Republic of Eire; background of the Irish literary renaissance; establishment of Northern Ireland.

**475 History of Canada (5) A**

WILLIAMS

The struggle for unity and nationhood as determined by geographical conditions, by religious antagonism, by the impact of modern commercial and industrial society upon an old-world culture, and by pulls toward Europe and the United States.

**477 History of Australia and New Zealand (5) W**

WILLIAMS

The techniques of overseas colonization of the nineteenth century and development of egalitarian democratic communities in the late nineteenth and twentieth centuries.

**478 Africa South of the Sahara (5) Sp**

BRIDGMAN, WILLIAMS

Political and cultural evolution of the peoples inhabiting these lands.

# HISTORY

## 479 South Africa (3) Sp

WILLIAMS

South Africa in the nineteenth and twentieth centuries: social, political, and economic developments; nationalism and race relations; South Africa in crisis. Prerequisite, upper-class standing.

## 480 History of the British Empire—Since 1783 (5) A

WILLIAMS

Britain in the Caribbean, Africa, India, Southeast Asia, and the Pacific: the dependent empire as a phase of modern capitalism; evolution of imperial policy from autocracy towards self-government and from laissez-faire toward economic planning.

## 481 History of the British Commonwealth (5) W

WILLIAMS

The settlement, economic development, and political evolution of Canada, Australia, New Zealand, and South Africa, studied comparatively.

## AMERICAN HISTORY

### 241 Survey of the History of The United States (5) AWSp

PEASE, PRESSLY, SAUM, SCHOLZ

See Introductory Courses.

### 340 The American People and Their Institutions (2)

PRESSLY

A study of the American people and their dominant institutions. (Open to foreign students only.)

### 341 Foundations of American Civilization (5) A

SCHOLZ

The founding of Anglo-Saxon society in the Western Hemisphere, with attention to the earliest colonial establishments, the growth of a new culture, independence, and the organization of the American Union.

### 342 American Civilization: The First Century of Independence (5) W

PEASE, SAUM

Establishment of the constitutional system; national expansion; intellectual and cultural development; internal conflicts, the Civil War, and Reconstruction.

### 343 Modern American Civilization from 1877 (5) Sp

BURKE, PEASE, PRESSLY

The emergence of modern America, after the Civil War; interrelationships of economic, social, political, and intellectual developments. Not open to students who have taken 450.

### 386 Latin America: The Colonial Period (5) A

ALDEN, SOLBERG

Discovery and founding of Spanish and Portuguese empires in the New World and their development until the eve of independence.

### 387 Latin America: The National Period (5) W

ALDEN, SOLBERG

Struggle for independence and later political, economic, social, and cultural history of the principal Latin American nations; their relations with each other, the United States, and other powers.

### 441 American Revolution and Confederation (5) W

SAVELLE, SCHOLZ

Causes of separation of the United States from the British Empire; political theory of the Revolution; its military history; diplomacy of the Revolution; the Revolution as a social movement; intellectual aspects; readjustment after independence; the formation of the American union; the Constitution.

### 442 The Colonial Mind (5) Sp

SAVELLE, SCHOLZ

An examination of the main currents of the colonial American mind, with special reference to Puritanism, the formation of a colonial mentality, and the relationship between colonial thought and institutions.

### 443 The Intellectual History of the United States (5) A

SAUM

Lectures and discussions devoted to the development of the American mind, from historical beginnings to the present.

### 445 Constitutional History of the United States, 1787-1877 (3)

BESTOR

English and colonial backgrounds, formation of the Constitution and Bill of Rights, issues of interpretation under Marshall and Taney, the slavery controversy and secession.

### 446 Constitutional History of the United States Since the Civil War (3)

BESTOR

Constitutional aspects of Reconstruction, laissez-faire and the Supreme Court, crisis and change in the 1930's, current issues of civil rights.

### 447 History of the Civil War and Reconstruction (5) Sp

PEASE, PRESSLY

The struggle between sections and rival nationalisms in midnineteenth-century America.

### 450 Twentieth Century America (5) A

BURKE, PEASE, PRESSLY

Political, social, economic, and intellectual developments in the United States from 1900 to the present. Not open to students who have taken 343.

### 457 Foundations of American Constitutionalism to 1789 (3)

BESTOR

The heritage of English constitutional principles, colonial experience, state constitutions after independence, the Articles of Confederation, the framing and adoption of the Constitution of 1787.

### 458 The United States in World Affairs, 1776-1865 (5) W

HOLT

World politics and the balance of power; background of major episodes in American foreign relations.

### 459 The United States in World Affairs, 1865 to the Present (5) Sp

HOLT

A continuation of 458, into the period when the United States became a major factor in the balance of power.

### 461 History of American Liberalism Since 1789 (5)

BURKE, PRESSLY

Comparative study of aims and accomplishments of four major reform movements in the United States: Jeffersonian democracy, Jacksonian democracy, Progressivism, the New Deal.

### 463 The Westward Movement (5) W

CARSTENSEN, SAUM

Territorial and economic expansion of the United States from the Revolution to World War I; conditions affecting settlement and development of the West; political and social institutions; interregional relationships.

### 464 History of Washington and the Pacific Northwest (5) ASp

CARSTENSEN, SAUM

Exploration and settlement; economic development; growth of government and social institutions; statehood.

### 486 The History of Mexico, 1517 to the Present (5) W

ALDEN

Political, social, and economic history of Mexico from its discovery by the Spanish to the present.

### 487 The History of Brazil: Colonial Period to the Present (5) Sp

ALDEN

Colonial foundations; the first and second empires; the old and new republics; current problems; prospects for the future.

### 489 Twentieth Century Latin American (5) Sp

SOLBERG

Analysis of economic problems, political and social changes, and intellectual trends in major Latin American republics; Latin American relations with the United States.

## HISTORY OF SCIENCE

### 316 Science in Civilization: Antiquity to 1600 (5) A

HANKINS

From preclassical antiquity to the end of the Middle Ages, stressing the growth of scientific ideas, the cultural context in which they take shape, and their relationship to other movements of thought in the history of civilization.

**317 Science in Civilization: Science in Modern Society (5) W**

HANKINS

The growth of modern science since the Renaissance, emphasizing the scientific revolution of the seventeenth century, the development of methodology, and the emergence of new fields of interest and new modes of thought.

**418 Origins of Modern Science: The Physical Sciences (5)**

HANKINS

The history of the physical sciences seen through an intensive study of key periods in their development. Emphasis will be placed upon the nature of scientific revolutions and the role of individual scientists. Prerequisite, one introductory course in a physical science.

**419J The Historical Foundations of Modern Biology (3) Sp**

BODEMER

A history of the biological sciences from their beginnings to their emergence as distinct disciplines. Emphasis will be placed on the origins of ideas contributing to the development of modern biology. Offered jointly with Division of Biomedical History in the School of Medicine.

**420 Science and the Enlightenment (5) A**

HANKINS

The role of science in relation to intellectual, social, economic, and religious forces in the eighteenth century, and growth of the international community in science during the same period.

**425 Science in the Age of Revolution, 1776-1848 (5) W**

A historical study of the sciences during that period when not only the sciences, but the arts and social institutions as well were undergoing great change.

**ASIAN HISTORY****280J Ancient Indian Civilization (5) A**

SPELLMAN

An introductory course dealing with the religions, literature, philosophy, politics, arts, and history of India from earliest times to the Muslim invasion. Offered jointly with the Far Eastern and Russian Institute.

**281J Modern Indian Civilization (5) W**

SPELLMAN

An introductory course dealing with the Islamic impact, British conquest, and contemporary India. Emphasis on the rise of nationalism, social organization, and contemporary life and history. Offered jointly with the Far Eastern and Russian Institute.

**295J Introduction to Japanese Civilization (5) Sp**

PYLE

Survey of Japan's political, social, and cultural development from early times to the present. Offered jointly with the Far Eastern and Russian Institute.

**385J Problems of Modern India (5)**

SPELLMAN

An analysis of the problems in the fields of social life, international and domestic politics, education, economics, and other areas that confront India today and which may determine her future. Offered jointly with the Far Eastern and Russian Institute.

**451J The Modernization of Japan (5) A**

PYLE

Historical approach to social, political, economic, and psychological problems of modernization in Japan. Offered jointly with the Far Eastern and Russian Institute.

**452J History of Early Japan A**

PYLE

Political, social, economic, and cultural development of Japan to the beginning of the Tokugawa period (17th century). Offered jointly with the Far Eastern and Russian Institute.

**453J History of Tokugawa Japan (5) W**

PYLE

Political, social, economic, and cultural development of Japan from the beginning of the Tokugawa period (17th century) to the present. Offered jointly with the Far Eastern and Russian Institute.

**454J History of Modern Japan (5) Sp**

PYLE

Political, social, economic, and cultural development of Japan from the late Tokugawa period to the present with special emphasis on the cultural impact of the West. Offered jointly with the Far Eastern and Russian Institute.

**456J Japanese-American Relations (5) Sp**

BUTOW

The confrontation between Japan and the United States from Perry to MacArthur with emphasis on the period from 1905 to 1945. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, permission.

**465J Chinese History: Earliest Times to 221 B.C. (5) A**

DULL, WILHELM

Pre-Imperial China. Offered jointly with the Far Eastern and Russian Institute. (Offered alternate years; not offered 1967-68.)

**466J Chinese History: 221 B.C. to A.D. 906 (5) W**

DULL, WILHELM

Development of the imperial Chinese state. Offered jointly with the Far Eastern and Russian Institute. (Offered alternate years; not offered 1967-68.)

**467J Chinese History: A.D. 906 to A.D. 1840 (5) Sp**

DULL, WILHELM

The Wu, Tai, Sung, Yuan, Ming and early Ch'ing periods. Offered jointly with the Far Eastern and Russian Institute. (Offered alternate years; not offered 1967-68.)

**468J Modern Chinese History (5) Sp**

SCHWARZ

Modern Chinese society from 1840 to 1949. Offered jointly with the Far Eastern and Russian Institute.

**482J History of India: Earliest Times to A.D. 647 (5) W**

SPELLMAN

India in ancient times; emphasis on forms of political organizations and economic life, social organizations, and cultural developments. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, 280J or permission.

**483J History of India: A.D. 647 to A.D. 1525 (5)**

SPELLMAN

Medieval India; emphasis on forms of political organizations and economic life, social organizations, and cultural developments. Offered jointly with the Far Eastern and Russian Institute.

**484J History of India: A.D. 1525 to the Present (5) Sp**

SPELLMAN

Modern India; emphasis on forms of political organizations and economic life, social organizations, and cultural developments. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, 281J or permission.

**485J Ancient Indian Politics (3) A**

SPELLMAN

Emphasizes the role of kingship, administration of justice, principles of statecraft, economic aspects, and the role of society within the political framework. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, 280J or permission.

**UNDERGRADUATE HONORS AND RESEARCH****390H-391H Colloquium in the History of Ideas (5-5) W,Sp**

BURKE, KAMINSKY, SAUM

Discussion of selected topics in the history of ideas; writing of an interpretive essay.

**490H-491H Historical Method (5-5) A,W**

ALDEN, BURKE, LYTLE

The purposes, materials, and techniques of historical scholarship. Theory, practice, and criticism.

**499 Undergraduate Research (1-5, max. 10) A,W,Sp****Courses for Graduates Only****HISTORIOGRAPHY****500 Historiography: Ancient and Medieval European (3) A**

HOLT AND STAFF

**501 Historiography: Early Modern European (3) W**

HOLT AND STAFF

# HISTORY

- 502 Historiography: Early Modern European and American (3) Sp**  
HOLT AND STAFF

## COURSES IN FIELDS OF SPECIALIZATION

These courses are introductions to advanced study. They are designed to show how important historical conclusions have been reached, to suggest further research, and particularly to give bibliographical guidance to students in their preparation for examinations in the fields selected.

- 511 Greek History (3-6)**  
EDMONSON

Problems in the history of the Athenian Constitution.

- 512 Roman History (3-6) W**  
FERRILL

Roman History, 31 B.C. - A.D. 37.

- 513 Byzantine History (3-6)**

- 514 Medieval History (3-6)**  
KAMINSKY

- 515 Renaissance and Reformation (3-6) A**  
GRIFFITHS

- 516J Field Course in Chinese History: Traditional Period (3-6) Sp**  
DULL

To introduce students to western language materials on traditional China in order to give the students bibliographical and other assistance in preparing for examinations in this field in history. Offered jointly with the Far Eastern and Russian Institute.

- 520 History of Science (3-6)**  
HANKINS

- 528J History of Eastern Europe, 1772-1939 (5)**  
SUGAR

A study of the East-Central European region: Poland, Czechoslovakia, Hungary, Rumania, and the Balkan countries, from their rebirth to World War II. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, reading knowledge of German, French, Russian, or one East European language.

- 532 Modern European History: Germany (3-6) W**  
EMERSON

- 533 Modern European History: France (3-6) Sp**  
LYTLE, PINKNEY

- 534J Modern Russian History (3-6) A**  
TREADGOLD

Offered jointly with the Far Eastern and Russian Institute.

- 538 Twentieth-Century European Diplomatic History (3-6)**

- 539J Medieval Russian History (3-6) Sp**  
SZEFTTEL

Offered jointly with the Far Eastern and Russian Institute. Prerequisites, 421J, 448J, or permission; Russian or French, and German.

- 540 American Constitutional History (3-6)**  
(Offered alternate years; offered 1967-68.)

- 541 American History: Early (3-6) W**  
SAVELLE

- 542 American History: Western (3-6) A**  
CARSTENSEN

- 543 American History: Civil War (3-6) W**  
PRESSLY

- 544 American History in the Nineteenth Century (3-6)**  
BESTOR  
(Offered alternate years; offered 1967-68.)

- 545 American History: Twentieth Century (3-6) AW**  
BURKE, PEASE

- 548J History of Eastern Europe, 1939 to the Present (5)**  
SUGAR

Offered jointly with the Far Eastern and Russian Institute. Prerequisite, reading knowledge of one major European or one East European language. (Offered alternate years; offered 1967-68.)

- 549J Japan in the Twentieth Century (3-6) Sp**  
BUTOW

Field course. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, permission.

- 559J Japan in the Nineteenth Century (3-6) W**  
PYLE

Field course. Offered jointly with the Far Eastern and Russian Institute. Prerequisites, 453J, 454J, or permission. (Offered 1967-68.)

- 574 English History: Tudor and Stuart (3-6)**  
LEVY

- 575 English History (3-6) A**  
COSTIGAN

- 576 British Empire History (3-6)**  
WILLIAMS

- 580 Latin American History: Colonial Period (3-6) W**  
ALDEN  
Prerequisite, permission.

- 581 Latin American History: National Period (3-6) Sp**  
ALDEN

- 587J Indian History (3-6)**  
SPELLMAN

Offered jointly with the Far Eastern and Russian Institute. Prerequisite, permission.

- 614J Field Course in Chinese History: Modern Period (3-6) Sp**  
GASSTER

Field course in modern Chinese history. Offered jointly with the Far Eastern and Russian Institute.

## SEMINARS

- 503-504 Seminar in Philosophy of History (3-6)-(3-6) A,W**  
COSTIGAN

- 517, 518, 519 Seminar in Medieval History (3-6, 3-6, 3-6) A,W,Sp**  
KAMINSKY

Prerequisites, a reading knowledge of French or German and Latin, and consent of the instructor.

- 521-522-523 Seminar in Modern European History (3-6)-(3-6)-(3-6) A,W,Sp**  
EMERSON

- 524A-524B-524C Seminar in French History (3-6)-(3-6)-(3-6) A,W,Sp**  
LYTLE, PINKNEY

- 525-526-527 Seminar in the History of Science (3-6)-(3-6)-(3-6) A,W,Sp**  
HANKINS

- 529-530-531 Seminar in the Renaissance and Reformation (3-6)-(3-6)-(3-6) A,W,Sp**  
GRIFFITHS

- 535J-536J-537J Seminar in Modern Russian History (3-6)-(3-6)-(3-6) A,W,Sp**  
TREADGOLD

Seminar in modern Russian history. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, reading knowledge of Russian.

- 546J-547J Seminar in Medieval Russian History (3-6)-(3-6) A,W**  
BOBA, SZEFTTEL

Offered jointly with the Far Eastern and Russian Institute. Prerequisites, reading knowledge of Russian and permission.

- 550J-551J-552J Seminar in War and Diplomacy: The Totalitarian Challenge, 1931-1945 A,W,Sp**  
BUTOW

The diplomacy of the Second World War with particular reference to the confrontation between the United States and the Axis Powers. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, permission.

**553-554-555 Seminar in American History:  
Early (3-6)-(3-6)-(3-6) A,W,Sp**

**556J-557J-558J Seminar in Chinese History:  
Traditional Period (3-6)-(3-6)-(3-6)  
A,W,Sp**  
DULL

Offered jointly with the Far Eastern and Russian Institute. Prerequisites, reading knowledge of Chinese and permission.

**560J-561J-562J Seminar in Modern East  
European History (3-6)-(3-6)-(3-6)  
A,W,Sp**  
SUGAR

Study and research involving special methods dealing with the histories of the East European countries in the modern period. Offered jointly with the Far Eastern and Russian Institute.

**563-564-565 Seminar in American History:  
Western (3-6)-(3-6)-(3-6) A,W,Sp**  
CARSTENSEN

**566A-566B-566C Seminar in American  
History: Recent Period (3-6)-(3-6)-  
(3-6) A,W,Sp**  
BURKE, PEASE

**567J-568J-569J Seminar in Korean History  
(3-6)-(3-6)-(3-6) A,W,Sp**  
KOH

Selected topics in Korean history and historiography. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, permission. (Last offered 1966-67.)

**572-573 Seminar in Modern English History  
(3-6)-(3-6)**  
COSTIGAN

**591-592 Seminar in American History:  
National Period (3-6)-(3-6)**  
BESTOR

**593-594-595 Advanced Seminar  
(3-6)-(3-6)-(3-6) A,W,Sp**  
HOLT

**611J-612J-613J Seminar in Chinese History:  
Modern Period (3-6)-(3-6)-(3-6) A,W,Sp**  
GASSTER

Research seminar in modern Chinese history. Offered jointly with the Far Eastern and Russian Institute. Prerequisites, reading knowledge of Chinese and permission.

**RESEARCH**

**600 Research (\*) AWSpS**

**700 Thesis (\*) AWSpS**

**HOME ECONOMICS**

**Courses for Undergraduates**

**110 Food and Nutrition (5) AWSp**  
CRUM, ARLIN

Meal management and food preparation with emphasis on nutritive and economic values. For nonmajors. Not open to students who have had 300.

**125 Textiles (3) AWSp**  
BROCKWAY, SMITH

Relationship of raw materials, construction, and finish to quality and cost; identification of fibers, yarns, and fabrics; microscopic and chemical tests; economic development of textile industry.

**134 Clothing (3 or 5) AWSp**  
MURDOCH, PRICE, SHIGAYA

Sociological, psychological, economic, and aesthetic aspects of clothing selection. Custom techniques in construction of cotton and linen garments. Students having had 231 will receive only 3 credits.

**148 The Home, Its Equipment, and  
Management (3) AWSp**  
HENDERSON

Management of resources to achieve family goals. Principles of management, kitchen and laundry planning, work simplification, wiring, and selection and care of household equipment.

**216 Food Preparation and Meal  
Management (1-3) AWSp**  
CRUM

Principles of food selection and preparation, with emphasis on meal management. Prerequisites, 148, Chemistry 101 and 102, or equivalent.

**231 Clothing Selection (2) ASp**  
PRICE

Sociological, psychological, economic, and aesthetic aspects of clothing for the individual. Not open to students who have had 134.

**234 Costume Design (3) AWSp**  
SHIGAYA, SMITH

Principles of flat pattern technique applied to design and construction of wool garments. Prerequisites, 125, 134, and Art 109 or 129, or equivalent.

**240 Home Furnishing (3) AW**  
SCHROEDER

A study of the house and its furnishings for present-day living. Not open to freshmen or to students who have taken 347.

**300 Nutrition (2) WSp**  
CRUM, ARLIN

Importance of food to the maintenance of health; nutritive values and human needs; ways of meeting requirements at different cost levels. For upper-division nonmajors. Not open to students who have had 110.

**307 Nutrition (3 or 5) A**  
JOHNSON

Chemistry of digestion and metabolism. Food values; human requirements and ways of meeting them at different cost levels. Qualified transfer students receive 3 credits. Prerequisites, general and organic chemistry and human physiology.

**315 Advanced Food Selection and  
Preparation (3 or 5) AWSp**  
NIELSEN

Scientific principles and experimental method applied to food preparation and preservation. Management related to food purchasing, meal preparation, and service. Prerequisites, 110 and permission, or 216, and organic chemistry.

**316 Demonstration Techniques (3) AWSp**  
NIELSEN

Principles and techniques of food and equipment demonstrations; food photography; recipe development. Prerequisites, 315 or permission.

**319 Family Nutrition (4) A**  
MONSEN

Chemistry and metabolism of the nutrients essential for maintenance of health. Normal nutritional needs of individuals at various age levels. Nutritional value of foods. Simple dietary modifications as appropriate to medical or dental fields. Prerequisites, Conjoint (Medical) 316, 317-318, or permission.

**321 Applied Design (2)**

Functional and decorative phases in the development of needlework and their application to contemporary design and textile art. Illustrated by a unique collection of historic lace. Prerequisites, 134 and Art 109 or 129 or equivalent, or permission.

**322 Applied Design (2)**

History of European national costume and embroidery as source material for modern design. Illustrated by rich collection of authentic folk costumes. Prerequisites, 134 and Art 109 or 129 or equivalent, or permission.

**329 Hand Weaving (2) AWSp**  
BROCKWAY

Weaving as an art form; fundamentals of loom design and operation; experimental problems in basic fabric structure. Prerequisites, permission and junior standing.

**334 Costume Design (3) W**

Designing as interpreted by techniques of draping, appropriate for silk and synthetic fabrics. Study of economic factors involved in clothing production at various price levels. Prerequisite, 234.

**338 Clothing for the Family (3) AWSp**  
PAYNE

Social and psychological aspects of family clothing, mass production, and the retail market. Individual problems of family clothing as affected by income, age, sex, and geographic locations. Prerequisite, 234.

**347 Home Furnishing (3 or 5) AWSp**  
SCHROEDER

Analysis of problems with relation to today's family living. Selection and arrangement of furnishings based on good design and appropriateness. Field trips and individual laboratory problems. Not open to students who have taken 240. Prerequisites, 125 and Art 109 or 129.

# HOME ECONOMICS

## 348 Home-Management House (3) AWSp

HENDERSON

Residence in the Home-Management House for 5 weeks. Application of principles of time, energy, and money management to group living. *Advance reservation required.* Prerequisites, 148, 307, 315, 347, 354, and permission.

## 350 Managing Family Finances (3) W

HALL

Use of financial resources to further family goals. Changes in income and in prices of consumer goods in relationship to family budgeting. Consumer credit, savings, insurance, social security, investments, taxes, trusts, and wills.

## 354 Family Economics and Finances (3 or 5) ASp

HALL

Economic and social conditions affecting the consumer. Use of financial resources to further family goals. Family budgeting, credit, savings, insurance, social security, investments, taxes, trusts, and wills. Not open to those who have had 350. Prerequisites, Economics 200 and junior standing.

## 356 Family Relationships (3) AWSp

KLEMER

Principles underlying good family relationships; wholesome adjustment of the home to a changing society. Prerequisite, upper-division standing.

## 372 Institution Food Preparation (5) WSp

ZIGLAR

Laboratory and institution practice in large-quantity food preparation and cost control. Prerequisite, 315 or permission.

## 380 Field Work in Apparel Manufacturing (2, max. 6) AWSp

PAYNE

Open only to apparel manufacturing majors. A program of part-time employment planned in advance with the instructor to provide on-the-job training correlated with periodic reports and evaluation of experience. Prerequisites, senior standing and permission.

## 406 Recent Developments in Nutrition (2) S

Review of nutrition in the light of recent developments; interpretation of current research; special needs of various age groups.

## 407 Advanced Nutrition (3) W

MONSEN

Recent research on vitamins, minerals, amino acids, lipids, and their interrelationships. Methods of utilizing knowledge in public health work, teaching, and research. Prerequisites, 307 and organic chemistry, or permission.

## 408 Diet Therapy (3) Sp

MONSEN

Nutrition as a curative and preventive factor in disease. Journal readings. Prerequisite, 407.

## 415 Experimental Foods (3) W

NIELSEN

Illustrating scientific principles by subjective and objective testing of foods. Individual research problems. Prerequisite, 315 or permission.

## 425 Advanced Textiles (3) W

BROCKWAY

Textile testing in research and in measuring fabric performance; textile legislation, standards, and methods of quality control; economic factors in world production and distribution of raw materials. Prerequisites, 125, organic chemistry, and Economics 200 or equivalent.

## 429 Advanced Weaving (3) A

BROCKWAY

Experimental problems, creative techniques, in designing decorative textiles; cloth analysis and design; library investigations of historic and contemporary contributions to textile arts. Prerequisite, 329 or equivalent.

## 432 History of Costume and Textiles (4) W

PAYNE

Fabrics and costumes of ancient civilizations and medieval European countries with consideration of their respective cultural origins. Prerequisites, Social Science 101 and 102 or equivalent, junior standing in Home Economics or permission.

## 433 History of Costume and Textiles (4) Sp

PAYNE

Continuation of 432 from the Renaissance to the present time. Prerequisite, 432.

## 434 Costume Design (3) Sp

SHIGAYA

Principles of tailoring. Analysis of methods and comparative costs of custom made and ready-to-wear garments. Appreciation of fine quality in clothing; discrimination in selection. Prerequisites, 338 or 334, and permission.

## 435 Advanced Costume Design (5) A

PAYNE

Application of the principles of flat pattern designing to problems in custom and mass production. Prerequisites, 334, 434, and Art 369 (which may be taken concurrently).

## 436 Advanced Costume Design (5) Sp

PAYNE

Application of the art of draping to custom and mass production. Prerequisite, 435.

## 447 Advanced Home Furnishing (3) Sp

SCHROEDER

Individual projects in specific fields of furnishings. Evaluation of standards in professionally constructed furniture and furnishings. Laboratory problems. Prerequisites, 240 and permission, or 347.

## 454 Advanced Family Economics and Finances (2) W

HALL

Family adjustment to differing social and economic conditions. Legislation affecting consumers. Prerequisites, 350, or 354, and permission.

## 456 Advanced Family Relationships (3) AWSp

KLEMER

Advanced study in interpersonal relationships in the family; growth and development during various phases of the family life cycle. Synthesis and evaluation of knowledge and concepts from the behavioral sciences concerned with family relationships. Prerequisite, 356 or teaching experience and upper-division standing.

## 457 Child Nutrition and Care (3) WSp

JOHNSON

Physical, mental, and emotional health of children. Experience with parents and children in nutrition clinic under supervision of a pediatrician. Prerequisite 300 or 307, or permission.

## 472 Institution Food Purchasing (3) W

TERRELL

Market organization, buying procedures, payment and credit; food selection and care; inspection of merchandise. Prerequisites, 315 and 372.

## 473 Institution Management (5) Sp

TERRELL

Organization and administration in food service institutions. A study of types of institutions, work planning, personnel direction, quality and cost controls, sanitation, budget analysis, professional ethics, executive qualifications. Prerequisite, 372.

## 474 Institution Management (5) A

SANDSTROM

Food and food service accounting problems. Recording financial transactions; cost controls; profit and loss statements. Prerequisite, 372.

## 475 Institution Equipment (3) A

TERRELL

Equipment requirements and flow of work in institutions. Institution kitchens and serving units; equipment selection, operation, and care; repair and depreciation records. Prerequisite, 372.

## 475FJ Improvement of Teaching: Home Economics (3, max. 6) S

MC ADAMS, GRANBERG

Identification of goals, concepts, and generalizations in home economics units at the secondary level with emphasis on teaching techniques, evaluation, and use of resources. Offered jointly with the College of Education. Prerequisite, teaching experience in home economics or permission.

# HUMAN RELATIONS IN BUSINESS AND INDUSTRY

## 494 Workshop in Home Economics Education (2½) S

Current problems in Home Economics Education. Prerequisites, Education 332 and 371S, or equivalent.

## 495 Special Problems in Home Economics (\*, no more than 10 credits toward any one degree) AWSp

Individual study and research in fields of special interest. In registration, field of interest should be indicated by area letter. Prerequisite, permission.

- A. Costume design
- B. Institution administration
- C. Nutrition
- D. Textiles
- E. Family economics
- F. Foods
- G. Home economics education
- H. Family relations
- I. Home management
- K. Home furnishing

## 496H Senior Honors Thesis (2 or 3, min. 6 and max. 6) AWSp

For undergraduate home economics honors students only. Six credits taken over a minimum of two quarters are required. In registration, subject area should be indicated by letter (see 495). Prerequisite, permission.

## Courses for Graduates Only

### 507 Readings in Nutrition (\*) Sp MONSEN

Library research and seminar on selected topics in recent developments in the field of nutrition. Prerequisite, 407 or equivalent.

### 515 Readings in Food Selection and Preparation (\*) W MONSEN

Library research and seminar on selected topics in recent developments in food chemistry, selection, processing, and preparation. Prerequisite, 315 or equivalent, or permission.

### 525 Seminar in Textiles (3) Sp BROCKWAY

Readings and discussion of factors affecting economic utilization and technical development of textile products. Trends in current research and methods of investigation. For graduate students in textiles and clothing. Prerequisites, 125, 425, or equivalent.

### 554 Social and Economic Problems of the Consumer (3 or 5) Sp HALL

Selected topics in the family economics field. Prerequisites, 454 or equivalent, and permission.

### 562 Home Economics Education (\*) W MCADAMS

Study of achievements, trends, functions, methods, and teaching materials.

## 576, 577, 578 Supervised Field Work (4,4,4) AWSp,AWSp,AWSp

TERRELL

Three quarters of practice and organized classwork for graduates in institution management and dietetics. An administrative dietetics internship approved by the American Dietetic Association. Fee, \$25.00 (payable first quarter).

### 600 Research (\*) AWSp

In registration, field of interest should be indicated by area letter (see 495). Prerequisite, permission.

### 700 Thesis (\*) AWSp

## HUMAN RELATIONS IN BUSINESS AND INDUSTRY

### Courses for Undergraduates

#### 365 Human Behavior in Organizations (3) AWSpS

BARNOWE, FENN, FRENCH, GARRISON,  
HENNING, KAST, KNOWLES, KNUDSON,  
SEABERG, SCHRIEBER, SUTERMEISTER

Content and instructional approach similar to 460 with emphasis on human aspects of organization and on administrative behavior. Not open to Business Administration students.

#### 460 Human Relations in Business and Industry (4) AWSpS

BARNOWE, FENN, FRENCH, GARRISON,  
HENNING, KAST, KNOWLES, KNUDSON,  
ROSEZWEIG, SAXBERG, SUTERMEISTER

Develops understanding of organizational behavior, with a clinical focus on basic processes and methods involved in diagnosing human situations and in taking action. Specifically concerns itself with personal, social, and organizational aspects. Case discussion and analysis of concepts and conceptual schemes. Prerequisite, senior standing.

#### 499 Undergraduate Research (3, max. 9) AWSp

Prerequisite, permission.

### Courses for Graduates Only

#### 500 Human Relations—Organizational Behavior (3) AW

BARNOWE, FENN, KNOWLES, KNUDSON,  
SAXBERG

Analytically examines basic clinical processes related to diagnosing organizational behavior and taking action, and such aspects as individual and group behavior, basic human relations skills, behavioral processes, and the effects of organizational systems and processes on human organization. Prerequisite, permission.

## HUMANISTIC-SOCIAL STUDIES

### Courses for Undergraduates

#### 265 Techniques of Communication (3) AWSp LEAHY, TRIMBLE

Organization, development, and expression of ideas. Prerequisite, passing of tests.

#### 270 Engineering Report Writing (2) AWSp MISE, SOUTHER, TRIMBLE, WHITE

Practical problems in making a logical, concise, and attractive presentation of technical materials; periodicals and reference works; the requirements of the reader; style; principles of spacing; illustrations; accepted abbreviations, proper bibliographical usages. Prerequisites, 265 and sophomore standing or permission.

#### 302 Technical Writing (3) Sp SOUTHER

An advanced course focusing on various types of technical and scientific writing: reports, articles, technical papers, manuals, proposals, books. Prerequisite, 270 or permission.

#### 331 Origins of Western Cultural Institutions (3) AWSp CHAPMAN, HUNNER

The nature of man and the nature of culture. Historical study of selected cultures, such as Mesopotamia, Greece, Rome, and medieval Europe; consideration of the social character of these cultures through their myth and literature. Prerequisite, 270 or permission.

#### 332 Development of Western Cultural Institutions (3) AWSp BOTTING, HIGBEE

The growth of modern institutions and of the ideas underlying them during the periods of the Renaissance, the Protestant Revolt, the Commercial Revolution, the Enlightenment, and the Industrial Revolution. Major emphasis is on political, economic, religious, and intellectual change. Prerequisite, 331 or permission.

#### 333 Contemporary Political and Social Problems (3) AWSp BOTTING, HIGBEE, RUSTAD

Twentieth-century background and development of contemporary political and social problems; comparison of competing political philosophies and systems: democracy, Fascism, Communism; current international and national events and issues. Prerequisite, 332 or permission.

#### 471 Introduction to the Folktale Among Literate Peoples (3) A SKEELS

Techniques of classification, geographic-historical distribution, theories of origin and interpretation, and related areas of investigation of the oral prose folk narrative of literate peoples. Prerequisite, senior standing.

# HUMAN RELATIONS IN BUSINESS AND INDUSTRY

- 491, 492, 493 Literary Heritage of the Western World I, II, III (3,3,3)**  
AWSp, AWSp, AWSp  
LEAHY, SKEELS, WHITE

The nature of literature and its role in culture, studied in a historical sequence of selected literary figures and works of Western civilization. 491: French medieval romance, Chaucer, Shakespeare, seventeenth-century poetry, Racine; 492: Voltaire, Goethe, Wordsworth, Flaubert, Tennyson; 493: twentieth-century literary figures. Prerequisites, 270 for 491; 491 for 492; 492 for 493.

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*HUNGARIAN—See Far Eastern and Slavic Languages and Literature*

*ICELANDIC—See Scandinavian Languages and Literature*

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## INDUSTRIAL ENGINEERING

For a description of courses required in this curriculum, see *College of Engineering* section.

## INTERNATIONAL BUSINESS

### Courses for Undergraduates

- 310 Principles of International Business (5)**  
AWSpS

CHAWNER, DENMAN, KOLDE,  
NIEDERREITER

Broad study of the major forms of international business: export and import trade, overseas investment, production and marketing operations; licensing, financing, and other services. Theoretical principles, government policies, business practices. Prerequisite, junior standing or permission.

- 320 International Business Environment (5) A**

CHAWNER, DENMAN, KOLDE

Study of international environment and its impact on business behavior: cultural, economic, and institutional factors; conditions in underdeveloped countries; communist enterprise; national policies and international relations. Prerequisite, 310 or permission.

- 370 Foreign Area Analysis (5) W**

CHAWNER, DENMAN, KOLDE

Objectives and methodology; business operations in the European Economic Community, other internationally integrated markets and trade blocs, and specific countries; student projects provide specialization and practical experience. Prerequisite, 310 or permission.

- 420 International Trade (5) W**

CHAWNER, DENMAN, KOLDE

Organization and administration of international trade: market research and product development; cost-price analysis; finance, credit, and transportation; export-import institutions and practices; tariffs and trade legislation. Prerequisite, 310 or permission.

- 470 Foreign Operations Management (5) Sp**  
CHAWNER, DENMAN, KOLDE

Case studies in foreign operations management: planning international objectives and

strategies; developing multinational company structures and executives; adapting administrative practices and operating policies to international diversities. Prerequisite, 310 or permission.

- 499 Undergraduate Research (3, max. 9)**  
AWSp

Prerequisite, permission.

### Courses for Graduates Only

- 515 Concepts and Policies (3) ASp**

CHAWNER, DENMAN, KOLDE

Theoretical and managerial concepts, institutions, and environment of international business; organization and administration of foreign operations; conflicts between domestic and international policies and practices. Prerequisite, permission.

- 520 Business Enterprise in Developing Areas (3) WS**

CHAWNER, DENMAN, KOLDE

The conditions, requirements, and problems which confront business enterprise in the developing countries of Africa, Asia, Latin America, and Oceania form the theme and the structure for this seminar. Prerequisite, permission.

- 521 Business Enterprise in Integrated Markets (3) ASp**

CHAWNER, DENMAN, KOLDE

A study in depth of the European Economic Community and other internationally integrated areas; their impact upon business operations and world trade is emphasized. Prerequisite, permission.

- 571-572 Research Reports (3-3) AWSpS**

See Accounting for description.

- 604 Research (\*, max. 10) AWSpS**

Prerequisite, permission.

- 700 Thesis (\*) AWSpS**

- 702 Degree Final (6) AWSpS**

Limited to students completing a nonthesis degree program.

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*ITALIAN—See Romance Languages and Literature*

*JAPANESE—See Far Eastern and Slavic Languages and Literature*

*JOURNALISM—See Communications*

*KOREAN—See Far Eastern and Slavic Languages and Literature*

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## LANDSCAPE ARCHITECTURE

### Courses for Undergraduates

- 230 Theory and Perception (2) W**

HAAG

General survey, orientation, and introduction to basic theory of landscape architecture. Prerequisite, Architecture 126 or permission.

- 231 History (3) Sp**

JOHNSTON

A critical and historical analysis of man's progress in designing land and outdoor space.

- 334, 335, 336 Construction (4,4,4) A,W,Sp**

SAKUMA

A study of the problems of earth grading, drainage, highway design and alignment, retaining walls, irrigation and utility systems. Prerequisite, Architecture 226.

- 350, 351, 352 Landscape Design, Grade III (6,6,6) AWSp, AWSp, AWSp**

HAAG, SAKUMA

Intensive study in the analysis, approach, solution, and presentation of basic landscape architectural problems. Prerequisite, Architecture 226.

- 460, 461, 462 Landscape Design, Grade IV (6,6,6) AWSp, AWSp, AWSp**

HAAG, SAKUMA

Advanced study in the analysis, approach solution and presentation of complex landscape architectural problems. Prerequisite, 352.

- 465 Planting Design (4) Sp**

HAAG

Studio exercises and lectures in the use of plant materials in landscape architectural design. Prerequisite, fifth-year landscape architecture major.

- 470 Office Procedure (3) W**

HAAG

A study of the professional practice and ethics of the landscape architect. Prerequisite, fifth-year student in landscape architecture.

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*LATIN—See Classics*

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## LAW

- 400 Contracts (8) AWSp**

CORKER, RIEKE, SHATTUCK

Principles which regulate the creation, operation, and extinguishment of the legal relation known as contract. The major subdivisions covered are mutual assent, consideration, conditions (express and constructive), performance, breach, damages, discharge, assignment, and beneficiaries. More limited coverage is accorded interpretation, the parol evidence rule, the statute of frauds and illegality.

- 410 Civil Procedure (5) WSp**

BEAVER, MEISENHOLDER

Fundamentals of procedure prior to trial in civil litigation. The major subdivisions include jurisdiction of courts, venue, commencement of actions, pleading, discovery and other pre-trial devices, and parties. The effect of former adjudication may be discussed.



**415 Processes (4) AW**

TUNKS

Processes which continuously produce "law": adjudicative, legislative, executive, and administrative, as well as "unofficial" or private. The course aims at a thorough understanding of the institutions which presently produce, and those which are likely in the future to produce, the materials with which the lawyer can most effectively work to contribute his share to the resolution of human quandaries. Principal methods of data organization—ranging from opinions in prior decided appellate cases, through a comparison with what systems of law in other countries provide, over to factual research—are rigorously sampled.

**416 Legal Research and Analysis (3) AWSp**

GALLAGHER, LYNESS, ROMBAUER, ROSENOW

An integrated introduction to analysis, research, and legal writing. In the orientation phase, how to study law, including briefing, basic decision analysis, synthesis of decisions, and problem solving are discussed. The next phase continues a more intensive introduction to basic research tools through instruction in legal bibliography. Students integrate their research, analysis, problem solving, and writing skills through preparation of office memoranda or exercises in drafting or preparation of memoranda for lower courts. In the final phase, students prepare appellate briefs and argue orally before a moot appellate court.

**420 Criminal Law (6) AW**

HEFFRON, JUNKER

Definitions of principal crimes and defenses to criminal prosecution, both common law and statutory, along with a critique of these definitions in light of the actual roles and goals of criminal law processes in a democratic society. Constitutional problems of criminal procedure are discussed.

**430 Property I (8) AWSp**

BILANCIA, CROSS, PROSTERMAN

Ownership and transfer of realty and personality. The course analyzes the legal relationship of persons to things, from both a historical and a contemporary point of view. Specific subjects included are finding, gifts, leases, real estate contracts, deeds, the recording system, title insurance, and transfers of personal and real property. There is also a brief introduction to the law of nuisance and water rights.

**440 Torts (8) AWSp**

G. FLETCHER, HEFFRON, PECK

Liability for civil injuries arising from the intentional and unintentional interference with personal and property interests.

**441 Land Use Planning (3)**

HUNT, JOHNSON

The process of land use planning with emphasis on the administrative and legislative aspects of that process. Brief attention is given to judicial controls of land use and to private law devices for controlling land development. Primary attention is devoted to public aspects of the planning process with consideration being given to such things as the development of the master plan, the official

map, subdivision controls, zoning, urban renewal, eminent domain, grants in aid, and taxation.

**SECOND AND THIRD YEARS—ELECTIVES****500 Administrative Law IV (4) A**

PECK

Administrative process and its role in the legal system. Because the administrative process involves action which is susceptible of characterization as executive, legislative, and judicial, a considerable portion of the course involves a study of the relationship of administrative agencies with these more traditional departments of government. Both formal and informal administrative procedures are examined.

**501 Administrative Law III (3) W**

ANDERSEN

A shorter version of Law 500, Administrative Law IV, for students who plan to concentrate in areas other than administrative law.

**503 Agency and Partnership (3) Sp**

TAYLOR

Problems arising as a result of conducting business and other activities through representatives. Partnership problems are also examined.

**505 Corporations V (5) A**

KUMMERT

Promotion, organization, and financing of business corporations. Examination is made of how and by whom corporations act, with emphasis on management and shareholder roles in corporate government, insiders' duties, devices for separating control from ownership, shareholders' individual and derivative suits, and issuance of shares, including a brief survey of securities regulation.

**506 Corporations IV (4) A**

HENDERSON

A shorter version of Law 505, Corporations V, for students who plan to concentrate in areas other than corporations.

**507 Business Planning (6) WSp**

KUMMERT

Advanced work in corporations and federal taxation in the context of business planning and counselling. Examination will be made of a series of problems involving common business transactions and presenting corporate and tax issues for analysis and resolution. The problems covered include such topics as the formation of corporations, both closely held and publicly owned, stock redemption, the sale and purchase of businesses, mergers and other forms of acquisition, and recapitalization, division and dissolution of corporations. Prerequisite, Corporations IV, Corporations V, or Business Associations. Students normally should complete Federal Income Taxation or Survey of Taxation before taking Business Planning. With permission of the instructor, however, students may take the necessary tax course concurrently with Business Planning.

**508 Securities Regulation (3) W**

HUNT

Legal controls over the issuance and distribution of corporate securities with primary emphasis on federal regulation: registration and distribution under the Securities Act of 1933; regulation of trading under the Securities and Exchange Act of 1934; regulation of investment companies under the Investment Company Act of 1940; the impact of the 1964 Securities Acts Amendments; regulation under state blue sky laws. Prerequisite, Corporations IV, Corporations V, or Business Associations.

**515 Commercial Transactions VII (7) AW**

TAYLOR

Payment, financing, and other problems in the distribution of merchandise. Sale, transportation, and storage of goods, as well as commercial paper, including notes, drafts, and checks, are studied. Emphasis is given the Uniform Commercial Code.

**516 Commercial Transactions V (5) WSp**

CORKER

A shorter version of Law 515, Commercial Transactions VII, for students who plan to concentrate in areas other than commercial law.

**520 Constitutional Law VIII (8) AW**

MORRIS

Principles of constitutional law under the United States Constitution as they relate to the scope of and limitations on the powers of state and national governments in dealing with matters of life, liberty, and property. Federal-state relationships and the constitutional role of the courts are also analyzed.

**521 Legal Accounting and Statistics (3) A**

KUMMERT

Accounting and statistical methods of gathering numerical data and interpreting such data, with emphasis on problems that may arise in the various aspects of a lawyer's work.

**522 Constitutional Law VI (6) WSp**

R. FLETCHER

A shorter version of Law 520, Constitutional Law VIII, for students who plan to concentrate in areas other than constitutional law.

**523 International Conflict Resolution (3) W**

STONE

A study of the processes and techniques of dealing with public international disputes.

**524 Human Law and Human Justice**

Seminar (3) W

STONE

Selected problems of legal philosophy will be discussed. Independent research projects will be required of all students. Enrollment is limited at the discretion of the instructor.\*

**525 Equitable Remedies IV (4)**

Basic substantive and procedural rules developed and applied in Equity, including specific performance of contracts, reformation and rescission, restitution, injunctions, interpleader and quieting title.

**526 Equitable Remedies III (3) Sp**

ROMBAUER

A short version of Law 525, Equitable Remedies IV, for students who wish to concentrate on other areas.

**527 Copyright and Patent Law (3) Sp**

FLETCHER, G.

A study of the patent and copyright systems, both domestically and internationally, with comparison being made with systems in other countries.

**528 Law and Society (3) Sp**

STONE

Dealing with law as a vital part of cultural anthropology and the history of civilization, involving the study of the major institutions of the legal order in their relation to society and economic conditions of the time and place, over an extensive time-scale and on a broad geographical basis.

**529 International Law Seminar (3) Sp**

STONE

Selected problems of international law are discussed. Independent research projects will be required of all students. Enrollment is limited at the discretion of the instructor.\* Prerequisites, Law 523, International Conflict Resolution, or Law 586, Public International Law.

**530 Federal Income Taxation (5) AW**

HJORTH

An introduction to the law of taxation, with focus on the federal income tax. Tax policy questions are discussed throughout. A major objective of the course is to train students generally in the use of statutes and administrative regulations and rulings.

**531 Survey of Taxation (6) WSp**

HARSCH

Income taxation, death and gift taxation, and state and local taxation are surveyed in a course intended for students who wish to have a basic understanding of taxation. Students taking this course are not eligible to take Federal Income Taxation, or Death and Gift Taxation.

**532 Tax Fraud Seminar (3)**

HEFFRON

Selected criminal and civil sanctions in the Internal Revenue and Criminal Codes applicable to tax evasion. Included will be studies of administrative procedures for the processing of potential fraud prosecutions developed by the Internal Revenue Service and the Department of Justice, the role of the defense lawyer, problems of the relationship between civil and criminal penalty procedures, selected relevant litigation problems. It is desirable that students have completed Law 530, Federal Income Taxation, or Law 531, Survey of Taxation, before enrolling. Enrollment is limited at the discretion of the instructor.\*

**533 Criminal Law Revision Seminar (3) Sp**

JUNKER

An examination of the substantive criminal law and proposals for its reform, leading to

the drafting of proposed statutes and commentaries supporting the proposed revision and explaining its impact. Emphasis is given to the policy bases of, and limitations on, the use of the criminal law as a device for social control in a democratic society, and the translation of policy conclusions into precise statutory provisions. Enrollment is limited at the discretion of the instructor.\*

**534 Insurance Seminar (3) WSp**

TAYLOR

A detailed examination of some of the more complex and difficult problems raised in Law 564, Insurance. Independent research and reports culminating in an extensive paper will be required of all students. Enrollment is limited at the discretion of the instructor.\* Prerequisite, Law 564, Insurance.

**535 Property II (8) AW or WSp**

R. FLETCHER, HALLGRING

Problems of voluntary disposition of assets, primarily through wills and trusts. Attention is paid to disposition by will, creation of and disposition by a trust, and the effectiveness of the disposition in the creation of present and future interests in property. Some consideration is given to alternative methods of wealth transmission and to the basic tax framework important in formulating plans of disposition.

**536 Business Planning Seminar (3) WSp**

KUMMERT

An intensive examination of selected problems in business planning from the standpoint of business consequences and corporation, securities regulation, and tax law. Students will be required to do extended research and will be expected to present their analyses and conclusions in reports to the Seminar. Enrollment is limited at the discretion of the instructor.\* Prerequisites, Law 505, Corporations V or Law 506, Corporations IV, Law 530, Federal Income Taxation or Law 531, Survey of Taxation, and either Law 507, Business Planning or Law 590, Corporate Income Tax. With permission of the instructor, however, students may take the seminar concurrently with Law 507, Business Planning.

**537 Criminal Procedure Seminar (3) WSp**

JUNKER

A critical study of the criminal law processes at various stages from detention to appeal, including a study of State and Federal Rules of Criminal Procedure, and the constitutionally derived procedural rights of persons accused of crime. Consideration will be given to proposals for pre-trial reform, including the American Law Institute's proposed Model Pre-Arrestment Code. Possibilities for research will include field studies of "low visibility" practices and studies of the procedure in "quasi-criminal" proceedings involving juveniles, parolees and probationers, and alleged mental incompetents. Enrollment is limited at the discretion of the instructor.\* The Seminar is not open to second year students during 1966-67.

**538 Evidence Seminar (3) WSp**

BEAVER

Selected problems in the law of evidence, with emphasis on the history and validity of the rules selected for study in light of the various objectives of evidentiary rules, particularly the search for objective truth. Topics which may be studied include judicial control in establishing objective fact such as judicial notice, burden of proof, presumptions, relevancy, remoteness and the like; rules of practice relating to witnesses such as examination and cross-examination, competency, and offers of proof; and rules of exclusion and selection, such as hearsay, expert opinion, and illegally obtained evidence. Enrollment is limited at the discretion of the instructor.\*

**539 Ocean Resources Seminar (3) AW**

JOHNSON

International law of the high seas, concerned with fisheries, mineral and other resources of the continental shelf, navigation and territorial waters; treaty law and the law of international organizations as they relate to the resources of the sea. Special attention will be paid to the four Conventions concerning the use of the high seas adopted at the Geneva Law of the Sea Conference of 1958. Enrollment is limited at the discretion of the instructor.\*

**541 Unfair Competition (4) Sp**

PROSTERMAN

Furnishes orientation in major areas of regulation of pricing and other competitive behavior. Within a framework of concern for relevant economic factors, the course provides familiarization with basic federal and state regulation affecting the prices at which goods can be sold, including the detailed Robinson-Patman guidelines for non-discriminatory pricing and state "fair trade" laws, and reviews the regulatory framework for non-price aspects of competitive behavior in connection with protection of copyrights, trademarks and "ideas," ground rules for advertising and labelling, and prohibited incursions upon another's business or goodwill.

**544 Conflict of Laws III (3) Sp**

TRAUTMAN

A shorter version of Law 553, Conflict of Laws V, covering the same material, as time permits, except that matters of jurisdiction are excluded.

**545 Conflict of Laws Seminar (3)**

Selected current problems in conflict of laws, with emphasis on the current literature in the field. Independent research projects are required of all students. Enrollment is limited at the discretion of the instructor.\* Prerequisite, Conflict of Laws III or V.

**546 Legal History (3) A**

BEAVER

The effect on law of social, economic, and constitutional change, with particular reference to the law of England and the United States.

\* In courses where class enrollment is limited, the instructor chooses those who may enroll.

**549 Japanese Law Seminar (3) AWS**

HENDERSON

A seminar in Japanese Law centered around critical problems in United States-Japanese business. Students with a competence in Japanese will be given an opportunity to use Japanese sources. Additional problems will be presented in which the Japanese position has been clarified in English and non-Japanese speaking students will be expected to do research in these areas. Joint research and co-authoring may be arranged with Japanese lawyers for appropriate comparative projects. Topics will be fixed early in Autumn Quarter by individual consultations and outlines will be discussed by the group. Research reports will be distributed to the group early in Spring Quarter with each paper being discussed and criticized by the group prior to the submission of a final paper. Prerequisite, Law 595, Introduction to Japanese Law or Law 552, Comparative Law. Enrollment is limited at the discretion of the instructor.\*

**550 Admiralty (3) A**

HENDERSON

Admiralty jurisdiction, including its nature and sources, waters and subject matter within the jurisdiction, vessels subject to the jurisdiction, laws affecting maritime rights and obligations and problems of government vessels. In addition, coverage is given maritime liens, seamen's rights, carriage of goods, charter parties, salvage, general average and limitation of liability.

**551 Community Property (3) W**

CROSS

Dealing with all aspects of community property, including what constitutes community property as distinguished from separate property, how it may be acquired and disposed of, and the problems of conflict of laws encountered in transactions with common law jurisdictions. Washington cases constitute nearly all of the course material.

**552 Comparative Law Seminar (3) W**

G. FLETCHER

Workings of the civil law system to enable lawyers trained in the common law to recognize and analyze problems arising in a different system and to work with civil lawyers in the solution of such problems. Included in a comparative study of specific problems as handled under the common law and under one or more civil law systems, with particular emphasis on the German and Russian systems.

**553 Conflict of Laws V (5) A**

TRAUTMAN

Problems arising when one or more fact elements in a case occur in a jurisdiction other than the forum. The course involves the study of that part of the law which determines before the courts of what state or nation a suit may be brought and by the law of what state or nation a suit may or should be decided.

**554 Corporate Finance Seminar (3) AW**

TAYLOR

Advanced corporation law and practice. Individual research assignments on specialized subjects of corporate law are made the bases

of oral and written reports and discussion by the seminar group. Typical problems include corporate stock structures, securities regulation and dissolution procedures and consequences. Each student is also required to draft a complete set of typical corporate documents. Prerequisite, Corporations IV, Corporations V, or Business Associations. Enrollment is limited at the discretion of the instructor.\*

**555 Creditors' Rights (4) A**

CORKER

Principal rights and remedies of unsecured creditors, individually and collectively. Among matters discussed are judgments and judgment liens, executions, attachments, garnishments, fraudulent conveyances, compositions, assignments for the benefit of creditors, receiverships, and bulk sales. Bankruptcy problems are also discussed.

**556 Criminal Procedure (3) Sp**

JUNKER

State and federal rules of criminal procedure, including the constitutionally derived procedural rights of those accused of crime.

**558 Death and Gift Taxation (3) A**

HALLGRING

Federal and state death and gift tax systems. The major subdivisions covered include basic application of death and gift taxes, transfers subject to both, and the application of death and gift taxes to joint interests, community property, and life insurance. Territorial jurisdiction to impose these taxes is considered as are the various components of the tax liability and the valuation for tax purposes of property transferred.

**559 Domestic Relations (3) Sp**

RIEKE

Law pertaining to marriage, protection of the marital relation, disintegration of the family relation, divorce, adoption, and the juvenile court. Washington law is emphasized, with comparisons being made to the law of other jurisdictions. Consideration is also given to such related conflict of laws problems as jurisdictions, procedure, costs, alimony, support, property division, custody and modification of orders and their enforcement.

**560 Estate Planning Seminar (3) WSp**

HALLGRING

Techniques of planning and implementing dispositive arrangements, effective during lifetime or at death, of properties and other rights possessed or controlled by an individual. The course attempts to interrelate and integrate principles of trusts, insurance, income tax, gift and death taxes, wills, fiduciary administration, property, real and personal, and accounting in the effectuation of dispositive arrangements. Enrollment is limited to sixteen.\*

**561 Evidence (6) WSp**

MEISENHOLDER

Scope and function of rules of evidence analyzed in the context of trial practice. Major problems covered include examination of witnesses, admission and exclusion of evidence, competency of witnesses, privilege, relevancy,

demonstrative evidence, hearsay and its exceptions, authentication of writings and the best evidence rule, burden of proof and presumptions, judicial notice and the parol evidence rule. Emphasis throughout is laid on trial evidence and trial problems.

**562 Federal Jurisdiction Seminar (3) A**

MEISENHOLDER

Structure, function, and powers of federal courts. Jurisdiction and venue problems are examined with emphasis on such areas as the original jurisdiction of federal courts, their diversity jurisdiction, removal from state courts and other matters relating to jurisdiction, such as intervention, interpleader, multiple party and multiple claim suits. Substantial written work is required. The course builds on the foundation established in Civil Procedure. Prerequisite, Civil Procedure I or Civil Procedure II. Enrollment is limited at the discretion of the instructor.\*

**563 Government Regulation of Business (5) AW**

RIEKE

Regulation of restraints of trade and monopolies resulting from mergers or consolidations, contracts, conspiracies or combinations between individuals, trade associations, or other groups. Common law regulation is surveyed both as an independent set of rules and as a background to current legislation. The course deals especially with the Sherman Act, Clayton Act, and Federal Trade Commission Act, with attention to some other legislation. Particular emphasis is given to preservation of price competition.

**564 Insurance (3) A**

TAYLOR

Aspects of insurance law most commonly encountered by attorneys, with particular emphasis on life, fire, and casualty insurance problems. More specifically, the course examines federal and state control of insurance; insurable interests, third party interests, amount of recovery and subrogation as they relate to property and liability insurance; insurable interests, rights and interests of beneficiaries, community property problems, and double indemnity in the life insurance area. The selection and control of risks and the marketing of insurance are also examined. If the enrollment is small, the course will be conducted as a seminar.

**565 International Transactions (3) A**

PROSTERMAN

Legal problems of investment and trading abroad, especially those arising out of national regulatory statutes and attempts to enforce them in court. Particular emphasis is placed on the problems of licensing of trademarks and technology, and the protection of patents and trademarks in international business operations. The international framework for foreign trade (bilateral commercial treaties, GATT, and Reciprocal Trade agreements) is explored from the standpoint of the federal and state laws of the United States.

\*In courses where class enrollment is limited, the instructor chooses those who may enroll.

**566 Jurisprudence (3) A**

MORRIS

An introduction to legal philosophy. The course covers the traditional schools of jurisprudence as represented by selected authors and undertakes an analysis of the method and aims of jurisprudence in light of the legal positivism of Austin and Learned Hand, legal realism, the sociological jurisprudence of Pound, Ehrlich, and Moore, ethical jurisprudence, and recent developments in positivism. Students are introduced to problems of semantics inherent in word usage as practiced in law.

**567 Labor Law (3) W**

PECK

Labor problems preceding the establishment of a collective bargaining relationship. More specifically, the course is concerned with the relationship of the individual employee with the union, and the organizational rights of the employee and the union. Included is a coverage of the economic weapons available to parties to labor disputes. Since this background provides the basis for understanding the bargaining process in which the parties engage, it is desirable that this course be taken by students who plan to take Law 568.

**568 Labor Relations (3) Sp**

PECK

Processes of collective bargaining. Included is a coverage of the statutory duty to bargain and problems which arise under specific contract clauses. Administration of the contract is also the subject of intensive investigation. Because an understanding of the limitations on the economic weapons available gives meaning to the bargaining processes, it is desirable that students taking this course have taken Law 567.

**569 Professional Responsibility (1) Sp**

HUNT

Acquainting students with the Canons of Legal Ethics in the context of the practice of law. Discussed are professional responsibility; unauthorized practice; sole and partnership practice and personnel problems; office efficiency; the function and activities of bar associations, national, state, and local; disciplinary proceedings, using the Washington State Bar Association rules as an example. The course also examines the machinery available locally for the improvement of the law. Some of the sessions are conducted by members of the Washington State or Seattle-King County Bar Associations.

**570 Legislation (3) A**

HARSCH

Characteristics of the legislative process. The objectives of the course are to delineate the uses and functions of statutory law, acquaint students with legislative procedures and controls under which legislative bodies operate, examine different types and parts of legislation and the judicially-developed principles and rules applicable thereto, review judicial techniques of interpretation, and provide some fundamental training in the art of legislative draftsmanship.

**571 Local Government Law (3) W**

TRAUTMAN

Legal problems encountered in the conduct of government at the local level, i.e., cities, counties, and school districts and other specialized local units of government. The course examines legislative control over municipal corporation and municipal powers, both generally, and more specially in the areas of land use, contracting, property, and bonding. Municipal tort liability is also discussed.

**572 Urban Planning Seminar (3) AW**

HUNT

Investigation and analysis of the lawyer's role in selected legal, political, economic, and social problems incident to the urban society in which we live: e.g., the impact of federal and state programs; revitalization and rehabilitation of the central core and inner city; mass transportation and rapid transit; development and control of the suburban and outer fringes; recreational facilities and open space; social legislation; technical and financial problems relating to housing, sanitation, and other urban services; air and water pollution; location and relocation of commerce and industry; modification and development of governmental units to deal with contemporary urban problems.

**573 Property Security (5) Sp**

SHATTUCK

Methods by which an obligation may be secured by property of the obligor or of a third person. The course covers the common law principles and statutes which regulate the creation, operation, and extinguishment of the legal relations known as pledge (including field warehousing and assignments of choses and title documents as security), conditional sales contract, mortgage (chattel and real property), and trust receipts. The Uniform Commercial Code, Article 9, is stressed.

**574 Natural Resources (3) A**

JOHNSON

Legal problems of water use, timber transactions, and mining operations (including federal land management). In the water law area, the major subdivisions covered are riparian and appropriation systems, evolution of administrative control, changing relationship of local, state and federal governments, interstate compacts, international law as applied to waters shared by the United States, Canada, and Mexico, and commercial and sport fishing. Timber transactions in standing timber are examined. In the mining area, study is given federal and state laws concerning the location of placer and lode mining claims in the Western states and the effect of these laws on the management of federal lands. Other aspects of federal land managements are also discussed.

**575 Probate Practice (2) A**

R. FLETCHER

Rights and responsibilities of the person appointed to administer the process of transmitting property from the estate of a decedent to those who succeed him in ownership. Study is made of the conflicting and exacting de-

mands made on such person in bringing the assets of the decedent under his control and in effecting an orderly distribution or relinquishment of the property to the decedent's successors and to the various governmental units and other creditors having claims on the property.

**577 State and Local Taxes (3) Sp**

HARSCH

State- and locally-levied taxes, with emphasis on sales, use, and business excise taxes. Also considered are certain constitutional problems common to all such taxes. Each student is required to do independent research and to present an oral and written report on an assigned topic relating to one of the common types of state- or locally-levied taxes.

**578 Civil Liberties Seminar (3) Sp**

MORRIS

Current civil liberties problems, with emphasis on in-depth analysis of cases on the current Supreme Court docket. An attempt is made to isolate the history of the civil liberties doctrines in question and to discuss alternative possible solutions, basing these solutions on relevant precedent and personalities, thereby producing predictions concerning the disposition of current cases. Each student is required to do a substantial amount of written work, including, but not limited to, presenting an analysis of a pending case. Enrollment is limited to fifteen.\*

**579 Suretyship (2) W**

SHATTUCK

Methods by which an obligation may be secured by the promise of a third person. The course covers the common law principles and statutes which regulate the creation, operation, and extinguishment of the legal relations known as suretyship, guaranty, accommodation paper, and accommodation contracts on negotiable paper. (Not covered are several types of bond typically written by professional corporate bondsmen, particularly court, fidelity, construction, and supply bonds. Bail bonds are also excluded.)

**580 Trial and Appellate Practice (5) WSp**

TRAUTMAN

Washington statutes, rules and decisions governing various aspects of the trial and appeal of cases. Within the available time, the course attempts to provide information and training in the how-to-do-it of trial practice. A required part of the course is the conduct of an actual case before a judge from the local superior courts. The emphasis throughout is on the example of Washington procedure and only limited consideration is given federal practice.

**581 Trust Administration (2) A**

HALLGRING

Rights and responsibilities of a trustee and the problems that arise by virtue of the fact that a trustee holds property not for himself but for others and has conflicting demands on him from various claimants.

\*In courses where class enrollment is limited, the instructor chooses those who may enroll.

**585 Problems in Evidence (4) A**

BEAVER

A short course in evidence for students intending to concentrate in other areas. The major subdivisions covered are examination of witnesses (direct examination, cross examination, and impeachment), opinion rule, hearsay rule, introduction of documents in evidence, and the best evidence rule. Other topics are covered as time permits.

**586 Public International Law (3)**

International law as a process of decision; recognition and diplomatic intercourse; allocation of international resources; agreements between states; jurisdiction.

**587 Natural Resources Seminar (4) WSp**

JOHNSON

Selected legal problems relating to water, mining, timber, oil and gas, high-seas fisheries, and other natural resources. It is desirable that students taking this course have taken Law 574. Enrollment is limited to ten.\*

**588 Land Use Seminar (3) AW**

HUNT

Legal and administrative problems and techniques encountered in the regulation of land use, including such areas as eminent domain, zoning, building and housing code, taxation, and urban renewal. The objectives of land use planning are discussed with the aim of not only equipping the student with professional knowledge, but also preparing him to accept the responsibilities he will face as a community leader. While stress is placed on land use in the Pacific Northwest, developments elsewhere in the United States and overseas are discussed. Enrollment is limited to fifteen.\*

**589 Common Market Seminar (4) AW**

HJORTH

Development and current status of the European Economic Community and other European regional organizations. Emphasis is placed on the effect of the Common Market on international trade and particularly on American commercial and financial interests establishing or investing in enterprises located within the Common Market. In the latter connection, attention is given to forms of European business organizations, overlapping and conflicting regulation of transactions, settlement of disputes, and tax effects of doing business within the Common Market. Enrollment is limited to fifteen.\*

**590 Corporate Income Tax (3) Sp**

HJORTH

Income taxation of corporations and shareholders. A comparison is made of the tax effects of conducting business through corporations, individual proprietorships, partnerships, trusts, and other forms of business organizations. Tax effects of corporate acquisitions and reorganizations are examined, as is the special tax treatment of affiliated corporations, personal holding companies, registered investment companies, and corporations electing to be treated as partnerships for tax purposes. Further, some treatment is

given tax problems arising from transactions between corporations and their shareholders, including such transactions as capital contributions, dividend payments, partial and complete liquidations, and redemptions.

**591 Public Finance Seminar (3) AW**

HARSCH

Selected problems of public finance and taxation at the federal, state, or local level. The subject matter varies from year to year as problems of current significance and interest arise. Enrollment is limited at the discretion of the instructor.\* Prerequisite, Federal Income Taxation, Survey of Taxation, or State and Local Taxation.

**592 Regulated Industries Seminar (4)**

ANDERSEN

Case studies relating to the general problems of government regulation of major industries through administrative agencies. Several industries will be selected, such as transportation, communication, power, etc. Emphasis is on individual research. Enrollment is limited to twelve.\*

**593 Social Legislation (3)**

Primary emphasis will be placed on Workmen's Compensation (Industrial Insurance), where some of the basic problems of work-connected injuries and disease will be considered. In addition, major problems in the law of Social Security, Unemployment Compensation, and Wage and Hour legislation will be considered.

**594 Transnational Tax (3) Sp**

HJORTH

United States taxation of foreign income and tax treaties; concerned mainly with tax problems of American investors and businessmen who have investments, other income producing property, and business operations abroad. Prerequisite, Federal Income Taxation or Survey of Taxation.

**595 Introduction to Japanese Law (3) W**

HENDERSON

The topics will be those deemed most useful to American lawyers seeking a career specialty: brief history of Japanese law, and reception of western law; constitutional framework, with emphasis on the judicial power and courts; the training and roles of the bench and bar; elements of the Japanese codes as a system with emphasis on the Code of Civil Procedure, Civil Code, and Commercial Code and the relationship between them and between these general codes and the vast bulk of special statutes. Enrollment limited at the discretion of the instructor.\* No language requirement.

**597 Commercial Code Seminar (3)**

Selected problems in secured and unsecured transactions arising under the Uniform Commercial Code, with emphasis on problem solving and on current literature in the field. Independent research projects are required of all students. Enrollment is limited at the discretion of the instructor.\* Prerequisite, Commercial Transactions, Commercial Transactions VII, or Commercial Transactions V.

**599 Introduction to Chinese Law (3) Sp**

BILANCIA

Law in China: A brief history of law in the traditional society of China, the impact of western law in republican China, and the development of law in the People's Republic of China. Particular emphasis will be given to an exploration of the following problems in communist law: criminal law, administration and public order; family law, land reform and social revolution; contract, planning and labor law in control of the economy and dispute settlement; international trade and treaty practices and the future of Chinese participation in a world legal order; selected legal and administrative institutions. Some consideration will be given to Soviet law and its recent influence in China.

**600 Research Problems in Law (1-5) AWSp**

Qualified students, with the consent of a member of the law faculty and the Dean, receive from one to five credits for individual research in any of the major fields covered by the curriculum.

**610 Law Review (1-4, max. 4)**

KUMMERT, TRAUTMAN

Assisting in editing, writing, and preparing for publication the *Washington Law Review*.

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*LIBERAL ARTS—See General and Interdepartmental*

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**LIBRARIANSHIP**

*Permission of the Director of the School is required for all librarianship courses with the exception of 100.*

**100 The Use of Books and Libraries (2) AWSp**

WILEY

Lectures and discussions illustrating the use of libraries, general reference materials and aids, and reference books in various subject fields. Open to any student, but designed primarily for freshmen, sophomores, and new students.

**440 Libraries and Society (3) AS**

LIEBERMAN

An introduction to the principal types of libraries and to issues and trends in modern librarianship. A prerequisite to graduate courses in librarianship.

**441 Basic Library Materials (3) AS**

BEVIS, TURNER

A presentation of the materials, book and nonbook, which form the sources of reference for the informational function of the library. A prerequisite to graduate courses in librarianship.

**442 Book Selection (3) WS**

BEVIS, TURNER

Basic principles of book selection applicable to library work. A prerequisite to graduate courses in librarianship.

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\*In courses where class enrollment is limited, the instructor chooses those who may enroll.

# LIBRARIANSHIP

## 443 Organization of Library Materials: Theory and Practice (3) SpS

PAGE, PETERSON

Current problems and practices in the organization of recorded information, including an introduction to principles of classification and cataloging. A prerequisite to graduate courses in librarianship.

## 450 Library Materials for Teachers (3) ASpS

AHLERS, TURNER

The evaluation and use of various types of instructional materials in teaching, with emphasis on the role of the library program in implementing the curriculum.

## 451 Children's Literature I (3) WSpS

BENNE

A survey of children's literature for teachers, librarians and others interested in evaluating and using children's books according to the needs, interests, and abilities of children.

## 452 Storytelling (3) AWS

BENNE

The role of the storyteller in the past and present. Selection, preparation, and presentation from folk and contemporary literature for various groups and purposes.

## 453 Literature for Young People (3) ASpS

AHLERS, TURNER

Reading and appraisal of literature appropriate to the needs, interests and abilities of young people. For the general student as well as the librarian and teacher.

## 454 Library in the School (3) SpS

AHLERS, TURNER

The role of the library in the school, with an introduction to library services and methods of management.

## 470 History of the Book (3) WS

BEVIS

Development of the written and printed book, growth of the book trade, and aspects of rare book collecting as it affects libraries.

## 476 Archival Management (3) \*

Lectures and demonstrations in archival administration, organization of manuscript collections and study of the principles and techniques employed by state archival and historical institutions.

## 480 Supervision of Public School Library Systems (3) W\*

AHLERS, TURNER

A course designed to aid school personnel in the administration and supervision of district-wide school library programs; emphasis will be given to problems involved in the organization and development of library systems.

## 497 Data Processing for Libraries (3) \*

A course which introduces the librarian to EDP concepts and procedures. After an in-

troduction to punched card equipment and computers, the course will consider how to analyze a job for machine applications, system analysis, problems of conversion from manual to machine systems, programming, and day-to-day operation of the system itself.

## 502 Library Organization and Administration (3) WS

MORRISON, PAGE

Study of public and academic library service, including a consideration of legal structure; finance and statistics; buildings and equipment; personnel; public relations; and other phases of library management. The extension of library service is also considered.

## 509 Directed Field Work (2-4) SpS

BEVIS, LIEBERMAN

Four weeks of professionally supervised field work in various types of libraries.

## 513 Government Publications (2) SpS

MORRISON

Government publications of the United States and foreign countries, their acquisition, organization, and use.

## 514 The Library and Audio-Visual Materials (3) SpS

LIEBERMAN

Types, cost, utility, and characteristics of modern sensory aids employed in communicating ideas; organization for handling films, film-strips, recordings and transcriptions, slides, pictures, exhibits, and similar materials in the library; experience in operating various types of equipment; techniques in extending the use of audio-visual materials by community groups; sources of information about materials and equipment.

## 515 Bibliography: Library Materials in the Humanities (3) AS

BEVIS, MORRISON, PAGE, TURNER

An examination of national and international problems of bibliographics control. Study and evaluation of library resources in the humanities. Prerequisite, 441.

## 516 Library Materials in the Social Sciences (3) WS

BEVIS, MORRISON, PAGE, TURNER

Study and evaluation of library resources in the social sciences, with attention to written milestones of the field. Prerequisite, 515.

## 517 Library Materials in Science and Technology (3) SpS

BEVIS, MORRISON

Study and evaluation of library resources in the natural and physical sciences and in technology. Attention is given to the special characteristics peculiar to library materials in the sciences.

## 535 Organization of Library Materials: Comparative Methods (3) AS

PAGE, PETERSON

A consideration of current practices in technical services and a critical study of comparative methods of classification, subject analysis, and descriptive cataloging. Prerequisite, 443.

## 536 Organization of Library Materials: Advanced Problems (3) WS

PAGE, PETERSON

A study of new developments in technical services, Library of Congress classification, and organization of special types of printed and non-book materials. Prerequisite, 535.

## 540 Advanced Legal Bibliography (2) A

GALLAGHER

Bibliographical data and use of federal and state law reports and statutes; quasi-legal and commissioners' reports of the states; bar association records, legal periodicals, indexes and digests, and cooperative bibliographies of law collections.

## 541 Selection and Processing of Law Library Materials (4) A

GALLAGHER

Aids to selection, processing, microphotography of legal material, etc.

## 542 Legal Reference and Research (5)

GALLAGHER

Bibliographical lists, law reference questions, briefing, and annotations.

## 543 Law Library Administration (5) W

GALLAGHER

Staff, patrons and public relations, circulation, architecture, book arrangements, equipment, rules, publicity, publications, budgets, reports, professional societies, regional service.

## 550 Introduction to Library Service for Children (3) AS

BENNE

The philosophy, organization, and administration of a children's department in a public library, together with an examination of its relationship to other social agencies in the community.

## 553 Library Work with Children (2) WS

BENNE

Further study of the organization and function of a children's department in a public library, with special attention to the study of reference books, periodicals, library publicity, and cooperation with the schools. Includes actual practice in conducting library lessons and book talks. Prerequisite, 550.

## 554 Children's Literature II (3) SpS

BENNE

Reading and discussion of children's books of all levels; examination of tools and review media for selection, with practice in selection for various fields of interest. Prerequisite, 451 or 550.

\*In courses where class enrollment is limited, the instructor chooses those who may enroll.

**599 Methods of Research in Librarianship (2) AS**

MORRISON, TURNER

A survey of problems and methods.

**600 Research (\*)**

Systematic investigation under faculty direction of a special project approved by the Director and the instructors concerned.

**700 Thesis (\*)**

**702 Degree Final (6)**

Limited to students completing a nonthesis degree program.

**LINGUISTICS**

**200 Introduction to Linguistics (5) W**

LUKOFF

An introduction to the scientific study of language; language and writing; phonological and grammatical analysis; language change; related disciplines.

**201 Language and Human Behavior (5) Sp**

LEHTINEN

The course will cover the elements of the biological basis of human language, the differences between animal and human communications of linguistic theory and the function of language in society. Prerequisite, 200.

**400 Survey of Linguistic Method and Theory (3) ASpS**

SAPORTA

The background and scope of modern linguistics; languages of the world; language analysis; relation to other disciplines. (Not open to students who have had Linguistics 200.)

**404, 405, 406 Indic and Indo-European (3,3,3) A,W,Sp**

KEILER, WYATT

Reading of simple Sanskrit texts with emphasis on structure of Sanskrit and its comparison with other Indo-European languages. Introduction to principles of comparative linguistics.

**441 Linguistics and Poetic Language (3) A**

GOVE

Relationship between linguistic structures, linguistic universals, and the poetic uses of language; linguistic description in the analysis of literature. Prerequisite, 400 or permission.

**445 Teaching English as a Foreign Language (3) W**

SELINKER

Linguistic analysis as a basis for the teaching of English as a foreign language; language as rule-governed behavior. Prerequisite, 400.

**451J, 452J, 453J Phonetics and Phonemics (3,3,3) A,W,Sp**

GREKOFF

Detailed study of speech sounds, mechanisms of their production, and structuring of sounds

in languages; practical experience with a wide variety of languages; field techniques. Offered jointly with the Department of Anthropology.

**454J Methods in Comparative Linguistics (3) WS**

GOVE

Method and theory of comparative linguistics in relation to anthropological research. Offered jointly with the Department of Anthropology. Prerequisite, 400 or permission.

**455J Areal Linguistics (3, max. 6) ASp**

LUKOFF

Linguistic analyses of the languages of a selected area. Offered jointly with the Department of Anthropology.

**462J, 463J Morphology and Syntax (3,3) W,Sp,S**

SAPORTA, CONTRERAS

Study of the structuring of meaningful elements in language; practical experience with a wide variety of languages; field techniques. Offered jointly with the Department of Anthropology. Prerequisite, 400 or permission.

**464 Phonetic Transcription (2½) S**

Practice in the transcription and analysis of phonological data from non-Indo-European languages. Prerequisite, permission.

**465 Problem Solving in Phonology (5) S**

BASCOM

Training in practical solutions to phonological problems from a variety of languages. Prerequisite, permission. (Formerly 457.)

**466 Problem Solving in Grammar (5) S**

ELSON

Training in practical solutions to grammatical problems from a variety of languages. Prerequisite, permission. (Formerly 458.)

**467 Grammatical Exercises (2½) S**

ELSON

Practice in eliciting, recording, and analyzing grammatical data of a non-Indo-European language. Prerequisite, 466, which may be taken concurrently. (Formerly 465.)

**471 Phonological Analysis (5) S**

RENSCH

Discussion of phonological theory. Advanced training in the analysis of tone, stress, and intonation. Prerequisite, 465 or equivalent. (Formerly 471-472.)

**472 Grammatical Analysis (5) S**

MERRIFIELD

Discussion of grammatical theory. Advanced training in grammatical analysis. Prerequisite, 466 or equivalent. (Formerly 481-482.)

**473 Informant Techniques (5) S**

MERRIFIELD, RENSCH

Guided practice in analyzing the phonology and grammar of a non-Indo-European language. Prerequisites, 471 and 472 may be taken concurrently. (Formerly 484-485.)

**478J Introduction to Southeast Asian Linguistics (3) A**

LI, THOMPSON

Survey of language families of Southeast Asia. Typology and relationships. Research needs and problems. Offered jointly with the Far Eastern and Russian Institute. Prerequisites, 452J, 462J.

**481-482 Grammatical Analysis (2½-2½) S**

Discussion of grammatical theory. Advanced training in grammatical analysis. Prerequisite, 458 or equivalent.

**484-485 Informant Techniques (2½-2½) S**

Guide practice in analyzing the phonology and grammar of a non-Indo-European language. Prerequisites, 471, 481 which may be taken concurrently.

**499 Undergraduate Research (1-5) AWSp**

**Courses for Graduates Only**

**500 Proseminar (3) A**

CONTRERAS

Introduction to bibliography and research in linguistics.

**501, 502, 503 Linguistic Analysis Laboratory (3,3,3) A,W,Sp**

THOMPSON

Guided analysis of a language unfamiliar to all students of the class; construction of a grammar based on material elicited from native informant. Prerequisites, 453J, 463J, or permission.

**504 Indo-European Comparative Phonology (2) A**

KEILER

Sound systems of the principal families of Indo-European and the relation of these to a hypothetical parent tongue. Prerequisite, 406 or permission. (Offered alternate years; offered 1968-69.)

**505, 506 Indo-European Comparative Grammar (2,2) W,Sp**

KEILER

Systematic treatment, with extensive surveys of individual language groups. Prerequisite, 504.

**514, 515, 516 Seminar in Comparative Linguistics (2,2,2) A,W,Sp**

KEILER, LI

Advanced problems emphasizing work with languages having few or no written records. Prerequisite, 406 or permission.

**519J Mathematical Models of Grammar (3) W**

RITCHIE

A study of some mathematical models of language recognition, emphasizing context-free and context-sensitive grammars. Offered jointly with the Department of Mathematics. Prerequisite, graduate standing in mathematics, linguistics, or psychology, or permission of the instructor. (Offered alternate years; offered 1967-68.)



# LINGUISTICS

## 530 Dialectology (3) Sp

REED

The principles of dialect deviation as related to linguistic structure and usage. Prerequisite, 452J or permission.

## 553J Analysis of Linguistic Structures (3, max. 6) AW

KEILER, LUKOFF

Offered jointly with the Department of Anthropology. Prerequisite, permission.

## 565 Contrastive Analysis (3) Sp

LUKOFF

The bases for the systematic comparison of linguistic structures; problems of interference between native and target languages. Prerequisites, 452J, 463J.

## 578J Seminar in Southeast Asian Linguistics (3, max. 9) A

LI, THOMPSON

Advanced consideration of specialized problems in Southeast Asian Linguistics. Reports on individual research. Offered jointly with the Far Eastern and Russian Institute. (Offered alternate years; offered 1967-68.)

## 579J Comparative Altaic Linguistics (3) W

POPPE

Comparative phonology and morphology of Mongol and Turkic and other related languages. Offered jointly with the Department of Far Eastern and Slavic Languages and Literature (Mongolian). Prerequisite, permission. (Not offered 1967-68.)

## 580 Problems in Linguistics (2-4, max. 12) AWSp

KEILER, SAPORTA

For advanced students of linguistics, dealing with significant movements, techniques, skills, and theories in the field. Prerequisite, permission.

## 599 Linguistics Colloquium (1, max. 6) AWSp

Biweekly seminar attended by faculty and graduate students to discuss research in progress and topics of general interest. Attendance is required for a minimum of three quarters during the student's residence. Prerequisite, permission.

## 600 Research (1-5) AWSpS

## 700 Thesis (\*) AWSpS

Specialized course work is available in various cooperating departments. Each student is expected to elect an area of specialization and to work out with his adviser an appropriate program of courses supporting his required work. The fields of specialization regularly available at this institution are the following (cooperating departments are in parentheses):

Altaic (Far Eastern and Slavic Languages and Literature); American Indian linguistics (Anthropology); anthropological linguistics (Anthropology); Chinese (Far Eastern and Slavic Languages and Literature); classical linguistics

(Classics); English (English, Germanic Languages and Literature); Germanic (Germanic Languages and Literature); Japanese and Korean (Far Eastern and Slavic Languages and Literature); mathematical linguistics (Mathematics); oral literature (Anthropology, Comparative Literature); Romance (Romance Languages and Literature); Scandinavian (Germanic Languages and Literature, Scandinavian Languages and Literature); Slavic (Far Eastern and Slavic Languages and Literature); South-east Asian Linguistics (Far Eastern and Slavic Languages and Literature); speech and phonetics (Speech); Tibetan (Far Eastern and Slavic Languages and Literature).

For a listing of course work in these fields, consult this section of the Catalog under the heading of the department indicated. In certain cases, arrangements may be made for students to specialize in fields not listed above. Students interested in such a possibility should consult with the chairman of the department.

# MARKETING

## Courses for Undergraduates

### 301 Marketing, Transportation, and International Business: An Integrative Analysis (5) AWSpS

Domestic and foreign marketing and physical distribution of products are closely interrelated in business practice. This course integrates these three areas in terms of the marketing concept, consumer demand and behavior, location analysis, functions, institutions, channels, prices, and public policy from management's point of view.

### 350 Marketing and Physical Distribution Management (Domestic and Foreign) (3) AWSpS

Analytical integration of tools, factors, and concepts used by management in planning, establishing policies, and solving problems. Prerequisite, 301.

### 371 Wholesaling (5) ASp

R. LITTLE, WHEATLEY

Management aspects of the organization, internal operations, policies, and problems of wholesaling institutions, including primary producers, manufacturers, and wholesaling middleman. Prerequisite, 301.

### 381 Retailing (5) AWSp

R. LITTLE, MILLER, WAGNER, WHEATLEY

Profit planning and business control; buying, stock control, pricing, promotion; store location, layout, organization, policies, systems; coordination of store activities. Prerequisite, 301.

### 391 Advertising (5) AWSpS

HARDER, WAGNER, WHEATLEY

The place of advertising in marketing; utilization by business; planning the program; analysis of media and budget; research; advertising institutions; economic and social aspects. Prerequisite, 301.

## 401 Sales Management (5) AWSpS

ETCHESON, R. LITTLE, WHEATLEY

Sales and distribution planning; sales organization and training; management of the sales force; methods of sales, cost, and performance analysis. Prerequisite, 301.

## 415 Consumer Behavior (3) Sp

ETCHESON

Theory and practice pertinent to marketing decisions of individuals and business firms; utilization of theories from behavioral sciences in marketing research; theories of fashion, characteristics of goods, shopping behavior, product differentiation, market segmentation, and opinion leadership; application of concepts to management of advertising, personal selling, pricing, and channels of distribution. Prerequisite, 301.

## 421 Marketing Research (5) AWSpS

DENMAN, GRATHWOHL, WHEATLEY

The marketing research process; preliminary steps and research design, questionnaires, secondary and primary data, sampling, processing and interpreting data, evaluation and effective presentation of findings. A class research project provides practical application of methods studied. Prerequisite, 301; Business Statistics 301 recommended.

## 481 Retail Field Work (2, max. 8) WSp

MILLER

Open to scholarship students only. Prerequisite, permission.

## 491 Marketing Problems (5) AWSpS

GRATHWOHL, MILLER, WHEATLEY

Analysis of managerial marketing problems of the manufacturer, wholesaler, and retailer. Prerequisite, 350.

## 499 Undergraduate Research (3, max. 9) AWSp

Prerequisite, permission.

# Courses for Graduates Only

## 500 Marketing Fundamentals (2) WS

DENMAN, GORDON

Analysis of domestic and foreign markets and institutions, physical distribution, and the role of marketing in the economy. Prerequisite, permission.

## 501 Marketing Management (3) SpS

ETCHESON, R. LITTLE, WHEATLEY

Considerations necessary for sound marketing management decisions in the pricing, demand creation, physical distribution, channel selection, and product development activities of the firm. Prerequisites, 500 and permission.

## 510 Market Structure and Channel Strategy (3) A

R. LITTLE

Principles, structure, and channel implications of both wholesale and retail distribution; factors affecting channels; selected product channels; physical distribution factors; marketing cost analysis and control. Prerequisite, 501 or equivalent.



**515 Price Practices and Policies (3) W**

GRATHWOHL

The nature of pricing decisions; price theory and practice; primary and secondary factors affecting price policy; pricing methods and strategies; pricing practices in selected industries. Prerequisite, 501 or equivalent.

**520 Marketing Trends and Developments (3) ASpS**

GRATHWOHL, WAGNER, WHEATLEY

The current evolution of marketing is subjected to critical evaluation and reviewed analytically. Prerequisites, 501 and permission.

**521 The Role of Marketing in the Economy (3) W**

R. LITTLE, WAGNER

The role of meeting the challenges of full employment and an expanding flow of goods and services through the American economy. Problem areas which may be examined include: marketing costs and efficiency, marketing and government, marketing and monopoly, pricing, and channels of distribution. Prerequisites, 501 and permission.

**522 Advanced Marketing Concepts (3) Sp**

ETCHESON, GORDON

The interdisciplinary exchange of ideas related to marketing is studied. The marketing theories and evolving concepts of marketing and management are critically appraised. Prerequisites, 520 or 521, and permission.

**571-572 Research Reports (3-3) AWSpS**

See Accounting for description.

**604 Research (\*, max. 10) AWSpS**

Prerequisite, permission.

**700 Thesis (\*) AWSpS**

**702 Degree Final (6) AWSpS**

Limited to students completing a nonthesis degree program.

## MATHEMATICS

### Courses for Undergraduates

**101 Intermediate Algebra (5) AWSp**

Similar to third term of high school algebra. Not open for credit to students who have taken one and one-half years of algebra in high school. Prerequisite, one year of high school algebra.

**104 Plane Trigonometry (3) AWSp**

Trigonometric functions, identities, equations, inverse functions, graphs, logarithms, and solution of triangles. Not open for credit to students who have taken trigonometry in high school. Prerequisites, one and one-half years of high school algebra and qualifying test, or 101, and one year of plane geometry.

**105 College Algebra (5) AWSp**

Real and complex number systems; sets and equations; simultaneous equations and matrices; inequalities; functions and relations; algebraic, exponential, and logarithmic functions. Prerequisites, one and one-half years of high school algebra and qualifying test, or 101.

**114 Elementary Computer Programming (2) AWSp**

Programming and coding of problems for automatic digital computers. Flow charts, loops, subroutines. Codes written will be executed by machine. Prerequisite, 101 or equivalent; 105 or equivalent recommended.

**124, 125, 126 Calculus with Analytic Geometry (5, 5, 5) AWSp, AWSp, AWSp**

Plane analytic geometry, differentiation of algebraic and transcendental functions, anti-derivatives, definite integrals, technique of integration, vector algebra, solid analytic geometry, multiple integrals, partial derivatives. Applications. No more than 5 credits from among 124, 130, 134H, and 157 may be counted toward any degree. Prerequisites, 105 or qualifying test, and 104 or equivalent for 124; 124 or 134H for 125; 125 or 135H for 126.

**134H, 135H, 136H Calculus with Analytic Geometry (5, 5, 5) A,W,Sp**

Honors sections of 124, 125, 126. No more than 5 credits from among 124, 130, 134H, and 157 may be counted toward any degree. Prerequisites, four years of high school mathematics and permission.

**157 Elements of Calculus (4) ASp**

Elementary treatment of the differential and integral calculus of simple functions. Intended for students who wish only a brief course in calculus. No more than 5 credits from among 124, 130, 134H, and 157 may be counted toward any degree. Prerequisite, 105 or qualifying test.

**170, 171 Theory of Arithmetic (3,3) AW,Sp**

Numerals and systems of numeration; concept of a set; relations and their properties; systematic development of the integers, rational numbers; real numbers and their properties. Prerequisites, one year of high school algebra and one year of geometry for 170; 170 for 171. Ordinarily, credit may not apply toward a major in mathematics.

**201H, 202H, 203H Selected Topics in Mathematics (3,3,3) A,W,Sp**

Honors course for liberal arts students. Various topics in mathematics selected to provide some acquaintance with mathematical thinking and some of the important concepts of mathematics. Not open to physical science majors and students having completed mathematics courses numbered 124 or above. Ordinarily, credit may not apply toward a major in mathematics. Prerequisites, three years of high school mathematics, permission of the Mathematics Department, and membership in the College Honors Program for 201H; 201H for 202H; 202H for 203H.

**224 Intermediate Analysis (3) AWSp**

Infinite series, complex functions, elementary differential equations. Prerequisite, 126.

**234H, 235H, 236H Advanced Calculus (3,3,3) A,W,Sp**

Honors courses covering the material of 238, 324, 325, and selected other topics. Prerequisites, 136H or permission for 234H; 234H for 235H; 235H for 236H.

**238 Elements of Differential Equations (3) AWSp**

Elementary methods of solution, linear differential equations of second and higher order. Prerequisite, 136H or 224.

**281 Elements of Statistical Method (5) AWSp**

Elementary concepts of probability. Binomial and normal distributions. Basic concepts of testing hypotheses and estimation. Application to binomial and normal distribution. Chi-square tests. Linear regression theory. For nonmajors only. No more than 6 credits from among 281, 391, 392, and Psychology 301 may be counted toward any mathematics degree. Prerequisite, 105.

**301 Elementary Number Theory (3) AWSp**

A brief introduction to some of the fundamental ideas of elementary number theory. Prerequisite, 126 or 136H.

**302, 303 Elementary Linear Algebra (3,3) AWSp, AWSp**

Vector spaces; linear transformations; systems of linear equations; equivalence and similarity of matrices; quadratic forms. 302 not open for credit to students who have taken 401 or 413; 303 not open for credit to students who have taken 404 prior to Spring Quarter 1967. Prerequisites, 126 or 136 H for 302; 302 (formerly 401) for 303.

**305 Introduction to Mathematical Logic (3) W**

Formal principles of inference and definition. Propositional inference and inference involving quantifiers. Applications to elementary mathematical theories and to the axiomatic method are stressed. Prerequisites, 126 or 105 and Philosophy 120.

**324 Advanced Calculus I (3) AWSp**

Functions of several variables, transformations and mappings, implicit function theorem. Prerequisite, 224 or 136H.

**325 Advanced Calculus II (3) AWSp**

Vector analysis, theorems of Stokes, Gauss, and Green. Prerequisite, 224 or 136H; 324 recommended.

**374 Principles of Digital Computers and Coding (5) A**

High-speed digital computation, number systems, machine components, programming, operation. Three hours lecture and four hours laboratory per week with problems run on a high-speed machine. Prerequisites, 114 and 124 or 134H, and permission of instructor.

# MATHEMATICS

## 382, 383 Statistical Inference in Applied Research (5,5) W,Sp

Analysis of variance and covariance; chi square tests; multiple and curvi-linear regression; sampling theory; discrete distributions; experimental design and power of tests. Application to biological problems. (Under normal circumstances does not count toward a mathematics major.) Prerequisites, 124 or 134H and 281, or permission, for 382; 382 for 383.

## 391 Elementary Probability (3) AWSp

Sample space, random variables, laws of probability. Combinational probabilities. Distributions: binomial, normal; expectation, variance. No more than 6 credits from among 281, 391, 392, and Psychology 301 may be counted toward any mathematics degree. Prerequisite, 126 or 136H.

## 392 Elements of Statistics (3) WSp

Basic concepts of testing hypotheses and of estimation (interval and point). Binomial, normal tests, and estimates. No more than 6 credits from among 281, 391, 392, and Psychology 301 may be counted toward any mathematics degree. Prerequisite, 391.

## 393 Analysis of Variance (3) Sp

General linear hypothesis-tests and estimates. Distribution theory of tests. Tests of all contrasts. Fixed, mixed, and random models. Prerequisite, 392 or 482.

## 400 Elementary Set Theory (3) A

Basic axioms of set theory, algebra of sets, Peano axioms, axiom of choice and Zorn's Lemma, transfinite recursion, cardinal numbers and arithmetic. Prerequisite, 236H or 325, or permission.

## 402, 403, 404 Introduction to Modern Algebra (3,3,3) A,W,Sp

Algebraic systems; elementary theory of groups, rings, and fields; polynomials; topics in linear algebra; reductions of forms. Prerequisites, 236H or 302 (formerly 401) for 402; 402 for 403; 403 for 404.

## 405 Introduction of Metamathematics (3) Sp

Formal systems; propositional calculus and predicate calculus of first order. The concepts of consistency, completeness, and decidability are introduced and applied to these systems. Prerequisite, 305 or permission.

## 407 Game Theory and Linear Programming (3) Sp

Mathematical approach to game theory and linear programming with applications to economics and operations research. Prerequisite, 302 (formerly 401) or 413.

## 411, 412, 413 Linear and Modern Algebra (3,3,3) A,W,Sp

Development of the number systems of elementary algebra; groups, rings, integral domains and fields; polynomials; vector spaces and matrices. Restricted to teaching majors. 411, 412 not open for credit to students who

have taken 402, 403. 413 not open for credit to students who have taken 302. Prerequisites, 126 or 136H for 411; 411 for 412; 412 for 413.

## 424, 425, 426 Fundamental Concepts of Analysis (3,3,3) A,W,Sp

424: Propositions, sets, relations, functions, real numbers, sequences, series, Fourier series, functions of bounded variation, Euclidean spaces, extremal problems, selected topics in the theory of real functions and functions on Euclidean spaces. Prerequisite, 236H, or 325, or permission. 425: Metric space theory and applications to analysis. Prerequisite, 424. 426: The Lebesgue integral in Euclidean spaces. Prerequisite, 425.

## 427, 428, 429 Topics in Applied Analysis (3,3,3) AW,WSp,Sp

427: Elementary complex variable. Prerequisite, 224 or 136H. 428, 429: Orthogonal functions and boundary value problems, calculus of variations. Prerequisites, 238 or 236H for 428; 428 for 429.

## 438 Principles of Differential Equations (3) AWSp

Linear systems, existence of solutions, solution by series, special functions. Prerequisite, 236H or 224; 238 and 302 recommended.

## 441, 442, 443 Advanced Geometry (3,3,3) A,W,Sp

Selected topics from among: projective geometry, differential geometry, advanced analytic geometry, algebraic geometry, algebraic topology, and the geometry of convex bodies. Prerequisites, 126 or 136H and 302 (formerly 401) or permission, for 441; 441 for 442; 442 for 443.

## 444, 445 Foundations of Geometry (3,3) A,W

Axiomatic treatment of the foundations of Euclidean geometry. Introduction to non-Euclidean geometry. Designed for teaching majors. Prerequisites, 126 or 136H for 444; 444 for 445.

## 464 Numerical Analysis I (3) A

Basic principles of numerical analysis, classical interpolation and approximation formulas, finite differences and difference equations. Laboratory work on desk calculators. Prerequisite or corequisite, 238 or equivalent.

## 465 Numerical Analysis II (5) W

Numerical methods in algebra. Systems of linear equations, matrix inversion, successive approximations, iterative and relaxation methods. Three hours lecture and four hours laboratory per week on a high-speed machine. Prerequisites, 302 (formerly 401), 303, 374, and 464.

## 466 Numerical Analysis III (5) Sp

Numerical differentiation and integration. Solution of differential equations and systems of such equations. Three hours lecture and four hours laboratory per week on a high-speed machine. Prerequisites, 374 and 464.

## 481 Calculus of Probabilities (5) A

Fundamental concepts; discrete and continuous random variables; mathematical expectations; law of large numbers; important types of distributions; characteristic functions; central limit theorem. Prerequisite, 224 or permission.

## 482 Statistical Inference (3) W

Universe, sample, parameters, and statistics; point estimates and confidence regions; distributions of classical statistics and their use in estimation and test of hypotheses. Prerequisites, 302 (formerly 401), 481.

## 483 Theory of Correlation (3) Sp

Multivariate distributions; variances, covariances, regression, and correlation; specialization of multivariate normal distributions; sampling of bivariate normal variables. Prerequisites, 303, 481.

## 484 Distribution-Free Inference (3) Sp

Some distribution-free methods of testing hypotheses and estimations. Distribution of Chi-square, and Chi-square tests. Prerequisite, 482.

## 486 Experimental Design (3) W

Topics in analysis of variance and experimental designs: choice of designs, comparison of efficiency, power, sample size, use of computer for standard analyses. Prerequisite, 383 or 393.

## 491 Introduction to Stochastic Processes (3) W

Random walks, Markov chains, branching processes, the Poisson process, birth and death processes, waiting lines. Prerequisite, 481.

## 496H Honors Seminar (\*, max. 9) AWSp

Problem seminar for senior honors students and first-year graduate students. Prerequisite, permission.

## 497J Special Topics in Mathematics for Teachers (2-5, max. 15)

Algebra and geometry for junior high school teachers of mathematics. Offered jointly with the College of Education when demand is sufficient.

## 498 Special Topics in Mathematics (2-5, max. 15) AWSp

Reading and lecture course intended for special needs of advanced students. Offered when demand is sufficient. Prerequisite, permission of the instructor.

## Courses for Graduates Only

### 501, 502, 503 Mathematical Logic (3,3,3) A,W,Sp

Theory of formal systems. Formal development of number theory. Completeness and incompleteness, decidability, and undecidability. The theorems of Gödel, Henkin, Church, Rosser, and Tarski. Selected topics from axiomatic set theory, recursive function theory, theory of models, or advanced theory of formal systems. Prerequisites, 405 or equivalent for 501; 501 for 502; 502 for 503.

**504, 505, 506 Modern Algebra (3,3,3)**  
A,W,Sp

Theory of groups, rings, integral domains, and fields; polynomials; vector spaces, Galois Theory, and theory of ideals. Prerequisite, 404 or equivalent for 504; 504 for 505; 505 for 506.

**507, 508 Foundations of Mathematics**  
(2½, 2½) S, S

Fundamental concepts and methods of mathematics; the axiomatic method; the logical foundations of mathematics.

**510 Seminar in Algebra (\*, max. 5) AWSp**  
Prerequisite, permission.

**511, 512, 513 Special Topics in Algebra**  
(2-3, 2-3, 2-3) A, W, Sp

Each may be taken three times for credit. In recent years the following subjects have been covered: Abelian Groups, Algebraic Function Fields, Algebraic Number Theory, Classical Groups, Game Theory, Group Extensions, Lattice Theory, Lie Algebras, Number Theory, and Structure of Rings.

**519J Mathematical Models of Grammar**  
(3) W  
RITCHIE

A study of some mathematical models of language recognition, emphasizing context-free and context-sensitive grammars. Offered jointly with the Department of Linguistics. Prerequisite, graduate standing in mathematics, linguistics, or psychology, or permission of the instructor. (Offered alternate years; offered 1967-68.)

**521, 522, 523 Probability (3,3,3) A,W,Sp**

Measure theory and integration, independence, laws of large numbers, Fourier analysis of distributions, central limit problem and infinitely divisible laws, conditional expectations, martingales. Prerequisite, 426.

**524, 525, 526 Real Variable (3,3,3) A,W,Sp**

Metric spaces; general measures and integration; differentiation of set functions; real valued functions on the line; Banach spaces. Prerequisites, 426 or equivalent for 524; 524 for 525; 525 for 526.

**527 Elements of Real Variables for Scientists (3) A**

Compactness theorems, Lebesgue integration and limit theorems, Fubini theorem,  $L_p$  spaces,  $L_2$  Fourier transform theory. Prerequisites, 427, 428, 429, or permission.

**528, 529 Hilbert Space Operators (3,3) W,Sp**

Spectral theorem for bounded Hermitian operators, statement for unbounded operators, application to ordinary and partial differential operators with Fourier transforms, construction of Green functions, contour integral representation. Prerequisites, 527 for 528; 528 for 529.

**530 Seminar in Analysis (\*, max. 5) AWSp**  
Prerequisite, permission.

**531, 532, 533 Special Topics in Analysis**  
(2-3, 2-3, 2-3) A, W, Sp

Each may be taken three times for credit. In recent years the following subjects have been covered: Functional Analysis, Abstract Harmonic Analysis, Linear Operations in Hilbert Space, Group Representations, Fourier Series and Integrals, Topological Linear Spaces, Potential Theory, and Numerical Analysis.

**534, 535, 536 Complex Variable (3,3,3)**  
A,W,Sp

Complex numbers; analytic functions; contour integration; power series; analytic continuation; sequences of analytic functions; conformal mapping of simply connected regions. Prerequisites, 426 for 534; 534 for 535; 535 for 536.

**537 Applications of Operator Theory (3) A**

Schrodinger equations; eigenvalue distributions; perturbation theory; special functions. Prerequisite, 529.

**538, 539 Nonlinear Ordinary Differential Equations (3, 3) W, Sp**

Phase plane; analysis of critical points (nodes, saddle points, foci); theory of oscillations, limit cycles, Poincaré-Bendixon theory; topological methods, fixed-point theorems. Prerequisites, 324 (or 236H) and 438 for 538; 538 for 539. (Offered alternately with 578, 579; offered 1967-68.)

**541, 542, 543 Special Topics in Applied Mathematics (3, max. 9; 3, max. 9; 3, max. 9) A,W,Sp**

Each may be taken three times for credit. Such topics as mathematical quantum theory, fluid mechanics, optimization and operations research, and control theory will be covered.

**544, 545, 546 Differential Geometry**  
(3,3,3) A,W,Sp

Differential geometry of curves and surfaces in ordinary space and in  $n$ -space. Differential forms and the Cartan calculus. Differential geometry in the large. Prerequisites, 303 and 426 for 544; 544 for 545; 545 for 546.

**550 Seminar in Geometry (\*, max. 5) AWSp**  
Prerequisite, permission.

**551, 552, 553 Special Topics in Geometry**  
(2-3, 2-3, 2-3) A, W, Sp

Each may be taken three times for credit. In recent years the following subjects have been covered: Riemannian Geometry, Differentiable Manifolds, Complex Manifolds, Geometry of Convex Bodies.

**557, 558, 559 Special Topics in Numerical Analysis (3, max. 9; 3, max. 9; 3, max. 9) A,W,Sp**

Each may be taken three times for credit. Such topics as linear systems, approximation theory, or the numerical solution of differential equations will be covered.

**561, 562, 563 General Topology (3,3,3)**  
A,W,Sp

Theory of sets; metric spaces; topological spaces; compactness and other covering properties; function spaces; polyhedra; dimension theory. Prerequisites, 400 (may be taken concurrently) and 426 for 561; 561 for 562; 562 for 563.

**564, 565, 566 Algebraic Topology (3,3,3)**  
A,W,Sp

Classical and modern approaches; complexes and their homology theory; applications. Fixed points, primary obstruction; products and Poincaré duality; axiomatic approach, covering spaces. Prerequisites, 506 for 564; 564 for 565; 565 for 566.

**569J Partial Differential Equations (3) Sp**

Classification of second order partial differential equations; solution by separation of variables and reduction to a boundary value problem; theory of characteristics and solutions by means of Green's functions. Examples from classical mechanics of continua. Offered jointly with the Department of Aeronautics and Astronautics. Prerequisite, 428 or 568.

**570 Seminar in Topology (\*, max. 5) AWSp**  
Prerequisite, permission.

**571, 572, 573 Special Topics in Topology**  
(2-3, 2-3, 2-3) A, W, Sp

Each may be taken three times for credit; special topics from general and algebraic topology.

**574, 575, 576 Advanced Partial Differential Equations (3,3,3) A,W,Sp**

Classification, existence, uniqueness, and boundary value problems for partial differential equations. Green's function and associated integral equations. Prerequisite, 426 or 527.

**578, 579 Special Functions (3,3) W,Sp**

Special functions arising from eigenvalue problems, asymptotic developments by contour integration, analytic continuation, complex variable aspects of Fourier integrals. Prerequisite, 427. (Offered alternately with 538, 539.)

**581, 582, 583 Advanced Theory of Statistical Inference (3,3,3) A,W,Sp**

Elements of decision theory; Neyman-Pearson theory; randomized tests; maximum likelihood statistics; confidence regions; distribution-free statistics; linear hypotheses; analysis of variance; block design. Prerequisites, 482 and 483 or permission for 581, 581 for 582; 582 for 583.

**590 Seminar in Probability and Statistics (\*, max. 5) AWSp**

Prerequisite, permission.

# MATHEMATICS

## 591, 592, 593 Special Topics in Statistics (3,3,3) A,W,Sp

Each may be taken three times for credit. In recent years the following subjects have been covered: Advanced Probability Theory, Stochastic Processes, Distribution-Free Inference, Game and Decision Theory, Advanced Theory of Estimation (including Sequential Estimation).

## 600 Research (\*) AWSpS

Prerequisite, permission.

## 700 Thesis (\*) AWSpS

## 702 Degree Final (6) AWSpS

Limited to students completing a nonthesis degree program.

# MECHANICAL ENGINEERING

## Courses for Undergraduates

### 201 Metal Casting (1) AWSp

FORD

Theory and application of the science of producing metal castings; preparation and testing of foundry sands; manual and machine preparations of sand molds and cores; gravity casting of gray cast iron and aluminum alloys into sand, shell, and permanent molds. Lecture and laboratory.

### 202 Welding (1) AWSp

ANDERSON, HOLT

Basic theory and application of the art and science of thermal metal-joining processes; fundamentals of weld design, sequence, and distortion; flame cutting and flame bending. Lecture and laboratory.

### 203 Metal Machining (1) AWSp

ANDERSON, WOLAK

Introduction to basic machining methods used in industrial metal processing. Fundamental concepts of the use of machine tools, layout methods, and measuring tools. Lecture and laboratory.

### 215 Statistical Methods in Engineering (3) AWSp

CHALUPNIK, DRUI, MILLS, OWENS

Application of statistical techniques to provide a measure of confidence in experimental data; normal and discrete distributions, least squares, elementary design of experiments. Prerequisite, Mathematics 124.

### 222 Introductory Mechanical Engineering Laboratory (1) AWSp

CRAIN, EMERY, GALLE

A laboratory course emphasizing measurements, interpretation of instrument readings, and analysis of errors. Special topics such as thermometry, piezometry, and dynamometry. Study of basic mechanical engineering equipment. Prerequisite, sophomore standing in engineering.

### 260 Mechanism (3) AWSp

BROWNE, DAY, KIELING

Analysis of displacement, velocity, and acceleration in linkages, gearing, cams, and other mechanisms. Linkage synthesis, space and analog computing mechanisms. Prerequisites, General Engineering 107 and Mathematics 125.

### 263 Mechanical Systems (3) AWSp

BALISE, GALLE, MILLS, SAUNDERS

Study of the mathematically common ground in basic engineering principles. Transient and steady-state solutions; validity of approximations; vector representations. Illustrative use of analog computer. Prerequisite, Mathematics 125.

### 305 Production Tooling (1) AWSp

ANDERSON

Design and fabrication of tooling for economical engineering manufacture, including production and special purpose machining methods. Lecture and laboratory. Prerequisites, 201, 202, 203.

### 306 Production Techniques (1) AWSp

FORD, HOLT

Application of techniques and engineering standards to founding, welding, forging, stamping, and heat-treating of engineering metals. Lecture. Prerequisite, 305.

### 307 Production Planning (1) AWSp

DRUI, FORD, HOLT

Layout of a manufacturing plant designed to meet specific production requirements. Materials handling and processing are especially stressed. Field trips to local industrial operations. Laboratory. Prerequisite, 305.

### 312 Machine Tool Fundamentals (3) A

ANDERSON

Study of machine tools and machining processes, including exercises on all principal tools. Laboratory. Not open to engineering students. Prerequisite, junior standing in industrial education or permission.

### 320 Thermodynamics I (4) AWSp

BODOIA, KIPPENHAN, NORDQUIST

A study of the basic thermodynamic laws covering the relationships between heat, energy, and work, with particular emphasis on the application of these laws to engineering problems. Prerequisite, 222.

### 321 Thermodynamics II (4) AWSp

CORLETT, DEPEW, WAIBLER

Application of the basic laws of thermodynamics to advanced problems and to the study of properties of pure substances. Analysis of power and refrigeration cycles and psychrometric processes. Prerequisite, 320.

### 323 Thermodynamics (4) AWSp

NORDQUIST

An analysis of the laws governing energy transformations. Study of the thermodynamic properties of substances. Analysis of cyclic processes. Prerequisite, junior standing in civil engineering or permission.

### 325 Thermodynamics (4) AWSp

CHILDS, DEPEW, EMERY, MCFERON, WAIBLER

An introduction to macroscopic thermodynamics, including properties, equations of state, processes, the zeroth, first and second laws, the combined laws, and elementary cycles. The MKS system of units is used. Prerequisite, junior standing in electrical engineering or permission.

### 330 Experimental Thermodynamics (4) AWSp

CRAIN, FIREY, GUIDON

Experimental demonstration of the basic principles of mechanical engineering thermodynamics. Tests for energy balances of boilers, turbines, refrigeration plants, and air compressors. Lecture and laboratory. Prerequisite, 321.

### 340 Engineering Materials (3) AWSp

DAY, FORD, MILLS, SANDWITZ, TAGGART

Fundamental aspects of the behavior of engineering materials. Elastic and plastic deformation, fracture, creep, fatigue, impact, temperature effects, and corrosion. Destructive and nondestructive evaluation. Prerequisite, Civil Engineering 292.

### 342 Industrial Materials and Processes (3)

FORD, MILLS

The nature, properties, and behavior of materials and finishes used in industrial design and their effects on processing or fabrication methods. Factors involved in materials selection for design adequacy and processing suitability. Not open to engineering students. Lecture, laboratory, and field trips. Prerequisite, junior standing in industrial design or permission.

### 361, 362 Machine Design (3,3) AWSp

BROWNE, KIELING, MORRISON, WOLAK

Introduction to the synthesis of mechanical components and systems, emphasizing principles of mechanics, properties of materials, and manufacturing methods as they relate to design. Lecture and laboratory. Prerequisites, 260, 340, and Civil Engineering 292 for 361; 361 for 362.

### 367 Dynamics of Machines (3) AWSp

CHALUPNIK, MORRISON, SAUNDERS, SHERRER

A study of the principles of dynamics as applied to the analysis and design of machinery. Includes force, momentum, and energy analysis of linkages and rotating machinery. Prerequisites, 263 and Civil Engineering 291.

### 410 Engineering Administration (3) AWSp

DRUI, FORD, OWENS

Structure, organization, management, and operation of manufacturing enterprises as related to production planning and control, methods analysis, product development, and industrial and human relations. Prerequisite, senior standing.

## 411 Engineering Economy (3) AWSp

DRUI, FORD, OWENS

The evaluation of engineering alternatives. Use of interest computations, valuation, depreciation, and operating cost estimates to predict the economic result of the application of engineered products or processes. Prerequisite, senior standing in engineering or permission.

## 414 Industrial Safety (2) Sp

ANDERSON

Recognition of hazards; analysis of industrial accidents, their costs, and fundamentals of prevention; organization of safety programs; personnel training for safety. Prerequisite, senior standing in engineering or permission.

## 415 Statistical Quality Control (3) AWSp

DRUI, OWENS

Elementary industrial statistics, with special application to the control of manufacturing processes. Statistical methods involving sampling procedure, calculations of probabilities, properties of normal distribution, control charts, and analysis of variance. Prerequisite, senior standing in engineering or business, or permission.

## 417 Methods Analysis (3) AW

DRUI, OWENS

Motion and time-study principles; flow-process charts; operation studies measuring human performance and the effects of fatigue on time required; delay and time-utilization studies; policies involved in using methods analysis; economic and morale limitations upon the use of motion and time study. Lecture and laboratory. Prerequisite, senior standing in engineering or business, or permission.

## 418 Work Simplification (2) Sp

OWENS

For majors in nursing, home economics, and allied fields. Principles of motion economy; work distribution and human-activity analysis; flow-process charts and diagrams; layout of work areas; economic and human factors involved in methods-study applications. Lecture and laboratory. Prerequisite, senior standing in nursing or home economics, or permission.

## 419 Industrial Facilities Design (3) Sp

DRUI, OWENS

Engineering approach to the design of new or expanding industrial facilities. Scope considers environmental engineering, heat and power requirements, structural equipment selection, economic factors, modifications, maintainability. Prerequisite, senior standing in engineering.

## 420 Engineering Reliability (3) W

OWENS

An introductory course in reliability technology, covering prediction, measurement, control, reporting, and analysis of failure modes and failure rates. Prerequisite, senior standing in engineering or permission.

## 425 Air Conditioning (3) Sp

CRAIN

Theory and practice in the field of heating, ventilating, and air conditioning for human

comfort, including psychometry, heat transfer, air distribution, humidity and temperature control, cooling and dehumidifying equipment, and air cleaning. Prerequisite, 321.

## 426 Thermodynamics for Nonmajors (4) AWSp

BODOIA, CORLETT, DEPEW, WAIBLER

Elementary microscopic thermodynamics, including the kinetic theory of gases, an introduction to statistical mechanics, entropy and probability, and fluctuation phenomena. Prerequisite, 325.

## 428 Refrigeration (3) W

NORDQUIST

Theory and practice in the field of commercial and industrial refrigeration. Includes study of cycles, cooling load calculations, compressor, condenser, and evaporator analysis. Laboratory testing of refrigeration systems and field trips to representative plants. Lecture and laboratory. Prerequisite, 321.

## 430 Introduction to Heat Transfer (3) AWSp

DEPEW, EMERY, MCFERON, WAIBLER

Study of steady-state heat transfer by conduction, radiation, and natural and forced convection; design of elementary heat-exchangers; transient heat flow. Prerequisites, 321 or equivalent, Civil Engineering 342 (which may be taken concurrently), and senior standing in engineering.

## 432 Gas Dynamics I (3) ASp

BODOIA, CHILDS

A study of the dynamic and thermodynamic relationships for the flow of a gas within closed channels. Analysis of the basic flow equations; study of the effects of friction and normal shock; application to thermodynamic processes involving nozzles, diffusers, compressors, and turbines. Prerequisites, 321 and Civil Engineering 342.

## 434 Advanced Mechanical Engineering Laboratory (3) AWSp

CRAIN, FIREY, GUIDON

Methods of measurement and analysis in compressible fluid flow and heat transfer; laboratory investigations of prime movers and other heat power equipment. Prerequisites, 330, 430.

## 436 Friction and Lubrication (3) ASp

FIREY

Study of the fundamental principles of friction and lubrication. Bearing materials and bearing design. Behavior of lubricants. Engineering applications, including plain bearings, ball and roller bearings, gears, and metal processing. Prerequisites, Civil Engineering 342 and senior standing in mechanical engineering, or permission.

## 441 Automatic Control (3) Sp

BALISE, GALLE

Theory and practice of industrial process control; system description and identification of the control problem; stability; equipment considerations. Lecture and laboratory. Prerequisite, senior standing in engineering or permission.

## 443 Instrumentation (3) A

BALISE, GALLE

Principles and practice of industrial measurement. Dynamics of instrument response; theory of transducers for temperature, pressure, flow, and other measurements. Indicating, recording, and telemetering in industry. Lecture and laboratory. Prerequisite, senior standing in engineering.

## 460 Kinematics and Linkage Design (3) W

KIELING, MORRISON

Introduction to the theories of advanced kinematics. Emphasis on synthesis and design of linkages, cam surfaces and mechanical computer mechanisms, number synthesis for plane and space mechanisms using graphical and computer methods. Prerequisite, 260 or permission.

## 464 Theory of Welding (3) W

HOLT

Theory of arc welding and flame cutting application to structural aircraft, and nuclear fabrication. Prerequisite, senior standing in mechanical engineering or permission.

## 465 Welding Design (3) Sp

HOLT

Theory of joint design, sequence, fixturing, and dimensional control in fusion welding. Prerequisite, senior standing in mechanical engineering or permission.

## 468 Machine Design (3) AWSp

KIELING, MORRISON

Current topics in engineering design. Projects in the design of major mechanical systems. Prerequisites, 362, 367.

## 469 Introduction to Advanced Dynamics (3) AWSp

CHALUPNIK, KOBAYASHI, SAUNDERS, SHERRER

Acceleration effects in machine design; equation of motion with variable mass and friction forces; elementary vibration theory; gyroscopic effects in machinery; flexible machine members in motion. Prerequisite, Civil Engineering 291 or permission.

## 481 Internal Combustion Engines (3) ASp

FIREY, GUIDON

Study of the fundamental principles of operation of gasoline and diesel engines; analysis of theoretical and actual cycles; fuels; combustion; detonation; carburetion, ignition, injection and performance characteristics of typical engines. Prerequisite, 321.

## 482 Internal Combustion Engine Laboratory (3) W

FIREY, GUIDON

Performance testing of gas, gasoline, and diesel engines with special emphasis on effects of operating variables and deviations from normal operating conditions. Automobile engine tune-up analysis. Laboratory. Prerequisite, 481.

## MECHANICAL ENGINEERING

### 483 Internal Combustion Engine Design (3) Sp

FIREY, GUIDON

Fundamental principles of engine design, laws of similitude; properties of engine materials; design of important component parts; preliminary calculations for an engine. Lecture and laboratory. Prerequisite, 481.

### 485 Rocket Propulsion (3) Sp

GUIDON

Study of the types of rocket engines; thermodynamic relations and nozzle theory; characteristics of gaseous, liquid, and solid propellant systems; rocket testing; performance calculations. Prerequisite, 321.

### 490 Naval Architecture (3) A

BARTLETT, BROWNE

Theory of naval architecture; ship's lines, displacement, stability, metacenters, curves of form, and displacement sheet computations. Prerequisite, junior standing in engineering.

### 491 Naval Architecture (3) W

BARTLETT, BROWNE

Theory of naval architecture; arrangements, strength, A.B.S. rules, construction, weights. Prerequisite, 490.

### 492 Naval Architecture (3) Sp

BARTLETT, BROWNE

Launching, resistance, powering, steering, and model testing. Prerequisite, 491.

### 499 Special Projects (2-5, max. 9)

## Courses for Graduates Only

### 516 Statistical Analysis of Engineering Measurements (3) Sp

OWENS

Application of statistical techniques to engineering problems; design of engineering test procedures so as to evaluate experimental error; investigation of inherent variability of processes and systems. Prerequisites, 415 and graduate standing, or permission.

### N518-N519-520 Seminar (0-0-1, max. 6)

### 521 Thermodynamics III (3) AW

DEPEW, WAIBLER

The fundamental concepts of temperature, thermodynamic properties, and systems. The first, second, and combined laws. The general form of the energy equation, and applications. Development of the relations of classical thermodynamics. Prerequisites, 321 and graduate standing in mechanical engineering, or permission.

### 522 Thermodynamics IV (3) Sp

CORLETT, WAIBLER

Selected topics from the thermodynamics and dynamics of fluid flow. The thermodynamics of reactive systems. Introduction to the kinetic theory of gases. Prerequisite, 521 or permission.

### 524 Combustion (3) Sp

CORLETT, FIREY

Chemical and physical processes of combustion, sources, and preparation of fuels, applications, design of combustion equipment. Prerequisite, graduate standing in mechanical engineering or permission.

### 530 Radiative Heat Transfer (3) W

DEPEW, EMERY, MC FERON

Fundamentals of thermal radiation for black, gray, nongray, diffuse, and specular surfaces. Gaseous radiation and special applications of thermal radiation. Prerequisite, graduate standing in mechanical engineering or permission of instructor.

### 531 Conductive Heat Transfer (3) A

CORLETT, MC FERON, WAIBLER, WOLAK

Fundamentals of the conduction process. The analysis of steady-state and transient heat conduction in single and multidimensional systems by mathematical, graphical, numerical, and analogical methods. Solutions for transient systems with unsteady boundary conditions, and with moving or fixed heat sources. Prerequisite, graduate standing in mechanical engineering or permission of instructor.

### 532 Convective Heat Transfer (3) Sp

EMERY, WAIBLER

An introduction to fluid flow and boundary layer theory as applicable to forced- and natural-convection heat transfer. Dimensional analysis. Condensation and boiling heat transfer. The design of heat exchangers. Prerequisites, Civil Engineering 542 and graduate standing, or permission of instructor.

### 533 Gas Dynamics II (3) W

BODOIA, CHILDS

A continuation of 432. A study of the dynamic and thermodynamic relationships for the flow of fluids; application of basic laws to flow processes in pipes, nozzles, diffusers, compressors, and turbines; wave phenomena; introduction to multidimensional flow; experimental techniques and measurements. Prerequisites, 432 and Civil Engineering 542, or permission.

### 534 Experimental Heat Transfer (3) A

DEPEW, EMERY, KIPPENHAN, MC FERON, WAIBLER

Study of instrumentation and techniques used in heat transfer measurements; investigation of conduction, radiation, and convection phenomena. Liquid metal, and water heat-transfer loops will be used for experiments to determine heat flux, film coefficients, boiling pressure drops, and other phenomena of current interest. Prerequisite, graduate standing in Mechanical Engineering or permission of instructor.

### 535 Heat Transfer Studies (3)

CORLETT, DEPEW, EMERY, KIPPENHAN, MC FERON, WAIBLER

Advanced heat transfer studies of interest to mechanical engineers. Subject coverage will vary from year to year. Offered when demand is sufficient. Prerequisite, permission of instructor.

### 536 Gas Dynamics III (3) Sp

BODOIA, CHILDS

A study of the dynamic and thermodynamic relationships in the flow of fluids; application of the basic laws in multidimensional flow; unsteady one-dimensional flow. Prerequisite, 533 or permission.

### 537 Boundary Layer Theory (3) W

BODOIA, CHILDS

A study of the dynamic and thermodynamic relationships for the flow of real fluids considering effects of viscosity and heat conductivity; applications of basic laws to problems in flow through nozzles, diffusers, and ducts; free turbulence; jets and wakes. Prerequisites, 432 and Civil Engineering 542, or permission.

### 538 Turbulent Boundary Layer Theory (3) A

BODOIA, CHILDS

A continuation of 537 with special emphasis on turbulent boundary layers. The origin of turbulence; turbulent flow through pipes; influence of pressure gradient on turbulent boundary layers; free turbulent flows, jets, and wakes; application to base pressure and base heating problems. Prerequisite, 537 or permission. (Offered even-numbered years only.)

### 541 Advanced Engineering Materials (3) W

MILLS, TAGGART

Behavior of engineering materials as affected by various conditions of loading and environment. Lecture, laboratory, and studies of technical literature. Prerequisite, graduate standing in mechanical engineering or permission.

### 542 Topics in Engineering Materials (3) Sp

MILLS, TAGGART

Selected topics of current importance concerning the nature and behavior of engineering materials. Lecture, laboratory, and studies of technical literature. Prerequisite, 541 or permission.

### 545 Automation (3) Sp

BALISE, GALLE

A study of the state variable approach as applied to the analysis and synthesis of automatic control systems. System state vectors, response matrices, simulation diagrams, controllability and observability. Geometrical and physical interpretations of the mathematical methods. Prerequisite, 565 or permission.

### 549 Fluid Power Control (3) Sp

BALISE, GALLE

An analytical treatment of hydraulic and pneumatic power applied in control systems. Valve actuators, hydraulic transmissions, block diagram representation, steady-state and dynamic analysis, applications, recent developments. Prerequisite, graduate standing in mechanical engineering or permission. (Offered odd-numbered years only.)

**551 Applied Elasticity (3) A**

KOBAYASHI, SHERRER

General equilibrium and stress-strain relations in homogeneous, isotropic, elastic materials. Elastic stress distributions in machine components; plane-stress and plane-strain problems; torsion and bending in machine members; problems in thermal stresses. Prerequisite, graduate standing in mechanical engineering or permission.

**552 Applied Plasticity (3) W**

KOBAYASHI, SHERRER

Elastic-plastic stress distributions in machine components; stress-strain relations in the plastic range; yield in thick-walled pressure vessels, rotating cylinders and disks; torsion and bending of machine members with plastic flow; thermal stresses in shells, rotating disks and plates. Prerequisite, 551 or permission.

**553 Applied Viscoelasticity (3) Sp**

KOBAYASHI, SHERRER

Time-dependent aspects of stress and strain, and stability in mechanical engineering design. Stress analysis in the presence of creep and stress relaxation. Uniaxial loading, pressure vessels, rotating disks, plates, columns. Cyclic variation of load and temperature. Prerequisite, 551 or permission.

**554 Advanced Theory of Plasticity (3) Sp**

KOBAYASHI

Basic equations for three-dimensional problems of perfectly plastic solid, general consideration of discontinuous solutions, problems in plane strain and plane stress, problems in elastic-plastic solids and rigid-plastic solids. Prerequisites, 552 and Civil Engineering 592, or permission. (Offered even-numbered years only.)

**555 Thermoelasticity (3) W**

EMERY

Basic equations of thermoelasticity for isotropic elastic solids. Analysis of discs, cylinders, spheres, beams, and plates under steady temperature and sudden and slow heating and cooling. Introduction to thermoelastic stability. Prerequisite, 551 or permission. (Offered even-numbered years only.)

**556 Experimental Stress Analysis (3) A**

DAY

Studies of stress and strain relationships under static and dynamic loading. Analytical methods for determination of stress and loading. Analytical methods for determination of stress and strains in irregular members. Theory and practice of the photoelastic method. Brittle lacquer method for study of strain. Application of resistance wire strain gauges to measurement of dynamic and static strain. Interferometry as a tool in stress analysis. Principles and application of mechanical strain gauges. Lecture and laboratory. Prerequisite, graduate standing in mechanical engineering or permission.

**557 Experimental Stress Analysis (3) W**

DAY

Study of structural similitude, dimensional analysis, and brittle models as they apply to experimental stress analysis. Use of nomo-

graphs with electric strain-rosettes, study of principles and application of instrumentation available for strain-sensitive pickups. Non-destructive methods of testing and inspecting structures and machine parts. Calibration of stress-analysis instruments. Prerequisite, 556.

**558 Experimental Stress Analysis (3) Sp**

DAY

Seminar and individual research on special problems in experimental stress analysis. Prerequisite, 557 or permission. (Offered odd-numbered years only.)

**559 Fracture Mechanics (3) A**

KOBAYASHI

Linear fracture mechanics based on the Griffith-Irwin theory; crack extension force and stress intensity factors in two- and three-dimensional solids, fracture toughness of engineering materials; ductile fracture, fracture dynamics, and crack growth rate. Prerequisite, 551 or permission. (Offered even-numbered years only.)

**564 Mechanical Engineering Analysis (3) AW**

BALISE, GALLE, SAUNDERS

Application of Fourier series and integral transforms, the Laplace transform, and complex variable theory to the description and analysis of linear systems in mechanical engineering. Analogies in heat transfer, fluid flow, stress distribution, dynamics, and feedback control. Prerequisite, graduate standing in mechanical engineering or permission.

**565 Mechanical Systems Analysis (3) W**

BALISE, GALLE

A continuation of 564 into the representation of systems by vectors, matrices, tensors, and partial differential equations. Emphasis is on physical interpretations of the mathematical representations, and on analogies. Prerequisite, 564 or permission.

**567 Advanced Dynamics (3) W**

CHALUPNIK, KOBAYASHI, SAUNDERS, SHERRER

Dynamics of particles and of rigid bodies, with emphasis upon applications involving machine parts and other engineering components. Generalized coordinates, Lagrange's equations, Hamilton's principle. Prerequisite, graduate standing in mechanical engineering or permission.

**568 Vibrations of Machinery (3) A**

CHALUPNIK, KOBAYASHI, SHERRER

Study of vibration phenomena, with emphasis on application to practical problems. Systems of one and two degrees of freedom, with and without damping, in translational and torsional vibration. Systems of many degrees of freedom in torsional vibration. Free and forced vibration. Prerequisite, graduate standing in mechanical engineering or permission.

**571 Servomechanisms I (3) W**

BALISE, GALLE

Linear and introductory nonlinear closed-loop system analysis and design on the complex plane and by frequency response; application to mechanical components; analogs. Prerequisite, 564 or permission.

**572 Servomechanisms II (3) Sp**

BALISE, GALLE

Continuation of 571 to include topics of current importance. Further study of nonlinear control, statistical analysis of feedback systems, sampled-data methods, self-adaptive systems. Prerequisite, 571 or permission.

**581 Magneto-Gasdynamics (3) A**

BODOIA

The dynamics of ionized gases in magnetic fields. The properties of dissociated and ionized gases. Penetration and driving of shock waves. Experimental observations and applications. Magneto-gasdynamics power generation and electric propulsion. Prerequisites, 432 and Civil Engineering 542, or permission. (Offered odd-numbered years only.)

**584 Gas Turbines (3) A**

BODOIA, GUIDON

Applications of the gas turbine; gas turbine cycles (theoretical Brayton, simple open, regenerative, reheat, intercooling, and closed cycles); axial-flow compressors; centrifugal compressors; turbines; combustion systems; gas turbine power plant materials; plant performance. Prerequisites, 330, graduate standing in engineering, or permission.

**589 Nonlinear Mechanical Vibrations (3) Sp**

SHERRER

Study of systems with nonlinear damping and restoring forces, applications of the phase-plane delta and the Ritz averaging method, and stability of nonlinear oscillations. Prerequisite, 568 or permission.

**590 Random Mechanical Vibrations (3) W**

SHERRER

The study of the problems in measuring random vibrations, in designing simulation equipment, and in mechanical design for random vibration in aircraft and missiles. Prerequisite, 568 or permission. (Offered odd-numbered years only.)

**592 Impact (3) Sp**

SHERRER

Theory and physical behavior of colliding solids. Study of stereomechanical impact; vibrational aspects of impact; contact phenomena occurring in tool design, explosions, vehicle accidents, etc. Prerequisites, 551 and 568 or permission. (Offered even-numbered years only.)

**599 Special Projects (1-5)**

Prerequisite, permission of Graduate Program Adviser.

**600 Research (\*)**

Prerequisite, permission of Graduate Program Adviser.

**700 Thesis (\*)**



## MEDICAL PRACTICE

### MEDICAL PRACTICE

#### 411 First Aid (1)

CLAWSON

Given during the orientation week for entering medical students.

#### 475 Externship in General Practice (\*)

LEIN, ROBERTSON

A period of two to six weeks of work with a selected general practitioner to give a firsthand view of the interests and problems presented in medical practice. Open to fourth-year medical students.

#### 481 Medical Ethics, Economics, and Legal Medicine (1)

HOGNESS

Lectures and discussions by authorities in these fields on topics of current and practical interest for the future physician. Required for fourth-year medical students as part of the fourth-year lecture series.

#### N483 Hospital Extension Service (0)

Students are assigned home-care cases for which they are responsible under the guidance of the instructor. Open to third- and fourth-year students.

## MEDICINE

#### 401 Samples of Clinical Medicine (\*) Sp

WILLIAMS

Elective course in which select patients will be shown to illustrate problems in clinical medicine and to demonstrate the importance of basic medical sciences in diagnosis and treatment. First-year medical students.

#### Conjoint 426-427 Introduction to Physical Diagnosis (\*, max. 4-\*, max. 9)

(See Conjoint Courses.)

#### 430 Basic Science Aspects and Introduction to Clinical Endocrinology (\*) AW

WILLIAMS

Elective course in which patients will be presented and discussed from the pathophysiological and clinical points of view. Second-year medical students.

#### 431 Human Genetics (\*) AWSp

MOTULSKY

Elective course giving review of genetics with special emphasis on genetic factors in the etiology of disease. Principles and facts of human heredity of value to the physician will be stressed. Second-year medical students.

#### 432 The Blood Group Systems (\*) Sp

GIBLETT

Elective course giving lecture and laboratory work including individual projects which apply to the general problems related to blood transfusion. Second-year medical students.

#### 433 Cardiology Statistics (\*) WSp

BRUCE

Informal conferences and laboratory work in the examination and evaluation of techniques for the mathematical approach to medical diagnosis. Prerequisite, medical students with previous interest in statistics and/or mathematics.

#### Conjoint 454 Laboratory Procedures (2)

(See Conjoint Courses.)

#### 465 Clinical Clerkships (\*, max. 24) AWSp

EVANS, DOWLING, PETERSDORF

Approximately three hospital patients a week are assigned to each student for a complete work-up. Ward rounds are held daily; lectures, clinics, and conferences weekly. A four-week period is devoted to fluid balance, neurology, and infectious diseases at the King County Hospital and at Firland Sanatorium. Required for third-year medical students.

#### 477 Clinical Immunology and Allergy (3 or 6) AWSp

VAN ARSDEL, JR.

Outpatient experience at University Hospital in diagnosing and managing allergic disease, clinical conferences and hospital rounds on hypersensitivity and immunology, and immunology research seminars. Fourth-year medical student elective.

#### 478 Clinical Dermatology (3 or 6) AWSp

ODLAND

Participation in dermatology clinics at University Hospital, King County Hospital, and Children's Orthopedic Hospital and Medical Center, as well as attendance at ward rounds at Veterans Administration Hospital, Rainier School at Buckley, and the aforementioned hospitals. Journal Club and Wednesday morning clinical conference with entire staff. Fourth-year medical student elective.

#### 479 Clinical Gastroenterology (6 or 12) AWSp

VOLWILER

Participation in inpatient clinics, rounds and conferences with divisional staff at University, King County, and Veterans Hospitals plus directed tutorial work. Fourth-year medical student elective.

#### 480 Clinical Clerkships (\*, max. 12) AWSp

FINCH, GOODNER

One fifth of the fourth-year class spends six weeks as clinical clerks on the medical wards or in the outpatient clinics at King County Hospital or University Hospital. All students attend specialty conferences. Students assigned to the outpatient services attend a general medical clinic and several of the following clinics: allergy, arthritis, cardiology, chest, dermatology, gastroenterology, genetics, hematology, infectious diseases, metabolism, and neurology. One lecture is given to the entire class each week.

#### 481 Advanced Clinical Endocrinology (\*) AWSp

PAULSEN

Elective work including library review on a selected topic in the field; optional participation in medical clinical research problems; work-up and presentation of patients on endocrine rounds each week at U.S.P.H.S. Hospital (optional). Fourth-year medical students.

#### 482 Clinical Cardiology and Electrocardiography (\*) AWSp

BRUCE, COBB

University Hospital, King County Hospital, Veterans Administration Hospital: Elective work in cardiology clinics. Interpretation of electrocardiograms, laboratory and exercise tests, cardiovascular hemodynamics. Rounds and conferences. Fourth-year medical students.

#### 483 Clinical Chest Disease and Pulmonary Physiology (\*) AWSp

BUTLER

Inpatient and outpatient sessions on chest disease. Methods of pulmonary function testing and interpretation of results. Fourth-year medical student elective.

#### 484 Clinical Hematology (\*) AWSp

BINGHAM, FINCH, HUFF

Outpatient and inpatient experience with hematologic disorders. Includes teaching rounds, conferences, and evaluation of laboratory work. Fourth-year medical student elective.

#### 485 Clinical Genetics (\*) AWSp

MOTULSKY

Elective work with intensive study of genetic principles required in clinical work. May work in depth on a selected problem or get broader experience in aiding to work up a variety of clinical cases. Fourth-year medical students.

#### 486 Advanced Clinical Neurology (\*) AWSp

SWANSON

Regular elective consists of neurology externship at the University Hospital or King County Hospital. Students work closely with staff, attend clinical conferences, and become more familiar with diagnostic neurological procedures. Fourth-year medical students.

#### 487 Out-Patient Clinic, University Hospital and King County Hospital (\*) AWSp

CONN, GOODNER

Work-up of patients under supervision; discussion of these patients with attending physicians. Fourth-year medical students.

#### 488 Elective Clerkship (externships) (\*) AWSp

DOWLING, PETERSDORF

Work on medical ward under supervision of house staff and visiting physicians. Attend rounds and conferences. Fourth-year medical student elective.



**489 Externship in Infectious Diseases, King County Hospital (\*) AWSp**

TURCK

Students will act as clinical clerks on Ward 4 South, King County Hospital, and will engage in special projects in the bacteriological laboratory.

**492 Metabolism (\*) AWSp**

WILLIAMS

Inpatient and outpatient experience on metabolic service under close supervision. Fourth-year medical student elective.

**493 Problems in Fluid Balance and Kidney Disease (\*) AWSp**

CUTLER, HEGSTROM, SCRIBNER

University Hospital, King County Hospital, Virginia Mason Hospital: Students will see complicated diagnostic problems in fluid and electrolyte balance on the renal service, plus pre-dialysis management of chronic uremia. Fourth-year medical student elective.

**498 Undergraduate Thesis (\*) AWSp**

For medical students. Prerequisite, permission.

**499 Undergraduate Research (\*) AWSp**

Case studies, with laboratory research. For medical students. Prerequisite, permission.

*METEOROLOGY—See Atmospheric Sciences*

## MICROBIOLOGY

**101 The Microbial World (5) WSp**

SPOTTS

A course designed primarily for majors in the social sciences, humanities, and physical and earth sciences. Selected topics in microbiology are designed to illustrate the nature of scientific investigation and the development of some major biological concepts. Included are discussions of the nature of the bacterial cell, bacterial processes in nature, relationship of microbes to man and other living organisms, the nature of viruses and some aspects of modern microbiological research.

**235 Microbiology for Students of Dentistry (7) A**

HENRY

Lecture and laboratory introducing the student to the principles of microbiology. Infectious microorganisms and the flora of the mouth are emphasized. Required for second-year dental students. Students who have had previous training in microbiology may substitute a research problem for the laboratory work. Prerequisite, for nondental students, permission.

**301 General Microbiology (5) AWSpS**

NESTER

A one-quarter lecture and laboratory course designed to acquaint students in the physical and biological sciences with microorganisms

and their activities. The understanding of basic biological concepts elucidated through investigations of microorganisms will be emphasized. Topics include microbial cell structure and function, metabolism, and microbial genetics as well as the relationship of these aspects of cell activity to disease, immunity, and other important applied areas. Laboratory exercises cover a variety of microbiological techniques, and experiments are designed to illustrate major concepts discussed in lecture. Prerequisite, two quarters of chemistry. A course in a biological science is desirable but not required.

**320 Media Preparation (3 or 5) AWSpS**

DUCHOW

Practical work in the preparation of culture media and solutions. Nutritional requirements of microorganisms are considered. For students expecting to enter vocations involving laboratory work with bacteria. Prerequisites, 301 or equivalent and permission.

**322 Applied Bacteriology (5) AWSpS**

SHERRIS

Practical experience in a clinical or public health laboratory; fifteen hours per week. For students majoring in medical microbiology. Prerequisites, 441-442 or equivalent, and permission.

**400 Fundamentals of Bacteriology (3 or 6) A**

DOUGLAS, ORDAL

Basic bacteriology; comparative morphology, taxonomy, physiology of bacteria. For students majoring in microbiology and others interested chiefly in the biological and chemical aspects of microbes. Required for students majoring in microbiology. Recommended for graduate students in biochemistry or biology. Prerequisites, 10 credits in organic chemistry, 10 credits in botany or zoology.

**430 Microbial Metabolism (3 or 5) W**

DOUGLAS

The major patterns of fermentative and oxidative metabolism of yeasts and bacteria. For students majoring in microbiology or food science. Prerequisites, 400 or 301, and Chemistry 221 and 232.

**441-442 Medical Bacteriology, Virology, and Immunology (3- or 5-)(-3 or -5) A,W**

EVANS, GROMAN, HENRY, MC ALISTER, SHERRIS, WEISER

441- includes a brief survey of general bacteriology and virology; an introduction to immunology, formation and properties of antibodies, nature of antigen-antibody reactions, blood groups, allergies, and an analysis of factors of innate and acquired immunity. During the last part of 441- and throughout 442, specific pathogenic bacteria and viruses are studied in detail. Students may take 441- or 442 for 3 credits rather than 5 credits only if they have had previous work in bacteriology and have obtained special permission from the Department of Microbiology. Required for second-year medical students. Open to upper-division undergraduates and graduate students. Prerequisites, 10 credits in organic chemistry, 10 credits in botany or zoology.

**443 Medical Mycology (2) Sp**

HENRY

Consideration of morphology, physiology, immunology, and epidemiology of the medically important fungi. Offered three weeks of quarter. Required for second-year medical students. Open to upper-division undergraduates and graduate students. Prerequisites, 441-442 or equivalent.

**444 Medical Parasitology (4) Sp**

GROMAN

Consideration of medically important parasites with emphasis on their biology in relation to the production and prevention of disease. Offered six weeks of quarter. Required for second-year medical students. Open to upper-division undergraduates and graduate students. Prerequisites, 441-442 or equivalent.

**Conjoint 454 Laboratory Procedures (2)**

(See Conjoint Courses.)

**498 Undergraduate Thesis (\*) AWSpS**

For medical students. Prerequisite, permission.

**499, 499H Undergraduate Research (\*) AWSpS**

Specific problems in industrial, medical, and general microbiology. Prerequisites, senior standing and permission; permission for honors section from Groman or Nester.

## Courses for Graduates Only

**501 Research Techniques in Virology (\*, max. 5) AW**

GROMAN

An introduction to the basic experimental techniques in virology and their theoretical background. Prerequisites, 400 or 441- or equivalent, and permission.

**502 Research Techniques in the Study of Microbial Enzymes (\*, max. 5) A**

WHITELEY

Cultivation of large quantities of bacteria; purification of proteins; enzyme kinetics; sedimentation properties; control of enzyme activity and synthesis; localization of enzymes in bacterial structures. Prerequisites, 400, Biochemistry, 440, 441, 442 and permission.

**503 Research Techniques for the Study of Nucleic Acids (\*, max. 5) AW**

MC CARTHY, SPOTTS

Techniques used in the study of the macromolecular composition of bacterial cells, and in the isolation and purification of several of these macromolecular components. Prerequisites, 400 or 441 or equivalent, and permission.

**504 Research Techniques in Microbial Genetics (\*, max. 5) AW**

NESTER, DOUGLAS

The isolation of mutants and their characterization by biochemical and genetic techniques. Emphasis will be placed on the DNA mediated transformation system of *Bacillus subtilis*. Prerequisite, permission.

# MICROBIOLOGY

## 510 Physiology of Bacteria (3) A

WHITELEY

Fundamentals of physiological and metabolic processes of bacteria with emphasis on the synthesis of cellular constituents, mechanisms, and energy-yielding processes. Prerequisites, 400 and Biochemistry 440, 441, 442, or permission. (Offered alternate years; not offered 1967-68.)

## 520 Seminar (1) AWSp

## 530 Advanced General Microbiology (4) W ORDAL

Enrichment, isolation, and comparative morphology and physiology of selected bacteria with distinctive developmental cycles. Prerequisite, permission. (Offered alternate years; not offered 1967-68.)

## 540 Virology (\*, max. 4) Sp

EVANS, GROMAN, MCCARTHY

(Offered alternate years; offered 1967-68.)

## 550 Advanced Immunology (5) W

WEISER

Prerequisite, 441-. (Offered alternate years; not offered 1967-68.)

## 600 Research (\*) AWSpS

## 700 Thesis (\*) AWSpS

## MICROBIAL GENETICS

See courses of the Department of Genetics, College of Arts and Sciences. Faculty of the Department of Microbiology collaborate with the Department of Genetics in graduate instruction.

## MILITARY SCIENCE

### Courses for Undergraduates

#### 101, 102, 103 Military Science I—Basic (1,1,1) AWSp, AWSp, AWSp

Introductory courses on principles and structure of military organizations, history and composition of the Reserve Officers Training Corps, objectives of military training, fundamentals of marksmanship (Trainfire), the use and employment of small arms weapons, and a brief presentation of National Defense policies, Army commitments in support of these policies, comparison of the military forces of the world, the role of the Army in conceivable types of warfare with emphasis on the One-Army concept, manpower and training problems, and the impact of research and technological advances on warfare.

#### 201, 202, 203 Military Science II—Basic (2,2,2) AWSp, AWSp, AWSp

Map and aerial photograph reading emphasizing basic principles of terrain appreciation and evaluation, use of military and topographic map symbols, military grid reference systems, and the methods of orientation and resection; mission and composition of basic military teams including rifle squad, patrols, platoons, and small infantry-tank teams, tech-

niques of fire, combat formation, use of cover and concealment, conduct of combat and reconnaissance patrols, field fortifications, and principles of offensive and defensive combat; survey of American military history from 1776 to present with emphasis on the principles of war and tactics employed in battles fought and how these factors led to the organizational, tactical, logistical, operational, strategic, and social patterns found in the present-day Army.

#### 260 Military Science II—Basic Camp (5) S

Six weeks training at Fort Knox, Kentucky. A special course designed to provide basic military training prior to entrance into Military Science III and IV. For those students who have not taken Military Science I and II. Prerequisite, sophomore standing.

#### 301, 302, 303 Military Science III— Advanced (3,3,3) AWSp, AWSp, AWSp

Techniques of leadership including consideration of the concept of leadership, the functional approach, the setting of goals and standards, the factors influencing motivation, the use of rewards and punishments, the use and support of subordinates, and the handling of disruptive influences; a study of the instructional techniques used in the five stages of military instruction including those used in planning and presenting instruction, speech habits and gestures, construction and use of training aids, and a practical application of these techniques by student lesson preparation; orientation on the various branches of the Army to include responsibilities, capabilities, types of organization and equipment and a brief history of each branch; familiarization with the means and principles of communication, signal procedures, message codes, authentication and the characteristics, operations and employment of wire equipment, radio-telephone equipment, and electronic relay equipment; principles of offensive and defensive combat and their application to the units of the divisional infantry battalion. Courses consist of three hours of classroom work and one hour of Leadership Laboratory per week. Three week-end field trips and one academic substitute are required during the year.

#### 360 Military Science III—Advanced Camp (3) S

Six weeks training at Fort Lewis, Washington. Emphasis is placed on field training in offensive and defensive tactics, weapons familiarization and firing, physical conditioning, leadership and exercise of command, and the practical application of subjects taught during the past three academic years.

#### 401, 402, 403 Military Science IV— Advanced (2,2,3) AWSp, AWSp, AWSp

A comprehensive study of those military subjects with which a newly commissioned officer in the Army will be confronted while on active duty, including supply and evacuation, troop movements, motor transportation, command and staff, estimate of the situation and combat orders, military intelligence, the military team, training management, military administration, military justice, role of the United States Army in world affairs and the present situation, officer orientation, and military customs and tradition.

Courses consist of two hours of classroom work and one hour of Leadership Laboratory per week in 401 and 402, and three hours of classroom work and one hour of Leadership Laboratory in 403. Two academic substitutes are required during the year.

## MINERAL ENGINEERING

### MATERIALS ENGINEERING

### Courses for Undergraduates

#### 250 Fundamentals of Materials Science (4) AWSp

ARCHBOLD, LICHTER, POLONIS, TOOP

Basic principles underlying the structure and properties of engineering materials. Internal structures of crystalline and noncrystalline materials, including metals and alloys, non-metallic materials and polymers; phase diagrams; rate processes including diffusion and phase transformation; behavior under mechanical stress, elevated temperature, corrosive conditions, irradiation, and electromagnetic fields. Prerequisites, Physics 121 and Chemistry 160.

#### 351 Mineral Processing I (4) A

BRIEN

Physical and chemical principles of mineral preparation and concentration. Comminution; classification, thickening, filtering of mineral suspensions; sampling; transport; and related physical processes. Physical and chemical theory applied to concentration processes; surface phenomena, electromagnetic, electrostatic, phase change, solution, and precipitation. Laboratory illustrates fundamental principles. Prerequisites, Chemistry 160 and Physics 122.

#### 352 Mineral Processing II (2) Sp

BRIEN

Continuation of 351. More detailed development of fundamentals of particular concentration processes with pertinent laboratory exercises. Prerequisite, 351.

#### 412 Introduction to X-ray Diffraction (3) A MUELLER

Theory and application of X-ray diffraction and spectroscopic techniques to the study of materials. Prerequisite, 250 or equivalent.

### Courses for Graduates Only

#### 512 X-ray Diffraction Analysis I (3) W

MUELLER

Application of X-ray diffraction and spectroscopic techniques and their evaluation in the structure and properties of materials. Laboratory practice in analysis, line broadening and displacement phenomena, structural effects on intensity. Prerequisite, 412 or equivalent.

#### 513 X-ray Diffraction Analysis II (3) Sp

ARCHBOLD

Advanced theory of diffraction by crystals and amorphous materials. Utilization of the reciprocal lattice concept and Fourier analysis in the study of defects and atomic arrangements in crystals. Line shape and diffuse scattering analysis. Laboratory in single crystal techniques. Prerequisite, 512 or equivalent.

## CERAMIC ENGINEERING

### Courses for Undergraduates

#### 201 Introduction to Ceramics (1) A

MUELLER

Scope of ceramic materials and ceramic industries; use of ceramics as engineering materials; economic importance.

#### 202 Ceramic Raw Materials (3) W

WHITTEMORE

Natural and synthetic materials used in ceramic products; their mineralogy, physical properties, compositions, and sources.

#### 203 Ceramic Measurements (3) Sp

CAMPBELL

Theory and methods used in measuring properties of ceramic materials; control of ceramic processes.

#### 301 Ceramic Processing I (3) A

CAMPBELL

Application of principles of material and energy balances to ceramic processes, combustion, reactions.

#### 302 Ceramic Processing II (3) W

CAMPBELL

Transport in ceramic processing systems; gas, solid and fluid flow, heat flow, mixing, and applications of drying and firing.

#### 306 Ceramic Engineering Excursion (1) A

Plant inspection trip; junior year.

#### N307 Ceramic Engineering Excursion (0) A

Plant inspection trip; senior year.

#### 312 Physical Ceramics: Structure and Rheology (5) A

TURNBAUGH

Crystalline and glassy state; physical-chemical reactions of ceramic materials. Colloidal and rheological phenomena and their effects on ceramic materials. Prerequisite, Materials Engineering 250 or permission.

#### 314 Physical Ceramics: Ceramic Equilibria I (3) W

WHITTEMORE

Equilibrium diagrams and their applications to ceramic research and control problems. Prerequisite, 312 or permission.

#### 315 Vitreous State (4) Sp

WHITTEMORE

Chemistry and physics of glass, glazes, and porcelain enamels; structure and properties of vitreous materials. Prerequisite, 312 or permission.

#### 322 Microscopy of Ceramics (3) W

TURNBAUGH

Polarizing microscope study of natural and artificial minerals peculiar to the ceramic industry.

#### 400 Ceramic Materials (4)

SCOTT

The nature and properties of ceramic materials and their relation to ceramics in engineering design. The atomic, micro- and macro-structure of ceramics related to their stability in electrical, mechanical, and thermal environments. Laboratory exercises relating properties to test environments. For nonmajors only. Prerequisite, Materials Engineering 250.

#### 401 Ceramic Process Analysis (3) A

WHITTEMORE

Case histories of ceramic industrial facilities. Plant visits. Economic factors and overall process integration, including raw materials, processes, fuels, personnel, distribution.

#### 402, 403 Equipment and Plant Design (2,2) AW,WSp

CAMPBELL

402: application of the theory of drying and firing to the calculation and design of dryers and kilns. Studied on the basis of projects designed for specific performance. Prerequisite, 401. 403: equipment selection, layout plans, and economics applied to specific problems.

#### 410 Physical Ceramics: Ceramic Equilibria II (3) A

Derivation of phase equilibria relations, phase transformations, solid and liquid solutions, and non-equilibrium systems. Prerequisite, 314 or permission.

#### 420 Colloidal Ceramics (3)

WHITTEMORE

Properties and surface chemistry of ceramic colloids. Topics include absorption, adsorption, gels and their contributions to cementitious bonding, ion exchange, rheological properties, and analytical techniques applicable to these studies. Prerequisite, 312.

#### 421 Ceramic Bodies Laboratory (3) W

TURNBAUGH

Quantitative determination of physical properties of ceramic bodies; study of the effects of variables in composition, forming, and firing. Prerequisite, 401.

#### 440 Glass Technology (3) Sp

MUELLER

Raw materials; chemistry and physics of glass; batches and calculations; melting and fabrication practices; physical properties; special glasses. Prerequisites, 315 or equivalent.

#### 441 Undergraduate Seminar (1, max. 3) AWSp

#### 460 Ceramic-Metal Systems (3) Sp

Vitreous and crystalline coatings for metals; ceramic-metal composites. Prerequisite, junior standing.

#### 470 Refractories (3) Sp

WHITTEMORE

Chemical and mineralogical composition; processing methods; thermal, physical, and chemical properties and tests; application.

#### 499 Special Projects (\*, max. 5) AWSp

Problems in ceramics; laboratory investigations and bibliographic research. A total of 5 credits is required.

### Courses for Graduates Only

#### 502 Process Ceramics: Unit Process Control (3) W

CAMPBELL

Principles of process control as applied to the ceramic industry; methods of measurement and evaluation of data for the control of partial size, viscosity, moisture content, fusion points, workability, humidity, temperature, drying rates, furnace atmosphere and pressures, time-temperature relationships, body and glaze textures, and imperfection causes; application of control data to plant production.

#### 503 Research Techniques (3) Sp

CAMPBELL

Principles and methods for deriving heat transfer, optical characteristics, electrical response, surface dependent properties, rheological behavior, and dynamic, thermal, gravimetric, and mechanical analyses in ceramic research.

#### 511 Advanced Physical Ceramics I (3) A

MUELLER

Theories and principles of diffusion; concepts of sintering and solid-state reactions with emphasis upon the role of diffusion; the effect of the defect nature of solids upon these phenomena.

#### 512 Advanced Physical Ceramics II (3) W

WHITTEMORE

Characterization of ceramic raw materials and molding mixtures. Forming methods and their relation to required product properties.

#### 513 Advanced Physical Ceramics III (3) Sp

MUELLER

Ceramic vitreology: composition and formation of glasses in ceramic bodies; their effect on such properties as mechanical and dielectric strength, porosity, hardness, chemical durability, refractoriness, and resistance to erosion. Prerequisite, 511 or 512.

#### 514 Thermodynamic Topics in Ceramics (3)

TURNBAUGH

Applications of thermodynamics to predict behavior of materials at high temperature. Techniques of measurement and estimation of high temperature thermodynamic properties, use of estimated values for thermodynamic calculations.

#### 515 Ceramic Single Crystals (3)

TURNBAUGH

Science and technology of the growth of single crystals. Topics include growth from solutions, solidification from melts, vapor deposition, flame fusion, and recrystallization.

#### 520 Seminar (1, max. 6) AWSp

Required for all graduate students.

## MINERAL ENGINEERING

### 521 Mechanical Behavior of Ceramics (3) Sp

Dislocation structures in ceramics; influence of dislocations on the deformation and fracture of single crystals and polycrystalline ceramics; brittle fracture and theoretical strength. Prerequisite, 511 or permission.

### 522 Transducer Ceramics (3) W CAMPBELL

Principles and theory of conductive, ferromagnetic, ferroelectric, piezoelectric, thermoelectric, and electroluminescent materials. Prerequisite, 512 or permission.

### 523 Solid State Ceramics (3) Sp TURNBAUGH

Modern bonding concepts and wave mechanics are used to study solid state aspects of ceramic systems. Selected phenomena are examined from the viewpoint of crystal chemistry. Prerequisite, Metallurgical Engineering 460.

### 590 Industrial Minerals Research (\*) AWSp

### 599 Special Topics in Ceramics (\*) AWSp

### 600 Research (\*) AWSp

Prerequisite, permission of director.

### 700 Thesis (\*) AWSp

## METALLURGICAL ENGINEERING

### Courses for Undergraduates

### 203 Chemical Metallurgy: Introduction (2) W TOOP

Chemical principles and unit processes in the production and preparation of metals. Introduction to high temperature reactions involving gas-solid systems, liquid metals, mattes, and slags. Typical processes of extractive metallurgy. Prerequisite, Chemistry 160.

### 204 Principles of Chemical Metallurgy I (3) Sp TOOP

Basic physico-chemico calculations with emphasis on metallurgical applications. Principles and problems related to mass and energy balances; combustion; properties of gases including kinetic theory, humidity, dew point; thermochemistry. Prerequisite, Chemistry 160.

### 224 Introductory Metallurgical Laboratory (2) Sp ARCHBOLD

Basic techniques in metallography, pyrometry, and measurements essential to the study of materials, data presentation, and analysis. Laboratory experience with instruments and equipment normally found in metallurgical laboratories. Prerequisite, Materials Engineering 250 or taken concurrently.

### 306 Metallurgy Excursion (1, max. 2) Sp Plant inspection trip; junior and senior years.

### 321 Principles of Chemical Metallurgy II (2) Sp

LICHTER

Application of the elements of physical chemistry and of mass and energy balances to metallurgical problems. Emphasis on application of kinetic theory, thermochemistry and elementary transport theory. Prerequisites, 204 and Chemistry 351.

### 322 Metallurgical Thermodynamics I (3) Sp LICHTER, TOOP

The quantitative application of thermodynamics to systems of interest to metallurgists: metals, slags, gases, and refractories. A detailed review of thermodynamic quantities and equations of state. Prerequisites, 361, Chemistry 351.

### 324 Chemical Metallurgy Laboratory (1) W TOOP

Experimental methods in metallurgy adapted from physical chemistry. Prerequisites, 203, Chemistry 351 or taken concurrently.

### 361 Structure of Solids (4) A ARCHBOLD

A continuation of Materials Engineering 250 with emphasis on the structure and physical properties of metals. Metallic and covalent bonding theories; solid solutions, intermetallic compounds and their interrelationships in alloys; thermal, electrical, and magnetic properties; semiconductors, superconductors, and insulators; structure of liquids. Laboratory investigations of crystal structures, phase determinations, solid solution hardening, quantitative metallography, resistivity, dislocation etch pitting. Prerequisites, 224 and Materials Engineering 250.

### 362 Properties of Solids (4) W ARCHBOLD

Development of the principles covered in 361. Crystal imperfections and their effect on the mechanical properties of solids; elastic and plastic deformation; ternary systems; stable and metastable constitution of alloy systems; nonequilibrium conditions accompanying solidification and solid-state reactions; diffusion in solids. Laboratory experiments related to these principles. Prerequisite, 361.

### 363 Reactions in Solids (4) Sp POLONIS

Introduction to principles underlying solid-state reactions including elementary kinetics, nucleation and growth theory; annealing of cold-worked metals; diffusionless transformation, precipitation reactions and tempering; physical metallurgy of steels; precipitation hardening; relation between properties and microstructure. Laboratory experiments related to phase transformations in steel and precipitation hardening. Prerequisite, 362.

### 421 Metallurgical Thermodynamics II (4) W LICHTER, TOOP

Application of thermodynamics to the solid state; specific heat theories; theory of alloy phases; surface energy and crystallographic contributions; thermodynamics of defects with special application to semiconductors. Prerequisites, 322 and Chemistry 455.

### 422 Chemical Metallurgy: Process Calculations (3) A

Calculations in the physical chemistry aspects of chemical metallurgy.

### 424 Metallurgical Experimental Techniques (2) A

LICHTER

Design of experiments and analysis of data with reference to modern research techniques for studying the properties of crystalline solids. Prerequisite, 363.

### 441 Engineering Physical Metallurgy (3) A ARCHBOLD

For mechanical, chemical, and civil engineers, and other nonmajors. Solidification of metals and alloys; precipitation hardening phenomena; metallurgy and heat treatment of steels and cast irons; the casting, forming, mechanical properties, the effects of working, and the corrosion of metals; effect of radioactive radiation on metal properties. For laboratory, register for 442. Prerequisite, Materials Engineering 250.

### 442 Engineering Physical Metallurgy Laboratory (1) A ARCHBOLD

Laboratory work to accompany 441 may be taken concurrently. The preparation and examination of metallographic specimens; photomicrography; simple phase diagram determination; cold working and annealing; age hardening; heat treatment of steels.

### 460 Deformation of Metals (3) A POLONIS

Principles of mechanical metallurgy: behavior of metals under conditions of combined stress; stress-strain relations; theories of strength; microscopic and atomistic mechanisms of plastic deformation including dislocation theory; effects of composition and temperature on mechanical properties; residual stresses. Prerequisites, 363 or 441, and Civil Engineering 292.

### 461 Advanced Physical Metallurgy (3) A TOOP

Advanced ternary phase diagrams; corrosion and oxidation; intermetallic phases. Prerequisite, 363.

### 464 Applied Physical Metallurgy (3) Sp ARCHBOLD

Interpretation of microstructure as it affects properties; metallographic analysis of normal and defective commercial alloys; metallurgical principles applied to commercially important metals and alloys. Prerequisite, 363 or 441.

### 466 Theory of Metals (3) W

Application of wave mechanical concepts to assemblies of atoms; atomic bonding; free electron theory of metals; elementary band theory of solids; application of principles to conductivity, magnetic behavior, phase equilibria. Prerequisite, 361 or equivalent.

### 468 Undergraduate Seminar (1, max. 3) AWSp

**470 Minerals Processing: Flotation (3) A**  
BRIEN

Theory and practice; applied surface chemistry, adsorption, surface tension, flocculation and dispersion and related fundamentals. Laboratory illustrates basic phenomena, practical testing and flotation variables. Prerequisite, Materials Engineering 351.

**471 Hydrometallurgy (4) Sp**  
BRIEN

Physical-chemical principles of solution processes; fundamental theory applied to effects of pressure, temperature, diffusion rates, pyrometallurgical pretreatment, activities, oxidation and reducing conditions, impurities, contact time, interphase areas and associated variables. Ion exchange and solvent extraction principles. Laboratory. Prerequisite, Materials Engineering 351 or equivalent.

**472 Mineral Processing Practices (2) W**  
BRIEN

Methods of laboratory investigations and recent plant and process innovations reported in the current literature. Prerequisite, 470.

**473 Mineral Process Plant Design (2) Sp**  
BRIEN

General arrangement planning and design calculations on a project basis. Prerequisite, 472.

**499 Special Projects (\*, max. 5) AWSp**

Laboratory investigation of a metallurgical problem on an independent basis. Total of 5 credits required.

**Courses for Graduates Only**

**520 Seminar (1, max. 6) AWSp**

Review of research problems and recent literature. Required for all graduate students.

**525 Thermodynamic Topics in Metallurgy (3) Sp**  
TOOP

Selected topics in application of classical and statistical thermodynamics to systems of current metallurgical interest. Prerequisite, 421.

**531 Advanced Metallurgy (\*) AWSp**

Study of selected problems, with particular attention to recent publications and scientific applications in physical or extractive metallurgy.

**541 Theoretical Structural Metallurgy I (3) A**  
ARCHBOLD

Detailed study of structural imperfections in solids; point and line defects; interaction between defects and their significance; fundamentals of dislocation theory; correlation of theory with experimental evidence. Prerequisite, 363.

**542 Theoretical Structural Metallurgy II (3) W**  
LICHTER

Theory, structure, thermodynamics, and properties of liquid metals and alloys. Solid-liquid interactions; solidification and solute

redistribution; dissolution reactions and liquid metal corrosion. Comparison of metallic and non-metallic liquids; liquid semiconductors; fused salts. Prerequisite, 541.

**543 Theoretical Structural Metallurgy III (3) Sp**  
ARCHBOLD

The fundamental view of mechanical properties and deformation of metals; elasticity, anelasticity, and internal friction; anisotropy; plastic deformation of single crystals and polycrystalline aggregates; theories of plastic flow and work hardening involving applications of dislocation theory; effects of temperature and composition on deformation behavior of metals and alloys. Prerequisite, 541.

**551 Special Topics in Advanced Physical Metallurgy (\*, max. 6) AW**

Prerequisite, 363 or equivalent.

**561 Phase Transformations in Solid Metals I (3) A**  
POLONIS

An advanced treatment of phase transformations from the standpoint of crystallography, and thermodynamics. Prerequisite, 363.

**562 Phase Transformations in Solid Metals II (3) W**  
POLONIS

Kinetics of solid state reactions in metals including basic equations and their derivation. Applications to specific metal and alloy transformations. Theory of nucleation and growth processes in solids. Prerequisite, 561.

**563 Phase Transformations in Solid Metals III (3) Sp**  
ARCHBOLD

Theory of diffusion; application of diffusion theory to solid state reactions; thermodynamics of irreversible processes. Prerequisite, 561.

**566 Advanced Theory of Metals (3) W**

Modern theories of the metallic state and their relationship to the physical properties of metals. Prerequisite, 466.

**570 Topics in Advanced Mineral Processing (\*) AWSp**  
BRIEN

Special topics of current interest in the preparation and concentration of minerals and the application of physical and surface-chemical fundamentals in investigative research.

**571 Advanced Mineral Processing Theory I (3) A**  
BRIEN

Thermodynamics and electrochemistry of surfaces. Potential differences across interfaces; electrical double layer, surface tension; Gibb's adsorption equation in three-phase flotation systems; anionic and cationic selectivity.

**572 Advanced Mineral Processing Laboratory (\*) AWSp**  
BRIEN

Experimental study of theoretical principles in preparation and concentration. Arranged concurrently with 571 and 573, or as required.

**573 Advanced Mineral Processing Theory II (3) W**  
BRIEN

Rate controlling processes in hydrometallurgical separations. Magnetic and electrostatic fundamentals in concentration. Movement of solids in solid-liquid suspensions. Comminution of solids.

**574 Advanced Mineral Processing Design (\*) Sp**  
BRIEN

Plant design studies and discussion of systems of current interest. Subjects may change from year to year.

**599 Special Topics in Metallurgy (\*) AWSp**  
TOOP

**600 Research (\*) AWSp**

Prerequisite, permission of director.

**700 Thesis (\*) AWSp**

**MINING ENGINEERING**

**Courses for Undergraduates**

**221 Explosives and Rock Drilling (2) W**  
ANDERSON

Principles of rock breaking and characteristics of explosives. Theory of fragmentation; design of blast and explosive loading patterns; nuclear explosives in industry; safe practices, and elements of costs. Applications in tunneling and surface work.

**306 Mine Excursion (1, max. 2) Sp**

Five-day trip to a neighboring mining region. Required in junior and senior years during spring vacation, or as scheduled.

**322 Principles of Mine Production (4) A**  
ANDERSON

Working of open pit and underground mines. Delineation of ore bodies; shafts and development; level planning and underground stoping methods; characteristics of mine rocks; support systems; introduction to transport, drainage, ventilation, hoisting, and mine organization. Emphasis on labor and equipment, productivity, and costs.

**325 Mineral Land Valuation (2) W**  
ANDERSON

Sampling methods in mines and placers; drill hole and coring methods; geological aspects; estimation of deposits and reserves; use of computers in ore reserve calculations; metallic and nonmetallic depletion and financial calculations; reports. Prerequisite, 322.

**330 Mine Surveying (3) Sp**  
ANDERSON

Practice in underground methods, use of special instruments, stope measurements, underground curves, shaft surveying, solar observations, and carrying of meridian underground; production of working and geologic maps and sections. Prerequisite, General Engineering 121.

# MINERAL ENGINEERING

## 425 Rock Mechanics (2) A

PIFER

Physical properties of rocks; stress around underground openings; behavior of rocks under stress; design of underground openings; measurement of stress in mines; rock slope stability; subsidence over mines; rock bolting system design. Prerequisites, 322 and Civil Engineering 292 or permission.

## 426 Exploration and Development of Mineral Deposits (3) Sp

PIFER

Mining geology; procurement of data by geologic mapping and drilling; solution of mine structural and fault problems; physiographic, mineralogical, and structural guides to ore applied to mine exploration; exploration and development programs; evaluation of prospects. A feasibility report is required after field study of a mineral deposit. Prerequisite, Geology 487 or permission.

## 427 Exploration Geophysics: Introduction (3) Sp

ANDERSON

Elementary principles of seismic, resistivity, electromagnetic, magnetic, radiometric, and gravitational methods in exploration for ore; applications and limitations of methods. Prerequisite, junior standing.

## 432 Mine Plant Design (5) Sp

ANDERSON

Principles and application; design of transport systems; air compression practice and distribution; pumping plant and mine water handling; electrical equipment and distribution systems in mines; plant design and construction. Prerequisites, 322 and Electrical Engineering 303.

## 433 Mine Ventilation (3) A

ANDERSON

Principles and practices. Physical and chemical aspects of mine atmosphere, gases, and dusts; physiological considerations; air flow and measurement; mechanical ventilation, equipment, and systems. Prerequisite, 322.

## 465 Opaque Minerals Microscopy (2) W

BRIEN

Microscopic determination of the ore minerals; elements of quantitative mineragraphy, microchemistry minerals; mineral association and liberation studies of polished ore sections and mounted mill products; grain-count studies; mineral processing products.

## 481 Mineral Industry Economics (3) W

PIFER

World mineral resources, their distribution, exploitation, and depletion; social, economic, and political effects; international control and trade, industrial organization, government policies, taxation, tariffs, marketing, and pricing; elements of production costs. Prerequisite, Economics 211.

## 483 Mining Laws (1) Sp

ANDERSON

Mineral land laws of the United States; federal, Washington State, and territorial laws.

Oil and gas acts. Federal and state mine safety regulations. Canadian and other foreign laws of importance. Prerequisite, 325.

## 499 Special Projects (\*, max. 5) AWSp

Problems in mining or mineral processing; field or laboratory investigations on an independent basis. Total of 5 credits required.

## Courses for Graduates Only

### 520 Seminar (1, max. 6) AWSp

Lectures and discussions; review of research problems and recent literature. Required for all graduate students.

### 521 Metal Mining (\*) AWSp

ANDERSON

Production methods; mining control; support; applied efficiency methods; administration; equipment and machinery; deep-level mining; health and safety; special problems. Arranged in accordance with student's major interest.

### 522 Mine Shafts (3) A

PIFER

Location and design, surface plant, collar preparation; sinking, mechanization, and organization, support, concrete lining, stations and bottoms, equipment and maintenance, safety and costs; special attention to modern circular shafts.

### 523 Mining Stratified Deposits (\*) Sp

PIFER

Studies in mining, with particular reference to mechanization and strata control. Prerequisite, graduate standing.

### 525 Rock Mechanics (3) W

PIFER

Physical characteristics and mechanics of response by rocks under stress; theories of stress distribution around structures; stability of rock slopes; subsidence and strata control; rock fragmentation. Prerequisite, 425.

### 600 Research (\*) AWSp

Prerequisite, permission of director.

### 700 Thesis (\*) AWSp

### 702 Degree Final (6) AWSp

Limited to students completing a nonthesis degree program.

*MONGOLIAN—See Far Eastern and Slavic Languages and Literature*

## MUSIC

## Courses for Undergraduates

*Courses Primarily for Nonmajors (See also ENSEMBLES.)*

## 100 University Singers (1, max. 6) AWSp

EICHENBERGER

## 107 Survey of Music (5) AWSp

CLARKE

Illustrated lectures with supplementary readings to provide the general student with understanding of common musical forms, idioms, and styles.

## 108 The Orchestra (2) AWSp

HOKANSON, MC INNES, SOKOL

Development of the orchestra and its literature.

## 117 Orchestral Music: Seventeenth and Eighteenth Centuries (2) A

TROY

## 118 Symphonic Music: Nineteenth Century (2) W,Sp

HOKANSON, O'DOAN, SOKOL

## 119 Symphonic Music: Contemporary (2) Sp

HOKANSON, SOKOL

## 121, 122, 123 Elementary Music Theory (2,2,2) AW,WSp,Sp

Prerequisites, 121 for 122; 122 for 123.

## 217, 218, 219 Opera (2,2,2) A,W,Sp

CHAPPLE

## 227 The Concerto (2) A

O'DOAN, SOKOL

## 300 University Singers (1, max. 6) AWSp

EICHENBERGER

## 314, 315, 316 Music Cultures of the World (3,3,3) A,W,Sp

ADRIAANSZ, GARFIAS

314: Music of India, Southeast Asia, Indonesia; 315: Africa, Western Europe, North and South America; 316: Eastern Europe, Middle East, Central Asia, Far East.

## 317 Chamber Music (2) W

MC INNES

Survey of literature for ensembles. Prerequisite, 107 or 108.

## 347 Music in the United States (2) W

CLARKE

Contribution of music to development of American culture.

## 349 History of Jazz (3) A

GARFIAS

The development of jazz in the United States from its beginnings to its present trends.

## 482J Music in Theatre (2, max. 4) W

BERGSMA

Open to majors and nonmajors who are conductors, composers, playwrights, or stage directors. Survey of representative examples of

musical theatre; collaborative creation and production. Prerequisite, 464 or 486 or 491, or Drama 461, or English 374. Offered jointly with the School of Drama.

*Introductory Courses*  
*Primarily for Music Majors*

**101, 102, 103 First-Year Theory (2,2,2)**  
**A,W,Sp**

VERRALL, STAFF

A study of basic musical concepts and terminology through a program of listening, analysis, and keyboard practice. To be taken concurrently with 114, 115, 116. Prerequisite, permission.

**114, 115, 116 Sight Singing (1,1,1) A,W,Sp**

To be taken concurrently with 101, 102, 103. Prerequisite, permission.

**131, 132, 133 Piano Sight Reading Laboratory (1,1,1) A,W,Sp**

GEISSMAR

For majors in piano and organ. Exemption by examination. Others by permission.

**191 Composition (2, max. 6) AWSp**

BEALE, BENSHOOF, BERGSMA, KECHLEY, MC KAY, SMITH, SUDERBURG, TUFTS, VERRALL

One half-hour private lesson and a one-hour laboratory session each week. Intended to develop skill in creative musical expression. Prerequisite, permission.

**201, 202, 203 Second-Year Theory (3,3,3)**  
**A,W,Sp**

KECHLEY, BEALE, SMITH, TUFTS

Practical writing and analytic experience in diatonic and chromatic harmony as it was used during the eighteenth and nineteenth centuries. To be taken concurrently with 207, 208, 209. Prerequisites, 103 and 116.

**207, 208, 209 Music After 1750 (2,2,2)**  
**A,W,Sp**

TROY

To be taken concurrently with 201, 202, 203. 207: 1750-1820; 208: 1820-1870; 209: 1870-1920. Prerequisites, 103 and 116.

**221, 222, 223 Introductory Composition (2,2,2) A,W,Sp**

BENSHOOF

For students not majoring in composition. Prerequisite, 103.

**THEORY AND COMPOSITION**

*Primarily for majors who have completed 203 and 209. Open to others with permission of the instructor.*

**291 Composition (2, max. 6) AWSp**

BEALE, BENSHOOF, BERGSMA, KECHLEY, MCKAY, SMITH, SUDERBURG, TUFTS, VERRALL

One half-hour private lesson and a one-hour laboratory session each week. Prerequisite, 191 or permission.

**303 Keyboard Harmony (3) Sp**

BABB, BEALE

Prerequisite, one quarter of 130A or equivalent.

**321 Modal Counterpoint (3) A**

BABB

Sixteenth-century style. To be taken concurrently with 307.

**322 Tonal Counterpoint (2) W**

VERRALL

The process of invention as exemplified in the music of the Baroque era. To be taken concurrently with 308.

**323 Contemporary Idioms (3) Sp**

MCKAY

Analytical studies of present-day composition techniques with emphasis on contrapuntal qualities. To be taken concurrently with 309.

**352 Musical Form (3) W**

BEALE

Analysis of principal forms of musical composition.

**353 Orchestration (3) AW**

MCKAY, VERRALL

**391 Composition (2, max. 6) AWSp**

BEALE, BENSHOOF, BERGSMA, KECHLEY, MC KAY, SMITH, SUDERBURG, TUFTS, VERRALL

One half-hour private lesson and a one-hour laboratory session each week. Prerequisite, 291.

**421 Modal Counterpoint (3) W**

BABB

Prerequisite, 321.

**422 Tonal Counterpoint (3) Sp**

VERRALL

The evolution of fugal practice from the Baroque era to the present. Prerequisite, 322.

**423 Contemporary Idioms (3) W**

MCKAY

Prerequisite, 323.

**452 Musical Form (3) Sp**

VERRALL

Prerequisite, 352.

**453 Orchestration (3) Sp**

MCKAY

Prerequisite, 353.

**481 Harmonic Analysis (3) Sp**

BEALE

**491 Composition (2, max. 12) AWSp**

BEALE, BENSHOOF, BERGSMA, KECHLEY, MC KAY, SMITH, SUDERBURG, TUFTS, VERRALL

One half-hour private lesson and a one-hour laboratory session each week. Prerequisite, 391.

**MUSIC HISTORY AND LITERATURE**

*Primarily for music majors who have completed 203 and 209. Open to others with adequate musical experience.*

**307, 308 Music Before 1750 (2,3) A,W**

CLARKE, TERRY, TROY

307: before 1600; 308: 1600-1750. To be taken concurrently with 321, 322. Prerequisite, 307 for 308.

**309 Music After 1920 (2) Sp**

BEALE

Neoclassicism, neoromanticism, serialism, electronic music. To be taken concurrently with 323.

**348 Twentieth-Century Music in the Americas (2) W**

CLARKE

Stylistic tendencies since 1900; analysis of representative works. Prerequisites, 203, 208 or permission.

**357 Church Music (3) Sp**

CLARKE

Survey of liturgy, chant, hymn, anthem and solo. Prerequisite, 308 or permission. (Not offered 1967-68.)

**367 History of Chamber Music (3) A**

MC INNES

**407 Medieval and Renaissance Music (3) ASp**

HARMAN

**408 Baroque Music (3) A**

TERRY

Prerequisite, 308 or permission.

**409 Contemporary Music (3) A**

MCKAY

**427 Haydn and Mozart (3) Sp**

TERRY

Prerequisite, 308 or permission.

**428 Beethoven (3) W**

**437 Rococo and Preclassic Music (3)**

TERRY

Prerequisite, 308 or permission.

**447 Early Nineteenth-Century Music (3) W**

IRVINE

Schubert, Schumann, Berlioz, Chopin, Mendelssohn.

**449 Late Nineteenth-Century Music (3) Sp**

IRVINE

**457, 458, 459 Area Studies in Ethnomusicology (3,3,3) A,Sp,W**

ADRIAANSZ, GARFIAS

457: Korea; 458: Japan; 459: India. Prerequisite, 316 or permission.

# MUSIC

## 471, 472 Introduction to Ethnomusicology (3) A,W

ADRIAANSZ, GARFIAS

Prerequisite, permission.

## 487, 488, 489 History of Opera (3,3,3)

TROY

Periods and styles, with special study of representative works in the light of cooperative contributions of voice, orchestra, and libretto. 487: pre-opera through Gluck; 488: Mozart through Verdi; 489: twentieth-century opera.

## 497, 498 History of Choral Music (3,3)

HARMAN, TERRY

497: Josquin through Bach; 498: Haydn to the present.

## SCORE ANALYSIS AND CONDUCTING

### 284 Basic Principles of Conducting (1) Sp

CHAPPLE

Prerequisite, 203.

### 384, 385, 386 Conducting (1,1,1) A,W,Sp

EICHENBERGER, SOKOL, WELKE

A. Instrumental; B. Choral. Prerequisite, 284.

### 484, 485, 486 Conducting (1,1,1) A,W,Sp

CHAPPLE, COLE, KECHLEY, KUCHUNAS

A. Instrumental; B. Choral. Prerequisite, 384.

### 495 Advanced Choral Conducting (3) S

KECHLEY

Prerequisite, permission.

## MUSIC TEACHING

### 104 Music Fundamentals (2) AWSp

For majors in elementary education. (Prerequisite for Education 377.)

### 214, 215, 216 String Techniques I (1,1,1)

A,W,Sp

CUNHA

Violin, viola, 'cello, string bass.

### 234, 235, 236 String Techniques II (1,1,1)

A,W,Sp

CUNHA

### 244, 245, 246 Woodwind Techniques (1,1,1)

A,W,Sp

WELKE

244: clarinet; 245: flute; 246: double reeds.

### 256 Percussion Techniques (1) WSp

BAUNTON

### 264, 265, 266 Brass Techniques (1,1,1)

A,W,Sp

COLE

264: trumpet; 265, 266: lower brass.

### 344 Elementary School Music (3) ASp

Prerequisites, 385, Education 370S, and examination in piano and voice.

## 346J The Teaching of Secondary School Music (3) AW

NORMANN

Offered jointly with the College of Education. Prerequisites, 344, 385, Education 309, 370S.

### 354 Band Arranging (2) W

WELKE

Prerequisite, 203.

### 474 The Curriculum in Music Education (2) Sp

NORMANN

### 476 The General Music Class (2) W

The teaching of music and its literature in nonperforming classes on the junior and senior high school level. Prerequisite, 344.

### 496 Workshop in Music Education (1 or 2, max. 10) S

- I. Music in the Primary Grades (classroom teachers, certified elementary teachers only).
- II. Music in the Intermediate Grades (certified elementary teachers only).
- III. Teaching of Stringed Instruments.
- IV. Teaching of Woodwind Instruments.
- V. Teaching of Brass Instruments.
- VI. Teaching of Percussion Instruments.
- VII. Junior High School Problems.
- VIII. Audio-Visual Materials.
- IX. Song Literature for Children (certified elementary teachers only).
- X. Observation and Participation in High School Demonstration Groups.

## VOICE AND INSTRUMENTS

### Class Instruction

#### Piano 110A (1, max. 6) AWSp

Prerequisite, permission.

#### Piano 210A (1, max. 6) AWSp

Prerequisite, examination.

#### Voice 110C (1-1-1, max. 3) AWSp

Prerequisite, examination.

#### Voice 210C (1, max 6) AWSp

### Private Instruction

#### 130 Vocal or Instrumental Instruction (2-3, max. 9) AWSp

Primarily for majors not specializing in performance; 30 minutes or 60 minutes of private instruction per week. Prerequisite, examination.

##### A. PIANO

Siki (AA), Bostwick (AB), Geissmar (AC), Hokanson (AD), Moore (AE), O'Doan (AF)

##### B. VIOLIN OR VIOLA

Zetlin (BA), Sokol (BB), McInnes (BC)

##### C. VOICE

Harris (CA), Lishner (CB)

##### D. VIOLONCELLO

Heinitz (DA)

##### E. DOUBLE BASS

Harnett (DB)

##### F. ORGAN

Eichinger (FA)

##### G. FLUTE

Zeitlen (GA)

##### H. OBOE

Allport (HA), Shapiro (HB)

##### I. CLARINET

Phillips (IA), Welke (IB)

##### J. BASSOON

Echols (JA)

##### K. HORN

Welke (KA), Cole (KB)

##### L. TRUMPET

Welke (LA), Cole (LB)

##### M. TROMBONE

Cloud (MA)

##### N. TUBA

##### O. HARP

Palmer (OA)

##### P. TIMPANI, PERCUSSION

Baunton (PA)

##### Q. HARPSICHORD

Bostwick (QA)

##### R. VIOLA DA GAMBA

Heinitz (RA)

##### S. NONWESTERN INSTRUMENTS

Garfias (SA), Tsuda (SB)

#### 150 Vocal or Instrumental Instruction (3-4, max. 12) AWSp

For majors specializing in performance; 60 minutes of private instruction and a studio class session in interpretation each week; 4 credits may be earned only by students accepted in the departmental honors program. For teacher designation, see 130.

#### 230 Vocal or Instrumental Instruction (2-3, max. 9) AWSp

For description and teacher designation see 130. Prerequisite, examination.

#### 250 Vocal or Instrumental Instruction (3-4, max. 12) AWSp

For description see 150; for teacher designation see 130. Prerequisite, examination.

#### 330 Vocal or Instrumental Instruction (2-3, max. 9) AWSp

For majors not specializing in performance. For description and teacher designation see 130. Prerequisite, examination.

#### 350 Vocal or Instrumental Instruction (3-4, max. 12) AWSp

For description see 150; for teacher designation see 130. Prerequisite, examination.

#### 351 Junior Recital (1) AWSp

For participants in departmental honors program only.

#### 430 Vocal or Instrumental Instruction (2-3, max. 18) AWSp

For majors not specializing in performance. For description and teacher designation see 130. Prerequisite, examination.



**450 Vocal or Instrumental Instruction (3-4, max. 24) AWSp**

For description see 150; for teacher designation see 130. Prerequisite, examination.

**451 Senior Recital (1) AWSp****PERFORMANCE TECHNIQUES****111, 112, 113 Rhythmic Movement**

(1,1,1) AWSp

ROSINBUM

Muscular coordination with musical rhythms.

**211 Music Theater Technique (1) A**

ROSINBUM

Stage deportment and dramatic movement for singers. Prerequisite, 113.

**331, 332, 333 Keyboard Transposition and Improvisation (2,2,2) A,W,Sp**

BABB, BEALE

Prerequisite, 303.

**334, 335, 336 Accompanying (2,2,2) AW,W,Sp**

HOKANSON, KUCHUNAS, O'DOAN

Study and performance of music of different types and periods for voice or instrument in combination with the piano.

**337, 338, 339 Repertoire (1,1,1) A,W,Sp**

EICHINGER, KUCHUNAS, SIKI

For applied music majors. To be taken concurrently with 350 during the junior year.

Section A. PIANO

Section C. SONG

Section F. ORGAN

**341 Keyboard Performance Practices (2) AWSp**

BOSTWICK

Problems in interpreting early keyboard music with special reference to the harpsichord. Prerequisite, permission.

**377, 378, 379 Score Reading (1,1,1) A,W,Sp**

Reading from score at the piano as a technique for the investigation of ensemble literature.

**434, 435, 436 Pedagogy (2,2,2) A,W,Sp**

HARRIS, HEINITZ, MOORE, ZETLIN

Principles of effective studio teaching; survey and evaluation of teaching materials.

Section A. PIANO

Section B. VIOLIN

Section C. VOICE

Section D. VIOLONCELLO

**464, 465 Opera Direction and Production (4,4) A,W**

ROSINBUM

Practical experience with problems of the theater. Prerequisite, 464 for 465.

**ENSEMBLES**

Open to nonmajors. All except 100 and 300 require auditions or permission.

**100 University Singers (1, max. 6) AWSp**

EICHENBERGER

**140 University Band (1, max. 6) WSp**

COLE

**160 University Symphony Orchestra (1, max. 6) AWSp**

CHAPPLE

**170 Chamber Music (1, max. 6) AWSp**

HEINITZ, MC INNES, ZETLIN

**171 Piano Ensemble (1, max. 6) AWSp**

GEISSMAR

**172 Woodwind Ensemble (1, max. 6) AWSp**

WELKE

**173 Brass Ensemble (1, max. 6) WSp**

COLE

**174 Percussion Ensemble (1, max. 6) AWSp**

BAUNTON

**175 Nonwestern Ensemble (1, max. 6) AWSp**

ADRIAANSZ, GARFIAS

**180 Opera Workshop (1, max. 6) AWSp**

ROSINBUM

**190 Madrigal Singers (1, max. 6) AWSp**

KECHLEY

**200 University Chorale (1, max. 6) AWSp**

EICHENBERGER

**220 Marching Band (1, max. 5) A**

COLE

**240 Wind Sinfonietta (1, max. 6) AWSp**

WELKE

**300 University Singers (1, max. 6) AWSp**

EICHENBERGER

Prerequisite, junior standing.

**340 University Band (1, max. 6) WSp**

COLE

**360 University Symphony Orchestra (1, max. 9) AWSp**

CHAPPLE

**370 Chamber Music (1, max. 6) AWSp**

HEINITZ, MC INNES, ZETLIN

**371 Piano Ensemble (1, max. 6) AWSp**

GEISSMAR

**372 Woodwind Ensemble (1, max. 6) AWSp**

WELKE

**373 Brass Ensemble (1, max. 6) WSp**

COLE

**374 Percussion Ensemble (1, max. 6) AWSp**

BAUNTON

**375 Nonwestern Ensemble (1, max. 6) AWSp**

ADRIAANSZ, GARFIAS

**380 Opera Workshop (1, max. 6) AWSp**

ROSINBUM

**390 Madrigal Singers (1, max. 6) AWSp**

KECHLEY

**400 University Chorale (1, max. 6) AWSp**

EICHENBERGER

**440 Wind Sinfonietta (1, max. 6) AWSp**

WELKE

**460 Sinfonietta (1, max. 6) AWSp**

CHAPPLE

**470 Chamber Music (1, max. 6) AWSp**

HEINITZ, ZETLIN

Prerequisite, graduate standing.

**480 Opera Theater (2, max. 6) AWSp**

CHAPPLE, ROSINBUM

Preparation for participation in public performance of roles in chamber opera.

**490 Collegium Musicum (1, max. 6) AWSp**

BOSTWICK, HEINITZ, KECHLEY, TERRY

**492 Problems in Twentieth-Century Ensemble (1, max. 6) AWSp**

SMITH, SUDERBURG

Exploration of notation and performance problems in today's music; preparation for public performance.

**UNDERGRADUATE RESEARCH****499 Undergraduate Research (\*, max. 6) AWSp****Courses For Graduates Only****500 Methods of Musical Research (3) ASp**

IRVINE

Bibliography and research techniques. Designed to prepare students for their work in seminars, individual research, and the writing of theses.

**501 Advanced Analysis (3) A**

CLARKE, HARMAN

Comparative analysis of works of the Palestrina period and earlier works.

**502 Advanced Analysis (3) W**

KECHLEY

Examination of the influences and an analysis of the technical devices that characterize Baroque and Classic period compositional procedures.

**503 Advanced Analysis (3) Sp**

BERGSMAN

The influence of dramatic aesthetic on musical form in the Romantic period.

# MUSIC

- 507 Seminar in Renaissance and Baroque Music (3, max. 6) AW**  
TERRY  
Prerequisite, one or more courses from 407, 408, 467, 487, 497.
- 508 Seminar in Classic and Romantic Music (3, max. 6) A,Sp**  
IRVINE, TERRY  
Prerequisite, one or more courses from 427, 428, 447, 449, 488.
- 509 Seminar in Modern Music (3, max. 6) W**  
MC KAY, VERRALL  
Prerequisite, one or more courses from 409, 423, 449, 488, 498.
- 511, 512 Seminar in Ethnomusicology (3,3) W,Sp**  
ADRIAANSZ, GARFIAS  
Prerequisite, 457 or 458 or 459, or permission.
- 514 Psychological Foundations of Music (3)**  
NORMANN  
The nature of musical effects; growth and development of musical powers; factors influencing musical taste; applications of music to therapy and industry.
- 522 Contemporary Contrapuntal Technique (3) A**  
VERRALL  
A study of the art of invention, canon, and fugue in the twentieth century, from both the analytic and practical viewpoints.
- 524 Seminar in Music Education (3) Sp**  
Special problems in the teaching and supervision of music in the elementary grades. Prerequisite, one year of teaching experience and permission.
- 525 Seminar in Music Education (3) A**  
NORMANN  
Special problems in the teaching and administration of music in the secondary school and junior college. Prerequisites, one year of teaching experience and permission.
- 526 Music and Society (3) W**  
NORMANN  
Philosophical foundations in music education. Prerequisites, one year of teaching experience and permission.
- 547 Seminar in American Music (3, max. 6) Sp**  
CLARKE  
History and literature of music in the United States from 1600 to the present.
- 550 Vocal or Instrumental Instruction (3, max. 12) AWSp**  
For graduate performance majors; 60 minutes of private instruction per week. Prerequisite, jury examination. For teacher designation see 130.
- 566 Opera Direction and Production (4 or 6, max. 12) AWSp**  
ROSINBUM  
Practical experience with problems of the opera theater.

- 586, 569 Historiography and Criticism (3,3) Sp, —**  
IRVINE  
An approach to critical scholarship through the review and evaluation of the writings of music historiographers and music critics, with main emphasis on the period since 1770. Prerequisite, 500.
- 577, 578 Early Notation (2,2) WSp**  
HARMAN  
577: Gregorian notation; *ars antiqua*; *ars nova*, 578: white mensural notation; lute and organ tablatures.
- 579 Seminar in Musicology (3, max. 6) WSp**  
CLARKE, HARMAN  
Selected topics in music history, literature, and theory. Prerequisite, permission.
- 584, 585, 586 Advanced Conducting (1-3,1-3,1-3) A,W,Sp**  
CHAPPLE  
Analysis of scores leading to rehearsal and preparation of musical groups.
- 590 Recital (2, max. 6) AWSp**  
Public performance in one solo recital and in chamber music, cantata, concerto, opera, or oratorio.
- 591 Graduate Composition (\*) AWSp**  
BERGSMA, MC KAY, SMITH, VERRALL

- 600 Research (\*) AWSp**  
Prerequisite, permission.

- 700 Thesis (\*) AWSp**

- 702 Degree Final (6) AWSp**  
Limited to students completing a nonthesis degree program.

## NAVAL SCIENCE

### Courses for Undergraduates

- 111 Naval Orientation (3) A**  
General introduction to the Navy; its organization, discipline, and methods of operation.
- 112 Concepts of Sea Power (3) W**  
Traditional concepts of geography and geopolitics as they are related to sea power; history of sea power from the ancient days to 1865; particular emphasis is placed on the role of the U.S. Navy.
- 113 Sea Power and the U.S. Navy (3) Sp**  
A study of the role of the U.S. Navy from 1865 to the present and its effect on world events.
- 211 Naval Weapons (3) A**  
Introduction to naval weapons and weapons systems; weapon and ordnance installations; the theory of fire control.

- 212 Naval Weapons Laboratory (1) W**  
Practical work on naval weapons and weapons systems.

- 213 Guided Missiles and Nuclear Weapons (3) Sp**  
The design and construction of guided missiles and their guidance systems; an introduction to nuclear weapons; general concepts of weapon use in naval warfare.

- 311 Navigation (3) A**  
Terrestrial navigation including dead reckoning, piloting, and electronic navigational developments; celestial navigation, emphasizing celestial theory.

- 312 Navigation and Naval Operations (3) W**  
Continuation of celestial navigation with the practical work of the navigator; introduction to Naval Operations which includes fleet communications and Rules of the Nautical Road.

- 313 Fleet and Task Force Operations (3) Sp**  
Employment of naval forces, naval tactics, operation plans and orders; employment of detection equipment; meteorology.

- 411 Naval Engineering (3) A**  
Principles of ship propulsion, marine steam power plants, auxiliary systems, elements of ship stability and damage control.

- 412 Naval Engineering and Leadership (3) W**  
Marine internal combustion engines and electrical plants; nuclear power plants. Introduction to naval leadership including the Uniform Code of Military Justice.

- 413 Naval Leadership (3) Sp**  
A study of leadership and management and their techniques as they relate to the naval officer.

### MARINE CORPS OPTION STUDENTS

- 321 Evolution of the Art of War (3) A**  
Introduction to the art of war; resumé of the evolution and history of warfare from the earliest recorded battles through the Mexican War.
- 322 Evolution of the Art of War (3) W**  
Continuation of the resumé of the history of warfare with emphasis on the Civil War and World War II; brief coverage of the Spanish American War, World War I.
- 323 The Study of Modern Basic Strategy and Tactics (3) Sp**  
An introduction to the theoretical principles of modern strategy and tactics; brief resumé of U.S. foreign and military policy; discussion of marine division organization.
- 421 Amphibious Warfare: Pacific Theater World War II (3) A**  
CHAPMAN  
Introduction and historical development of amphibious campaigns in the Pacific Theater, World War II.

## 422 Amphibious Warfare: European Theater World War II, Korea (3) W

CHAPMAN

Detailed study of the amphibious campaigns, European Theater, World War II, and Korea. Planning for an amphibious operation including Marine Corps Staff organization, command relationship, task organization, and the development and characteristics of the various planning phases.

## 423 Military Justice: Marine Corps Leadership (3) Sp

CHAPMAN

A study of military law including the Uniform Code of Military Justice. A study of leadership, its concepts, objectives, characteristics, and practical techniques as related to the Marine Corps Officer.

## SUPPLY CORPS OPTION STUDENTS

### 331 Organization and Logistics, Navy Accounting and Finance (3) A

Introduction to Supply Corps; Navy Bureau system; inventory control point concepts; naval finance, appropriation, and cost accounting. Introduction to shipboard allowance list and material recognition.

### 332 Advanced Navy Accounting and Basic Supply Afloat (3) W

Navy accounting, balance sheet reconciliation; reports and returns; organization and administration of supply afloat.

### 333 Advanced Supply Afloat (3) Sp

Afloat custody and stowage and security of material; surveys, issues, transfers, and financial management of afloat inventories; special supply systems.

### 431 Ship's Store Afloat; Clothing and Small Stores (3) A

Operating procedure, records, reports, and returns for ship's store afloat including clothing and small stores.

### 432 Ship's Store Afloat; Clothing and Small Stores and Leadership (3) W

A continuation of 431. Introduction to naval leadership including the Uniform Code of Military Justice.

In the Spring Quarter of the senior year, Supply Corps Option Students take 413.

## NEAR EASTERN LITERATURE— See Classics

## NEUROLOGICAL SURGERY

### 428 Neurological Surgery Seminar (1) AWSp

BLACK, CALVIN, CHATRIAN, FOLTZ, KELLY, LOCKARD, MORETTI, OJEMANN, WARD, WHITE

A weekly seminar centered around neurological research topics with discussion by staff and students. Elective for second-, third-, and fourth-year medical students and graduate students. Prerequisite, permission of Department.

### 477 Electroencephalography Laboratory (\*) AWSp

CHATRIAN

Introduction to EEG techniques and interpretation as well as the opportunity to obtain superficial acquaintance with neurophysiological techniques. Elective for medical students. Prerequisite, permission of Department.

### 478 Neurological Surgery Research (\*) AWSp

BLACK, CALVIN, DE VITO, FOLTZ, KELLY, LOCKARD, OJEMANN, WARD, WHITE

Investigation of special problems as an intimate member of the research team in the neurological surgery laboratories. Research to lead to a thesis, if desired. Elective for medical students. Prerequisite, permission of Department.

### 479 Clinical Neurological Surgery (\*) AWSp

FOLTZ, KELLY, OJEMANN, WARD, WHITE

Student serves clinical clerkship as active extern on neurological surgery ward at University Hospital or University affiliated hospital. Elective for fourth-year medical students. Prerequisite, permission of Department.

### 480 Surgical Specialty Clerkship—Selective Elective: Neurological Surgery (\*) AWSp

Student serves clinical clerkship as an intimate member of the staff, participating in in-patient and out-patient care, both pre- and post-operative, involving neurological surgery patients. Duration is three weeks. University Hospital or a University affiliated hospital may be selected, subject to approval of the Department. This specialty course may be one of two required for fourth-year medical students.

## NORWEGIAN—See Scandinavian Languages and Literature

## NUCLEAR ENGINEERING

### 444 Nuclear Materials (4) W

OLONIS

A lecture course covering the structure, properties, and performance of materials in nuclear reactor applications; engineering requirements and selection of materials for reactors; technology of materials for reactor fuels, moderators, shields, control elements, and structural components; corrosion and oxidation; effects of radiation on the structure and properties of materials. Prerequisites, Physics 320, and Materials Engineering 250 or equivalent.

### 445 Nuclear Materials Laboratory (2)

OLONIS

This course comprises a series of experiments to supplement the lecture material of 444. The experiments are designed to illustrate fundamental behavior of metals important in nuclear engineering. The principles of melting, casting, and heat treatment are covered, together with the more basic aspects of structural changes and transformation kinetics. The course will require 6 hours of laboratory

work per week. Prerequisite, 444, or may be taken concurrently.

### 484 Introduction to Nuclear Engineering (4) A

BABB

An introductory course in nuclear engineering for seniors, graduate students, and practicing engineers. The course is designed to demonstrate the application of the principles of nuclear science to the processes associated with the release, control, and utilization of all forms of energy from nuclear sources, including elements of reactor nuclear physics; elementary nuclear reactor theory; radiation shielding; materials of construction; chemical processes associated with nuclear reactors; heat transfer and fluid flow problems; mechanical accessories and controls; thermonuclear reactions. Prerequisites, Physics 320 and Mathematics 238.

### 485 Nuclear Instruments (3) W

WILSON, WOODRUFF

A lecture and laboratory course devoted to the principles of measurement and detection of various types of radiations encountered in nuclear energy systems. Laboratory demonstrations will include the use of Geiger, proportional and scintillation detectors; ionization chambers; analog-digital data logging equipment; and multi-channel gamma ray spectrometers. Sources of radiation will include the 100 KW UW Nuclear Reactor and pulsed neutron generators. Typical applications of neutron activation analysis and various radioactive tracer techniques in medicine, oceanography, forensic science, and engineering will also be presented. Prerequisite, Physics 320 or permission.

### 486 Nuclear Power Plants (3) Sp

A course for students interested in applications of nuclear energy to power generation. Discussions of various types of nuclear reactor systems will include pressurized water, boiling water, high temperature gas cooled, sodium graphite, as well as advanced converter and breeder reactors. Particular attention will be given to the problem of world energy resources and the United States and world views of the availability and consumption of nuclear fuels. The use of nuclear energy in land, sea, air, and space transportation will be described and various design concepts considered. The economics of nuclear power will be emphasized throughout the course. Prerequisite, senior standing; 484 recommended.

### 500, 501 Nuclear Reactor Theory I, II (4, 3) A,W

GARLID

Consecutive lecture courses in fission reactor theory covering interactions of neutrons with matter; neutron production, dispersion, and slowing down; diffusion, age-diffusion, and multigroup treatment of homogeneous and heterogeneous systems; elements of intermediate and fast reactor theory; elements of reactor kinetics and dynamics; elements of perturbation theory, transport theory, and control rod theory. Prerequisites, 484, Physics 323 and Mathematics 238, or permission; equivalent of Mathematics 428 recommended.

# NUCLEAR ENGINEERING

## 505 Nuclear Engineering Laboratory I (3) A WOODRUFF

A laboratory course involving the use of a graphite moderated subcritical assembly, the UW nuclear reactor, a pulsed neutron generator, and analog and digital computers. The experiments involve the determination of reactor parameters such as diffusion length, Fermi age, material buckling, control rod worths and other reactivity effects, and flux measurements. Prerequisite, 500 or permission.

## 506 Nuclear Engineering Laboratory II (5) Sp WOODRUFF

An advanced laboratory course in which experimental research is conducted. Selected experiments are performed which involve the use of such equipment as the reactor as a neutron and gamma ray source, pulsed neutron generator, helical neutron monochromator, neutron diffraction spectrometer, pile oscillator, pile-noise analysis equipment, time-of-flight equipment, and analog and digital computers. Prerequisite, 505 or permission.

## 510 Nuclear Reactor Engineering (3) W BABB

An advanced course in engineering analysis of nuclear reactor systems. The course covers core design methods; heat generation and distribution in nuclear reactor systems; the removal and utilization of heat for power production; fuel cycles; shielding of nuclear radiations. Prerequisite, 500.

## 512 Nuclear Reactor Design (3) Sp FOX

A design laboratory course involving the synthesis of reactor theory, engineering analysis, material specifications, and economics to meet the design specifications for a complete nuclear reactor facility. Emphasis upon cycle analysis, hazards, arrangements, and requirements peculiar to nuclear reactor plants. Prerequisite, 510.

## N521, N522, 523 Graduate Seminar (0,0,1) A,W,Sp

## 524 Seminar in Nuclear Systems Analysis (1-2, max. 12) AWSp CLAYTON

Studies of recent advances in nuclear systems analysis with students and faculty reporting on recent research and publications. Only open to students having a master's degree or equivalent.

## 550 Neutron Transport Theory I (3) ALBRECHT, MC CORMICK

Derivation and physical interpretation of the Boltzmann equation, exact solutions, Milne's problem, selected approximate methods such as spherical harmonics and  $S_N$  methods, variational methods. Emphasis is on steady state, monoenergetic systems. Prerequisite, 501.

## 551 Neutron Transport Theory II (3) W GARLID, MC CORMICK

Numerical methods of solution, time dependent neutron transport, energy dependent transport, multi-region systems, Boltzmann equation for gamma ray interactions. Prerequisite, 550.

## 556 Nuclear Fusion Reactor Theory I (3) W ALBRECHT

A lecture course in fusion reactor theory concentrating on the plasma state in which the possibility exists of achieving controlled fusion. Included are discussions of collision phenomena, Maxwell's equations, charged particle motion, radiation losses from plasmas, plasma Boltzmann equation, hydromagnetics, properties of plasmas.

## 557 Nuclear Fusion Reactor Theory II (3) Sp ALBRECHT

A continuation of 556 with emphasis on special problems such as plasma oscillations and plasma stability. A study is made of specific types of devices including those using pinch and magnetic mirror principles.

## 559 Control of Radioactive Wastes (3) W BOGAN

Environmental problems resulting from utilization of nuclear reactions; radioactive waste disposal practice; decontamination of water supplies; reactor site location, and control of stream and atmosphere pollution. Prerequisite, Physics 320 or permission.

## 560 Nuclear Reactor Dynamics I (3) W ALBRECHT

Nuclear reactor dynamic equations, delayed neutron representations, response of reactors to various perturbations, operational techniques of system analysis, feedback mechanisms, stability criteria, power coefficients. Prerequisites, 501, Mathematics 427, 428.

## 561 Nuclear Reactor Dynamics II (3) Sp ALBRECHT

Experimental nuclear reactor dynamics, oscillators, pulsed neutrons, stochastic processes; dynamics of heat removal system components, analysis of closed loop system, space dependent dynamics. Prerequisite, 560.

## 570 Neutron Thermalization I (3) A GARLID

A detailed study of the energy distribution of neutrons at energies below 1 ev. Kinematics of scattering of intermediate and slow neutrons, scattering data and the scattering law, scattering kernels, calculation of stationary neutron spectra, variational methods. Prerequisite, 501.

## 571 Neutron Thermalization II (3) W GARLID

A continuation of 570 with increased emphasis on applications. Nonstationary neutron spectra, pulsed neutron fields, temperature and material discontinuities, experimental measurement of neutron spectra, influence on reactor design, computer codes. Prerequisite, 570.

## 588J Nuclear Fuel Management (3) Sp BABB

Technical and economic principles for management of nuclear fuels including: energy resources, fuel cycle schemes, fuel cycle neu-

tronics, fuel cycle economics, irradiated fuel processing, isotopic separations, utilization of fission products and other radioactive isotopes. Offered jointly with Chemical Engineering. Prerequisites, 484, Chemical Engineering 530, or permission.

## 599 Special Topics in Nuclear Engineering (\*) AWSp

MC CORMICK

Discussions and readings of topics of current interest in the field of nuclear engineering research. Subject matter may include reactor fuels and materials, reactor dynamics and control, instrumentation, thermonuclear processes, direct conversion problems. Prerequisite, permission of Department Chairman.

## 700 Thesis (\*)

Prerequisite, permission of Department Chairman.

# NURSING

## Courses for Undergraduates

## 102 Introduction to Professional Nursing (2) AWSp

STEWART

Orientation to the profession, emphasizing present day concepts of nursing and preparation required. A survey of fields of nursing and interrelationships with other health groups. Opportunity for discussion provided in quiz sections. Open to nonmajors.

## 227 Nursing Fundamentals (2) A

COLIN, HAY, HEINEMANN, REDMAN, SAXON

Concepts of health among differing cultures, as they affect health practices of individuals and families. The nurse's role in relation to maintenance of health, seeking medical care and initial hospitalization, and the learning of concomitant nursing activities. Two hours lecture-demonstration, two hours laboratory weekly.

## 228 Nursing Fundamentals (2) W

COLIN, HAY, HEINEMANN, REDMAN, SAXON

Effects of illness upon individuals. Selected technical, observational, and interpersonal nursing activities in caring for the sub-acutely ill patient. Natural and social science principles applied. Two hours lecture-demonstration, three hours clinical laboratory weekly. Prerequisite, 227.

## 229 Nursing Fundamentals (3) Sp

CARNEVALI, COLIN, HAY, HEINEMANN, REDMAN, SAXON

Role of the nurse in meeting needs of patients. Selected technical, interpersonal, and therapeutic nursing activities in the performance of nursing care. Natural and social science principles applied. Two hours lecture-demonstration, six hours of clinical laboratory weekly. Prerequisite, 228.

**250 Introduction to Psychiatry and Psychiatric Nursing (5) AWSp**

KILLEN, MEUWLY, OLSON, RISLEY

Concepts and principles used in planning nursing care of mentally ill patients. Therapies and rehabilitative measures. For affiliated students and registered nurse students needing undergraduate psychiatric nursing.

**251 Selected Psychiatric Nursing Practice (5) AWSp**

CASHAR, KILLEN, MEUWLY, OLSON, RISLEY

Application of fundamental principles in planning and caring for the mentally ill patient. Fifteen hours clinical experience weekly. Concurrent with 250. For affiliate students and registered nurse students needing undergraduate psychiatric nursing.

**252 Introduction to Nursing Care and Treatment of Tuberculosis (2) AWSp**

AMIS

Basic concepts regarding the etiology, control, and treatment of tuberculosis. Relevant natural and social science principles and the rehabilitation of the chronically ill, including the alcoholic. Seven hours per week for three weeks. For affiliated students only.

**253 Selected Tuberculosis Nursing Practice (2) AWSp**

AMIS

Includes emphasis on planning nursing care of the chronically ill, including the alcoholic. Twenty-two hours of clinical laboratory weekly for three weeks. Concurrent with 252. For affiliate students only.

**260 Scientific Principles Basic to Nursing (2) Sp**

BRUNO

Basic principles of pathologic change and implications for nursing actions.

**298 Introduction to Normal Growth and Development (2) W**

BARNARD

Basic concepts and theories related to the physical, emotional, and social development of children from infancy through the pre-school period. Emphasis on environmental factors, behavioral patterns, and the caretaking implications. Concurrent with 368 or 370.

**299 Introduction to Normal Growth and Development (2) ASp**

BARNARD

Basic concepts and theories related to significant physical, emotional, and environmental factors in the developmental period from school age to young adulthood; emphasis on the caretaking implications. Introduction to major developmental deviations associated with learning and behavior.

**301 Principles of Patient Teaching (3) A**

REDMAN, TJELTA

Designed to provide the basic nursing student with a fundamental concept of the learning and teaching processes as they apply in nursing practices. The quiz sections are utilized to assist students in applying the concepts to the planning for patient-teaching.

**315 Nursing for Physical Therapists (3) A**

HAY, HULTHEN

Selected nursing activities and techniques for students in the physical therapy program. Four hours laboratory weekly.

**351 Changing Concepts of Professional Nursing (4) A**

CARNEVALI

An exploration of current trends in nursing. Included are the education of the nurse and her professional responsibilities, and the concept of the scientific approach to nursing problems.

**353 Scientific Basis for Nursing Actions (3) W**

CARNEVALI

Homeostasis, particularly as related to fluid and electrolyte balance, is used as an organizing concept in determining nursing actions in preventing, correcting, and controlling disease. Prerequisite, 351.

**354 Comprehensive Maternal-Child Nursing (4) AS**

ROSE

Current theories, concepts, and principles applicable to maternal-child nursing. Six hours clinical laboratory weekly. Prerequisite, 353.

**356 Comprehensive Medical-Surgical Nursing (4) W**

TJELTA

Theories, concepts, and principles applicable to the nursing care of medical-surgical adult patients. Emphasis on prevention, rehabilitation, continuity of care, and application of science principles. Six hours clinical laboratory weekly. Prerequisite, 353 and 354.

**358 Psychiatric Concepts for Nursing Actions (4) Sp**

Weekly conferences and six hours of clinical experience in application of selected theoretical concepts in interactions with patients with specific emotional problems. Prerequisite, 353.

**367 Family-Centered Maternal and Infant Nursing (4) AWSp**

KLEMER

Basic concepts and nursing principles in family-centered care of women before, during, and after childbirth, and of infants in the neonatal period. To be taken concurrently with 368.

**368 Laboratory in Maternal and Infant Nursing (5) AWSp**

GREENLEAF, KLEMER, REINBRECHT

Utilization of basic concepts and nursing principles in providing family-centered nursing for women before, during, and after childbirth, and for infants in the neonatal period. Fifteen hours laboratory experience per week. To be taken concurrently with 367.

**369 Family-Centered Nursing of Children (4) AWSp**

STEWART

Basic concepts and nursing principles in family-centered care of children. Emphasis on

health needs of children and families from infancy through adolescence. Includes health supervision and common illnesses and disabilities. To be taken concurrently with 370.

**370 Laboratory in Nursing of Children (5) AWSp**

METTLER, STEWART

Utilization of basic concepts and nursing principles in providing family-centered nursing for children in health supervision and during illness and disability. Fifteen hours laboratory experience per week. To be taken concurrently with 369.

**371 Principles of Medical-Surgical Nursing (4) W**

BOOZER

Relationships between pathological changes, symptoms, medical therapy, and nursing care in adults with common medical-surgical conditions. Scientific principles of nursing care.

**372 Medical-Surgical Nursing Practice (5) W**

BRUECKNER, BRUNO, C. GRAY, HARLOW, HASTIE, HULTHEN

Application of scientific and nursing principles to the care of adult patients with selected medical-surgical conditions. Fifteen hours weekly clinical laboratory including operating room. Concurrent with 371.

**373 Principles of Medical-Surgical Nursing (4) ASp**

BOOZER, BRUNO

Selected medical-surgical conditions and related nursing care. Identification of principles from nursing and the basic sciences.

**374 Medical-Surgical Nursing Practice (5) ASp**

BOOZER, C. GRAY, HARLOW, HARTLEY, HASTIE

Identification of common elements and significant differences in care of medical-surgical patients with specialized nursing problems. Fifteen hours weekly clinical laboratory including operating room. Concurrent with 373.

**409 History and Trends of Nursing (3) AWSp**

F. GRAY

History of nursing from antiquity to the present with emphasis on the trends influencing nursing and including study of the professional nurse and her responsibilities in the modern world.

**412 Scientific Principles in Nursing Care (3) AWSp**

BRANDT, CROWLEY, C. GRAY, HARLOW, STANDEVEN

An undergraduate seminar devoted to critical analysis of selected nursing situations, with identification of the natural and behavioral science principles which guide nursing diagnosis and action.

**413 Principles of Psychiatric Nursing (5) AWSp**

BYFORD, STEVENS

Concepts and principles of psychiatric-mental health nursing used in planning care of mentally ill patients. Psychiatric therapies and rehabilitative measures.

# NURSING

## 414 Psychiatric Nursing Practice (5) AWSp BYFORD, STEVENS

Application of psychiatric-mental health principles and skills in the care of selected psychiatric patients. Fifteen hours clinical laboratory weekly. Concurrent with 413.

## 415 Community Health Nursing Principles (3) AWSp

JONES, POZORSKI, STANDEVEN

Concepts and principles of public health nursing used in analyzing and implementing health programs in family and community settings. Prerequisite, Preventive Medicine 323.

## 416 Community Health Nursing Practice (5) AWSp

FISHER, HOESCHEN, JONES,  
PITTMAN, POZORSKI, STANDEVEN

Application of public health nursing principles and skills in family and community health situations. Problem-solving and interpersonal relationship skills emphasized. Concurrent with 415.

## 420 Special Fields of Public Health Nursing (3-8) A

COBB

Practicum devoted to nursing responsibilities in special fields such as school health nursing or occupational health nursing. Emphasis and credit of course varies with the interest and needs of the student. Weekly seminar. Prerequisite, 415, 416, or equivalent.

## 421 Selected Problems in Clinical Nursing (4) AWSp

LITTLE

Comparative analysis of complex nursing problems related to the care of adults or children with chronic or acute illnesses. Comparative analysis of various methods of care used by an independent nurse practitioner and by a team leader.

## 422 Senior Nursing Practice (6) AWSp

B. HALL, HARTLEY, PATRICK, SHORES

Complex nursing care problems including those associated with stress or emergency situations. Planning, directing, guiding, evaluating nursing care activities as an individual and as a team leader. Eighteen hours clinical laboratory weekly. Concurrent with 421.

## 425 Current Literature in Nursing (2) AWSp

BURKE

Analysis of current literature and research findings related to a selected clinical area of interest.

## 429 Nursing Functions in Gerontology (2) AWSp

HARLOW, JOFFE

Nursing principles related to the physical, social, and emotional needs of the geriatric patient in individual, family, and group settings. Biological, social, and cultural influences upon the aging population included.

## 499 Undergraduate Research (1-5, max. 5) AWSp

Supervised individual research on a specific

nursing problem. Open to qualified majors in the senior year. Prerequisite, permission of instructor.

## Courses for Graduates Only

### 430 Advanced Nursing Field Work (3) AW

BUCKLES, CROWLEY, GIBLIN, NEHREN,  
NITE, PITTMAN, ROSE

Guided experience in diagnosing nursing problems, identifying rationales for implementing nursing therapy, and evaluating results in selected situations in the clinical specialty. Weekly seminar.

### 431 Advanced Nursing Field Work (2) ASp

BUCKLES, MURRAY, PITTMAN

Continuation of Nursing 430. Guided experience in selected situations in area of clinical interest. Weekly seminar.

### 435 Practice Supervision in Nursing (3) ASp

NEHREN, REGAN

Guided experience in supervisory functions. Identification, analysis, and solution of selected supervisory problems in clinical nursing. Evaluation of progress. Weekly seminar.

### 436 Practice Teaching in Nursing (3) AWSp

BUCKLES, MURRAY, NITE

Guided experience in selected teaching-learning situations in clinical nursing. Identification, analysis, and solution of teaching-learning problems in clinical nursing. Evaluation of progress. Weekly seminar.

### 454 Administration in Nursing (2) A

REGAN

Philosophy, purpose, and elements of administration. Exploration of administrative behavior to include problem analysis and decision making, organizational relationships, management of personnel, administration of change and administrative communications.

### 456 Nursing Service Administration (3) W

REGAN

Application of principles of administration to hospital nursing service. Consideration of intra- and inter-departmental relationships and communications, implications of automation, personnel administration, and budget control. Planning for personnel, physical facilities, and equipment to provide optimal patient care.

### 462 Teaching in Schools of Nursing (3) ASp

TJELTA

Consideration of philosophical and psychological relationships in teacher-learner processes and of ends-means relationships for learning efficiency in cognitive, psychomotor, and affective learning outcomes. Prerequisite, Education 309.

### 463 Personnel Guidance in Nursing (3)

BUCKLES

Development of concepts and principles of interpersonal relations in personnel guidance.

### 464 The Nurse in Mental Health (3) A

BUCKLES

Analysis of selected sociocultural and psychological concepts relating to personality development; formulating nursing principles applicable to therapeutic nurse-patient interaction. Observational experiences.

### 466 In-Service Education in Nursing (3)

REGAN

Planning, developing, and evaluating in-service programs in various institutions and agencies, seen as a part of continuing education of all nursing personnel.

### 467 Evaluation of Performance in Nursing (3) Sp

METZ

Philosophy and principles of performance evaluation for nurses with administrative, teaching, and supervisory responsibility in various health agencies. The purposes of evaluation as they relate to guidance of students or staff, to increased satisfaction in one's work, and to improved patient care.

### 501 Development of Nursing Procedures (2)

MANSFIELD

Nursing procedures as a basis for nursing service planning and as a teaching tool. Procedures analyzed against selected criteria and developed according to clinical needs.

### 502 Applied Group Development Principles (3) W

BUCKLES

Evaluation of selected theoretical concepts relating to dynamics operating in groups; analysis of process and development of skills to increase group productivity.

### 505 Seminar in Administration of Schools of Nursing (3)

F. GRAY

Application of principles of administration to schools of nursing. Case method with discussion and analysis of situations presented.

### 506 Seminar in Nursing Service Administration (3) Sp

REGAN

Critical analysis of problems affecting the administration of nursing services. Intensive directed study of selected problems by small groups. Prerequisite, 456.

### 507 Seminar in Nursing Problems in Mental Health (2)

NEHREN

Psychiatric concepts of the nurse's therapeutic role in relation to the family and selected community facilities.

### 508 Seminar in Advanced Psychiatric Nursing (2) W

BUCKLES

Development of a philosophy of psychiatric nursing through comparative analysis of psychiatric theoretical formulations; implications for role expectations in therapeutic settings. Concurrent with 430.

## 510 Curriculum Development in Nursing Education (5) W

METZ

Study of problems involved in developing and implementing nursing curricula and plans of instruction; study of means by which basic problems may be approached.

## 511 Psychosomatic Nursing (3) Sp

NEHREN

Seminar and clinical experiences centering on interrelationships of physical and emotional aspects of illness and development of principles of nursing care.

## 512 Advanced Fields in Psychiatric Nursing (3) A

NEHREN

Analysis of specific role relationships in treatment of the emotionally ill; emerging roles implied by trends in mental health programs. Prerequisite, 508.

## 513 Field Experience in Mental Health Nursing (3)

NEHREN

Application of psychiatric concepts in the development of the psychiatric-mental health nurse's role within the family and within selected community facilities. Concurrent with 507.

## 516 Seminar in Child Psychiatric Nursing (5)

Analysis of concepts relating to normal and abnormal phenomena drawn from nursing, psychiatry, and social sciences, underlying nursing of the emotionally disturbed child and his family. Seminars, readings, participation, and observation with normal children. Minimum of 12 clinical laboratory hours per week.

## 517 Seminar in Child Psychiatric Nursing (5)

Intensive therapeutic nursing relationship with the emotionally disturbed child and his family; analysis of nursing problems; implementation of nursing actions; study of research findings applicable. Minimum of 16 laboratory hours per week.

## 518 Seminar in Child Psychiatric Nursing (5)

Continuation of 517 with major emphasis upon synthesis of a body of child psychiatric nursing knowledge. Minimum of 16 laboratory hours weekly.

## 519 Seminar in Child Psychiatric Nursing (5)

Planning and implementing therapeutic group relationships with disturbed and defective children in a children's treatment center. Minimum of 12 laboratory hours weekly.

## 520 Methods of Research in Nursing (3) ASp

HOFFMAN, TAYLOR

Development of research designs. Use of the literature in building theoretical rationale. Selection of appropriate methods. Presentation of findings.

## 521 Methods of Research in Nursing (2) W

HOFFMAN, TAYLOR

Methods of research applied to the solution of problems in all fields of nursing.

## 530 Advanced Concepts in Maternal and Child Health and Implications for Nursing (3) ASp

MURRAY

Consideration of changing philosophy in maternal and child care; factors influencing health; ways of meeting health needs; role of the nurse in solution of related problems.

## 535 Problems in Nursing Mentally Retarded Children (3)

BARNARD

Analysis of significant problems in care of mentally retarded children and their families, through consideration of the complex biophysical, psychological, and sociocultural factors involved.

## 537 Developmental Deviance and Nursing Problems I (3) W

BARNARD

Reconceptualization of maternal and perinatal factors affecting development as they pertain to nursing problems. Review of research, analysis of phenomena identified in clinical situations.

## 538 Developmental Deviance and Nursing Problems II (3) Sp

BARNARD

Reconsideration of hereditary factors influencing deviant development in terms of significant nursing problems. Review of research, analysis of phenomena identified in clinical situations.

## 539 Developmental Deviance and Nursing Problems III (3) S

BARNARD

Synthesis of psychological, social, and cultural factors affecting developmental patterns in relation to nursing problems. Review of research, analysis of phenomena identified in clinical situations.

## 540 Seminar in Medical-Surgical Nursing (3) A

GIBLIN

Factors influencing the pathophysiology underlying selected manifestations of physical illness. Implications for nursing diagnosis and for nursing therapy.

## 542 Seminar in Cardiovascular Nursing (3) W

GIBLIN

Analysis of the possible influence of physical and emotional factors on pathophysiology underlying selected cardiovascular conditions. Implications for nursing management. Prerequisite, 540.

## 543 Seminar in Nursing in Gerontology (3) S

PATRICK

Research findings which identify changes due to aging applied to complex nursing problems in maintenance of health and restoration of maximum functioning of the aging.

## 550 Advanced Public Health Nursing (3) A

COBB

Derivation of public health nursing concepts and principles. Identification of current and complex community health problems. Role of the nurse in their solution. Prerequisites, 415, 416, or equivalent, and Preventive Medicine 323.

## 558 Seminar in Advanced Public Health Nursing (3) S

BURKE

Application of public health nursing concepts, principles, and research findings in analysis and solution of current and complex community health problems.

## 562J Implications of Concepts from Anthropology for Nursing (3) A

ATKINS

An examination of selected core concepts from anthropology and an assessment of the implications of these concepts for nursing research. Offered jointly with the Department of Anthropology.

## 563 Implications of Sociology for Research in Nursing (3) W

EMERSON

An examination of principles and concepts from sociology and their implications for nursing research.

## 564 Implications from Physiology for Nursing (3) A

BRENGELMANN

One field from following studied intensively: body temperature regulation, respiration, cardiovascular system, renal system, acid-base balance. Remaining areas considered more briefly. Emphasis on unifying aspects, modern research techniques, implications for nursing care. Prerequisite, permission.

## 570 Seminar in Clinical Research in Nursing (3) Sp

HOFFMAN

Philosophy, problems of design; use of criterion measures in terms of patient care. (Offered 1966-67.)

## 571 Seminar in Nursing and the Social Order (3)

HOFFMAN

Changing patterns of nursing service and education in contemporary society. Implications of personal value systems.

## 600 Research (\*)

## 700 Thesis (\*)

# OBSTETRICS AND GYNECOLOGY

Conjoint 426-427 Introduction to Physical Diagnosis (\*, max. 4, \*, max. 9)  
(See Conjoint Courses.)

# OBSTETRICS AND GYNECOLOGY

## 466 Introduction to Obstetrics and Gynecology (\*, max. 3)

Lectures on embryology, physiology, and endocrinology of the pelvic organs; pregnancy and parturition; diseases associated with pregnancy; etiology, pathology, symptomatology, and diagnosis of gynecological conditions. Required for third-year medical students as a part of the third-year lecture series.

## 476 Obstetric Externship (\*)

Student to be assigned to Madigan Army Hospital. All terms, twelve days, full time.

## 479 Obstetric and Gynecologic Investigation (\*)

The investigation may cover any one of the following fields: uterine muscle physiology, toxemias of pregnancy, hormone assays in obstetrics and endocrinology, obstetric and gynecologic oncology. All terms. By arrangement.

## 480 Clinical Clerkship (\*, max. 16)

The student spends eight weeks as a clinical clerk on obstetrics and gynecology at the University Hospital and at the King County Hospital. On the obstetrical service the student actively participates in the deliveries and closely follows the management of all obstetric patients. In the gynecology service the student makes ward rounds and actively participates in the medical or surgical management of the inpatient gynecologic patients. In addition, he is assigned to the obstetric and gynecologic outpatient clinics which afford him the opportunity to learn the office problems of the specialty. Required for fourth-year medical students.

## 481 Senior Seminar (\*)

Current literature in obstetrics and gynecology, oncology, and research as it pertains to obstetrics and gynecology. Selected presentations of research done in the Department will also be presented from time to time. All terms, one hour weekly by arrangement.

## 484 Endocrinology of Reproduction (\*)

HERRMANN

The biochemistry of steroids. Steroid metabolism as related to clinical problems. Diagnosis and treatment of endocrine disorders. Case studies with special emphasis on modern methods of investigation.

## 498 Undergraduate Thesis (\*)

For medical students. Prerequisite, permission.

## 499 Undergraduate Research (\*)

Discussion of methods used in obstetrics and gynecology research. Several specific projects relating to the most fascinating and intriguing problems of the specialty will be dealt with.

# OCEANOGRAPHY

## Courses for Undergraduates

### 101 Survey of Oceanography (5) AWSpS

BENNETT, ENGLISH, TAYLOR

Origin and extent of the oceans; nature of the sea bottom; causes and effects of currents and

tides; animal and plant life in the sea. Recommended for nonmajors.

### 109H Survey of Oceanography-Honors (5) Sp

ENGLISH

Origin and extent of the oceans; nature of the sea bottom; causes and effects of currents, waves, and tides; animal and plant life in the sea. Not for oceanography majors. Prerequisites, College of Arts and Sciences Honors Program and permission.

### 110-111-112 Lectures in Oceanography (1-1-1) A,W,Sp

FLEMING

Weekly lectures, demonstrations, and tours to familiarize students with the subject matter and opportunities in oceanography. May be entered any quarter.

### 180H Lower-Division Tutorial-Honors (6) S

Research with a departmental program. Prerequisites, College of Arts and Sciences Honors Program and permission.

### 203 Introduction to Oceanography (5) Sp

FLEMING

A description of the oceans and their relation to man; physical, chemical, biological, and geological aspects of the sea; areal distribution and seasonal cycles of properties; currents; factors affecting populations. Demonstrations and some classes aboard ship and in laboratories. Prerequisites, one year of mathematics, chemistry, and two quarters of physics.

### 280H Introduction to Oceanography-Honors (5) Sp

FLEMING

Descriptive and regional oceanography covering the physical, chemical, biological, and geological aspects of the sea. For science majors. Prerequisites, sophomore standing in College of Arts and Sciences Honors Program and permission.

### 360 Methods and Instruments in Oceanography (3) Sp

Theory and practice of instrumental measurement and sampling in oceanography; ship-board equipment, position finding, and selected information on equipment design and properties of materials, calibration and observation of the behavior of typical instruments. Prerequisites, 203, Mathematics 125, one year of physics.

### 380H Upper-Division Tutorial-Honors (6) S

Research under faculty supervision. Prerequisites, junior standing in College of Arts and Sciences Honors Program and permission.

### 385 The Oceans I (10) S

Application of basic scientific principles to water on the surface of the earth. Institute for high school teachers. Open to selected participants only. Held at Skagit Valley College. (Subject to N.S.F. approval each year.)

### 386 The Oceans II (10) S

Application of basic scientific principles to the solid earth and its atmosphere. Sequential institute for high school teachers. Open to selected participants only. Prerequisite, 385. Held at Skagit Valley College. (Subject to N.S.F. approval each year.)

### 401, 402 General Physical Oceanography I, II (5,5) A,W

BARNES, COACHMAN

Physical properties and processes; theories and methods involved in ocean currents, waves, and tides. Not open to physical oceanography majors. Prerequisites, for 401, one year of chemistry, one year of physics, Mathematics 126; 401 for 402.

### 404J Introduction to Geophysics: The Ocean (5) A

COACHMAN

Composition and character of sea water; physical, chemical, and geological properties and processes; dynamics; waves. Primarily for majors in the geophysical sciences. Offered jointly with Geophysics. Prerequisites, Mathematics 324, Physics 371, Chemistry 170, or permission.

### 405 General Geological Oceanography (5) Sp

CREAGER

Shorelines and nearshore sedimentation; structure and morphology of the continental terrace and deep-sea floor; sediment types and distribution; marine geological methods and applications. Not open to majors in geological oceanography. Prerequisites, 402, or 411 and 412 (or concurrent registration), Geology 205 or 310.

### 410 Physical Oceanography (3) W

BARNES, COACHMAN

Physical properties, processes, and the theory of the distribution of variables in the sea; mass and energy budgets. Prerequisite, 404J or graduate standing.

### 411 Ocean Tides and Waves (3) Sp

RATTRAY

Cause, nature, measurement, analysis, and prediction of tides and tidal currents and surface waves. Prerequisites, 404J, Mathematics 238, Physics 222, or graduate standing.

### 412 Ocean Currents (3) Sp

BARNES, COACHMAN

Characteristics of currents and of forces that establish and modify them; methods of direct measurement and computation, use of indirect techniques; associated distributions of mass and properties. Prerequisites, 410, Mathematics 126, Physics 123.

### 415 Fundamentals of Underwater Acoustics (3) A

SANDS

Vibrating strings, bars, and membranes; plane and spherical acoustic waves; transmission and reflection at boundaries. Prerequisites, 402 or 410, Mathematics 126 or 136H, or permission.



**416 Applications of Underwater Acoustics (2) W**  
SANDS

Transducers and arrays, absorption and refraction in sea water, sound channels and bottom effects, ambient noise, scattering, passive and active tracking, acoustic telemetering. Prerequisite, 415.

**421-422 Chemical Oceanography (2-2) A,W**  
RICHARDS

Physical and chemical properties of sea water and marine products; processes determining the chemical make-up of the oceans. Prerequisite, 401 or 404J (or concurrent registration in one).

**423, 424 Chemical Oceanography Laboratory (2,2) AW,W**  
RICHARDS

Laboratory problems in the analytical and physical chemistry of sea water and marine materials. Prerequisites for 423: 421, Chemistry 221; for 424: 422 and 423. 423 and 424 may be taken concurrently with 421 and 422 respectively.

**433 Biological Oceanography: Organisms and Processes (3) W**  
LEWIN

Marine organisms with emphasis on bacteria, the microscopic plants, the protozoa, and smaller animals; biological processes affecting the sea. Recommended for non-biologists. Prerequisites, 203, Zoology 111 or Biology 101-102, or permission.

**434 Biological Oceanography: Organisms and Environments (3) W**  
TAYLOR

Organisms of the plankton, nekton, and benthos; their adaptations to ocean environments and their relationships to each other. Prerequisites, 203, and 15 credits in biological sciences.

**435 Biological Oceanography: Quantitative Aspects (3) Sp**  
BANSE

Quantitative distribution in time and space of pelagic and bottom organisms in the open ocean and on the shelf; rates of processes. Prerequisites, 433 or 434 or permission.

**440 Undergraduate Seminar (1, max. 3) AWSp**  
FLEMING

Reviews of history and literature; description of local waters and applications of oceanography. Prerequisite, senior standing.

**443 Regional Oceanography (2) Sp**  
FLEMING

Application of modern methods to the comprehensive description of selected areas of the oceans. Prerequisite, advanced senior standing.

**450 Geological Oceanography (5) Sp**  
CREAGER

Shore processes; structure and morphology of the continental terrace and deep-sea floor; marine sedimentary deposits and stratigraphy; geological history of ocean basins and sea water. Prerequisites, major in geological oceanography or geology, 402, or 411 and 412 (or concurrent registration), or permission.

**452 Sedimentary Processes (3)**

Origin, transportation, and deposition of marine sediments; composition of sediments and sedimentary minerals; marine sedimentary environments; physical and chemical aspects of sedimentary processes. Prerequisites, Geology 326, Chemistry 160.

**453 Sedimentary Techniques (2) Sp**  
MC MANUS, WHETTEN

Survey of laboratory techniques for analysis of mineral and chemical composition of sediments; measurement of size, shape, and density of particles; and investigation of mass properties. Methods of data presentation. X-ray diffraction analysis. Prerequisites, 452 (which may be taken concurrently), Mathematics 281.

**454 Biogenic Sediments (3) A**  
ECHOLS

Ecology and systematics of plant and animal groups contributing to Neogene marine sediments. Emphasis on microfossils. Prerequisites, 433 or 434, and 435, 450 or Geology 326, 330, or permission.

**456 Acoustic and Seismic Techniques (2) W**  
BENNETT

Acoustic data-taking techniques; analysis and interpretation of acoustic bathymetry and seismic reflection and refraction data. Prerequisite, 416 or permission.

**460 Field Experience in Oceanography (2-6, max. 6) AWSpS**  
DUXBURY

Practical work on shipboard and ashore by participation in regular oceanographic operations on the "Thomas G. Thompson" and other vessels; chemical, physical, biological, and geological analyses; preparation of reports. 2 credits for field work portion (required of Bachelor of Science candidates). 1 to 4 credits for analyses and report preparation (optional). 2 credits offered every quarter; 6 credits offered Summer and Autumn Quarters only. Prerequisites, 402 or 412, 433 or 434, and 435; 405 or 450; 423, and permission.

**461 Applications of Oceanography (3) W**  
FLEMING

Analysis of special cases involving application of oceanography to practical problems. Prerequisite, a physical or biological science major or permission.

**480H Undergraduate Research—Honors (6) AWSp**

Independent research. Prerequisites, 180H or 380H, and permission.

**488H Field Experience—Honors (2-6, max. 6) AWSp**

Participation in extended oceanographic field operations on a research vessel; data analysis and reduction, report preparation. Prerequisites, 380H or 480H, and permission.

**489H Undergraduate Thesis—Honors (1-6, max. 6) AWSp**

A theoretical or experimental contribution to oceanography. Prerequisites, 480H, and permission.

**499 Undergraduate Research (1-3, max. 6) AWSp**

Research on assigned topics which may involve laboratory work, field work, or literature surveys. 1 credit required of Bachelor of Science candidates. Prerequisite, permission.

**Courses for Graduates Only**

**511, 512, 513 Marine Hydrodynamics I, II, III (4,4,4) A,W,Sp**  
RATTRAY

Methods for solving problems in physical oceanography. Prerequisite, a major in a physical science.

**515 Waves (2) A**  
RATTRAY

Application of marine hydrodynamics principles to wave motion in oceans. Prerequisite, 513. (Offered only in odd-numbered years.)

**516 Ocean Circulation (2) W**  
RATTRAY

Hydrodynamic theories concerning origin and characteristics of major ocean currents. Prerequisite, 513 (Offered only in even-numbered years.)

**517 Oceanography of Inshore Waters (5) Sp**  
BARNES, RATTRAY

Theories and techniques of investigation and interpretation of conditions existing in inshore waters with particular reference to mixing and flushing and to areas adjacent to the state of Washington; use of dynamic models. Prerequisite, 512. (Offered only in odd-numbered years.)

**518 Seminar in Physical Oceanography (\*, max. 9) AWSp**  
BARNES, RATTRAY

Lectures, discussions, and field and laboratory work on selected problems of current interest. Prerequisite, permission.

**519 Interaction of the Sea and Atmosphere (5) Sp**

Interchange of heat, water, and energy; study of budgets and of mechanisms of exchange. Prerequisites, 410, Atmosphere Sciences 462.

**520 Seminar (1, max. 6) AWSp**

**521 Seminar in Chemical Oceanography (\*, max. 9) AWSp**  
RICHARDS

Lectures, discussions, and readings on selected problems of current interest. Prerequisite, permission.

**523 Advanced Problems in Chemical Oceanography (1-4, max. 18) AWSp**  
RICHARDS

Field and laboratory work on selected problems of current interest. Prerequisites, 424 and permission.

# OCEANOGRAPHY

## 530 Marine Primary Productivity (3) Sp

ANDERSON

General concepts of marine phytoplankton production; laboratory and field studies; critical examination of special problems. Not open to students who have taken 534. Prerequisites, 433 or 434, and 435 and permission.

## 531 Seminar in Biological Oceanography (\*, max. 9) AWSp

BANSE, ENGLISH, LEWIN, TAYLOR

Lectures, discussions, and field and laboratory work on selected problems of current interest. Prerequisite, permission.

## 532 Marine Microbiology (1-4) Sp

ORDAL

Ecology and biochemistry of marine bacteria. Prerequisites, Microbiology 400 and permission.

## 533 Zooplankton Ecology (6) S

Adaptations, modifications, and life histories of animals in the plankton. Evaluation of methods and techniques used in field and laboratory studies. (Offered only in even-numbered years at Friday Harbor Laboratories.) Prerequisite, permission.

## 534 Phytoplankton Ecology (6) S

Contemporary problems in marine phytoplankton investigations. Evaluation of methods used in field and laboratory studies. (Offered only in even-numbered years at Friday Harbor Laboratories.) Prerequisite, permission.

## 535 Advanced Plankton Ecology (2) Sp

BANSE

Factors controlling the distribution, abundance, and production of plankton organisms; methods of sampling and analysis of standing stock. Prerequisite, permission.

## 536 Benthos Ecology (3) Sp

TAYLOR

Quantitative consideration of the population of the sea-bed. Discussion of modern methods of sampling and analysis. Factors affecting production. Prerequisite, permission.

## 537 Environmental Physiology of Marine Microalgae (3) A

LEWIN

Culture and nutrition of marine unicellular algae; use of algal cultures for the study of problems in biological oceanography. Prerequisite, permission of instructor.

## 550 Seminar in Geological Oceanography (\*, max. 9) AWSp

CREAGER

Lectures, discussions, and field and laboratory work on selected problems of current interest. Prerequisite, permission.

## 551 Marine Sediments I: Particle Size, Shape, and Density (3) Sp

MCMANUS

Principles and techniques of measuring particle size, shape, and density; methods of data pre-

sentation; interpretation of environmental significance of these properties in marine sediments. Prerequisites, 452 (which may be taken concurrently), Mathematics 281.

## 552 Marine Sediments II: Mineral Analysis (3) A

WHETTEN

Identification and analysis of detrital and authigenic minerals with emphasis on optical and X-ray diffraction techniques. Prerequisite, Geology 423.

## 553 Research Techniques in Marine Geochemistry (2)

Analytical techniques and instruments applicable to problems of marine geochemistry. Prerequisite, Chemistry 351.

## 554 Research Techniques in Marine Geology (3) A

MC MANUS

Planning field programs; selection of equipment and survey procedures; collection, analysis, compilation, and presentation of bathymetric and sediment data; evaluation of techniques and results. Prerequisites, 450; 453 or 551, and 552 (which may be taken concurrently).

## 555 Marine Geochemistry (3)

Topics in geochemistry of the oceans and marine sediments. Prerequisites, Chemistry 351 and permission.

## 556 Advanced Marine Geology (3) Sp

CREAGER

Contemporary problems in marine geology; concepts supporting or at variance with accepted hypotheses; discussion of recent advances. Prerequisite, permission.

## 557 Submarine Volcanism and Deep Sea Sediments (3) Sp

NAYUDU

Petrography and petrology of submarine volcanics and deep sea sediments; the origin, distribution, and interpretation of environments and paleoclimatic significance. Prerequisite, permission.

## 600 Research (\*) AWSpS

## 700 Thesis (\*) AWSpS

## 702 Degree Final (6) AWSp

Limited to students completing a nonthesis degree program.

## OPERATIVE DENTISTRY

### 131 Elementary Operative Dentistry Technic (4) Sp

DIEPENHEIM

Fundamental principles of cavity preparation; training in digital skill.

### 132, 133, 134 Oral Anatomy (4,2,2) A,W,Sp

SCHROETER

Detailed study of the human dentition from the standpoint of function, and of morphology

of the component parts in detail, with attention to systematized nomenclature. Drawings and carvings of teeth are made and the relationship of their form to environment and functional association is studied.

### 231, 232, 233 Operative Dentistry Technic (4,4,5) A,W,Sp

OSTLUND

Advanced application of the principles and requirements of operative procedures; exercises on manikins to further manual dexterity; consideration of instrumentation and of manipulation of restorative materials.

### 300, 301, 302 Operative Dentistry (1,1,1) A,W,Sp

HABERMAN

Lectures on the clinical application of knowledge acquired in lower-division technic courses; introduction to professional conduct and clinical demeanor.

### 346 Clinical Operative Dentistry (8) AWSp

STIBBS

Clinical procedures in all phases of operative dentistry; varied clinical experience under close supervision.

### 400, 401, 402 Advanced Operative Dentistry (1,1,1) A,W,Sp

DIEPENHEIM, ELLSPERMAN, SMITH, STIBBS

Lectures on refinements in technical procedures, treatment of atypical cases, and problems in diagnosis and treatment planning.

### 446 Advanced Clinical Operative Dentistry (7) AWSp

STIBBS

Supervised opportunity to attain optimum experience and self-reliance so that each student may develop as an operator to the best of his ability.

## Courses for Graduates Only

### 560 Restorative Dental Materials (2) W

HODSON

A comprehensive review of restorative dental materials with emphasis on recent research.

### 561 Plastics As Restorative Materials (4) W

AZAR, STIBBS

Metallography of silver-tin amalgams; physical properties of zinc oxyphosphate cements, siliceous cements, and acrylic resins. Post-operative history of teeth restored with plastic materials; relative service life materials. Basic and variant designs of cavity preparation, considering morphology of tooth, masticatory stress, physical properties of material, and location and size of restoration. Variant technics of manipulation of plastics; analysis of failures in plastics.

**562 Gold Foli Restorations (4) Sp**

STIBBS

Physical properties, indications and contra-indications for the various forms of pure gold for dental restorations. Rationale and techniques of manipulation of these materials. Modifications of cavity preparation forms, with emphasis on the Ferrier designs. Reactions of hard and soft tissues to restorative procedures and environmental change.

**563 Research Methodology in Operative Dentistry (2) A**

HODSON

The design of research projects, the procedures involved in completing a thesis, and the evaluation and recording of printed material.

**565 Dental Caries Seminar (2) A**

STIBBS

Detailed study of the microbiologic, biochemical, microscopic, and clinical nature of the carious lesion with emphasis placed on the etiology, prevention, and treatment of caries.

**567, 568, 569 Operative Dentistry Literature Review (2,2,2) A,W,Sp**

STIBBS

A weekly seminar devoted to a review of past and current literature relating to clinical practice teaching and experimental methods in operative dentistry.

**570 Principles of Dental Practice (2) Sp**

STIBBS

A consideration of modern dental practice techniques, auxiliary personnel, time and motion techniques, ultra-high speed instruments, multiple restorations, and other factors.

**590-591-592 Teaching Training (2-2-2) A,W,Sp**

DIEPENHEIM, STIBBS, OSTLUND

Supervised training in undergraduate teaching of operative dentistry procedures.

**600 Research (\*) AWSp**

An investigative program in one of the basic or clinical sciences under the direction of the departmental faculty.

**700 Thesis (\*) AWSp**

An investigative program carried out under the direction of a member of the Department staff by a student working toward the degree of Master of Science in Dentistry. The problem may be in one of the basic sciences or may have a clinical application.

**OPHTHALMOLOGY**

**481 Surgical Externship in Ophthalmology (\*) AWSp**

MARLOWE, JR., Madigan Hospital

Individual externship training in outpatient department of ophthalmology at Madigan Hospital. The student attends hospital conferences and meetings. Elective for medical students. Prerequisite, permission of Department.

**ORAL BIOLOGY**

**131 Oral Histology and Embryology (3 or 4) W**

Histology of enamel, dentin, dental pulp, cementum, periodontal membrane, alveolar bone, oral mucous membrane, maxillary sinus and temporomandibular articulation.

**331 Oral Pathology (5) W**

The principles of pathologic processes as related to diseases of the mouth and adjacent structures.

**Courses for Graduates Only**

**510 Clinical Oral Pathology (1) W**

Presentation of interesting oral lesions from the Dental School and the University Hospital and the correlation of the clinical findings with the underlying morphologic and biochemical changes in the tissues. The relation of these oral lesions to systemic disease will be stressed. Prerequisite, permission.

**520 Seminar in Oral Pathology (1-3, max. 9) AWSp**

Conferences, seminars and round table discussions of advanced topics and recent literature in oral pathology. Prerequisite, permission.

**531 Oral Pathology (5) W**

The purposes of this course are to train the student so that he may recognize and intelligently interpret clinical manifestations of diseases of the oral cavity, and to stimulate an intellectual curiosity regarding the basic pathological mechanisms responsible for these conditions.

**540 Oral Biology Seminar (1-3, max. 10) AWSp**

Presentation of and discussion of current research problems by members of the staff, investigators from other departments in the University, visiting scientists, and trainees. Prerequisite, permission.

**550 Experimental Oral Biology (2-4, max. 15) Sp**

Introduction to morphologic and biochemical techniques employed in molecular pathology and biochemical cytology. The application of these techniques to fundamental problems in human and animal disease will be emphasized. Different techniques will be stressed from time to time. The principles underlying these techniques will be presented and students will be given the opportunity to participate in many investigative procedures including light microscopy, electron microscopy, radioautography, polarizing microscopy, histo- and cytochemistry, and a variety of preparative and analytical biochemical techniques which include cell fractionation, paper and column chromatography, zone electrophoresis, biological tracer techniques, and appropriate chemical and enzymic determinations. Prerequisite, permission.

**600 Research (\*)**

Prerequisite, permission.

**700 Thesis (\*)**

**ORAL DIAGNOSIS AND TREATMENT PLANNING**

**216, 217 Oral Roentgenology (1,1) W,Sp**

JACOBSON

Biophysical, clinical, and interpretative aspects of dental X-ray procedures, with practical application in the completion of acceptable fullmouth surveys on patients.

**300, 301 Oral Diagnosis and Treatment Planning (1,1) A,W**

DEGERING, JACOBSON

Fundamental procedures in oral diagnosis; preparation for advanced instruction.

**346 Clinical Oral Diagnosis and Treatment Planning (1) WSp**

Opportunity for examining, performing X-ray survey, and planning treatment for less involved patients. Students also participate in rendering diagnosis and emergency treatment.

**400, 401, 402 Advanced Oral Diagnosis and Treatment Planning (1,1,1) A,W,Sp**

JACOBSON

Instruction in advanced X-ray interpretation. Diagnosis and treatment of typical cases to be encountered in general practice. Recognition and treatment of the more common manifestations of oral disease.

**446 Advanced Clinical Oral Diagnosis and Treatment Planning (1) AW**

Advanced instruction in diagnosis and in the examination and handling of patients. Students are in block assignment and perform radiographic surveys oral diagnosis, and treatment plans for prospective patients.

**Courses for Graduates Only**

**500 Extraoral Radiology (1)**

JACOBSON

The purpose of this course is to familiarize the student with the various techniques necessary to produce diagnostic radiographic films of the jaws and their contiguous parts. This is done by means of seminar and clinical performance on patients. Offered when demand is sufficient.

**ORAL SURGERY**

**200 Local Anesthesia (1) Sp**

GEHRIG

A review of the head and neck anatomy, the pharmacology of the anesthetic agents and their vasoconstrictors, and the physiology involved in local anesthetic administration are presented. Patient evaluation and premedication with indications and contraindications for local anesthesia are stressed. The armamentarium with sterilization of same and sterile technique are included. Methods of anesthetizing the branches of the trigeminal nerve for dental manipulations are outlined in detail. The complications and emergencies attending local anesthetic administrations are stressed. Limited group demonstrations and practical experience are acquired during the course.

# ORAL SURGERY

## 300, 301, 302 Exodontia (1,1,1) A,W,Sp

GORDON.

The definition, history, and scope of Oral Surgery are presented. Surgical principles, history taking, and patient evaluation including the performance of an adequate, thorough oral examination are emphasized. The principles of asepsis, adequate armamentarium, and surgical technique for the extraction of all normally erupted teeth with the recovery of fractured roots resulting from such extractions are presented. Surgical techniques for the extraction of teeth associated with the low antrum; the extraction of complicated teeth; impaction diagnosis and removal; soft and hard tissue surgery; pre- and postoperative management of the patient; types, prevention, and control of hemorrhage; surgical complications; fundamentals of diagnosis, treatment and prevention of shock are included. The fundamentals of office emergency treatment are introduced.

## 303 General Anesthesia (1) W

ALLEN

Introduction to the use of general anesthesia for oral surgery; agents employed and the physiological action, including the stages of anesthesia; methods of administration; premedication of the patient; armamentarium; complications and accidents; agents designed primarily for administration to children. Lectures and clinical demonstrations.

## 331 Oral Surgery Laboratory (1) Sp

GEHRIG

An introduction to the theoretical and technical aspects of exodontia and associated minor oral surgery is offered. A correlation of the lecture material with clinical experience is presented with special emphasis on the medical conditions influencing dental surgery. Various operations, such as: biopsy; incision and drainage; hyperplastic tissue trim; buried root recovery; simple and surgical extractions; alveolectomy; perforated antrum care; and finally, maxillary and mandibular immediate denture surgery are performed on mounted models. Additional soft tissue surgery is performed during the dog surgery session. Practical clinical procedures, such as blood pressure determination; venipuncture; intramuscular injection of penicillin; oxygen administration; artificial respiration; and cricothyroidotomy are practiced during the course. TV demonstrations of each procedure are performed prior to the laboratory session.

## 346 Clinical Exodontia (2) AWSp

Extractions and other minor oral surgery under local anesthesia are accomplished in the Oral Surgery Clinic. The junior student is responsible for the patient's medical history, the oral examination, radiographic and clinical diagnosis, treatment planning, administration of the local anesthetic agent, assisting the senior student in the treatment and postoperative care of the patient under the supervision of the staff. Opportunities are provided for practical application for the principles of sterilization of instruments and supplies, as well as the demonstration of intravenous and intramuscular injections and prescription writing. Demonstrations of emergency oxygen equipment and the treatment of emergencies in the dental office are practiced.

## 400, 401, 402 Oral Surgery (1,1,1) A,W,Sp

FUNK, HOOLEY

Surgical Bacteriology, the physiology of inflammation, and the anatomy of the progress of spread of oral infections through the fascial spaces and planes of the head and neck are reviewed. The therapeutic and surgical management of oral infections are presented, including the rational use of anti-infective agents. Major oral surgery problems, such as the care of facial and intraoral lacerations, and the diagnosis and treatment of facial trauma are included (fractures of the maxilla, mandible, and zygomatic bones are stressed). Initial emergency treatment of facial trauma patients (management of air-way, hemorrhage, and shock) are emphasized. Bone and allopastic grafting, disturbances of temporomandibular articulation, the affections of the 5th and 7th nerves, the diagnosis and treatment of cysts, major salivary gland pathology (sialolithiasis), developmental deformities of the maxilla and mandible (prognathia, retrognathia, apertognathia), and the principles of plastic procedures are included. Legal aspects of Oral Surgery are also presented.

## 403 Maxillofacial Surgery (1) W

FUNK

Review of benign and malignant oral neoplasms with particular emphasis on the clinical findings, differential diagnosis, and treatment of each. White lesions, swellings, ulcerations, radiolucencies and radiopacities of the jaws, and associated structures are discussed. The dentist's role in the diagnosis, tumor board, biopsy, and postoperative management of the patient with an oral malignancy is stressed. Students attend meetings of the University Hospital Head and Neck Tumor Clinic during their block rotations in Oral Surgery Clinic.

## 404 Medical Emergencies (1) Sp

HOOLEY

Office emergencies are discussed in detail. A scheme for evaluation and stepwise treatment of any office emergency is outlined. Specific initial therapy prior to the arrival of the physician for each office emergency (angina pectoris), myocardial infarction, cardiac arrhythmia, epileptic attack, cerebrovascular accident, allergic reaction, anaphylactic shock, and others) is discussed. The taking of an adequate medical history and premedication for prevention of the emergency are strongly emphasized.

## 446 Clinical Oral Surgery (2) AWSp

The senior student is responsible for mastering the medical evaluation, the oral examination, the x-ray and clinical diagnosis, treatment plan, administration of premedication, operation, and postoperative management of clinic patients. The student learns to manage problems of multiple dental extractions with flap design and alveolectomy, surgical extractions, hyperplastic tissue removal, exostoses, small cysts, uncomplicated biopsies, buried roots, intraoral incision and drainage of abscesses with their complete management, and the removal of some unerupted or impacted teeth. Clinical experience with intravenous and intramuscular drug administration is provided.

## Courses for Graduates Only

### 500, 501, 502 Oral Surgery Seminar (2,2,2) A,W,Sp

A weekly seminar is devoted to the discussion of oral surgery and related problems from basic science, medical, diagnostic, therapeutic, operative, and postoperative aspects. Subjects such as hemorrhagic diathesis, antibiotic therapy, facial trauma, neurologic disorders, developmental deformities, soft tissue surgery, maxillary sinus pathology, pharmacology of general anesthetics, bone physiology, and tracheotomy are discussed. Prepared presentations are given by the graduate students. Guest lecturers are invited to discuss their specialties in the fields such as ophthalmology, otolaryngology, neurosurgery, and general surgery, as they are related to oral surgery. Several seminars are held jointly with other departments (Prosthodontics and Orthodontics). Each graduate student attends ninety seminars over the three-year period.

### 530, 531, 532 Clinical Pathology Conference (1,1,1) A,W,Sp

FUNK, GEHRIG, GORDON

Patients with interesting or unusual oral pathology are presented by senior students and discussed by a graduate student. Questions and comments are supplied by the staff. This conference presents a practical proving ground for the oral pathology knowledge of both the undergraduate and graduate students.

### 540, 541, 542 Advanced Oral Surgery Clinic (3,3,3) A,W,Sp

FUNK, GEHRIG, GORDON

The medical workup, clinical diagnosis, treatment plan, operation and management of oral surgery cases that can be operated under premedication and local anesthesia on an outpatient basis are accomplished. Problems such as biopsy, benign tumor, cyst, vermilionectomy, peripheral neurectomy, vestibular extension, removal of hyperplastic tissue, exostosis, torus, foreign body, supernumerary impacted teeth, and other procedures are included.

### 550 Anatomical Approaches to Head and Neck Surgery (2) W

FUNK, GEHRIG, GORDON

A study and laboratory dissection of the anatomical structures as they are found in major oral surgery procedures. Prerequisite, permission.

### 600 Research (\*) AWSp

An investigative program in one of the basic or clinical sciences under the direction of the departmental faculty. Prerequisite, permission.

### 700 Thesis (\*) Sp

A research project is carried out under the direction of a staff member from the Oral Surgery Department or the department in which the research is primarily centered. This project and a thesis are submitted as partial requirements for the degree of Master of Science in Dentistry. The research problem may be in either the basic or clinical sciences, or may represent a combined project in both areas.

## ORTHODONTICS

### 300 Orthodontics (1) Sp

Discussions and illustrations of the periodontal membrane, bone, and adjacent tissues as related to the forces of occlusion, of a balanced occlusion, and of the growth and development of the individual, with special emphasis on the head. Review of the major growth studies in the literature and their applications to dentistry and to orthodontics.

### 400, 401 Advanced Orthodontics (1,1) A,W MOORE

Brief historical review of the etiology of malocclusion; classification and analysis of cases; growth anomalies as well as deformities and their evaluation; the temporomandibular joint; the mandibular position as related to orthodontic case analysis; treatment planning; types of appliances and their uses; retention; the ultimate outcome of orthodontic treatment. Prerequisite, 300.

## Courses for Graduates Only

### 500, 501, 502, 503, 504 Orthodontics Seminar (2,4,4,2,2)

Methods of diagnosis, analysis, and treatment planning of malocclusion; analysis of methods and theoretical principles used in the treatment of malocclusion. The student presents a detailed case analysis and plan of treatment for each clinical patient he is supervising. Each course is prerequisite to the following course.

### 546, 547, 548, 549, 550, 551 Clinical Orthodontics (4,5,5,5,5,6)

Technics of construction and manipulation of the edgewise arch mechanism; application of the technics in the treatment of malocclusion. Treatment of patients begins in the second quarter. Each course is prerequisite to the following course.

### 600 Research (\*)

Prerequisite, permission.

### 700 Thesis (\*)

An investigative program carried out under the direction of a member of the Department staff by a student working toward the degree of Master of Science in Dentistry. The problem may be in one of the basic sciences or may have a clinical application.

## ORTHOPEDICS

### 475 Preceptorship in Orthopedics (\*) AWSpS

K. ANDERSON, GLOYD, STEWART

Student will follow a preceptor in all his work to better understand the pathophysiology and management of problems of the musculoskeletal system. Full time required for either a ten-day or a three-week period. Prerequisite, permission of preceptor and Department.

### 476 Clinical Orthopedic Clerkship (\*) AWSpS

CLAWSON

Student will be given the opportunity to participate in the inpatient and outpatient serv-

ices at one of the affiliated hospitals. He will become an integral part of the service, assisting in patient care and attending rounds, seminars, and correlative anatomy conferences. Students desiring pediatric orthopedics only will be assigned to Children's Orthopedic Hospital and Medical Center. Full time is required for either a ten-day or a three-week period. Prerequisite, permission of Department.

### 480 Clerkship—Selective Elective: Orthopedics, Neurological Surgery, Urology (\*) AWSpS

Time is divided between the inpatient and outpatient services of two of these specialties, affording students opportunity to explore in depth the various diagnostic techniques and therapeutic management offered to patients by these specialties. Two specialties required for fourth-year medical students.

### 499 Undergraduate Research (\*) WSpS

AKESON, FRY, TAYLOR

Investigation of problems pertinent to the study of musculoskeletal problems in the orthopedic laboratories as a participant in the research group conducting investigations in histochemical and electronmicroscopic changes of cartilage, mucopolysaccharide changes in periarthral structure and cartilage associated with immobility and aging, tissue culture, and histochemical and x-ray diffraction studies of intervertebral disks subject to immobility and aging. Prerequisite, permission of Department.

## Courses for Graduates Only

### 521 Orthopedic Research Seminar (\*) AWSpS

AKESON, FRY, TAYLOR

Each week a current laboratory topic is discussed with members of the attending and resident staff. Active participation of the student is required. Prerequisite, graduate student.

### 522 Orthopedic Seminar (\*) AWSpS

CLAWSON

Seminar in current topics of orthopedic interest. Prerequisite, senior medical student or graduate student.

## OTOLARYNGOLOGY

### 481 Otolaryngology Externship (\*)

DONALDSON

University Hospital: Student will participate in evaluation and care of outpatients and inpatients at the University Hospital. In addition he will attend Department conferences and is expected to prepare a written report on an otolaryngologic problem of his choice. All terms, 6 weeks, full time; maximum of one student. Prerequisite, permission of Department.

### 482 Otolaryngology Externship (\*)

CAIN

U.S.P.H.S. Hospital: Student serves externship in Otolaryngology in outpatient clinic

where visits average 600 per month supplemented by inpatient assignments. Individual training provided, giving student opportunity to utilize his own diagnostic abilities; performs or assists instructor in all phases of patient work-ups and care; attends ward rounds and conferences. No ophthalmology included. All terms, 3 or 6 weeks, full time; maximum of two students. Prerequisite, permission of Department.

### 483 Otolaryngology Externship (\*)

BOYD, MARLOW

Madigan Hospital: Individual externship training at outpatient clinic where visits average 1,200 per month, supplemented by inpatient assignments. Responsible for patient work-ups; follows assigned patient to operating room; participates in ward rounds and hospital conferences. No ophthalmology included. Students reside at the hospital during externship, using facilities of BOQ and Hospital mess. (Subsistence and quarters charges, approximately \$2.00 per day) All terms, 10 days, 3 or 6 weeks, full time; maximum of three students. Prerequisite, permission of Department.

## PATHOLOGY

### 110 Lectures in Medical Technology (1) W

Weekly lectures, demonstrations, and tours to familiarize students with subject matter and opportunities in medical technology. Prerequisite, sophomore pre-medical technology students.

### 310 General Pathology (2) A

WIEGENSTEIN

Study of causes, processes, and effects of important diseases. Lectures, demonstrations, and discussions. A reasonable knowledge of anatomy, histology, and physiology is required. For students of dental hygiene, physical therapy, and medical technology; others by permission.

### 321 Medical Technology (7) S

HOUGIE, LAGUNOFF

The first half of the course is devoted to the principles and practice of histological, histochemical and electron microscopic tissue technique; the second half is devoted to hematology. Prerequisite, permission.

### 322- Medical Technology (12-) A

Clinical Chemistry. Completion of three years prescribed curriculum.

### -424- Medical Technology (-12-) W

Internship I. Prerequisite, permission.

### -425 Medical Technology (-14) Sp

Internship II. Prerequisite, permission.

### 426 Medical Technology (6) S

Internship III. Prerequisite, permission.

## General Pathology (3-) A

ROSS, SREEBNY

This course introduces the student to the basic pathologic processes such as inflammation and neoplasia. Lectures and demonstrations of human pathologic material are used to teach the basic concepts of pathology which underlie practice. For second-year medical and dental students, and graduate students by permission.

## -441- General Pathology (-3-) A

Laboratory course given with 440-. For second-year medical students and graduate students by permission.

## -442-443- Systemic Pathology and Laboratory Diagnosis (-9-7) WSp

MOTTET

The incidence, etiology, and pathogenesis of developmental, neoplastic, inflammatory, and degenerative disease processes of each organ and system are presented. The gross and microscopic morphologic features of each are correlated with biochemical and physiological changes and symptomatology. Thus a coherent picture of systemic diseases is presented. The usefulness of laboratory diagnostic procedures is highlighted. Prerequisite, -441- or permission.

## -444- General Pathology (-2-) A

Laboratory course given with 440-. For second-year dental students and graduate students by permission.

## -445 Systemic Pathology (-2) W

A survey is made of pathologic processes affecting organs and systems of particular pertinence to the practice of dentistry. Lectures and demonstrations to present a coherent picture of systemic disease will be presented. For second-year dental students and graduate students by permission.

## 460 Autopsy Participation and Review (\*) WSpS

MOTTET

Course consists of assistance at and review of selected autopsy cases at one of the four hospitals: University Hospital, King County, Veterans Administration, and Children's Orthopedic Hospital and Medical Center. Elective open to second-year medical students. Limited to ten students.

## 461 Microscopic Autopsy Review (\*) Sp

MARTIN

The slides from selected and particularly instructive autopsies will be reviewed by the students individually and then with the instructor. Clinical and basic science correlations will be stressed. Elective open to second-year medical students. Limited to ten students.

## 462 Cardiovascular Pathology Conference (\*) AWSpS

This course consists of two parts, a laboratory review of gross and microscopic cardiovascular pathology of selected autopsied cases followed by a combined clinical (medical and

/or surgical) radiological and pathology conference discussing these cases. Elective open to second-year medical students.

## 463 Neuropathology (\*) AWSpS

ALVORD, SHAW

This course consists of three parts, combined neurology-neurosurgery-neuropathology conferences, gross and microscopic studies of selected autopsied cases with review of study sets, and experimental projects in neuropathology. Prerequisite, permission.

## 464 Neuropathology Brain Modeling (4 or 8) S

ALVORD

Three-dimensional neuroanatomical relationships, critical for understanding neuropathology, can best be obtained in the construction of a model of the brain. Prerequisite, permission.

## 465 Surgical Pathology (\*) WSpS

WIEGENSTEIN

The objective is to study fresh gross surgical specimens and to review microscopic sections of diagnostic problems in general surgery. For third-or fourth-year medical students; graduate students by permission.

## 466 Pediatric Pathology (\*, max. 10)AWSpS

Assignments by arrangement according to need and background. Prerequisite, permission.

## 467 Renal Pathology Conference (1-3) AWSpS

Light and electron microscopic study of human and experimental renal disease. Conference discussions and individual study. Prerequisite, permission.

## 468 Skin Pathology (1) AWSpS

SAGEBIEL

Developmental, inflammatory, neoplastic and degenerative diseases of the skin will be presented with an attempt to correlate the gross (clinical) with the microscopic changes. Prerequisite, permission.

## 469 Oral Pathology (1) AWSp

SREEBNY, ROSS

The purpose of this course is to train the student to recognize and interpret clinical manifestations of diseases of the oral cavity, and to stimulate an intellectual curiosity regarding basic pathological mechanisms responsible for these conditions. Prerequisite, permission.

## 476 Clinical Pathological Conference (\*) AWSp

Interesting, unusual, or provocative cases principally from the University Hospital are presented for discussion by senior staff from the clinical and basic science areas. For third- and fourth-year medical students; graduate students by permission.

## 480 Diagnostic Pathology Clerkship (\*) AWSp

Medical student participation in the dissection and study of autopsy and surgical pathology cases. Each student is responsible for the work-up of cases assigned to him under the direction of a senior staff member. The

student presents his cases at conferences and seminars and may participate in laboratory teaching. Clerkships are available at the University, King County, and Veterans' Administration Hospitals and Children's Orthopedic Hospital and Medical Center. Prerequisites, 440-441-442-443, or equivalent.

## 498 Undergraduate Thesis (\*) AWSpS

Elective. Prerequisite, permission.

## 499 Undergraduate Research (\*) AWSpS

Elective. Prerequisite, permission.

## Courses for Graduates Only

### 500 Principles of Pathology (6) AW

This course introduces the student to the basic pathologic processes such as inflammation, neoplasia, etc. Lectures, laboratory exercises, and demonstrations of human pathologic materials are used to teach the basic concepts of pathology which are important in medical and biologic research. A suitable knowledge of gross anatomy, histology, physiology, and biochemistry is required. Prerequisite, permission.

### 501 Cellular and Subcellular Response to Injury (2) W

SMUCKLER

Lecture-seminar. Considerations of current concepts of cellular and subcellular reactions to injury as studied by modern techniques of cell biology. Prerequisite, 440-441-, 500, or permission. (Offered alternate years; offered 1967.)

### 502 Inflammation and Repair (2) Sp

ALVORD, ROSS

Seminar. A systematic examination of the processes involved in inflammation and repair of injury. Prerequisite, 441-, 500 or permission. (Offered alternate years; offered 1967.)

### 503 Topics in Genetic Pathology (2) W

MARTIN

An analysis of selected pathologic processes (neoplasia, inborn errors of metabolism, congenital anomalies, ageing) from the point of view of modern genetic theory. Prerequisites, 441, Genetics 451 or permission. (Offered alternate years; offered 1968.)

### 504 Neoplasia (2) W

PREHN

Basic research findings in carcinogenesis, progression, immunology, virology, etc. The emphasis is on the methodology and results of experimental cancer research rather than on topics of direct clinical applicability. Prerequisite, 441- or permission. (Offered alternate years; offered 1968.)

### 505 Enzymatic Histochemistry (2-3) W

LAGUNOFF

Development of basic concepts with technical and experimental applications. Elective open to medical students and graduate students. Prerequisite, permission. Limited to six students. (Offered alternate years; offered 1967.)

**506 Determinative Histochemistry (2-3) W**

LAGUNOFF

Principles and techniques of histochemical identification of proteins, polysaccharides, and lipids. Prerequisite, permission. Elective open to medical students and graduate students. (Offered alternate years; offered 1968.)

**507 Ultrastructural Pathology (2) S**

ROSS, BULGER

Lectures in techniques of electron microscopy including fixation, embedding, staining, histochemistry, autoradiography, photographic technique, microtomy, interpretation of micrographs, and maintenance and operation of the electron microscope. Prerequisite, permission.

**508 Ultrastructural Pathology (4-6) WSpS**

ROSS, BULGER

Instruction in techniques of electron microscopy. Prerequisite, permission.

**510 Anatomical Analysis of Disease (\*, max. 30) AWSpS**

MOTTET

The anatomical features of human disease as revealed at surgery or postmortem by gross examination and light microscopy are correlated with chemical and physiologic changes. Prerequisites, 440-441-442-443, 500, or permission.

**520 Experimental Pathology Seminar (1) AWSpS**

Review of current problems by members of the Department and visiting scientists. Prerequisite, permission of chairman.

**551 Experimental and Molecular Pathology (2-5, max. 20) AWSpS**

An introduction to experimental pathology. A tutorial course introducing the beginning graduate student to selected methods and problems through literature surveys and/or laboratory experience. Emphasis is on cellular and molecular aspects of experimental pathology. Prerequisite, permission of chairman.

**552 Clinical Pathology (2-5, max. 20) AWSpS**

A study of the principles and techniques of the usual clinical chemical procedures or of the tests used to study diseases of the hematopoietic system. The precision and accuracy of the various procedures is stressed, as is the interpretation of the results obtained. The work in either biochemistry or hematology may be taken in the appropriate sequence. For graduate students, fellows, and trainees. Prerequisite, permission.

**553 Hematopathology (2-5) AWSpS**

HOUGIE

Peripheral blood and bone marrow smears are reviewed and discussed. Prerequisite, permission.

**554 Blood Coagulation (2-5) AWSpS**

HOUGIE

Modern techniques and theories in blood coagulation are discussed; a course in methodology is included. Prerequisite, permission.

**600 Research (\*) AWSpS**

Selected problems arranged in accordance with the student's needs. Prerequisite, permission of chairman.

**700 Thesis (\*) AWSpS**

**PEDIATRICS**

**404 Human Growth and Development (\*, max. 6) AWSp**

HAMMAR, MC LEAN

Provides an opportunity to observe growth and development, and to participate in the pediatric health supervision of selected families in a multidisciplinary setting. Principles of development, child care, and their implications in child rearing will be discussed. Maximum of four first- and/or second-year medical students.

**Conjoint 426-427 Introduction to Physical Diagnosis (\*, max. 4, \*, max. 9)**

(See Conjoint Courses.)

**465 Clinical Clerkships (\*, max. 16)**

WEDGWOOD

A general pediatric inpatient and outpatient clerkship. Students are divided between the pediatric facilities at the University Hospital, Children's Orthopedic Hospital and Medical Center, and King County Hospital and work under the supervision of members of the Department faculty. Required for third-year medical students.

**470 Pediatric Infectious Diseases and Immunology (\*) AWSpS**

WEDGWOOD, DAVIS

Elective dealing with the development of immune mechanisms and diagnosis and treatment of infectious diseases and immunologic defects in children. Opportunity for experience in clinical research and laboratory techniques will be provided. Open to two medical students.

**471 Clinical Research in Pediatrics (\*) AWSpS**

BAUM

Introduction to methods of clinical investigation through study of pediatric patients admitted to the Clinical Research Center. Open to one third- or fourth-year medical student.

**472 Pediatric Pulmonary Physiology and Neonatal Biology (\*) AWSpS**

OLIVER

Clinical physiology and biochemical aspects of pediatric pulmonary disease. Participation in the activities in the Newborn Division; ward rounds, seminars, conferences and familiarization with certain laboratory techniques, particularly those relating to acid-base balance. Open to one medical student.

**473 Office Practice (\*) AWSpS**

BERGMAN, ROBERTSON

Opportunity to observe and function in the private office settings of a number of clinical

pediatric faculty and accompany pediatricians as they pursue their daily activities in the community. Open to three third- or fourth-year medical students.

**480A Senior Pediatric Elective Clerkship (\*) AWSpS**

WEDGWOOD, WILLIAMS

Outpatient, newborn, and inpatient experience will be assigned at University Hospital, with consideration given to the student's wishes. Externship experience is available. Open to two fourth-year students.

**480B Senior Pediatric Elective Clerkship (\*) AWSpS**

SMITH

Outpatient, inpatient, emergency room, and newborn service experience at King County Hospital, with modification of assignments according to student's interest. Externship experience can be provided. Open to two fourth-year students.

**480C Senior Pediatric Elective Clerkship (\*) AWSpS**

DOCTER

An elective conducted as an externship at Children's Orthopedic Hospital and Medical Center, involving the student in actual patient care, with responsibility for patient admission, order writing, and following the patient's progress under staff supervision. The student will be included in the night and week-end call rotation and will be expected to participate in the resident and intern teaching conferences of this hospital. Open to three fourth-year students.

**481 Research in Child Growth and Development (\*) AWSpS**

DEISHER

Pursuit of short-term projects in growth and development by student under guidance of Child Health Center staff, including special behavior problems in childhood. Open to two third- and fourth-year medical students.

**482A Research in Pediatric Endocrinology and Metabolic Diseases (\*) AWSpS**

KELLEY, FERRIER, LIMBECK

Clinical and basic research performed so that students may learn techniques of laboratory evaluation of children with classical endocrinopathies, abnormal growth pattern, abnormal sexual development and/or differentiation, and metabolic diseases. Techniques learned during such an elective program can then be applied to summer research fellowships in areas of student interest. In addition, the program can be so designed that continuing projects may be developed in terms of elective programs and/or summer research fellowships. Techniques available include chromatography (paper, thin-layer, glass-fiber, column, gas-liquid), urinary 17 ketosteroid fractionation, identification of specific plasma and urinary hydroxylated steroids, fluorometry, and cytogenetic techniques. Open to three first- and second-year students.



## PEDIATRICS

### 482B Pediatric Endocrinology and Metabolic Diseases (\*) AWSpS

KELLEY, FERRIER, LIMBECK, MAHONEY, RUVALCABA

This program can be oriented to the special interest of the individual student so that principal emphasis may be placed on clinical, laboratory, or both clinical and laboratory areas. Intensive clinical experience will be provided in classical endocrinopathies, abnormal sexual differentiation and/or development, abnormal growth, renal diseases, mesenchymal diseases, steroid therapy, diabetes and related disorders, and general metabolic disorders in children. Outpatient experience is available through specialty clinics and conferences at University Hospital, Children's Orthopedic Hospital and Medical Center, and King County Hospital; inpatient experience is obtained from patients admitted to the Clinical Research Center and Pediatric Ward, University Hospital, and from consultations to this Division concerning inpatients in the affiliated hospitals. Students also may perform some clinical and/or basic research in the various clinical conditions noted here. Techniques available include chromatography (paper, thin-layer, glass-fiber, column, gas-liquid), urinary 17 ketosteroid fractionation, identification of specific plasma and urinary hydroxylated steroids, fluorometry, and cytogenetic techniques. Open to three fourth-year students.

### 483 Clinical Experience in Problems of Well Child Care (\*) AWSpS

DEISHER

Further experience at the Child Health Center in the common problems met in clinical practice among well children from infancy through adolescence. Open to two third- and fourth-year medical students.

### 485 Clinical Problems in Mental Retardation (\*) AWSpS

DEISHER

Experience in multidisciplinary evaluation of the retarded child and study of the community management of this problem. Open to two senior medical students.

### 486 Pediatric Cardiology (\*) AWSpS

BAUM, GUNTHEROTH, MORGAN

The student will do the admission work-up on all pediatric cardiology inpatients and on one outpatient per week. He will read all electrocardiograms with the Fellows, and assist in interpretation of pressure and oxygen content data from catheterization studies, in addition to assisting during the performance of catheterizations and angiocardiograms. During open-heart surgery, the student will observe and participate in the post-operative management, including fluid and electrolyte balance, medication, schedules, etc. Open to two medical students.

### 487 Pediatric Neurology (\*) AWSpS

CARLSON

An advanced course in neurology with emphasis on neurological disease in the immature nervous system. Experience in special diagnostic techniques will be available. Open to two medical students.

### 488 Congenital Defects (\*) AWSpS

SHURTLEFF

An advanced course in pediatrics providing experience in the clinical diagnosis and management of structural and metabolic congenital defects.

### 489A Pediatric Outpatient Clinic (\*) AWSpS

WILLIAMS

Elective outpatient clerkship in pediatrics includes general pediatrics in addition to specialty clinics. Sub-specialty clinics include Endocrinology, Mental Retardation, Adolescent and Child Development, Seizure, Neurology, Cardiology, Allergy, Collagen Diseases (Special Diagnostic Clinic) and Congenital Defects Clinic. Open to two third- or fourth-year medical students.

### 489B Pediatric Outpatient Clinic (\*) AWSpS

SMITH

Same elective at King County Hospital. Open to two third- or fourth-year medical students.

### 489C Pediatric Outpatient Clinic AWSpS

BERGMAN

Same elective at Children's Orthopedic Hospital and Medical Center. Open to two third- or fourth-year medical students.

### 490 Adolescent Development (\*) AWSpS

HAMMAR

An advanced pediatric clerkship dealing with special problems of the adolescent. Senior medical students are offered an experience in a multidisciplinary clinic at University Hospital. Open to two medical students.

### 496 Concept of the Child (3) A

HAMMAR

An advanced course for students who desire a more complete understanding of the child through integration of the viewpoints of pediatrics, preventive medicine, psychology, psychiatry, nutrition, social work, and nursery education. For nonmedical students. Prerequisite, permission.

### 498 Undergraduate Thesis (\*) AWSpS

WEDGWOOD

For medical students.

### 499 Undergraduate Research (\*) AWSpS

WEDGWOOD

An opportunity to gain research experience through participation in various clinical or basic research programs in progress.

## Course for Graduates Only

**505 Physical Growth of the Well Child (2) W**  
Nine weekly seminars (18 hours). Presentation by departmental staff of relationships between growth and development and diseases as they pertain to dental health. For twenty graduate students in dentistry. (Offered alternate years; offered 1967-68.)

## PEDODONTICS

### 200, 201 Preventive Dentistry (1,1) A,W

MOORE, SCHUMACHER

Etiology and control of dental caries. Physiology and composition of saliva, ecology of the mouth, chemical composition of teeth, degradation of carbohydrates, systemic factors in the caries process, enzyme inhibitors, fluorides, and caries susceptibility tests. Study of the growth and development of the oral mechanism and of the human head is begun in the second quarter; the forces of occlusion are analyzed and a comparison made between the various animal dentitions. The Broadbent-Bolton cephalometer is discussed, with particular emphasis on its research implications.

### 216 Pedodontics (2) Sp

LEWIS

Operative technics applicable to primary and mixed dentitions; cavity preparations in primary teeth, construction of a functional space maintainer, and restoration of a fractured incisor.

### 300, 301 Pedodontics (1,1) A,W

LEWIS

Emotional development of the child and its implications in pedodontic procedures. Space maintenance, the interception of incipient malocclusion, and clinical management of oral habits.

### 346 Clinical Pedodontics (3) AWSpS

Diagnosis and examination of the child patient. Restorative procedures in primary and mixed dentitions, with special emphasis on application of the rubber dam.

### 400 Pedodontics and Public Health Dentistry (1) Sp

HOFFMAN, LAW

The child in the dental health program. Organization of dental health programs on local, state, and national levels. The role of the dentist in community public health planning. Public health legislation and its implications to the dental profession.

### 446 Advanced Clinical Pedodontics (3) Sp

Diagnosis and treatment planning, with emphasis upon preventive dentistry. Complete operative procedures, including vital pulp therapy, construction of space maintainers, bite planes, and restoration of fractured anterior teeth.

## Courses for Graduates Only

### 500, 501, 502, 503, 504 Pedodontics Seminar (2,2,2,2,2)

LAW

Seminar on problems of tooth formation, development, calcification, and eruption in the child. Management of clinical problems of tooth development; operative procedures, pulp therapy, treatment planning, and the consideration of emotional factors in pedodontic practice.



**546, 547, 548, 549, 550**  
**Clinical Pedodontics (\*,\*,\*,\*)**  
**A,W,Sp,S,A**  
**LAW, LEWIS**

Advanced clinical practice. Assignment of selected cases, with student responsibility for complete examination, diagnosis, and treatment planning including completion of the case. The use of appliances to effect limited tooth movement in cases of space closure and the application of the Broadbent-Bolton cephalometer in diagnosis and treatment.

**600 Research (\*)**  
 Prerequisite, permission.

**700 Thesis (\*)**  
 An investigative program carried out under the direction of a member of the Department staff by a student working toward the degree of Master of Science in Dentistry. The problem may be in one of the basic sciences or may have a clinical application.

## PERIODONTICS AND ENDODONTICS

### PERIODONTICS

**200 Introduction to Periodontics (1) W**  
**EASLEY**  
 A lecture series which surveys periodontics and links this field to dentistry in general.

**231 Periodontic Technic (1) Sp**  
**OGILVIE**  
 A clinical and seminar experience in relating both the normal and the abnormal periodontium to dental practice.

**300 Periodontics (2) A**  
**OGILVIE**  
 A program intended to facilitate the development of clinical confidence and proficiency in dentistry. Cause and effect in periodontal disease, the objectives of therapy, the interpretation of case data, the determination of prognosis, the indications for and applications of treatment procedures. Lectures, class discussions, clinical exercises.

**301 Periodontics (1) W**  
**OGILVIE**  
 A continuation of 300.

**346 Clinical Periodontics (1-1-1) AWSp**  
 Treatment of periodontal disease. Emphasis upon diagnosis, treatment planning, and non-surgical treatment procedures.

**400, 401 Advanced Periodontics (1,1) A,Sp**  
**DRENNAN**  
 The surgical aspects of therapy in periodontics, their rationale, their selection, their application.

**446 Advanced Clinical Pedodontics (1-1-1) AWSp**  
 Treatment of patients with more complex periodontal involvement. The development

of skill in treatment planning and execution by the individual student. Concrete experiences in surgical periodontics.

### Courses for Graduates Only

**546, 547, 548 Clinical Periodontics (3,4,4)**  
**DRENNAN**  
 The clinical diagnosis and treatment of periodontal disease.

**549, 550, 551 Clinical Periodontics (3,4,4)**  
**SCHLUGER**  
 The clinical diagnosis and treatment of periodontal disease. Prerequisites, 546, 547, 548.

**576, 577, 578 Periodontics Seminar (2,2,2)**  
**EASLEY**  
 A continuous weekly seminar devoted to review of periodontic and related literature and to discussion of teaching methods and philosophy of teaching and treatment.

**579, 580, 581 Periodontics Seminar (2,2,2)**  
**SCHLUGER**  
 A continuation of the weekly seminars devoted to review of periodontic and related literature and to discussion of teaching methods and philosophy of teaching and treatment. Prerequisites, 576, 577, 578.

**582, 583, 584 Treatment Planning Seminar (2,2,2)**  
**SCHLUGER**  
 A weekly seminar to discuss controversial treatment problems and difficult diagnostic cases.

**585, 586, 587 Treatment Planning Seminar (2,2,2)**  
**SCHLUGER**  
 A continuation of the weekly seminar to discuss controversial treatment problems and difficult diagnostic cases. Prerequisites, 582, 583, 584.

**591, 592, 593 Clinical Practice Teaching (1,1,1)**  
**OGILVIE**  
 A closely supervised experience in teaching clinical periodontics to the undergraduate dental student. Prerequisites, 546, 547, 548, 576, 577, 578.

**600 Research (\*)**  
**SCHLUGER**  
 An investigative program in one of the basic sciences under the direction of the department faculty. Prerequisite, permission.

**700 Thesis (\*)**  
**SCHLUGER**  
 An investigative program carried out under the direction of a member of the Department staff by a student working toward the degree of Master of Science in Dentistry. The problem may be in one of the basic sciences or may have clinical application.

### ENDODONTICS

**201 Introduction to Endodontics (1) Sp**  
**NATKIN**  
 A lecture course dealing with the anatomic, microanatomic, microbiologic, and pathologic problems encountered with the pulpless tooth and its sequelae.

**232 Endodontic Technic (2) Sp**  
**NATKIN**  
 A lecture-laboratory course in root canal therapy in terms of present-day concepts, with emphasis on a definite, simplified technic. Treatment of extracted teeth as practice for clinical cases.

**304 Endodontics (1) A**  
**NATKIN**  
 A lecture course in which is presented the differential diagnosis of facial pain, problems in pulp anesthesia, periapical surgery, and systemic antibiotic therapy.

**349 Clinical Endodontics (2) W**  
 The student is required to complete the endodontic treatment on an anterior, bicuspid, and molar tooth.

**449 Advanced Clinical Endodontics (2) A**  
 In addition to filling several root canals, the student performs periapical surgery and at least three minor operations (pulp capping, pulpotomy, or bleaching).

### Courses for Graduates Only

**546, 547, 548 Clinical Endodontics (3,4,4)**  
**NATKIN**  
 The clinical diagnosis and treatment of the pulpless tooth.

**549, 550, 551 Clinical Endodontics (3,4,4)**  
**NATKIN**  
 The clinical diagnosis and treatment of the pulpless tooth. Prerequisites, 546, 547, 548.

**576, 577, 578 Endodontic Seminar (2,2,2)**  
**STEINER**  
 A continuous weekly seminar devoted to review of endodontic and related literature and to discussion of teaching methods and philosophy of teaching and treatment.

**579, 580, 581 Endodontic Seminar (2,2,2)**  
**STEINER**  
 A continuous weekly seminar devoted to review of endodontic and related literature and to discussion of teaching methods and philosophy of teaching and treatment. Prerequisites, 576, 577, 578.

**582, 583, 584 Treatment Planning Seminar (2,2,2)**  
**NATKIN**  
 A weekly seminar to discuss controversial treatment problems and difficult diagnostic cases.

# PERIODONTICS AND ENDODONTICS

## 585, 586, 587 Treatment Planning Seminar (2,2,2)

NATKIN

A continuation of the weekly seminar to discuss controversial treatment problems and difficult diagnostic cases. Prerequisites, 582, 583, 584.

## 591, 592, 593 Clinical Practice Teaching (1,1,1)

STEINER

A closely supervised experience in teaching clinical endodontics to the undergraduate dental student. Prerequisites, 546, 547, 548, 576, 577, 578.

## 597, 598 Endodontics Teaching Seminar (2,2) W,W

GUILD

Weekly seminars devoted to an examination of general problems of teaching and learning and specific problems of endodontics teaching. Prerequisite, 597 for 598.

## 600 Research (\*)

An investigative program in one of the basic sciences under the direction of the departmental faculty. Prerequisite, permission.

## 700 Thesis (\*)

An investigative program carried out under the direction of a member of the Department staff by a student working toward the degree of Master of Science in Dentistry. The problem may be in one of the basic sciences or may have clinical application.

## PERSONNEL AND INDUSTRIAL RELATIONS

### Courses for Undergraduates

#### 301 Industrial Relations (3) AWSpS

FENN, FRENCH, PETERSON, SUTERMEISTER, WOODWORTH

The recruitment, selection, utilization, and development of human resources, with special emphasis on union management relations and relevant behavioral science research. Not open for credit to students who have taken 310.

#### 310 Personnel Management (5) WSpS

FENN, FRENCH, PETERSON, SUTERMEISTER, WOODWORTH

Philosophy and procedures in obtaining and maintaining an efficient work force, with emphasis on the methods of initiating and carrying out an effective personnel program. Not open to Business Administration students for credit, or to those who have taken 301.

#### 345 Personnel Methods and Theory I (3)

SUTERMEISTER, WOODWORTH

Job analysis, job evaluation, and wage surveys, wage and salary administration; performance standards, performance evaluation; employee services and fringe benefits. Prerequisite, 301 or 310. (Offered twice yearly.)

#### 346 Personnel Methods and Theory II (3)

FENN, PETERSON

Recruitment, selection, interviewing, testing, placement, training, research, and statistics. Prerequisite, 301 or 310. (Offered twice yearly.)

#### 450 Industrial Relations Administration (5) AWSp

FRENCH, PETERSON, WOODWORTH

Cases, lectures, and collective bargaining simulation are used to develop administrative skill in dealing with unions. Subjects covered are: nature of unions, institutional forces conditioning collective bargaining practices, and administrative practices dealing with unions.

#### 499 Undergraduate Research (3, max. 9) AWSp

Prerequisite, permission.

### Courses for Graduates Only

#### 520 Seminar in Personnel and Industrial Relations (3)

SUTERMEISTER, WOODWORTH

Problems and policies in personnel and industrial relations are analyzed in the following areas; personnel philosophy, ethics, role of personnel department, breadth of personnel department's responsibilities, implementation of personnel program, collective bargaining, and contribution of personnel department to the organization. Prerequisite, permission. (Offered twice yearly.)

#### 521 Current Problems in Personnel and Industrial Relations (3)

FRENCH, WOODWORTH

Depth analysis of the utility, reliability, and validity of current and proposed personnel devices and systems in staffing, directing, appraisal, compensation, training and development, and collective bargaining. Prerequisite, permission. (Offered twice yearly.)

#### 571-572 Research Reports (3-3) AWSpS

See Accounting for description.

#### 604 Research (\*, max. 10) AWSpS

Prerequisite, permission.

#### 700 Thesis (\*) AWSpS

#### 702 Degree Final (6) AWSpS

Limited to students completing a nonthesis degree program.

## PHARMACEUTICAL CHEMISTRY

### Courses for Undergraduates

#### 237, 238, 239 Organic Pharmaceutical Chemistry (3,3,3) A,W,ASp

HUITRIC, MCCARTHY

The chemistry of the carbon compounds. Prerequisite, Chemistry 170.

#### 248, 249 Organic Pharmaceutical Chemistry Laboratory (3,3) W,Sp

HUITRIC, NELSON

Laboratory study of the reactions and the identification of organic compounds. Prerequisites, 238 for 248, which may be taken concurrently, and 239 for 249, which may be taken concurrently.

#### 301 Bibliography Technique (2) A

MCCARTHY

Use of scientific literature, preparation of abstracts, and assignments in selected pharmaceutical topics.

#### 325 Quantitative Pharmaceutical Analysis (5) A

KRUPSKI, MCCARTHY

Principles of volumetric and gravimetric analysis with special emphasis on medicinal compounds. Prerequisite, Chemistry 170.

#### 326 Quantitative Pharmaceutical Analysis (5) W

KRUPSKI, MCCARTHY

Physicochemical and special methods used in pharmaceutical analysis. Prerequisite, 325.

#### 430 Inorganic Medicinal Products (3) Sp

MCCARTHY, ORR

Classification, nomenclature, physical and chemical properties of inorganic medicinal compounds; and a discussion of radioactive medicinal products. Prerequisite, Chemistry 170.

#### 440, 441, 442 Medicinal Chemistry (3,3,3) A,W,Sp

FISCHER, KRUPSKI, NELSON

Nomenclature, classification, synthesis, properties, structure, and activity of medicinal products. Prerequisite, 239.

#### 460 Mechanism of Drug Action (3) A

NELSON

Consideration of factors concerning availability of drugs at active sites, e.g., transport, sites of loss, and drug latentiation; molecular mechanisms of drug action; topics in drug design. Prerequisites, 442, Biochemistry 442 or 406, Pharmacology -443 or -302, or permission.

#### 480 Advanced Medicinal Chemistry Laboratory (3) A

HUITRIC

Synthesis of important medicinal products. Prerequisite, permission. (Offered alternate years; offered 1968-69.)

#### 497 Toxicology (2) Sp

FISCHER

A study of poisons, their action, and the treatment of conditions produced by them. Prerequisite, 239.

#### 499 Undergraduate Research (\*, max. 6) AWSp

FISCHER, HUITRIC, KRUPSKI, MCCARTHY, NELSON

Research problems in pharmaceutical chemistry. Prerequisite, cumulative grade-point average of 2.50 and permission.

## Courses for Graduates Only

### 511, 512, 513 Advanced Pharmaceutical Chemistry (3,3,3) A,W,Sp

KRUPSKI

Chromatography, gas chromatography, ion exchange, and the use of various instruments for scientific investigations and vitamin determinations. (Offered every third year; offered 1967-68.)

### 520 Seminar (1, max. 5) AWSp

Graduate students attend seminars and make one formal presentation per year while in residence; 1 credit per year is allowed.

### 521, 522 Advanced Medicinal Chemistry (3,3) W,Sp

HUITRIC

Application of integrated data from the physical and biological sciences to problems of chemotherapy, including transport of drugs to site of action, biotransformation of drugs, interaction of drugs with enzyme systems, and recent advances in drug design. Prerequisites, Chemistry 457, 531, and Biochemistry 442, or permission. (Offered alternate years; offered 1967-68.)

### 531, 532, 533 Plant Chemistry (3,3,3) A,W,Sp

MCCARTHY

Alkaloids, volatile oils, steroids, and glycosides, including methods of isolation, proof of structure, configuration, conformation and synthesis, with emphasis on materials of pharmaceutical interest. (Offered every third year; offered 1968-69.)

### 600 Research (\*) AWSp

FISCHER, HUITRIC, KRUPSKI, MCCARTHY, NELSON

### 700 Thesis (\*) AWSp

## PHARMACOGNOSY

### Courses for Undergraduates

### 312, 313, 314 General Pharmacognosy (4,4,4) A,W,Sp

BRADY

The study of natural products of plant and animal origin as important pharmaceuticals. Sources, processes of isolation and general fundamental properties are described. Prerequisites, Pharmaceutical Chemistry 239, Botany 111, and Zoology 112 or an equivalent course in biology, Microbiology 301, Biochemistry 406.

### 405 Advanced Pharmacognosy (3) W

A laboratory course covering advanced techniques in pharmacognosy.

### 406 Medicinal Plants (2) ASp

Problems in drug plant cultivation and commerce, with considerable field work in the Drug Plant Gardens. Emphasis is placed upon alkaloid-, glycoside-, and oil-yielding plants.

Weedicides and insecticides are included. Prerequisite, 314 or permission.

### 411 Hormones and Glandular Products (2) W

BRADY

An advanced study of pharmaceutical products derived from animal exocrine and endocrine glands, with emphasis upon hormones and their chemical and physiological role as drugs. Prerequisites, 314, and Physiology and Biophysics 360 or equivalent.

### 499 Undergraduate Research (\*, max. 6) AWSp

BRADY

Research problems in pharmacognosy. Prerequisite, cumulative grade-point average of 2.50 and permission.

## Courses for Graduates Only

### 520 Seminar (1, max. 5) AWSp

Graduate students must attend seminars and make one formal presentation per year while in residence; 1 credit per year is allowed.

### 581 Topics in Pharmacognosy (1, max. 2) AWSp

BRADY

Discussions and readings of topics of current interest in the field of pharmacognosy. Subject matter changes from year to year. Prerequisite, reading knowledge of German.

### 600 Research (\*) AWSp

BRADY

### 700 Thesis (\*) AWSp

## PHARMACOLOGY

### 234 General Pharmacology (4) Sp

The action of drugs on physiological functions, with special emphasis on agents which are important in the practice of dentistry. Laboratory experiments and demonstrations of the action of drugs. For dental students.

### 300 Principles of Drug Action (3) W

WEST

Current concepts of the actions and effects of therapeutic and toxic chemicals. Prerequisites, Chemistry 231, 232, Biology 101-102 or Zoology 112, or permission.

### 301-302 General Pharmacology (4-5) W,Sp

Emphasis is placed upon the rational therapeutic use of drugs. Contra-indications for interactions and toxic effects of drugs are delineated and their sites and mechanisms of action stressed. Laboratory experiments and demonstrations are designed to illustrate these phenomena. For pharmacy students. Prerequisites, Physiology and Biophysics 360 and Chemistry; Pharmaceutical Chemistry 239.

### 442-443 General Pharmacology (5-4) A,W

The action of drugs, with emphasis on their basic mechanisms and their application to the relief and treatment of disease. Toxicological manifestations of excessive doses of drugs; management and treatment of these poisonous effects. Laboratory experiments and demonstrations. Required for second-year medical students. Prerequisite for graduate students, a major or a minor in pharmacology.

### 498 Undergraduate Thesis (\*) AWSp

For medical students. Prerequisite, permission.

### 499 Undergraduate Research (\*) AWSp

Participation in departmental research projects. For medical students. Prerequisite, permission.

## Courses for Graduates Only

### 507 Pharmacology Seminar (1) AWSp

Presentation of comprehensive reports on recent medical and scientific literature in fields of current importance. Research progress reports, and reports on results of completed research. Prerequisite, permission.

### 509 Introduction to Pharmacological Research (3) A

DILLE

Principles, concepts, and methods for the investigation of the effects of chemicals on biological systems. Elective for medical students. Prerequisite, permission.

### 511 Special Pharmacological Techniques (3) W

A laboratory treatment of biochemical, biophysical, and surgical approaches employed in pharmacological investigation. Elective for second-year medical students. Prerequisites, 442-443 or 301-302 or 234, and permission.

### 525 Cardiovascular Pharmacology (2) A

WEST

A didactic consideration of drug action on electrical and mechanical events in the heart and vascular system with clinical correlation. Open to medical students. Prerequisites, 442-443 or 301-302 or 234, and permission. (Offered alternate years; offered 1968-69.)

### 526 Autonomic Pharmacology (2) W

HORITA

An advanced treatment of pharmacologic effects on storage, release, and action of autonomic transmitter substances. Open to medical students. Prerequisites, 442-443 or 301-302 or 234, and permission. (Offered alternate years; offered 1968-69.)

### 527 Biochemical Pharmacology (2) Sp

WEBER

Biochemical considerations of the mechanisms of action, structure-activity relationships, and metabolism of pharmacologic agents. Open to medical students. Prerequisites, 442-443 or 301-302 or 234, and permission. (Offered alternate years; offered 1968-69.)

# PHARMACOLOGY

## 528 Neuropharmacology (2) A

HALPERN

The pharmacology of the central nervous system. Open to medical students. Prerequisites, 442-443 or 301-302 or 234, and permission. (Offered alternate years; offered 1967-68.)

## 529 Psychopharmacology (2) W

HOLLIDAY

The principles and methods of determining the action of drugs modifying human behavior. Open to medical students. Prerequisites, 442-443 or 301-302 or 234, and permission. (Offered alternate years; offered 1967-68.)

## 531 Toxicology (2) Sp

LOOMIS, DIXON

A descriptive treatment of harmful effects of chemicals on biological tissue and chemical analytical aspects of forensic medicine. Open to medical students. Prerequisites, 442-443 or 301-302 or 234, and permission. (Offered alternate years; offered 1967-68.)

## 600 Research (\*) AWSp

Participation in research projects already set in progress by members of the Department staff. Directed experience in research investigation. Prerequisites, 443 and permission.

## 700 Thesis (\*) AWSp

# PHARMACY AND PHARMACY ADMINISTRATION

## Courses for Undergraduates

### 204 Orientation and History (2 or 3) ASp

ORR

A study of the profession of pharmacy, its development and its literature. A laboratory, required only of freshmen, in basic pharmaceutical manipulations. Without laboratory, 2 credits; with laboratory, 3 credits.

### 318 Pharmaceutical Accounting (5) W

LORIG

Basic principles of accounting as used in pharmacy, with emphasis on state and federal taxes and deductions, and on fiscal reports for comparing business trends under accepted business procedures.

### 331, 332, 333 General and Physical Principles (4,4,4) A,W,Sp

HAMMARLUND

A study of pharmaceutical dosage forms including processes, physical principles and metrology involved in their preparation. Prerequisites, Physics 115 and 118, Microbiology 301, and Pharmaceutical Chemistry 239.

### 352 Pharmacy and Therapeutics (3) Sp

J. PLEIN

Principles of pharmacy; mathematics of pharmacy; pharmacological and therapeutic action of drugs. For nonmajors.

### 407, 408, 409 Pharmacy in Dispensing Practice (4,3,3) A,W,Sp

HALL

The dispensing of medication on prescription and on direct order of the consumer. Topics include specialized compounding techniques, biopharmaceutics, classification and evaluation of drug products. Prerequisites, 333 and Pharmacology-302.

### 410 Clinical Dispensing Pharmacy (1) AWSp

E. PLEIN

Compounding and dispensing of prescriptions originating in the Student Health Service (Hall Health Center) and University Hospital. Laboratory work is under direct supervision of Student Health Service pharmacist and University Hospital pharmacists.

### 412 Drug Products for Autotherapy (2) S

HALL

Self-medication as a public health problem. An analytical study of the use and abuse of non-prescription remedies by the general public. Prerequisite, 408.

### 420 Manufacturing Pharmacy (3) AW

E. PLEIN

A study of the techniques and equipment in preparing pharmaceutical products on a small plant scale basis. Prerequisites, 333 and fifth-year standing.

### 450 Pharmacy Laws (3) A

RISING

A study of the laws regulating the practice of pharmacy. These include federal, state, and municipal laws, and professional ethics. Prerequisite, fifth-year standing.

### 451 Specialized Pharmaceutical Practice (3) W

RISING

A study of several areas of specialized practice in pharmacy. Important examples are veterinary pharmacy, dental pharmacy, pediatric pharmacy, ophthalmologic pharmacy, and podiatric pharmacy. Prerequisite, fifth-year standing.

### 452 Professional Management (3) Sp

RISING

A study of the special problems involved in the management of the professional phases of pharmacy at the retail or manufacturing level. Their integration with over-all managerial procedures is stressed. Prerequisite, fifth-year standing.

### 483 Hospital Pharmacy (3-5) AWSp

E. PLEIN

Introduction to hospital pharmacy. Principles and techniques of hospital pharmacy operation. Laboratory work is conducted in pharmacies of University Affiliated Hospitals. Prerequisite, permission.

### 499 Undergraduate Research (\*, max. 6) AWSp

HALL, HAMMARLUND, E. PLEIN, RISING

Pharmaceutical research problems. Prerequisites, cumulative grade-point average of 2.50 and permission.

## Courses for Graduates Only

### 510 Topics in Pharmaceutics (3, max. 6) Sp

HALL, HAMMARLUND, E. PLEIN

Reading, conference, and laboratory work in physical pharmacy and biopharmaceutics. Prerequisite, permission.

### 520 Seminar (1, max. 5) AWSp

Graduate students must attend seminars and make one formal presentation per year while in residence; 1 credit per year is allowed.

### 560 Manufacture of Sterile Pharmaceuticals (4) W

E. PLEIN

The technology of parenteral preparations, ophthalmic solutions and ointments, and specific problems in formulation of sterile pharmaceuticals. (Offered alternate years; offered 1967-68.) Prerequisite, permission.

### 570 Hospital Pharmacy Administration (5) Sp

E. PLEIN

The organization and administration of the hospital pharmacy and the responsibility of the director of pharmacy services in a hospital. (Offered alternate years; offered 1967-68.) Prerequisite, permission.

### 580 Advanced Manufacturing Pharmacy (5)

E. PLEIN

A study of the methods of manufacture of pharmaceutical preparations on a semi-commercial scale. (Offered alternate years; offered 1968-69.) Prerequisite, Chemistry 457, or taken concurrently, and permission.

### 600 Research (\*) AWSp

HALL, HAMMARLUND, E. PLEIN, RISING

### 700 Thesis (\*) AWSp

## PHILOSOPHY

## Courses for Undergraduates

### 100 Introduction to Philosophy (5) AWSp

Reading and discussion of writings of the great philosophers on issues of lasting importance. Nature and limits of knowledge; the appeals to reason and experience. Relations of science and religion; naturalism and supernaturalism. Conceptions of reality; materialism, idealism, and skepticism. Conceptions of morality; the appeals to duty and happiness. Conflict of social ideals.

### 110 Introduction to Social Ethics (5) W

RADER

The nature of a good social order and right social action. The rival ideals of aristocracy, fascism, liberalism, and socialism, with emphasis upon the nature and ideals of democracy.

### 120 Introduction to Logic (5) AWSp

Deductive and inductive logic; conditions of clear statement and valid reasoning; propositions, contradiction, definition, inference, types of argument, detection and avoidance of fallacies; probability and the methods by which theories and laws are established in daily life and in the sciences. Application of logic to other fields.

**200 Types of Philosophy (5)**

An introduction to metaphysics and epistemology. A study of the contrasting positions of major philosophers.

**215 Introduction to Ethics (5) A**

MISH'ALANI

Systematic study of typical analyses of the distinction between good and evil, right and wrong. The appeals to custom, theology, reason, human nature, and happiness as standards for solution of moral problems. Readings in Plato, Hume, Kant, Bentham, and Mill.

**230 Philosophic Issues in World Affairs (2)**

Philosophic issues in the conflict between soviet and liberal interpretations of democracy, and the bearing of these differences on world order. Ideals of the more neutralist nations. Philosophical basis of a world order. (Alternates with 231.)

**231 Philosophy of Human Rights (2)**

RADER

Historical development of the concept of human rights with particular attention to original sources. (Alternates with 230.)

**267 Introduction to Philosophy of Religion (5)**

DIETRICHSON

A study of Western religious thought. Examination of the problem of evil, the nature of mysticism, atheism, theism, and the relationship between religion and morality.

**320 History of Ancient Philosophy (5) A**

KEYT

The pre-Socratics; Plato and Aristotle; the Stoics, Epicureans, and Skeptics; Plotinus.

**321 History of Medieval Philosophy (5) A**

BOLER

Development of main lines of philosophical thought in the Latin West from 400-1400, with emphasis on Augustine, Anselm, Abelard, Aquinas, and Occam. Prerequisite, 320 or permission.

**322 History of Modern Philosophy (5) W**

SMULLYAN

Development of philosophical ideas from beginning of the Renaissance through the Continental Rationalists, the British Empiricists, and Kant.

**325 History of Nineteenth-Century Philosophy (5) W**

STERN

Post-Kantian idealism: Fichte, Schelling, Hegel, and Schopenhauer. Development of absolute idealism in England. Resurgence of empiricism in England and America. Prerequisite, 322 or permission.

**326 History of Recent Philosophy (5) Sp**

MISH'ALANI

A survey of the main problems in Philosophical Analysis from the English Realist reaction against Idealism to the present. Prerequisite, 120 or permission.

**347 Philosophy in Literature (3)**

STERN

Study of philosophical ideas expressed in great works of literature.

**348 Philosophy in the Romantic Poets (2) W**

RADER

A study of the philosophical ideas implicit in the great poetry of the Romantic Period.

**370 Intermediate Logic (5) A**

KEYT

The notation, basic notions, and proof techniques used in symbolic logic.

**410 Social Philosophy (5)**

SMITH

Philosophical theories of the nature of society. The epistemological, metaphysical, and ethical issues in the conflict between individualism and collectivism.

**412J Indian Philosophy (3)**

GEROW

A survey of the leading Indian traditional schools of philosophy and theology, with emphasis on the origins and growth of Vedānta. Offered jointly with the Far Eastern and Russian Institute.

**414 Philosophy of Law (3)**

SMITH

Nature and function of law. Relation of law to morality. Logic of legal concepts. Prerequisite, 110 or 215, or permission.

**415J History of Chinese Philosophy (5) A**

SHIH

Development of Chinese philosophy from the sixth century B.C. to modern times. Emphasis on Confucianism, Mohism, Taoism, Legalism, the Dialecticians, Buddhism, and Neo-Confucianism; re-evaluation of them in the light of new trends of thought after contact with the West. Offered jointly with the Far Eastern and Russian Institute.

**416J Neo-Confucianism (5) W**

SHIH

Systematic study of Neo-Confucianism, its background and development with emphasis on the Rationalistic school of Ch'eng-Chu and the Idealistic school of Lu-Wang. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, 415J or permission.

**421 Studies in Medieval Philosophy (3, max. 9) W**

BOLER

Detailed study of an individual figure or problem in Medieval Philosophy (of the Latin West), selected by the instructor. Prerequisite, 321.

**424 American Philosophy (3) Sp**

BOLER

The philosophies of Pierce, Royce, Dewey, James, and Santayana. Recent developments in analytic and speculative philosophy. Current issues and problems. Prerequisite, 322 or permission.

**431 Philosophy of Plato (3)**

KEYT

A reading of selected middle and late dialogues. (Alternates with 433.) Prerequisite, 320 or permission.

**433 Philosophy of Aristotle (3)**

KEYT

A study of the Aristotelian system with emphasis on two major works. (Alternates with 431.) Prerequisite, 320 or permission.

**436 British Empiricism (3)**

Development of empiricism in writings of Locke, Berkeley, and Hume. Detailed attention to application of empiricist views of origin and nature of ideas to the problems of substance, self, nature, causation, mathematics, and induction. Prerequisite, 322 or permission.

**437 Philosophy of Hume (3)**

Study of principles and methods employed by Hume in elaboration of his system of philosophy, comprising his analyses of knowledge, the passions, and morals. Prerequisite, 322 or permission.

**438 Philosophy of Kant (3)**

SMULLYAN

A systematic study of *The Critique of Pure Reason*. Prerequisite, 322 or permission.

**439 The Later Philosophy of Wittgenstein (3) Sp**

MARKS

A detailed study of topics in the later philosophy of Wittgenstein. Particular attention will be directed to the *Philosophical Investigations*. Prerequisite, 322 or permission.

**440 Advanced Ethics (3) W**

MISH'ALANI

A critical examination of the concepts and judgments of value, including an analytical treatment of the notions of right and wrong, obligation, good and evil, and the relationship between ethical and aesthetic value. Prerequisite, 215 or permission.

**445 Philosophy of Art (5) W**

MOULTON

A critical examination of characteristic accounts of the nature of art, artistic activity, the aesthetic experience, and the artist and his art in relation to society. The philosophy of criticism: the role of the critic, and problems in interpretation and evaluation of works of art.

**446 Development of Aesthetic Theory (5) Sp**

RADER

The historical development of aesthetics, emphasizing such major figures as Plato, Aristotle, Plotinus, Hume, Kant, and Hegel. Prerequisite, 100 or 445, or permission.

**447 Philosophy of Literature (3)**

STERN

Inquiry into concepts, values, and presuppositions necessary for the creation of traditional literary forms of epic, dramatic, and lyric poetry.

# PHILOSOPHY

## 450 Epistemology (3) A

SMULLYAN

Problems in the theory of knowledge, the nature, possibility, criteria, and limitations of knowledge; critical evaluation of subjectivism and realism, dogmatism and skepticism, intuitionism, pragmatism, empiricism, rationalism, and positivism; theories of meaning, truth, and perception; synthesis of various positions around the scientific method. Prerequisite, 100.

## 453 Philosophy of Language (5) A

MOULTON

Theories of meaning, reference, predication, and related concepts. Typical authors include Frege, Russell, Strawson, and Austin. Prerequisite, 120 or permission.

## 456 Metaphysics (5) Sp

DIETRICHSON

A critical examination of alternative metaphysical theories on such topics as the nature of substance, causality, the self, freedom, space, time, monism, pluralism. Prerequisite, one history of philosophy course, or permission.

## 458 Phenomenology (3) Sp

STERN

The contribution of phenomenology to selected topics in the theory of meaning, philosophy of mind, ontology, and epistemology.

## 460 Introduction to the Philosophy of Science (5) Sp

CLATTERBAUGH

Concepts and methods fundamental in mathematics and in physical and social sciences. Relations of the sciences to each other as well as to ethics, religion, and philosophy. Speculations on the nature of the world suggested by past and present scientific theories. Operationalist tendencies in recent interpretations of science. Prerequisite, 100 or 120.

## 463 Philosophy of Mind (3)

MARKS

Theories of the nature of mind, the relation between mind and body, the self, memory, the unconscious, introspection, and our knowledge of other minds. Prerequisite, 100.

## 465 Philosophy of History (5)

RADER

Analyses of basic concepts employed in historical interpretation, and some of the principal philosophers of history: Plato, St. Augustine, Hegel, Marx, Spengler, Toynbee, etc.

## 467 Philosophy of Religion (5)

DIETRICHSON

A critical examination of three approaches to religion: reason, intuition, faith. Prerequisite, one history of philosophy course, or 267, or permission.

## 469 Existentialist Philosophy (3) W

DIETRICHSON

A critical study of major ideas in the philosophies of Kierkegaard, Heidegger, Sartre, and

Marcel. Prerequisite, 322 or 325 or 326, or permission.

## 470 Advanced Logic (5) W

KEYT

Symbolic logic; deductive systems; types of order; infinity; propositions, classes, and relations; logical paradoxes and theory of types; critical examination of logical doctrine and analytic methods on philosophical questions.

## 480H Philosophical Studies (2, max. 4)

Discussion and the writing of philosophical essays on advanced topics. The reading materials vary from year to year. For selected junior and senior honors students only.

## 484 Reading in Philosophy (1-4, max. 12) AWSp

Reading of approved philosophical works. (The name of the staff member with whom research will be done must be indicated in registration.) Prerequisite, permission.

## 490 Philosophy of Leibniz (3)

An examination of the basic principles employed by Leibniz in the development of his systematic philosophy. Attention is given to the importance of Leibniz for the historical development of logic, the theory of knowledge, the philosophy of science, and metaphysics. Prerequisite, 322 or permission.

## 491 Philosophy of Spinoza (3)

A detailed analysis of the *Ethics* of Spinoza.

## Courses for Graduates Only

### 514 Seminar in Legal Philosophy (3, max. 12) Sp

### 520 Seminar in Ancient Philosophy (3, max. 12)

KEYT

### 521 Seminar in Medieval Philosophy (3, max. 12)

BOLER

### 522 Seminar in Modern Philosophy (3, max. 12)

### 526 Seminar in Recent Philosophy (3, max. 12)

### 540 Seminar in Ethics (3, max. 12)

RICHMAN

### 545 Seminar in Philosophy of Art (3, max. 12)

### 550 Seminar in Epistemology (3, max. 12)

SMULLYAN

### 556 Seminar in Metaphysics (3, max. 12)

## 565 Seminar in Philosophy of History (3, max. 12)

RADER

## 567 Seminar in Philosophy of Religion (3, max. 12)

DIETRICHSON

## 570 Seminar in Logic (3, max. 12) Sp

KEYT

## 584 Reading in Philosophy (1-4, max. 12) AWSp

Intensive reading in the philosophical literature. (The name of the staff member with whom research will be done must be indicated in registration.) Prerequisite, permission of the chairman.

## 587 Contemporary Analytic Philosophy (3, max. 12)

RICHMAN

## 600 Research (1-6) AWSp

Prerequisite, permission.

## 700 Thesis (\*) AWSp

## PHYSICAL AND HEALTH EDUCATION

### PHYSICAL EDUCATION ACTIVITIES

#### 101 through 255 Physical Education Activities (Men) (1 each)

\$2.00 locker fee required unless otherwise specified.

101, adapted activities; 105, canoeing (\$3.00 per quarter); 106, handball; 107, basketball; 108, tennis; 109, softball; 110, golf (\$3.00 per quarter); 111, track; 112, rowing, prerequisite, swimming; 113, fencing; 114, boxing; 115, gymnastics; 117, wrestling; 118, volleyball; 120, soccer; 121, touch football; 122, badminton; 123, archery; 124, calisthenics (body conditioning); 126, aerial ball; 127, bowling (\$5.00 per quarter); 128, weight-training; 129, sailing; 130, Korean dance; 131, American folkdance; 132 international folkdance; 136, mountain climbing; 137, advanced mountain climbing; 138, ballet I; 139, contemporary dance II; 151, contemporary dance I; 153, contemporary dance III; 154, social dance; 156, beginning swimming; 157, intermediate swimming; 158, advanced swimming; 159, springboard diving; 160, skin diving; 161, life saving; 162, water polo; 208, intermediate tennis; 215, intermediate gymnastics; 217, judo; 227, intermediate bowling (\$5.00 per quarter); 230, intermediate Korean dance; 238, ballet II; 239, ballet III.

141, freshman, 241, varsity, basketball; 142, freshman, 242, varsity, crew; prerequisite, swimming; 143, freshman, 243, varsity, football; 144, freshman, 244, varsity, track; 145, freshman, 245, varsity, swimming; 146, freshman, 246 varsity, baseball; 147, freshman, 247, varsity, tennis; 148, freshman, 248, varsity, golf; 149, freshman, 249, varsity, skiing; 150, freshman, 250, varsity, volleyball; 152, freshman, 252, varsity, gymnastics; 155, freshman, 255, varsity, wrestling.

## 105 through 162; 215 through 267 Physical Education Activities (Women) (1 each)

105, orientation to physical education; 110, special physical education activity; 111, adapted activities; 112, basic activities (general); 114, basic activities (applied); 115, archery; 118, badminton; 119, body conditioning; 121, bowling (\$5.00 per quarter); 124, fencing; 125, canoeing (\$3.00 per quarter); 126, golf (\$1.50 per quarter); 128, riding; 129, sailing; 130, Korean dance; 131, ski conditioning; 132, elementary skiing; 133, tumbling and apparatus; 134, rebound tumbling; 135, tennis; 136, mountain climbing; 137, advanced mountain climbing; 140, ice skating; 141, basketball; 142, field sports; 143, hockey; 144, softball; 145, volleyball; 148, American folk dance; 149, international folk dance; 151, contemporary dance I; 152, contemporary dance II; 153 contemporary dance III; 154, social dance; 155, jazz dance; 156, ballet I; 157, ballet II; 158, ballet III; 160, adapted swimming; 161, beginning swimming; 162, elementary swimming; 215, intermediate archery; 218, intermediate badminton; 221, intermediate bowling; 222, advanced bowling; 224, intermediate fencing; 228, intermediate riding; 230, intermediate Korean dance; 231, intermediate skiing; 232, advanced skiing; 235, intermediate tennis; 240, intermediate ice skating; 257, intermediate canoeing; 263, intermediate swimming; 264, advanced swimming; 265, aquatic art; 266, diving; 267, lifesaving.

## PROFESSIONAL AREAS

### DANCE

(See also courses listed under Dance.)

### 278 Intermediate Folk Dance (Men and Women) (3) Sp

Prerequisite, 148 or permission.

### 282 Fundamentals of Rhythm (Women) (2) W

HORNE

Understanding of fundamental rhythm concepts and their application in the development of technique and style in basic dance forms.

### 283 Contemporary Dance (Women) (2) A

Understanding of fundamental rhythm concepts and their application in the development of technique and style in contemporary dance forms.

### 309 The School Dance Program: Secondary (Men and Women) (2) Sp

HORNE

Practice in basic skills in folk, square, and ballroom dancing; methods and opportunity for presentation, including "calling"; source materials; organization of coeducation dance program. Prerequisite, junior standing or permission.

### 310 Traditional Dance Forms (Men and Women) (2½) S

HORNE

Dance and rhythmic activities appropriate for

older children; folk and ethnic dance, American traditional dances, and creative forms of dance.

### 311 Rhythmic Activities for Small Children (Women) (2) S

Activities suited to the kindergarten and primary child. Educational value, significance in child growth and development, and methods of presentation.

### 355 Dance Composition (Men and Women) (2, max. 6) Sp

Practice in modern dance; analysis of choreography; creative work. Prerequisite, 151 or permission.

### 364 History of Dance (Men and Women) (3) Sp

Survey of the function and form of dance from primitive culture to its present art form with emphasis on Western Civilization.

### 377 Methods in Physical Education III (Women) (6) A

HORNE

Methods and materials in ballroom, folk, square, tap, and contemporary dance. Prerequisites, Dance 282, 283, Physical Education 375, or permission.

## HEALTH EDUCATION

### 250 Contemporary Health Concepts (Men and Women) (2) AWSp

GAINES, MILLS, REEVES

Investigation of contemporary health problems and the scientific concepts and knowledge essential to the comprehension and solution of these problems within society.

### 291 Personal and General Hygiene (Men and Women) (3) WSp

GAINES, MILLS, REEVES

Advanced course designed for the professional student in health and physical education areas. Prerequisite, Health Education 250 or equivalent, sophomore standing, or permission.

### 292 First Aid and Safety (Men and Women) (3) AWSp

HENDERSHOTT, MACLEAN, REEVES, STEILBERG

The student may meet requirements for both Standard and Advanced American Red Cross First Aid Certification. Includes safety education in schools.

### 429 Methods in Teaching First Aid and Safety (Men and Women) (3) A (Women); ASp (Men)

MACLEAN, REEVES

American Red Cross, Standard, Advanced, and Instructor's First Aid Certification awarded. Prerequisite, junior standing or permission.

### 451 Health Education for the Classroom Teacher (Men and Women) (2½) S

Health instruction in elementary schools, including subject matter, source material, and methods of instruction.

### 453 Methods and Materials in Health Teaching (Men and Women) (3) A

GAINES

Health instruction in elementary and junior and senior high schools, including subject matter, source material, and method. Prerequisites, Health Education 291, Zoology 118, 118L or 208, or permission.

### 454 Curriculum Development and Evaluation in Health Education (Men and Women) (2-3) Sp

GAINES

Development and evaluation of objectives in health education. Content determination and progression at all levels of instruction. Evaluation tools and their utilization in health education. Prerequisite, Health Education 453 or permission.

### 465 The School Environmental Health Program (Men and Women) (3) W

MILLS, REEVES

Schoolroom construction; lighting, heating, ventilation; sanitation of spaces; selection and location of equipment; medical inspection and supervision; communicable disease; the school lunch; fatigue, rest, and play. Prerequisites, Health Education 291, Preventive Medicine 461, or equivalents.

### 498 Special Studies in Health Education (Men and Women) (2-6, max. 6) AWSp

Prerequisite, permission.

## PHYSICAL EDUCATION

### 164 Skills and Materials in Aquatics (Men) (2) A

TORNEY

### 165 Skills and Materials in Gymnastics (Men) (2) W

SCHWARZKOPF

### 166 Skills and Materials in Team Sports (Men) (2) Sp

HENDERSHOTT

### 190 Introduction to Physical and Health Education (Men) (2) A

MILLS

Survey of and orientation to the professional fields of physical education, health education, recreational leadership, and coaching. History and philosophies; personnel qualifications, training and preparation; opportunities; organizations; related fields.

### 264 Skills and Materials in Track and Field and Weight Training (Men) (2) A

HUGHES

### 265 Skills and Materials in Low-Organized Games (Men) (2) W

STEILBERG

### 266 Skills and Materials in Individual Sports (Men) (2) Sp

PARISEAU

# PHYSICAL AND HEALTH EDUCATION

## 271 Field Sports (Women) (2) A

MACLEAN

Fundamentals of women's field sports.

## 272 Fundamentals of Movement (Women) (2) A

FOX

Development of understanding of fundamental concepts of human movement.

## 273 Individual Sports (Women) (2) Sp

Development of an understanding of individual and dual projectile activities through the application of mechanical principles and common movement patterns.

## 280 Introduction to Physical and Health Education and Recreational Leadership (Women) (2) W

Survey of the fields of health education, physical education and recreational leadership; an introduction to the history, philosophy, and literature of these fields.

## 281 Women's Gymnastics (Women) (2) W

MACLEAN

Understanding of gymnastic fundamentals and skills in women's basic gymnastic activities.

## 284 Aquatics (Women) (1) Sp

MACLEAN

Understanding of the mechanics of and development of skills in aquatic activities.

## 290 Officiating (Men) (2) W

HENDERSHOTT, MILLS, PARISEAU

Techniques of officiating football, basketball, track and field, swimming, tennis, volleyball, softball, and speedball.

## 293 Physiology of Muscular Exercise (Men and Women) (3) Sp

MILLS

Muscular efficiency, fatigue, recovery, chemical changes and neuromuscular control, with special reference to games, sports, corrective work, and body mechanics. Prerequisite, Zoology 118, or 208, or 358.

## 295 Water Safety Instructor Course (Men and Women) (2) Sp

BUCKLEY, MACLEAN

(W.S.I. certification) A course designed to prepare students for employment as teachers or administrators in the aquatic programs of camps, schools, beaches, recreation departments, the Armed Forces, and service organizations. Prerequisites for men, 158 or 161; for women, 267 and American Red Cross life-saving card; or permission for men and women.

## 304 Officiating (Women) (2) A

Techniques of officiating in volleyball, basketball; opportunity for national and local ratings. Prerequisite, junior standing or permission. (Offered alternate years; offered 1967-68.)

## 305-306 Officiating (Women) (1-1) A,W

(Offered alternate years; not offered 1967-68.)

## 312 Physical Fitness Activities for Children (Men and Women) (2½) S

Movement experiences which contribute to physical fitness and motor efficiency; performance standards as related to physical growth and development levels; criteria and techniques for evaluation of physical performance of children.

## 322 Kinesiology (Men and Women) (3) A

CUTLER

Analysis of leverage in body movements and problems of readjustment in relationship to body mechanics and to physical education activities. Prerequisites, 293 and Biological Structure 301.

## 336 Athletic Training and Conditioning (Men) (2) Sp

PETERSON, MARTY

Prerequisite, 292 or permission.

## 340 Administration of Intramural Sports (Men) (3) Sp

STEVENS

## 345 Principles of Physical Education (Men and Women) (3) A

TORNEY

Beliefs and facts which determine physical education objectives, policies, standards, and methods. Prerequisites, Zoology 118 or 208, or 358, Sociology 110, and Psychology 100.

## 358 Methods of Teaching Gymnastics (Men) (2) W

HUGHES, SCHWARZKOPF

Prerequisite, 165 or permission.

## 359 Workshop in Gymnastics (Men and Women) (3) S

HUGHES

Lectures, practice, and supervised teaching in gymnastics. Prerequisite, 358 or equivalent.

## 361 Methods of Teaching Wrestling (Men) (2) A

STEILBERG

Prerequisite, 264 or permission.

## 363 Methods of Teaching Sports (Men) (2) Sp

PEEK, STEILBERG

Organization, presentation, and evaluation of student lesson plans in teaching team sports in the school physical education program. Prerequisites, 164, 165, 166, 264, 265, 266.

## 364 Methods of Teaching Aquatics (Men) (2) Sp

TORNEY

Prerequisite, 164 or equivalent, or permission.

## 370 Coaching of Football (Men) (2) Sp

OWENS, TIPPS

## 371 Coaching of Basketball (Men) (2) A

DUCKWORTH

## 372 Coaching of Track and Field (Men) (2) W

HISERMAN

## 373 Coaching of Baseball (Men) (2) Sp

LEHMAN

## 374 Theory and Evaluation of Motor Learning and Performance (Women) (5) A

PURDY

Application of principles and techniques to motor learning and performance. Prerequisite, junior standing or permission.

## 375 Methods in Physical Education I (Women) (4) Sp

General methodology, methods in team and individual sports. Prerequisites, 141, 145, 271, 272, 273, 374, or permission.

## 376 Methods in Physical Education II (Women) (7) W

BROER, MACLEAN

Methods and materials in gymnastics, marching, stunts and tumbling, apparatus, aquatics. Prerequisites, 267, 272, 281, 284, 375, or permission.

## 435 Adapted Physical Education (Men) (3) Sp

CUTLER

Programs for atypical cases from the standpoint of individual needs. Prerequisites, 293, 322, and Zoology 118, or 208, or 358.

## 436 Adapted Activities (Women) (3) Sp

KIDWELL

A study of activities suited to the interests, capacities, and limitations of students with handicaps. Prerequisites, Zoology 118 or 208, or permission.

## 438 Developmental Motor Activities for the Exceptional Child (Men and Women) (3) Sp

WILLS

Principles of developmental motor activities and their applications in the education of the exceptional child. Prerequisites, 435, 436, Education 404, or permission.

## 447 Tests and Measurements (Men and Women) (3) W

CUTLER

Evaluative procedures in health and physical education; criteria for selection; formulation of a testing and measuring program.

## 450 The School Physical Education Program (Men and Women) (Men, 3; Women, 2) Sp (Women); W (Men)

PEEK, WILSON

Problems of organization and administration. Prerequisites for men, 345, senior standing, or permission; for women, majors or permission.



## N466 Coaching (Women) (0) AWP

Prerequisite, Physical Education 374.

## 478J Programs in Elementary Physical Education (Men and Women) (2½) S HORNE

Progress and problems in modern programs. Offered jointly with the College of Education.

## 480 Principles of Movement (Women) (3) Sp BROER, FOX, PURDY

The interpretation of the physical principles which make for efficient movement through the integration of physics, anatomy, kinesiology, and sport and dance techniques. Prerequisites, Biological Structure 301, or permission.

## 493 Problems in Athletics (Men) (3) Sp TORNEY

The place of interschool athletics in education. Control, finance, eligibility, safety measures, publicity, and public relations. Qualifications and duties of coaches, managers, and officials. Prerequisites, 345 and 450.

## 498, 498H Special Studies in Physical Education (Women) (2-3, max. 6) AWSp, AWSp BROER, PURDY

Prerequisite, permission.

## 499, 499H Undergraduate Research (Women) (2-3, max. 6) AWSp, AWSp BROER, PURDY

Prerequisite, permission.

## RECREATION EDUCATION

## 254 Recreation Resources (Men and Women) (2) AWSp KUNDE

Directed observations of recreational resources, including general and community, public schools, youth-serving agencies, hospitals, institutional, and industrial organizations.

## 304 Introduction to Recreation (Men and Women) (2) A KUNDE

Nature, function, and scope of organized recreation; historical background, philosophy, theories of play; leadership implications; organized play in the United States. Prerequisites, Sociology 101 and Psychology 100.

## 324 Recreation Programs (Men and Women) (3) W KUNDE

Lectures, demonstrations, and reading assignments for orientation in recreation skills and techniques suitable for various age groups; classifying, adapting, and utilizing materials. Prerequisites, 304 and 6 credits in recreation program competencies.

## 334 Conduct of Recreation (Men and Women) (2) W KUNDE

Leadership in operation of areas and facilities. Duties and responsibilities, personnel regula-

tions. Motivating and conducting a diversified program. Prerequisites, 324 and 8 credits in program competencies.

## 344 Organization and Administration of Camp Programs (Men and Women) (3) Sp

KIDWELL, KUNDE

The educational and social significance of camping; organization of activities and problems of administration. Prerequisites, men, junior; women, sophomore standing, Psychology 100, and Sociology 110, or permission.

## 354 Recreation Practicum (Men and Women) (3) AWSp KUNDE

Directed experience in recreational activities and program services for the enhancement of leadership techniques. Prerequisites, 304, 324, and 12 credits in recreation program competencies.

## 374 Social Recreation Leadership (Men and Women) (2) W KUNDE

Methods and materials in organizing programs for social recreation.

## 384 Camp Counseling (Men and Women) (3) S HUGHES

On-the-job experience in camp counseling. Students will be quartered at Camp Waskowitz, act in the capacity of camp counselors for select groups, and assist in the direction of evening and Sunday educational and social activities.

## 434 Administration of Recreation (Men and Women) (5) Sp KUNDE

Practices and procedures in management and operation of areas and facilities. Duties and responsibilities, personnel regulations and staff organization. Motivating and conducting a diversified program. Prerequisite, senior standing.

## 454 Recreation Internship (Men and Women) (6) AWSp (Women); ASp (Men) KIDWELL, KUNDE

On-the-job experience under agency executives and their supervisors for experiences in all phases of administration and supervision. Prerequisites, men: recreation majors with 135 credits and permission; women: senior recreation leadership majors.

## Courses for Graduates Only

## HEALTH EDUCATION

## 503 Seminar in Health Education (Men and Women) (3, max. 9) Sp GAINES

Prerequisites, 453, 465, or permission.

## 508 Administration of the School Health Program (Men and Women) (3) Sp REEVES

The interrelated functions of school health

services, safe and healthful school environment, health of the school personnel, the school day as related to the pupil's total health, and health and safety instruction in developing a total school health program. Consideration of health needs of school age groups, legal regulations, budgetary needs, personnel requirements, facility and resource needs, and administrative policies as they relate to effective organization of school health programs. Prerequisites, Health Education 291, 465, Preventive Medicine 461 or equivalent, or permission.

## PHYSICAL EDUCATION

## 501 Seminar in Physical Education (Men and Women) (3, max. 9) AW (Women); A (Men)

BROER, TORNEY, WILSON

Prerequisites, 345 and 450 or equivalents, or permission.

## 502 Problems in Physical Education (Men and Women) (2½, max. 7½) S Prerequisite, permission.

## 506 The Curriculum (Men and Women) (3) A KUNDE

Selection and organization of program content in relation to characteristics and needs of pupils and local conditions. Prerequisite, 345 or permission.

## 507 Supervision in Physical Education (Men and Women) (2½) S PEEK

Functions, supervisory organization, evaluation, workshops, in-service education, application of democratic leadership to specific program and personnel problems. Prerequisites, 345 and 450, or permission.

## 547 Seminar in Research Procedures (Men and Women) (3) A BROER, FOX

Prerequisite, 447 or equivalent, or permission.

## 580 Seminar in Human Performance I (Women) (3) AS PURDY

Analysis of gross human movement considered from the physiological bases of movement. Prerequisites, 322, 480, or permission.

## 581 Seminar in Human Performance II (Women) (3) WS WILLS

Analysis of gross human movement considered from the psychological bases of movement. Prerequisites, 322, 480, or permission.

## 600 Research (Men and Women) (2-5) AWSpS

## 700 Thesis (Men and Women) (\*) AWSpS

# PHYSICAL AND HEALTH EDUCATION

## RECREATION EDUCATION

### 504 Public Recreation (Men and Women) (3) Sp

KUNDE

Legal basis and responsibilities; internal organization; financial support and budgeting. The acquisition, construction, development, maintenance, and operation of areas and facilities. Personnel selection and management. Prerequisite, graduate standing.

### 524 Seminar in Community Resources for Recreation (Men and Women) (3) W

KUNDE

Functional analysis of integrated community recreation services. Experience in recreation fact-finding, analysis, and evaluation. Study of pertinent problems and needs in the field. Prerequisite, graduate standing.

## PHYSICAL MEDICINE AND REHABILITATION

### N107 Introduction to Occupational Therapy (0)

Orientation to occupational therapy as a paramedical specialty. Elementary concepts of treatment through activity and their application in various disability areas. Relationship of occupational therapy to allied specialties such as nursing, physical therapy, social work.

### 290 Pre-Occupational Therapy Clerkship (2) AWSp

Supervised observations and work with patients in local occupational therapy clinics concurrent with lectures on professional ethics and on elementary techniques of occupational therapy. Prerequisite, permission.

### 320-321 Medical Science (4-4) W,Sp Staff of Departments of Medicine, Obstetrics and Gynecology, Orthopedics, Pediatrics, Physical Medicine and Rehabilitation, Psychiatry, Radiology, Surgery

Lectures in medical science fields related to: general surgery, obstetrics and gynecology, internal medicine, neurology, physical medicine and rehabilitation, orthopedics, psychiatry, rheumatology, and roentgenology. Required for occupational therapy students and physical therapy students, others by permission.

### 332 Pathologic Physiology for Physical Therapists and Occupational Therapists (5) A

HARRIS

Emphasis on normal and pathologic physiology of the circulatory, respiratory, central nervous, and musculo-skeletal systems as basis for treatment in occupational therapy and physical therapy. Required for occupational therapy students and physical therapy students, others by permission. Prerequisites, Biological Structure 301, Zoology 208.

### 380 Occupational Therapy Theory I (2) W

LUCCI

Study of fundamentals applicable to all areas of occupational therapy; relationships of

physical therapy, occupational therapy, nursing, rehabilitation counseling, social service, and other allied services in carrying out the team concept of a complete rehabilitation program. Prerequisite, third year in occupational therapy.

### 408 Tests and Measurements (3) Sp

OLASON, STAFF

Methods of performing, recording, and interpreting test procedures used in physical therapy; measurement of joint motion, evaluation of muscle strength through manual tests, and posture evaluation. Laboratory. Required for physical therapy students, others by permission.

### 414 Psychological Aspects of Disability (2) W

FORDYCE

Psychological processes underlying adjustment to disability; application of conditioning techniques in patient therapy management; effects of intellectual and perceptual deficit on neuromuscular re-education. Required for physical therapy students, others by permission. Prerequisite, Psychology 100.

### 415 Professional Relations (2) A

TROTTER

Basic principles of medical ethics; history, scope of physical medicine and rehabilitation; relationships of physical therapy, occupational therapy, nursing, rehabilitation counseling, social service, and other allied services. Required for physical therapy students, others by permission.

### 416 Principles of Physical Therapy Administration (2) Sp

TROTTER

Basic principles of medical ethics, professional organizations and obligations of a physical therapist, and administration of a physical therapy department. Required for physical therapy students.

### 442 Advanced Kinesiology (3) Sp

LEHMANN

Study of joint motion and muscle function in relation to both the normal and abnormal state. Analysis is made of specific techniques employed in the field of physical medicine and rehabilitation. Required for occupational therapy and physical therapy students, others by permission.

### 444-445 Function of the Locomotor System (3- or 4-)-(-3 or -4) A,W

LEHMANN

Functions of musculo-skeletal system as applied to normal and pathologic patterns of motion. Emphasis on upper extremity, shoulder girdle, lower extremity, and trunk. Anatomy of peripheral-vascular and peripheral-nervous system. Required for occupational therapy students and physical therapy students, others by permission. Prerequisites, Biological Structure 301, Zoology 208.

### 444L-445L Anatomy Laboratory for Occupational Therapists (1-1) A,W

LUCCI

Study of musculo-skeletal, peripheral-vascular, and peripheral-nervous systems from pro-

sected material. Concurrent with 444-445. Required for occupational therapy students, others by permission.

### 448J Introduction to Vocational Rehabilitation (2) A

Oriented toward the role of a rehabilitation counselor as a professional worker. The history, background, scope and trends of vocational rehabilitation services. Field trips are utilized extensively to acquaint students with resources serving the disabled in the immediate community. Offered jointly with the College of Education.

### 451 Anatomy Dissection for Physical Therapists (4) Sp

JEBSEN, TROTTER

Dissection of musculo-skeletal, peripheral-vascular, and peripheral-nervous systems. Required for physical therapy students, others by permission.

### 461 Massage (2) W

OLASON

History of massage, methods of application, indications and contraindications, and physiological effects on various systems of the body. Laboratory. Required for physical therapy students.

### 463-464 Modality Treatments (4-4) W,Sp

OLASON

Theory, technique, demonstration, and practice in the use of the physical agents employed in physical therapy which include thermotherapy, actinotherapy, hydrotherapy, low-frequency and high-frequency currents. Required for physical therapy students.

### 466-467 Advanced Biophysical and Physiological Effects of Modalities (2-2) A,W

LEHMANN

Biophysical principles of equipment employed in physical therapy, physiological effects produced. Required for physical therapy students, others by permission.

### 468 Therapeutic Activities I (1-5) A

PETERSON

Laboratory study of materials and techniques in a variety of handicrafts as they are used in occupational therapy. Includes a study of the design and fabrication of splints, self-help devices, etc. Prerequisite, fourth year in occupational therapy.

### 469 Therapeutic Activities II (1-5) W

PETERSON

Laboratory survey of special skills used in occupational therapy (recreation skills, industrial activities, etc.) Adjusted to meet the needs of the individual student. Prerequisite, third year in occupational therapy.

# PHYSICAL MEDICINE AND REHABILITATION

## 470-471-472 Therapeutic Exercise (3-3-2)

A,W,Sp

TROTTER

Methods of application, physiologic and therapeutic effects of exercises commonly used for treatment purposes in physical therapy. Opportunities are provided for supervised clinical practice of skills, and special attention is given to correlation of technics to appropriate age level and handicap. New developments from the field are analyzed and evaluated. Required for physical therapy students.

## 475-476 Physical Restoration of the Disabled (3-2) A,W

OLASON, STAFF

Instruction in theory and methods of physical restoration of the severely handicapped patient. Laboratory demonstration, practice, and supervised clinical practice in: selection, care and use of wheelchairs, crutches, canes, walkers, and other assistive devices; training in use of braces and prostheses; special problems in the area of activities of daily living. Required for physical therapy students.

## 477 Occupational Therapy Clinical Affiliation in Physical Disabilities (1-6, max. 6) AWSpS

LUCCI

Directed and supervised clinical practice in the Occupational Therapy Clinics of the University Hospital Rehabilitation Center or other affiliated hospitals. Prerequisite, fourth year in occupational therapy.

## 479J Physical Medicine and Rehabilitation Information for Speech Pathology (3) A

HALL, CARRELL

Orientation information for speech pathology students on rehabilitation principles and techniques. Offered jointly with the Department of Speech.

## 480 Physical Medicine Clerkship (\*)

Each student of the fourth-year medical class, as part of a small group, spends 16 half days as a clinical clerk on the Physical Medicine and Rehabilitation wards and outpatient clinics of the University Hospital, Veterans Hospital, or King County Hospital. During the course of this time, the student learns the fundamental principles of treatment in physical medicine common to all physicians and learns to evaluate disability and plan total treatment programs for both minor and major physical disabilities. The students become familiar with the various paramedical professions and services that contribute to the treatment program of the physically disabled patient. Introductory work in braces, prosthetics, and electromyography is also included. Required for all fourth-year medical students, others by permission.

## 481 Occupational Therapy Theory II (3) Sp

A study of the principles and techniques of occupational therapy in the treatment of the psychiatric patient. Prerequisite, third year in occupational therapy.

## 482 Occupational Therapy Theory III (4) W

PETERSON

A study of the application of occupational therapy in special fields: pediatrics (including

cerebral palsy); geriatrics; patients with special problems (blind, deaf, mentally retarded, etc.). Includes a study of the various professions and agencies and organizations involved in the comprehensive care of the physically disabled. Prerequisite, fourth year in occupational therapy.

## 483 Occupational Therapy Theory IV (4) Sp

LUCCI

Emphasizes the total rehabilitation of the physically disabled patient. Includes laboratory demonstrations, and practice in assessment techniques, prosthetics, orthotics, and activities of daily living. New developments from the field are analyzed and evaluated. Prerequisite, fourth year in occupational therapy.

## 484 Occupational Therapy Theory V (2) Sp

PETERSON, SHEVLIN

Principles of administration, organization, and supervision as applied in the management of occupational therapy programs. Prerequisite, fourth year in occupational therapy.

## 489, 490, 491 Clinical Clerkships in Physical Therapy (2-3-4) A,W,Sp

TROTTER

Observation, instruction, and supervised practice in treatment of patients in diverse clinical settings. Emphasis is given to the application of previously learned material and skills to specific clinical problems. Required for physical therapy students.

## 492 Occupational Therapy Clinical Affiliation in General Medicine and Surgery and/or Tuberculosis (1-8, max. 8) AWSpS

LUCCI

Directed and supervised clinical practice in Occupational Therapy Clinics for general medical and surgical patients. Arranged in University Hospital or other affiliated hospitals. Prerequisite, fourth year in occupational therapy.

## 493 Occupational Therapy Clinical Affiliation in Pediatrics (1-4, max. 4) AWSpS

LUCCI

Directed and supervised clinical practice in a pediatric occupational therapy service. Arranged in University Hospital or other affiliated hospitals. Prerequisite, fourth year in occupational therapy.

## 494 Occupational Therapy Clinical Affiliation in Psychiatry (1-6, max. 6) AWSpS

LUCCI

Directed and supervised clinical practice in Psychiatric Occupational Therapy Clinics in University Hospital or other hospitals approved for occupational teaching. Prerequisite, third year in occupational therapy.

## 495 Clinical Affiliation in Physical Therapy (5) S

TROTTER

Twelve to fifteen weeks with 600 minimum working hours. Clinical application of physi-

cal therapy techniques under supervision in affiliated hospitals. Required for physical therapy students.

## 498 Undergraduate Thesis (\*)

Prerequisite, permission.

## 499 Undergraduate Research (\*) AWSpS

(a) Research for undergraduate medical students. Participation in clinical and basic research projects in the department; (b) research projects with special reference to modality treatment and physical therapy techniques, for physical therapy students; (c) research projects with special reference to occupational therapy applications for occupational therapy students. Prerequisite, permission.

## Courses for Graduates Only

### 510 Somatopsychology: Psychological Aspects of Disability (3) Sp

FORDYCE

Psychological adjustment to disability; techniques of milieu management; application of conditioning techniques to treatment structuring; effects of intellectual and perceptual deficit; rehabilitation team management. Elective for majors.

### 520 Seminar (1-5)

Conferences, seminars, discussions of advanced physical medicine and rehabilitation topics. Prerequisite, permission.

### 530 Medical Aspects of Vocational Rehabilitation (3) Sp

PALMER

Introduction to vocational implications of physical and emotional disabilities. Methods, counseling techniques, therapeutic modalities, community resources used in producing vocational assistance for the handicapped. Prerequisite, resident in physical medicine and rehabilitation.

### 543 Biomechanics Basic to Therapeutics in Physical Medicine (3) Sp

LEHMANN, SIMONS

The physical and mechanical properties of the musculo-skeletal system will be discussed. Mechanical principles in the functional, replacement, using ambulation aids, braces, and prosthesis, will be reviewed. Emphasis will be on basic understanding of the biomechanical principles involved, as well as on detailed discussion of clinical application at the level of residents and academicians trainees. Prerequisite, resident in physical medicine and rehabilitation, others by permission.

### 556J Social Aspects of Illness and Disability (2) WSp

Physical growth and change of the individual as correlated with factors of emotional and social development. Consideration of specific medical problems. Offered jointly with the school of Social Work. Prerequisite, permission.

# PHYSICAL MEDICINE AND REHABILITATION

## 568 Biophysics as Applied to Physical Medicine (2) A

LEHMANN

Propagation and absorption characteristics of physical forms of energy used for treatment in physical medicine. Physiologic effects basic to prescription of the physical therapy modalities. Prerequisite, resident in physical medicine and rehabilitation; others by permission.

## 596 Electromyography and Electrodiagnosis (3) S

JEBSEN

Elective work in clinical electromyography and other electrodiagnostic methods, with lecture-demonstrations involving selected cases in the laboratories. Prerequisite, permission.

## 596L Electromyography and Electrodiagnosis Laboratory (2) A

JEBSEN

Elective work in clinical electromyography and other electrodiagnostic methods. Prerequisite, permission. (Formerly 496.)

## 700 Thesis (\*) AWSpS

## PHYSICS

### Courses for Undergraduates

#### 110, 111, 112 General Physics (3,3,4) A,W,Sp

A survey of the more important topics of general physics for students not majoring in mathematics, the natural sciences, or engineering. Prerequisites, 110 for 111; 111 for 112.

#### 114, 115, 116 General Physics (4,4,4) AWSp, AWSp, AWSp

Concurrent registration in 117, 118, 119 recommended and may be required by individual departments. 114: mechanics and sound. Prerequisites, some working knowledge of trigonometry, one year of high school physics or one quarter of any college-level physical science. 115: heat and electro-magnetism. Prerequisite, 114. 116: light and modern physics. Prerequisite, 115 or concurrent registration in 115.

#### 117, 118, 119 General Physics Laboratory (1,1,1) AWSp, AWSp, AWSp

117: mechanics and sound laboratory. Prerequisite, 114 or concurrent registration in 114. 118: heat and electromagnetism laboratory. Prerequisite, 115 or concurrent registration in 115. 119: light and modern physics laboratory. Prerequisite, 116 or concurrent registration in 116.

#### 121, 122, 123; 121H, 122H, 123H General Physics (4,4,4) AWSp, AWSp, AWSp; AWSp, AWSp, AWSp

Development of the basic principles of physics with special emphasis on mechanics, electromagnetism, and modern physics. Primarily for students majoring in mathematics, sciences, or engineering. Prerequisites for 121, one year of high school physics, or equivalent

by permission, Mathematics 124 or 134H (may be concurrent); for 122, 121 and concurrent calculus; for 123, 122 and concurrent calculus.

#### 131, 132, 133 General Physics Laboratory (1,1,1) WSp, ASp, WA

Experimental topics in physics for physical science majors. Prerequisites, 121 for 131; 122 for 132; 123 and 132 for 133.

#### 221, 222 Mechanics (3,3) A,W

Kinematics and dynamics of a mass point; motion of a rigid body; motion of systems of masses. Prerequisites, 123, Mathematics 126 or 136H, and 221 for 222.

#### 225, 226 Electric Circuits (4,4) W,Sp

Basic linear elements in D.C., A.C., and transient circuits; vacuum tube circuits; solid state devices; electrical measurements. Laboratory work is included. Prerequisites, 123, Mathematics 126 or 136H, and 225 for 226.

#### 320 Introduction to Modern Physics (3) AWSp

Discoveries in modern physics particularly basic to engineering and science, including the structure of atoms, molecules, and solids, elementary particles, the interaction of radiation with matter, nuclear disintegrations and reactions. Prerequisite, 123 or permission.

#### 323 Introduction to Nuclear Physics (3) W

A study of nuclear reactions, including fission, particle accelerators, and nuclear instrumentation; cosmic rays; astrophysics; applications of nuclear phenomena in atomic energy; use of tracers, etc. Prerequisite, 320 or permission.

#### 325, 326, 327 Electricity and Magnetism (3,3,4) A,W,Sp

Charges at rest and in motion; dielectric and magnetic media; electromagnetic waves; physical optics. Laboratory work in 327. Prerequisites, 123, Mathematics 324 or 235H for 325; 325 for 326; 326 for 327.

#### 371, 372 Properties of Matter (3,3) W,Sp

Equilibrium and nonequilibrium properties of gases, solids, and liquids from macroscopic and microscopic viewpoints. Prerequisites, 222 or concurrent registration in 222, and Mathematics 324 or 235H for 371; 371 for 372.

#### 400 Basic and Modern Physics (11) S

A review of the fundamental and modern developments in physics with suggestions for lecture demonstration and laboratory. Primarily for Summer Institute students. Prerequisite, permission.

#### 401, 402, 403; 401H, 402H, 403H Special Problems (\*,\*,\*) AWSp, AWSp, AWSp; AWSp, AWSp, AWSp

Supervised individual study. Prerequisite, permission.

## 440 Basic Concepts of Physical Science (3) Sp

Deals with the nature and origin of some of the basic concepts of the physical sciences. Not open to science or engineering majors. Prerequisite, junior standing.

## 461, 462, 463 Atomic, Nuclear, and Particle Physics (3,3,3) A,W,Sp

Foundations of atomic, nuclear, and particle physics: relativity, quantum theory, and elementary quantum mechanics; radioactivity, nuclear structure, and modern high energy particle physics. Prerequisites, 327 and Mathematics 325 or 236H.

## 471, 472, 473 Atomic and Nuclear Physics Laboratory (3,3,3) A,W,Sp

471, 472: measurements in modern atomic physics. Prerequisite, 30 credits in physics. 473: techniques in nuclear research. Prerequisite, 323, or concurrent registration in 463, or permission.

## 481, 482, 483 Introduction to Mathematical Physics (3,3,3) A,W,Sp

Applications of vector analysis, coordinate transformations, types of fields, special solutions of field equations, variational principles and fields, boundary value problems of physics. Prerequisites, 327, 372.

## 485H, 486H, 487H Senior Honors Seminar (1,1,1) A,W,Sp

Prerequisite, permission.

## 499H Undergraduate Research (2-5, max. 5) AWSp

Supervised individual research. Prerequisite, permission.

### Courses for Graduates Only

#### 505, 506 Analytical Mechanics (3,3) A,W

Topics from mechanics and applied mathematics including variational principles, Lagrange's equations, Hamilton's equations, and canonical transformations.

#### 509, 510, 511 Atomic, Molecular, and Nuclear Structure (2,2,2) A,W,Sp

Fundamental experiments and concepts of modern physics; introduction to quantum theory and application of quantum mechanics to problems in atomic, molecular and nuclear structure. This course should be particularly appropriate to graduate students in other areas of science and engineering who wish to acquire some understanding of modern physics.

#### 513, 514, 515 Electromagnetism and Relativity (4,4,4) A,W,Sp

Properties of electric and magnetic fields in free space and material media; boundary value problems; radiation from accelerated charges and electromagnetic waves; the theory of special relativity leading to a relativistic formulation of electromagnetism and particle dynamics.

**517, 518, 519 Quantum Mechanics (4,4,4)  
A,W,Sp**

Physical and historical basis for quantum theory; solutions of the Schrödinger wave equation for discrete and continuous energy eigenvalues; representation of physical variables as operators and matrix formulation of quantum mechanics; theory of angular momentum; identical particles; elementary collision theory; various approximation methods for solution of the Schrödinger equation.

**520 Seminar in Physics, History, and Society (1) Sp**

Lectures and discussions on subjects of current interest in physics, but which are not included in conventional courses. Emphasis is on relationships between physics and other disciplines and activities. Prerequisite, graduate standing or permission.

**524, 525 Thermodynamics and Statistical Mechanics (3,3) A,W**

Statistical mechanical basis for the fundamental thermodynamical laws and concepts; applications of thermodynamic reasoning to selected physical problems; classical statistical distribution functions; quantum statistical mechanics; introduction to equilibrium many-body problems. Prerequisite, 517 or concurrent registration in 517.

**528 Current Problems of Physics (1) W**

Discussion of research topics which are currently being investigated within the department.

**530 Physics Colloquium (1-2) AWSp**

Seminar. Prerequisite, permission.

**531 Seminar in High Energy Physics (1-2) AWSp**

Prerequisite, permission.

**532 Seminar in Atomic Collisions and Spectroscopy (1-2) AWSp**

Prerequisite, permission.

**533 Journal Colloquium (1-2) AWSp**

Seminar. Prerequisite, permission.

**534 Seminar in Magnetic Resonance and Solid State Physics (1-2) AWSp**

Prerequisite, permission.

**535 Seminar in Nuclear Physics (1-2) AWSp**

Prerequisite, permission.

**536 Seminar in Low Temperature and Solid State Physics (1-2) AWSp**

Prerequisite, permission.

**537 Seminar in Theoretical Physics (1-2) AWSp**

Prerequisite, permission.

**538 Seminar in Cosmic Ray Physics (1-2) AWSp**

Prerequisite, permission.

**539 Seminar in General Physics (1-2) AWSp**

Prerequisite, permission.

**558, 559 High Energy Physics (3,3) W,Sp**

Prerequisite, 560.

**560, 561 Theoretical Nuclear Physics (3,3) A,W**

Prerequisite, 519.

**562 Theory of Spectra (3)**

Prerequisite, 519.

**564, 565 General Relativity (3,3) W,Sp**

Prerequisites, 506 and 515.

**566 Advanced Quantum Mechanics (4) A**

Second quantization; applications to the many-body problem; Klein-Gordon equation; radiation theory; elementary meson theory. Prerequisite, 519.

**567, 568 Theory of Solids (3,3) W,Sp**

Prerequisite, 519.

**570, 571, Quantum Field Theory (3,3) W,Sp**

Emphasis will vary in different years between relativistic quantum field theory and the many body problem. Prerequisite, 566.

**574 Collision Theory (3) A**

Emphasis will vary in different years among topics involving elementary particles, nuclei, and atomic and molecules.

**576 Selected Topics in Experimental Physics (\*, max. 6) AWSp**

Prerequisite, permission.

**578 Selected Topics in Theoretical Physics (\*, max. 6) AWSp**

Prerequisite, permission.

**600 Research (\*) A,W,Sp**

Research under the supervision of individual faculty members. Prerequisite, permission.

**700 Thesis (\*) AWSp**

Prerequisite, permission.

**702 Degree Final (6) AWSp**

Limited to students completing a nonthesis degree program.

**PHYSIOLOGY AND BIOPHYSICS**

**Conjoint 316, 317-318 Introductory Anatomy and Physiology (2, 5-5) A,W,Sp**

(See Conjoint Courses.)

**360 General Human Physiology (5) A**

Lecture, laboratory, and laboratory conference instruction in the basic principles and basic laboratory techniques of physiology. For students of pharmacy. Prerequisites, Zoology 112, Pharmaceutical Chemistry 239, Physics 115 and 118, Microbiology 301.

**Conjoint 400 Human Anatomy and Physiology (6 or 9) A**

(See Conjoint Courses.)

**401-402 Advanced Human Physiology (5 or 7-5 or 7) W,Sp**

Advanced work in physiology approached from the biophysical, mammalian, and clinical points of view. Small-group teaching and special laboratory problems. Required for first-year medical students; graduate students by permission.

**405 Human Physiology (8) W**

Intensive coverage of advanced physiology through lectures, laboratories, and demonstrations. Required for first-year dental students; graduate students and others by permission.

**Conjoint 409 Basis of Neurology (3, 5, or 8) Sp**

(See Conjoint Courses.)

**418 Biological Instrumentation (4) S**

BROWN

Principles of biological instrumentation systems, transfer relations, transient and frequency response of simple systems, noise, feedback and control systems, analog computation. Oriented toward biology, medical, and premedical students. Prerequisite, beginning calculus or permission.

**419 Biological Instrumentation Laboratory (2) S**

BRENGELMANN

Laboratory to illustrate and extend material presented in 418. Prerequisite, permission.

**424 Introductory Membrane Potentials (3) S**

WOODBURY

Ionic basis of electrical activity in excitable tissues. Membrane structure, capacity, resistance. Ion distributions, permeation, active sodium potassium transport. Cable and excitable properties of membrane. Prerequisite, permission.

**492 Selected Topics in Physiology and Biophysics (2) AWSpS**

Seminars or research in collaboration with a faculty member on topics selected by individual arrangement. Elective for medical students; graduate students and others by permission.

**494 Neurological Study Unit (2)  
Physiology, Neuroanatomy, Neurology,  
Neuropathology, Neurosurgery,  
and Psychiatry AW**

Faculty and student discussion of neurological topics illustrated with clinical cases or demonstrations. Elective for medical students; graduate students by permission.

# PHYSIOLOGY AND BIOPHYSICS

**498 Undergraduate Thesis (\*) AWSpS**  
For medical students. Prerequisite, permission.

**499 Undergraduate Research (\*) AWSpS**  
For medical students. Prerequisite, permission.

## Courses for Graduates Only

**515-516-517 Physiological Proseminar (7-7-7) A,W,Sp**

A guided survey of the experimental literature of major topics in physiology. Course conducted as seminar with oral analysis of assigned papers and topics. Prerequisites, 401-402, Conjoint 409, and permission.

**520 Physiology Seminar (2-5) AWSpS**  
Selected topics in physiology. Prerequisite, permission.

**521 Biophysics Seminar (2-5) AWSpS**  
Selected topics in biophysics. Prerequisite, permission.

**522 Biophysics of External Respiration (2-5) A YOUNG**

Viscous and elastic properties of chest-lung system; flow of gases in tubes. Generalized alveolar air equations. Gas transport. Prerequisite, permission.

**523 Heat Transfer and Temperature Regulation (2-5) S BROWN, BRENGELMANN**  
Prerequisites, B.S. in physical science and permission.

**524 Advanced Membrane Potentials (3) A WOODBURY**  
Quantitative analysis of electrical activity in nerve. Active sodium-potassium transport. Ionic flux equations. Conductance changes. Calculations of the action potential. Prerequisite, permission.

**525, 526, 527 Advanced Mammalian and Clinical Physiology (\*,\*,\*) A,W,Sp, S**  
Guided study of the experimental literature of physiology and biophysics. Essays are written and discussed with the staff. Emphasis is placed on critical analysis, accuracy of expression, bibliographical technique, and other factors of good scholarship. Prerequisite, permission.

**528 Physiological Control Systems (2-5, max. 10) A YOUNG**  
Theories of nonlinear mechanics and their applications to physiological control systems. Prerequisite, B.S. in physical science or permission.

**529 Motoneuron Physiology (4) A TOWE**  
Electrical properties of surface membrane; excitatory and inhibitory reactions and their

ionic mechanisms; properties of the spike potential; interaction of synaptic responses. Prerequisites, 424, 515-516-517 and permission.

**530 Synapse and Reflex Seminar (4) A PATTON**  
A guided survey of the literature pertaining to reflex and synaptic physiology. Course is conducted as seminar with students giving oral reports on assigned topics. Prerequisite, 401-402, 515-516-517, and permission.

**531 Biophysics of Circulation (3) A SCHER, WIEDERHIELM**  
Study of cardiovascular physiological areas where quantitative models have been seriously proposed: dynamic models of arterial circulation, characteristics of microcirculation, transport across capillary wall. Prerequisite, permission.

**535 Operative Techniques in Neurophysiology (2-5) S PATTON, SMITH**  
Deafferentation, decerebration, and Sherrington reflex preparation, osteoplastic bone flap, Horsley-Clarke apparatus, and reconstruction of lesions; primate colony and operating room management. Prerequisite, permission.

**536 Behavioral Techniques in Neurophysiology (2-3) Sp GLICKSTEIN, SMITH**  
Study and use of behavioral methods applicable to nervous system studies, quantification of activity and physiological variables, interpretation of neural lesions and chronic electrode implants. Prerequisite, permission.

**540 Neurophysiology of Learning (3) W GLICKSTEIN**  
Consideration of the literature relating to brain mechanisms of learning.

**550 Cortical Potentials (4) W TOWE**  
Properties of continuous and evoked potentials and their interactions. Relationship of cortical unit activity to cortical potentials. Prerequisites, 515, 529, and permission.

**600 Research (\*) AWSpS**  
Prerequisite, permission.

**700 Thesis (\*) AWSpS**  
Prerequisite, permission.

## POLICY AND ADMINISTRATION

### Courses for Undergraduates

**440 Organization Theory (3) AWSpS HENNING, KAST, KNUDSON LE BRETON, SAXBERG**  
A study of concepts of power, authority, and influence; communications, delegation and decentralization, decision and planning theory; formal organization structures, group decision making, philosophy and values in business organizations, and considerations of organization as a social issue. Prerequisite, advanced junior standing.

**441 Advanced Organization Theory (3) Sp**  
Deals with current research, measuring organizational effectiveness, planning, leadership patterns, current problems, developments in related disciplines. Prerequisite, 440.

**463 Administrative Behavior (4) W BARNOWE, KNOWLES**  
Practice and theory in formal organizations studied through selected readings and actual cases. Emphasizes the superior-subordinate relationship at all levels. Considers the administrator's frame of reference, communication in organizations, motivation, informal organization, situational and environmental aspects, and administrative controls. Prerequisite, Human Relations 460.

**470 Business Policy (4) AWSpS BROWN, GARRISON, KAST, KNUDSON, LE BRETON, MEIER, NEWELL, ROSENZWEIG, SCHREIBER**

Case study of policy-making and administration from a general management point of view. Emphasis is on problem analysis, the decision-making process, administration and control, and continuous reappraisal of policies and objectives. This course integrates and builds upon the work of the core curriculum. Prerequisites, Finance 350, Marketing 301, Production 301, and Personnel 301, or permission.

**471 Problems of the Independent Businessman (3)**  
The role of small business in the economy. Case studies of problems faced by owner-managers of small business enterprises. Emphasis on problem analysis, the decision-making process, administration and control, and continuous reappraisal of policies and objectives. Prerequisites, Finance 350, Marketing 301, Production 301, and Personnel 301, or permission.

**480 Business Simulation (5) WSp NEWELL, SCHRIEBER**  
Critical analysis of integrated business policy formulation in a complex and dynamic industrial environment by means of simulation (business gaming). Prerequisite, senior standing.

**499 Undergraduate Research (3, max. 9) AWSpS**  
Prerequisite, permission.

### Courses for Graduates Only

**550 Organization and Management (3) AWSpS GARRISON, HENNING, KAST, LE BRETON, ROSENZWEIG, SAXBERG**  
Studies concepts of power, authority and influence, objectives and goals, decision making and planning, communication, delegation and decentralization, leadership and motivation, and considerations of values, social issues, and future trends in organization. Research and theories in other fields, such as behavioral science and economics, will be related to business organization and management theory. Prerequisite, permission.

**565 Seminar in Comparative Administrative Theory (3)**

KAST, LE BRETON

An evaluation of the various approaches to the study of administration. A theoretical and historical point of view is taken. Each approach to the study is analyzed independently, and also related to a general theory. Prerequisite, permission. (Offered once yearly.)

**571-572 Research Reports (3-3) AWSpS**

See Accounting for description.

**575 Human Aspects of Administration (3) AWSpS**

BARNOWE, FENN, KAST, KNOWLES, KNUDSON, SUTERMEISTER

Examines administration process with a primary focus on organizational behavior. Develops the basic contributions of social science and other sources in the formulation of administrative-organizational conceptual schemes. Critically evaluates administrative theory in relation to administrative practice. Prerequisite, permission.

**576 Human Aspects of Administration (3)**

BARNOWE, KAST, KNOWLES, SAXBERG

Develops in depth some of the basic contributions to administrative theory and practice made by past and current research, thought, and experience. Typically examines several major research studies, drawing on findings from psychology, sociology, social and cultural anthropology, business administration, government, and other sources. Prerequisite, permission. (Offered twice yearly.)

**580 Planning and Decision Theory (3) AWSpS**

LE BRETON, MEIER, NEWELL, ROSENZWEIG

Development of a theory of planning, including foundation for theory, process of planning, role of participants in planning, the auxiliary functions, and integration into a general theory. Prerequisite, permission.

**593, 594 Policy Determination and Administration (3,3) AWSpS**

BROWN, KAST, KNUDSON, LE BRETON, MEIER, ROSENZWEIG, SCHRIEBER

Analysis of policy problems faced by chief administrative officers of business firms. Determining of objectives; development of policies to achieve objectives; organization of executive personnel to implement policies; coordination of the organization; appraisal and adjustments to changes in environment. The course is intended to give a clearer insight not only into how business decisions are reached, but into the motivation of businessmen in deciding what to do under varying circumstances. Case study seminars with simulation (business gaming) included in 594. (It is recommended that these courses be scheduled toward the end of the student's course work.) Prerequisites, Master of Business Administration candidacy and permission for 593; 593 for 594.

**604 Research (\*, max. 10) AWSpS**

Prerequisite, permission.

**700 Thesis (\*) AWSpS**

**702 Degree Final (6) AWSpS**

Limited to students completing a nonthesis degree program.

*POLISH—See Far Eastern and Slavic Languages and Literature*

**POLITICAL SCIENCE**

**Courses for Undergraduates**

These courses are primarily for sophomores, but are also open to freshmen. Either 201 or 202 is normally a prerequisite for all upper-division courses.

**201 Modern Government (5) AWSp**

HITCHNER, MEEKISON, MYHR

Political life in the modern world; the ideas behind its democratic and non-democratic forms. A systematic and comparative study of political structures, institutions, behavior, and processes.

**202 American Government and Politics (5) AWSp**

BEST, KAGI, PUTTERMAN

Popular government in the United States; the theory and practice of national institutions.

**203 International Relations (5) AWSp**

RILEY, SMITH

An analysis of the world community, its politics and government.

**POLITICAL THEORY AND PUBLIC LAW**

**311 Theories of Modern Government (5) Sp**

STEVENS

The principal political ideas of recent times with particular reference to their significance for democracy and liberal values. An introduction intended especially for other than political science majors.

**362 Introduction to Public Law (5) W**

STEVENS

The general significance of the legal order; private rights and public duties; nature of the judicial process; sources of law.

**411 The Western Tradition of Political Thought (5) A**

HARBOLD

Origin and evolution of major political concepts from ancient Greece to the eighteenth century which underlie much contemporary thinking. A background in history is desirable. Prerequisite, 201 or equivalent.

**412 American Political Thought (5) Sp**

PUTTERMAN

Major thinkers and movements from the Colonial period to the present.

**413 Contemporary Political Thought (5) W**

HARBOLD

Developments from the eighteenth century to the present, as a basis for contemporary philosophies of democracy, communism, and fascism. Prerequisite, 411 or equivalent.

**414J Chinese Political Thought (5) Sp**

HSIAO

Theories of the Oriental state as exhibited in the writings of statesmen and philosophers. Offered jointly with the Far Eastern and Russian Institute. (Offered alternate years; offered 1967-68.)

**415 Analytical Political Theory (5) Sp**

CASSINELLI

Analysis of principal problems, approaches, concepts, values, and hypotheses of political science.

**460 Introduction to Constitutional Law (5) ASp**

PUTTERMAN, STEVENS

Growth and development of the United States Constitution as reflected in decisions of the Supreme Court; political, social, and economic effects.

**461 The Courts and Civil Liberty (5) W**

STEVENS

Cases and literature bearing on protection of constitutionally guaranteed private rights, with particular reference to period since 1937.

**GOVERNMENT, POLITICS, AND ADMINISTRATION**

**350 Government and Interest Groups (5) W**

KAGI

Agrarian, labor, professional, business, and ethnic interest in politics; impact on representative institutions and governmental processes. Prerequisite, 202 or equivalent.

**351 The American Democracy (5) A**

GORE, GOTTFRIED

Selected aspects and problems of contemporary American government: parties and politics; the presidency; Congress; the role of the Supreme Court; civil rights and civil liberties. Prerequisites, 202 or equivalent, or junior standing, and permission of instructor.

**360 The American Constitutional System (3) A**

WEBSTER

Fundamental principles, function, evolution, and unwritten constitution; recent tendencies.

**370 Government and the American Economy (5) W**

PUTTERMAN

Government regulation, promotion, and services affecting such principal interest groups as business, labor, agriculture, and consumers. The independent regulatory agencies, public ownership, government corporations, and the cooperative movement.

# POLITICAL SCIENCE

## 375 Urban Government and Administration (5) A

WARREN

Reform ideology; formal organization, external relations; structure and distribution of influence and leadership; role of bureaucracies; policy issues.

## 376 State and Regional Government and Administration (5) Sp

BEST

State-federal politics; interstate and regional cooperation and competition; constitutions; role of parties, people and groups in decision making; formal structure and behavior patterns of legislature, executive and administration; policy issues.

## 450 Political Parties and Elections (5) A

BONE

Theories of American parties, campaigns and voting behavior; party leadership; political socialization and participation. Political Science 202 recommended.

## 451 The Legislative Process (5) W

BONE

Organization and procedure of Congress; state legislative politics; lobbying; legislative roles; the theory and practice of representative government. Prerequisite, 202 or permission.

## 452 Political Processes and Public Opinion (5) Sp

BEST

The foundations and environment of opinion; organization and implementation of opinion in controlling government, and public opinion as a force in the development of public policy; public relations activities of government agencies.

## 470 Introduction to Public Administration (5) ASp

KAGI, MEEKISON

Basic relationship of administration to other agencies of government.

## 471 Administrative Management (5) W

KAGI

Introduction to problems of public service, emphasizing managerial supervision and control, personnel administration, budgetary and fiscal administration, administrative analysis, and program planning and reporting.

## 472 Introduction to Administrative Law (5) Sp

KAGI

The legal context of American administration, the public function, public management, administrative powers, the nature of judicial control.

## 473 Administration in Modern Democracies (5) W

KROLL

The changing formal and informal structure of administrative organization and processes in non-communist urban-industrial societies;

the nature and role of bureaucracy; the effect of attitudes toward the state on administrative practices. Prerequisites, 470 and one or more of 346, 444, 445, or permission of instructor.

## 474 Administration in Developing Nations (5) Sp

KROLL

Administrative aspects of governmental change and modernization in developing nations; colonial influences on administration; problems of establishing new nations and adapting to change in established states; bureaucratic development and behavior; theories of development administration. Prerequisites, 470 and at least one course in the politics of developing nations, or permission of instructor.

## 480 Metropolitan Area Government (5) W

WARREN

Conceptual problems in metropolitan analysis; urban governmental systems; regional political decision making structures; metropolitan, state, and federal relations; value implications of formal organization.

## 487 Intergovernmental Relations (5) Sp

GORE

Analysis of the content and dynamics of the relations between federal, state, and local governments, with emphasis upon patterns in these relationships which reflect program structures. Prerequisite, 202.

## 490 Analysis of Political Behavior (5) A

BEST

Examination of concepts and research techniques used by political behaviorists and the results of their work.

## COMPARATIVE GOVERNMENT AND INTERNATIONAL RELATIONS

### 321 American Foreign Policy (5) Sp

SMITH

Constitutional framework; major factors in formulation and execution of policy; policies as modified by recent developments; the principal policy makers—President, Congress, political parties, pressure groups, and public opinion. Prerequisite, 202; 203 recommended.

### 322 Diplomatic Practices and Procedures (5) A

RILEY

Department of State; diplomatic and consular services; American diplomatic practice and procedure.

### 323 International Relations of the Western Hemisphere (5) Sp

MYHR

The Monroe Doctrine; Pan-Americanism; special interests in the Caribbean; hemisphere solidarity; the "Good Neighbor" policy; Latin America and World War II; Latin America and the United Nations.

### 324 Contemporary International Relations in Europe (5) Sp

HITCHNER

European diplomacy and international relations between the two world wars; problems of European integration; contemporary developments.

### 328 The United Nations and Specialized Agencies (5) W

The structure and functions of the United Nations and specialized agencies; accomplishments; proposals for strengthening; relations of regional bodies and member states.

### 335J Japanese Foreign Policy in Asia (3) Sp

HELLMANN

Analysis of modern Japanese political, diplomatic, and economic impact on Asia; and contemporary problems. Offered jointly with the Far Eastern and Russian Institute.

### 340 Government and Politics of South Asia (5) W

BRASS

A comparison of problems of national integration and political development in India, Pakistan, and Ceylon.

### 341 Government and Politics of Canada (5) Sp

MEEKISON

A critical analysis of parliamentary institutions, political parties, and the federal system in Canada. Prerequisite, 201.

### 342 Government and Politics of Latin America (5) W

MYHR

An analysis of the political dynamics of change in Latin America comparing various national approaches to the political problems of modernization, economic development, and social change. Prerequisite, upper-division standing.

### 343J Government and Politics of Southeast Asia (5) A

SMITH

Analysis of the organization and functioning of government and politics in the countries of Southeast Asia, with attention given to the nature of the social and economic environments which condition them. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, 201; 203 recommended.

### 344J Chinese Government (5) A

SCHWARZ

Imperial government; transition period; national government; present forms of local government; constitutional draft; present political situation. Offered jointly with the Far Eastern and Russian Institute. Prerequisites, Far Eastern 110 or 310, and junior standing.

### 345J Japanese Government (5) A

HELLMAN

Characteristics from 1868 to 1945; governmental changes since 1945. Offered jointly with the Far Eastern and Russian Institute.



**346 Governments of Western Europe (5) A**  
HITCHNER

Modern government and politics of Great Britain, France, and Germany.

**347 Governments of Eastern Europe (3) Sp**  
RESHETAR

Survey of the Communist regimes of Poland, Hungary, Czechoslovakia, East Germany, and the Balkans. (Offered alternate years; not offered 1967-68.)

**348 The European Community (5) W**  
ROHN

The movement toward a political union of European states; national, international, and supranational elements in the law and politics of the community.

**408J Problems of Peace and Conflict Resolution (3) W**  
BRASS

Study of factors involved in conflict and in conflict resolution; application to international and other problems. Lectures, discussions, and readings in social psychology, political science, and economics. Offered jointly with the Department of Economics. Prerequisite, permission.

**420J Foreign Relations of the Soviet Union (5) W**  
RESHETAR

Ideological, historical, and strategic components of Soviet foreign policy; Comintern, Cominform, and international Communist movement; Soviet policy in foreign trade, international law and organization, and in specific geographic areas. Offered jointly with the Far Eastern and Russian Institute.

**425 International Law (5) A**  
ROHN

World law as developed by custom and agreement and as exhibited in decisions of international tribunals and municipal courts.

**426 International Politics (5) Sp**  
MODELSKI

Principles and practice in the contest for power and influence between the states of the world.

**427 International Government and Administration (5) W**  
MYHR

Law and organization in international affairs; regional and general international institutions.

**429 International Relations in the Far East (5) ASp**  
HELLMAN

China, Japan, Southeast Asia; the Western Powers in Asia; the Far East in world politics.

**430 International Relations in the Middle and Near East (5) A**

Islamic backgrounds. Special countries, Egypt, Turkey, Iran, Israel, Saudi Arabia. Recent crises and their significance.

**432J American Foreign Policy in the Far East (5) W**

TAYLOR

Relationship to diplomacy, trade, and internal politics. Offered jointly with the Far Eastern and Russian Institute.

**433 International Relations in Southeast Asia (5) W**

SMITH

Analysis of the problems affecting the relations among the countries of Southeast Asia. Prerequisites, 203, 343J, or permission of instructor.

**434 International Relations of South Asia (5)**

BRASS

Interrelationships of domestic, interstate, and extra-regional forces and their effects upon the resolution or expansion of interstate conflicts in South Asia. Prerequisites, 203, 340, or permission of instructor.

**441J Political Institutions of the Soviet Union (5) A**

RESHETAR

Ideological and historical bases of Soviet politics; Leninism-Stalinism; Communist Party organization and membership; administrative agencies; the police and army; law and the judiciary; Soviet federalism and nationality policy. Offered jointly with the Far Eastern and Russian Institute.

**444 Systems of Modern Government (5) A**  
CASSINELLI

A comparative study of democratic, autocratic, and transitional types of modern government, related to their social, economic, and historical environments.

**445 Comparative Political Institutions (5) W**  
HITCHNER

Comparative study of the nature, structure, and function of the major institutions of government, including the party, executive, legislature, and judiciary. Prerequisites, 201 and one 300-level course in comparative government, or permission.

**449 Politics of Developing Areas (5) W**

BRASS

Comparative study of problems of national integration and political development in the new states of Asia and Africa. Prerequisite, junior standing.

**GENERAL**

**398H Honors Seminar (5, max. 15) AWSp**

Intensive and advanced studies in various aspects of political science. Open only to participants in the departmental honors program.

**499 Individual Conference and Research (2-5, max. 10) AWSp**

Open to qualified majors in the senior year. No more than one registration in 499 under the same instructor will be permitted. A

second registration with a different instructor may be permitted only in very exceptional cases and with departmental approval. Prerequisite, permission of instructor.

**Courses for Graduates Only**

**506 Contemporary Problems, Domestic and Foreign (3) S**

**511, 512, 513 Seminar in Readings in Political Science (3,3,3) A,W,Sp**

COLE

Important writings of the masters in political science; the political classics.

**514 Seminar in Problems of Political Theory (3, max. 9) AW**

HARBOLD, CASSINELLI

Selected topics, historical and conceptual, national, regional, and universal. Prerequisite, permission of instructor.

**515 Scope and Methods in Political Science (3) W**

HARBOLD

Inquiry into the philosophic foundations of various approaches in political science and their possible contributions to an understanding of politics. Substantial background in philosophy, as well as in political science, is highly desirable.

**519 Theories of Decision Making (3) W**  
GORE

A survey of the several theories of collective decision making, including analysis of alternative strategies and the spectrum of decisional functions associated with each strategy.

**520J Seminar on the Foreign Policy of the Soviet Union (3) Sp**

RESHETAR

Selected topics in the development, methods, and objections of the foreign policy of the Soviet Union. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, permission.

**521 Seminar in the Theory of International Relations (3) A**

MODELSKI

The principal theories underlying interstate relations; the sovereign state as a unit in the community of states; the theory of the state and the theory of the society of nations.

**522, 523, 524 International Government and Organization (3,3,3) A,W,Sp**

MANDER, ROHN

Constitutional organization and administrative procedures, with particular reference to the United Nations, specialized agencies, and other recent developments.

**525 Seminar in International Law (3) A**  
ROHN

Transition from classical to modern international law; research in the emerging law of outer space, nuclear weapons, organic alliances, neutralism, human rights, and other selected topics.

# POLITICAL SCIENCE

## 526 Seminar in International Politics (3) W MODELSKI

Perceptions by scholars and statesmen of international politics as a system; the problem of systematic change and cause-effect analysis.

## 527 Seminar in Foreign Policy (3) Sp

The foreign policies of major countries; substance and procedure; foreign and domestic determinants; selected foreign policy decisions as case studies.

## 528 Seminar in National Security Policy Formation (3) A DENNY

The principal elements of national security. Constitutional, historical, theoretical, and administrative analysis of United States foreign and defense policy formation and execution.

## 530 Seminar in Regional Foreign Policy (3) Sp MANDER

Regionalism in the world order and economy; the "region" as a basis of foreign policy; foreign interests and policies of the major regions of the world: the U.S.S.R., Central Europe, Western Europe, the British Empire, the Middle and Near East, the Far East, and Latin America. Prerequisite, permission of instructor.

## 531 Problems of Southeast Asian Politics (3) Sp SMITH

Inquiry into selected domestic and international problems. Prerequisite, permission of instructor.

## 540 Seminar in Modern Indian Politics (3) BRASS

Research problems in contemporary Indian politics.

## 541J The Soviet Political System (4) A RESHETAR

Critical appraisal of the principal research methods, theories, and types of literature dealing with the government and politics of the Soviet Union. Offered jointly with the Far Eastern and Russian Institute. Prerequisite, permission.

## 542 Seminar in Commonwealth Governments (3) Sp MEEKISON

Analysis of the governments of Canada, Australia, and New Zealand; their relations with the United Kingdom.

## 543 Seminar in British Government (3) Sp HITCHNER

Advanced studies in British parliamentary government.

## 544 Problems in Comparative Government (3, max. 9) W CASSINELLI

Selected problems in the comparative analysis of political institutions, organizations, and systems.

## 545J Seminar in Japanese Government and Diplomacy (3, max. 6) W HELLMAN

Offered jointly with the Far Eastern and Russian Institute.

## 546 Seminar in Problems of Soviet Politics (3) W RESHETAR

Selected problems of Soviet domestic politics. Prerequisite, 541J or permission.

## 547 Problems in Latin American Political Systems (3) W MYHR

Prerequisite, permission of instructor.

## 548 Comparative Political Parties (3) Sp BRASS

An examination of the role of political parties in the modern state. Similarities and differences in the origins and development of political parties and the functions they perform, both in established democracies and in the development countries, will be discussed.

## 549 Problems of Political Development (3, max. 9) Sp BRASS

Analysis of new political patterns and relationships evolving in the nonwestern world where nations are in various stages of reaction to western practices and institutions. Prerequisite, permission of instructor.

## 550-551-552 Seminar in Politics (3-3-3) A,W,Sp GOTTFRIED

Topical and regional studies of political associations in the United States; leading principles and motivations of political action and leadership; legislative processes; methodology and bibliography. All three seminars are to be taken in sequence. Prerequisites, at least three of the following courses or their equivalent: 350, 370, 450, 451, 452.

## 554 Legislative Politics (3) Sp BONE

Selected problems in legislative processes and leadership, state, and national. Prerequisite, 451 or equivalent.

## 562, 563, 564 Public Law (3,3,3) A,W,Sp COLE

Constitutional and legal concepts governing governmental authority and institutions and the conduct of governmental activities.

## 570-571-572 The Administrative Process (3-3-3) A,W,Sp GORE, KROLL

An analysis of the administrative process relying primarily upon case materials and emphasizing policy formation, organization behavior, the nature of administrative roles, and the mechanisms of responsibility.

## 573-574-575 Public Management (3-3-3) A,W,Sp LYDEN

Expression of public policy through program activity, program planning, programming and scheduling, budgeting, staffing, fiscal and other operating controls, evaluations of effectiveness. Same as Public Administration 521, 522, 523. Prerequisite, permission.

## 576-577-578 Administrative Problems (3-3-3) A,W,Sp SHIPMAN

Methods employed in the analysis of administrative problems, programs, organization, process, procedure, and staffing; the design of organizations and operations. Same as Public Administration 511, 512, 513. Prerequisite, permission.

## 579 Comparative Administrative Systems (3) Sp KROLL

Methodological problems of research in comparative administration. Theoretical and substantive aspects of administrative systems in urban-industrial and developing nations. Same as Public Administration 551. Prerequisites, 470, 473, and one graduate course in public administration, or permission of instructor.

## 580, 581, 582 Seminar in Metropolitan and Urban Planning Problems (3,3,3) A,W,Sp WEBSTER

The metropolitan community; nature, characteristics, functions, governmental structure, and intergovernmental relations. Urban planning; theory, law and administration, policy determination, and public relations. Methods and devices for plan implementation. Drafting local ordinances for planning, zoning, subdivision control, and urban renewal.

## 584 Approaches to Subnational Government (3) A WARREN

An analysis of current approaches and concepts in the study of subnational government—urban, state, and regional public organization.

## 585, 586 Local, State, and Regional Politics and Administration (3,3) W,Sp WARREN

Exploration and analysis of political and organizational behavior at the local, state, and regional levels of government, with emphasis upon methodology and field research.

## 590 Seminar in Political Behavior (3) W BEST, GORE

Analysis of behavioral research in selected fields of political science.

## 600 Research (\*)

## 700 Thesis (\*)

**702 Degree Final (6)**

Limited to students completing a nonthesis degree program.

*PORTUGUESE — See. Romance. Languages and Literature*

**PREVENTIVE MEDICINE**

**323 Introduction to Public Health Principles and Practices (3) AWSpS**

WILKEY

A survey of principles, practices, and the agencies concerned. This basic course is required of all preventive medicine majors.

**410 Principles of Communicable Disease Control and Biostatistics (2) AWSp**

FOY, KRONMAL

Vital statistics, measures of central tendency and dispersion, introduction to interpreting statistical data, and control of communicable disease. Required of senior nursing students in the basic nursing curriculum. Prerequisite, 323.

**420 Principles of Epidemiology (3) A**

PETERSON

Descriptive, analytic, and experimental epidemiology as presented in examples from infectious and chronic noninfectious disease. Includes descriptive statistics as applicable in epidemiology. Prerequisites, 323, Microbiology 301 or permission, or graduate standing.

**422 Introduction to Environmental Health (3) W**

HATLEN

Relationship of man to his environment, how it affects his physical well-being, and what he can do to influence this environment for the protection of his health. Emphasis on environmental factors involved in transmission of communicable diseases and hazards due to exposure to chemical and physical materials in our environment.

**424 Public Health Programs (3) Sp**

HALL

Current problems and programs of major concern in the following areas: maternal and child health, accident prevention, mental health, chronic diseases, and medical economics. Prerequisite, 323 or 461.

**425 Introduction to Preventive Medicine (1) Sp**

GRAYSTON, PERRIN

Introduction to epidemiology, communicable disease control, and vital statistics. Required for second-year medical students.

**440 Water and Waste Sanitation (4) A**

HATLEN

Advanced study of the sanitary control of water supplies and sewage and refuse disposal,

with emphasis on the knowledge and skills utilized by the sanitarian.

**441 Milk and Food Sanitation (4) W**

HATLEN

Advanced study of the sanitary control of the production, processing, and distribution of milk and food.

**442 Vector Control and General Sanitation (3) Sp**

HATLEN

Advanced study of the control of rodents and arthropod vectors of disease; the control of environmental utilities, including plumbing, swimming pools, bathing beaches, recreation areas, housing, schools, and other topics of general sanitation.

**450 Measurement and Control of Air Pollution (2) A**

BOVEE, BREYSSE

Description of methods for air pollution research and control, including field survey techniques, stack sampling, continuous monitoring, and use of control equipment. Administrative problems are also discussed.

**453 Industrial Hygiene Techniques (3) W**

BOVEE, BREYSSE

Field and industrial laboratory testing procedures for chemical and physical hazards as employed by industrial health workers.

**455 Control of the Industrial Environment (3) Sp**

BOVEE, BREYSSE

Principles of control of the industrial environment including control of nonionizing radiation, heat, and hazardous chemicals with special emphasis on exhaust ventilation.

**456 Laboratory Management and Safety (1) W**

BREYSSE

Designed for laboratory management safety to consider chemical and physical hazards, their control and management.

**460J Field Training in Health Education (5)**

MILLS, REEVES

Four and one-half weeks of full-time supervised work experience in the health education division of a local official health agency. Offered jointly with the College of Education. Prerequisite, permission.

**461 School and Community Health Programs (5) AWSpS**

MILLS, REEVES

Organizational structure, function, and services of official and nonofficial community and school health agencies, with particular attention to the interrelated roles of teachers, physicians, nurses, and sanitarians. Prerequisite, junior standing.

**472 Applied Statistics in Health Sciences (3) W**

BENNETT

Application of statistical techniques to biological and medical research; design and interpretation of experiments.

**475 Clerkships and Seminar (\*, max. 4) AWSp**

GRAYSTON

Preventive and community medicine, emphasizing the management of complex health problems with the utilization of community health agencies and resources. Required for fourth-year medical students.

**476 Sample Survey Techniques (3-5) Sp**

BENNETT

Methods appropriate for conducting and analyzing results of sample surveys. (Offered when demand is sufficient.)

**477 Statistical Methods in Biological Assay (3) A**

BENNETT

Methods appropriate to estimation of the dose-effect relationship; biological standardization; microbiological assay; design of experiments. (Offered when demand is sufficient.)

**478 Practice of Epidemiology (3) AWSp**

Participation in the field investigations of important or unusual disease outbreaks. Senior medical student elective.

**480 Public Health Problems (\*, max. 6) AWSpS**

Special assignments in the field of public health. Prerequisite, permission.

**482 Field Practice in Public Health (2-6) AWSpS**

An assignment to a local health department for supervised application of public health practices. Prerequisite, permission.

**483 Field Practice in Public Health (6) AWSpS**

An assignment to a local health department for practice in program planning. Prerequisite, permission.

**484 Field Practice in Public Health (3) AWSpS**

An assignment to a local health department for training in the utilization of community resources. Prerequisite, permission.

**490 Public Health Administration (3) Sp**

Public health administration, including philosophy, legal aspects, program and fiscal planning, personnel management and public relations. Prerequisites, 420, 422, 424, or permission.

# PREVENTIVE MEDICINE

## 492 Problems in International Health (2) Sp

Conference and discussion based on a survey of international health organizations and the services offered by regions and countries. Prerequisites, graduate standing and permission.

## 498 Undergraduate Thesis (\*) AWSp

For medical students. Prerequisite, permission.

## 499 Undergraduate Research (\*) AWSpS

Prerequisite, permission.

## Courses for Graduates Only

### 506 Mammalian Cell Culture as a Tool for Virus Research (\*, max. 3) S

KENNY

General concepts and techniques of cell culture as applied to problems of virus isolation and propagation. Prerequisites, 5 credits in microbiology, 5 credits in biochemistry, and permission.

### 510 Preventive and Community Medicine (3) AWSp

GRAYSTON

Introduction to academic preventive medicine with emphasis on community agencies and resources for medical practice. Prerequisites, M.D., or Ph.D. in medical science and permission.

### 520 Epidemiology of Acute Diseases (3) A

FOX

A study of the principles and practice of epidemiology as derived from a study of communicable diseases. Prerequisites, M.D., or Ph.D. in medical science and permission.

### 521 Epidemiology of Chronic Diseases (3) W

MCCARROLL

A study of the principles and practice of epidemiology as applied to the noncommunicable diseases. Prerequisites, M.D., or Ph.D. in medical science and permission.

### 522 Advanced Epidemiology (\*, max. 3) AWSp

Seminar on current research and epidemiological studies of communicable and chronic diseases. Prerequisites, M.D., or Ph.D. in medical science and permission.

### 523 Epidemiology Reading Seminar (1) AWSp

FOX, KOGON

Objectives are to promote critical reading of scientific papers and increase knowledge and understanding of principles and methods in epidemiology. Required of all fellows and residents in Preventive Medicine. Prerequisite, permission.

### 530, 531 Medical Biometry I, II (3,3) A,W

PERRIN

The application of mathematical and statistical techniques to the problems of advanced

medical and epidemiological research. Prerequisite, M.D., or Ph.D. in medical science or permission.

### 533 Computer Applications in Medical Research and Biostatistics (3) W

KRONMAL

A course designed to acquaint the medical researcher and biostatistics student with both the potentialities and the use of the digital computer in medicine. Prerequisite, permission.

### 535-536-537 Stochastic Models in Biology and Medicine (3-3-3) A,W,Sp

PERRIN

The application of techniques of advanced probability and statistics to problems in health sciences, with emphasis on the role of stochastic processes in biology and medicine. Prerequisite, permission.

### 540 Environmental Medicine (3) Sp

MCCARROLL

Air and water pollution, industrial toxicology, and physical environmental factors affecting health. Prerequisites, M.D., or Ph.D. in medical science and permission.

### 600 Research (\*) AWSpS

Selected problems arranged in accordance with the student's needs. Prerequisite, permission.

### 700 Thesis (\*) AWSpS

Prerequisite, permission.

## PRODUCTION

### Courses for Undergraduates

#### 301 Principles of Operations Management (3) AWSpS

MEIER, NEWELL, SCHRIEBER, VERGIN

Fundamentals of the production function in business and industry; background of scientific management and decision making; organization of operations; research and product development; operations location; facilities layout; equipment selection; planning and control of operations; material and quality control; methods analysis and time standards; performance control for internal operations; uses of computers. Prerequisites, Accounting 230 and Business Statistics 301, or permission.

#### 441 Systems Design (3) W

JOHNSON, SCHRIEBER

Theory and analysis of systems design; including the administration of product research and development programs and the techniques which are used in system design, e.g., computers, methods study, critical path methods, and work standards. Prerequisite, 301 or permission.

#### 442 Analysis of Production Operations (3) Sp

NEWELL, SCHRIEBER, VERGIN

Principles, procedures, and analysis of purchasing and materials management, facilities

planning, equipment replacement, and control of quality in business operations. Prerequisite, 301, or permission.

#### 443 Production and Inventory Control (3) A

MEIER, NEWELL, SCHRIEBER, VERGIN

Theory and analysis of planning and inventory control including the development of production programs, manpower requirements, assignment of men and machines, determination of lot sizes and run lengths, analysis of alternative production and inventory control systems, and the use of computer simulation in system analysis. Prerequisite, 301, or permission.

#### 455 Analytical Techniques in Production Management (3) Sp

MEIER

Advanced study of the application of mathematical and statistical methods such as linear programming, queuing theory, calculus, and simulation to solution of problems in production management. Prerequisites, 301, Business Statistics 450, or permission.

#### 460 Manufacturing Administration (5) W

JOHNSON, MEIER, NEWELL, SCHRIEBER, VERGIN

Administration of integrated production activities in manufacturing enterprises. Particular attention is given to production decisions and other executive responsibilities at the management level through the use of cases. Prerequisites, 301 and senior standing, or permission.

#### 499 Undergraduate Research (3, max. 9) AWSp

Prerequisite, permission.

### Courses for Graduates Only

#### 500 Operations Management (3) SpS

JOHNSON, MEIER, NEWELL, SCHRIEBER, VERGIN

A study of the production function in business and industry with emphasis on the administration of internal operations. Basic concepts, philosophy, and techniques of analysis are covered together with their application and integration in solving operating problems. Prerequisites, Accounting 500 and Business Statistics 500.

#### 520 Seminar in Production (3) ASp

JOHNSON, NEWELL, SCHRIEBER

Research, readings, and reports on current problems using a topical approach with emphasis on such areas as productivity, product research and development, reliability, plant location, equipment policies, computers, and automation. Prerequisite, 500 or equivalent.

#### 521 Seminar in Manufacturing (3) W

NEWELL, SCHRIEBER

Policy formulation and administration of manufacturing enterprises by analysis of case studies of selected industries, emphasizing integration of the functions of production management with the major goals of the organization. Prerequisite, 500 or equivalent.

**571-572 Research Reports (3-3) AWSpS**

See Accounting for description.

**604 Research (\*, max. 10) AWSpS**

Prerequisite, permission.

**700 Thesis (\*) AWSpS****702 Degree Final (6) AWSpS**

Limited to students completing a nonthesis degree program.

**PROSTHODONTICS****131 Complete Denture Technic (8) Sp**

LORD

A lecture-laboratory course dealing with basic principles of complete denture fabrication; construction of selected dentures on technic manikins.

**231, 232 Removable Partial Denture Technic (2,6) A,W**

WYKHUIS

A lecture-laboratory course dealing with basic principles of removable partial denture fabrication; construction of selected removable partial dentures on technic manikins.

**300, 301, 302 Complete Denture Prosthodontics (1,1,1) A,W,Sp**

BOLENDER, LORD

A lecture course devoted to the diagnosis and treatment of the completely edentulous patient.

**303, 304 Removable Partial Denture Prosthodontics (1,1) W,Sp**

BOLENDER, WYKHUIS

A lecture course devoted to the diagnosis and treatment of the partially edentulous patient requiring the fabrication of a removable partial denture.

**346 Clinical Prosthodontics (8) AWSp**

Diagnosis and treatment of completely edentulous and partially edentulous patients.

**400, 401 Advanced Complete Denture Prosthodontics (1,1) A,Sp**

BOLENDER, WYKHUIS, BEDER

A lecture course devoted to a discussion of conventional complete dentures for patients presenting special problems, immediate dentures, maxillofacial appliances, and other special appliances.

**402 Advanced Removable Partial Denture Prosthodontics (1) W**

BOLENDER

A lecture course devoted to the design and fabrication of complex removable partial dentures.

**446 Advanced Clinical Prosthodontics (5) AWSp**

Diagnosis and treatment of completely edentulous and partially edentulous patients. Fabrication of conventional and immediate complete dentures and removable partial dentures.

**Courses for Graduates Only****560 Complete Dentures (4) A**

BOLENDER

A comprehensive lecture-clinical course devoted to the diagnosis and treatment of the completely edentulous patient. Emphasis is placed on control and management of patients who present difficulties in treatment.

**561 Immediate Dentures (4) W**

BOLENDER

A lecture-clinical course concentrating on those factors which are peculiar to the fabrication of immediate dentures. This course will provide an opportunity for the application of the principles covered in course 560.

**562 Removable Partial Dentures (4) Sp**

BOLENDER

A lecture-clinical course devoted to the diagnosis and treatment of the partially edentulous patient requiring the fabrication of a removable partial denture. The study of supporting tissues and their physiologic responses is included.

**563 Obturators and Speech Appliances (2) Sp**

BEDER

A lecture-laboratory course devoted to the theories and principles involved in the fabrication of prostheses for the patient presenting congenital or acquired defects of the palate and contiguous tissue.

**564 Definitive and Adjunctive Maxillofacial Appliances (2) S**

BEDER

A lecture-laboratory course devoted to the theories and principles in the fabrication of somato prostheses; appliances for the osteotomized, osteotomized, or traumatized mandible; vehicle and protective devices in irradiation therapy; stents, cranial, and other alloplastic prostheses; splints and other special prostheses.

**565, 566, 567 Clinical Practice Teaching (1,1,1) A,W,Sp**

BOLENDER

Supervised experience in teaching clinical prosthodontics to the undergraduate dental student.

**568 Obturators and Speech Appliances (2)**

BEDER

Clinical application of 563. Patients requiring the fabrication of obturators and speech appliances are treated.

**569 Definitive and Adjunctive Maxillofacial Appliances (2)**

BEDER

Clinical application of 564. Patients requiring the fabrication of a variety of special appliances are treated.

**570, 571, 572, 573, 574, 575, 576, 577 Prosthodontics Seminar (2,2,2,2,2,2,2,2)**

BOLENDER

A continuous weekly seminar devoted to the review of prosthodontic and related literature.

**600 Research (\*)**

Prerequisite, permission.

**700 Thesis (\*)**

An investigative program carried out under the direction of a member of the Department staff by a student working toward the degree of Master of Science in Dentistry. The problem may be in one of the basic sciences or may have a clinical application.

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*PROVENAL—See Romance Languages and Literature*

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**PSYCHIATRY****267 Preventive Methods for Mental Health (2) Sp**

PATTISON

Explores the concepts of mental health and mental illness and the factors that produce each, with analysis of methods of primary, secondary, and tertiary programs, including psychological, social, and cultural factors.

**400 Human Personality Development and Behavior (\*, max. 3) W**

Emotional and personality development from infancy through old age; the adaptation of the individual to his environment, with attention to the roles of heredity, constitution, physical changes, and family and social relationships as determinants in psychodynamics. Comparative personality development is illustrated by animal and human behavior. Required for first-year medical students; restricted to medical students.

**Conjoint 426-427 Introduction to Physical Diagnosis (\*, max. 4, \*, max. 9)**

(See Conjoint Courses.)

**430 Psychopathology (2) A**

BAKKER, BROWNSBERGER, CHRIST, HAMPSON, PATTISON, RIPLEY, SPOERL

Abnormalities of behavior, thinking and feeling, and the structural and psychological factors that produce them. Anxiety, depression, elation, withdrawal, repression, compensation, projection, and other personality reactions are discussed. Required for second-year medical students; restricted to medical students.

# PSYCHIATRY

## 440 Physiology of Emotions (\*) WSp

HOLMES

Seminar based on discussion of selected reading of original articles from psychophysiology and psychosociologic literature. Designed to orient and interest students for participation in current or future research projects. Elective open to first- and second-year medical students. Prerequisite, permission.

## 441 Psychological Testing and Measurement (2) AWSp

Principles of individual and group testing, with particular reference to the problems of reliability and validity. Designed to orient students toward research design and methodology in psychiatric research. Elective open to second-year medical students. Prerequisite, permission.

## 442 Culture and Illness (\*) Sp

Examination of several social systems with regard to the manner in which patterns of illness are developed, maintained, or modified by cultural elements. A lecture-discussion course with guided reading. Elective open to first-year and second-year medical students. Prerequisite, permission.

## 444 Medical Aspects of Sexual Problems (2) W

HAMPSON

Lecture-discussion format, covering a body of information on sexual behavior, both normal and disturbed, with particular focus on the pertinence to medical practice. Elective open to second- and fourth-year medical students. Prerequisite, permission.

## 450 Principles of Personality Development (2) A

KAUFMAN

Discussion of the principles of personality development and the problems most commonly met. Consideration will be given to the physiologic, psychologic, and cultural factors from infancy through old age. For nonmedical students. Prerequisite, senior or graduate standing.

## 451 Principles of Personality Development (2) W

HEILBRUNN

Continuation of 450. Consideration will be given to the physiologic, psychologic, and cultural factors from maturity through old age. For nonmedical students. Prerequisite, 450 or permission.

## 452 Clinical Psychiatry (2 or 3) Sp

SCHER

Discussion of clinical psychiatry considering causation, prevention, treatment, and rehabilitation. For nonmedical students. Quiz section required for Occupational Therapy students; optional for other students. Prerequisite, 267, 450, 451, or permission.

## 465 Clinical Clerkships (\*, max. 8) AWSp

Four weeks of closely supervised experience on a psychiatric inpatient service. The stu-

dent is responsible for diagnostic evaluations of patients with a variety of psychiatric disorders at the University Hospital, King County Hospital, and Veterans Administration Hospital. He is introduced to the principles of the use of psychologic tests, ward milieu management, group psychotherapy, and the physical and pharmacologic treatments. Clinical conferences with discussion of psychoses, psychoneuroses, and psychosomatic disorders are held. Lectures are given throughout the year. Required for third-year medical students.

## 475 Psychiatric Externship (\*) AWSp

Opportunity to learn, from first-hand experience and active participation, the methods used in caring for seriously ill patients at a state psychiatric hospital.

## 480 Clinical Diagnosis and Treatment (\*, max. 6) AWSp

Individually supervised outpatient experience with adults and children is obtained in the outpatient departments at the University Hospital and at the King County Hospital. Emphasis is placed on an understanding of the psychodynamics of minor mental and emotional problems, the therapeutic interaction between the doctor and patient, and the simpler methods of counseling and psychotherapy. Lectures are given throughout the year. Required for fourth-year medical students.

## 490 Advanced Clinical Psychiatry (\*) AWSp

Clinical work, which may include inpatient and outpatient experience, is arranged to accommodate the particular interests of students. The objective is to give more prolonged and intensive experience than is possible in the required fourth-year work. Opportunities for this experience are available at the University Hospital, Seattle Veterans Administration Hospital, the Community Psychiatric Clinic, and King County Hospital. Elective open to fourth-year medical students. Prerequisite, permission.

## 491 Seminars and Conferences in Psychiatry (\*) AWSpS

Special seminars and conferences on a variety of topics can be arranged to accommodate the particular interests of students. Prerequisite, permission.

## 492 Behavioral Science Study Unit (\*) AW

HOLMES

A variety of topics will be presented under the sponsorship of the Department of Psychiatry, with participation of faculty members from the Departments of Neurological Surgery, Pediatrics, Pharmacology, Physiology and Biophysics, Psychology, and Sociology. When practicable, selected patients will illustrate topics presented. Elective open to medical students. Prerequisite, permission.

## 498 Undergraduate Thesis (\*) AWSpS

Supervised library, clinical, or experimental work. Elective open to medical students. Prerequisite, permission.

## 499 Undergraduate Research (\*, max. 15) AWSpS

Opportunities are available for participation in a wide variety of ongoing research in the behavioral sciences and clinical psychiatry, or for the development of an individual investigative project under the supervision of a faculty sponsor. Elective open to medical students. Prerequisite, permission.

## Courses for Graduates Only

## 553 Psychodynamics and Psychopathology (2) A

HEILBRUNN

Heredity, constitution, physical changes, and family and social relationships as determinants in psychodynamics are discussed. Attention is paid to defense mechanisms such as anxiety, depression, resentment, evasion, withdrawal, repression, projection, and overcompensation as commonly encountered in psychopathology. For nonmedical students. Prerequisite, 267, 450, 451, or permission.

## 558 Seminar: Interviewing (2)

Case studies are presented by individual students for discussion of the psychodynamics and methods of dealing with personality problems. For graduate students who are having practical experience in interviewing. For nonmedical students. Prerequisite, permission. (Not offered 1967-68.)

## 559 Child Psychiatry (2) Sp

KAUFMAN

Series of discussions and lectures dealing with psychopathology of children, including a discussion of the fundamentals of psychotherapy with children. For nonmedical students. An interview with a child is essential for receiving credit. Prerequisite, 267, 450, 451, or permission.

## 565 Biological Foundations of Psychiatry (2) S

HEILBRUNN

Anatomical and physiological factors involved in various forms of psychopathology. For nonmedical students. Prerequisite, permission.

## PSYCHOLOGY

## Courses for Undergraduates

## 100 General Psychology (5) AWSpS

BOLLES, FIELDS, LOUCKS, WOODBURN

An introductory survey of various fields of work in scientific and professional psychology, illustrating basic principles derived from experimental studies of human and animal behavior, including applications in the measurement, prediction, and development of human capabilities. Participation as a subject in experiments is required.

**190, 190H Introduction to the Scientific Analysis of Behavior (5) AWSp**

GALANTER, RABINOWITZ, ROSE, SMITH

Concepts and methods of psychology as a laboratory science, including its scope and limitations. Emphasis is on certain basic aspects of rationale and methods, with no attempt to survey substantive findings of psychology or areas of application. Prerequisite for 190H, permission of College of Arts and Sciences Honors Program Adviser.

**191, 191H Laboratory in the Scientific Analysis of Behavior (5) AWSp**

BEACH, LOCKARD, MAKOUS, PAGANO, SMITH, WELLS

Application of the experimental method to some problems of psychology using both human and animal subjects. Prerequisites, 100 or 190; for 191H, permission of College of Arts and Sciences Honors Program Adviser.

**205 Introduction to Personality and Individual Differences (4) AWSpS**

SARASON

Introduction to basic concepts and methods within the field of personality and background for more intensive study in the field of personality. Prerequisite, 100 or 190, or permission.

**222 Intermediate Physiological Psychology (3) SpS**

WOODBURNE

An introduction to physiological principles involved in activity of sensory receptors; chemical integration, reflex activity, and organization of muscular activity of animal organisms. Prerequisite, 100 or 190.

**300 Human Desires and Democratic Society (5)**

GALANTER

Individual desires are examined in terms of modern psychological theories. The ways that individual values are amalgamated by sociopolitical mechanisms are studied. Classical and modern social theories will be examined.

**301 Statistical Methods (5) AWSpS**

CAMPIONE, HEATHERS, LOCKARD, LUNNEBORG

Application of statistical methods to psychological problems; description of psychological data in terms of averages, measures of variability, and measures of relationships; problems of prediction; frequency distributions and elementary sampling theory. Prerequisites, 100 or 190 and Mathematics 101, or equivalents, or permission.

**305 Deviant Personality (5) AWSpS**

BECKER, VAN EGEREN

Introduction to the field of psychopathology; analysis of forms, nature, and causes of disorders of behavior and personality. (Formerly Abnormal Psychology). Prerequisites, 10 credits in psychology, including 100 or 190, or permission.

**306 Developmental Psychology (5) AWSpS**

BEE, CAMPIONE, RABINOWITZ

An analysis of psychological development of the child in relation to biological, physical,

and sociological antecedent conditions from infancy to adolescence. Occasional hours arranged for supervised observation, analysis, and interpretation of behavior in the Laboratory Preschool. Prerequisite, 100 or 190.

**320 Field Analysis of the Behavior of Young Children (3) AWSp**

HARRIS

Objective analysis of the behavior of young children with and interpretations of data for research and guidance purposes. One hour weekly arranged for supervised observation in the Laboratory Preschool. Prerequisite, 306 or equivalent.

**345 Social Psychology (5) AWSpS**

CANON, STOTLAND

A study of the interaction of the individual and the group with emphasis upon interpersonal processes, social motivation, attitude formation and change, leadership, and the relation between personality and social behavior. Prerequisite, 100 or 190.

**350H Honors Seminar I (5) W or Sp**

Intensive study of selected research problems of contemporary interest. Prerequisites, 191H or equivalent, junior standing and permission of departmental honors adviser.

**355 Thinking and Problem Solving (5) Sp**

WELLS

Empirical and theoretical approaches to thinking, problem-solving, and concept formation. Prerequisite, 10 credits in psychology, including 100 or 190, or permission.

**361 Laboratory in Social Psychology (5) WS**

CANON, STOTLAND

Practice and discussion of methods of systematic observation, content analysis, etc.; experimental manipulation in social psychology; individual research projects. Prerequisites, 301, 345 and major standing, or permission.

**400 Learning (5) AWSpS**

MC KEEVER, SMITH

Experimental research and basic theories in the psychology of learning. Prerequisite, 100 or 190.

**401 Verbal Learning (3)**

MC KEEVER

Selected experimental problems and theoretical interpretations relevant to verbal behavior and learning. Prerequisite, 400.

**403 Motivation (5) ASp**

LOCKARD, SMITH

Theory and research on reinforcement, punishment, frustration, preference, instinctual mechanisms, and other factors controlling the performance of organisms. Prerequisite, 100 or 190.

**405 Advanced Personality: Theory and Research (5) ASpS**

BECKER, SARASON

A more intensive survey of theoretical concepts in the field of personality and a more

detailed review of experimental methods and experiments in the field of personality. (Formerly 307.) Prerequisite, 205 or permission.

**406 Experimental Psychology (5) W**

LOUCKS

Training in the design, instrumentation, and execution of experiments with human and animal subjects. Practice in the use and standardization of psychomotor tests employed in psychopharmacology. Techniques of recording and quantifying various biopotentials such as "brain waves," muscle potentials, heart rate, etc., that have been used as indices of learning, emotional conditioning, and dreaming. Prerequisites, 15 credits in psychology and permission.

**407 History of Psychology (5)**

Experimental and theoretical backgrounds of modern psychology, especially in the nineteenth century. Prerequisites, 100 or 190, and permission.

**410 Deviant Development (3) A**

STROTHER

Introduction to developmental deviations, including sensory-motor handicaps, mental retardation, brain injury and emotional disturbances. Particularly for students interested in advanced work in clinical psychology or special education. Prerequisite, 305 and 306, or permission.

**412 Learning and Motivation in Children (5) W or Sp**

CAMPIONE

Experimental literature dealing with learning and motivation in children, particularly topics such as discrimination learning, generalization and transposition, operant conditioning, and reinforcement factors in learning. Comparisons between normal and deviant development will be included where appropriate and possible. Prerequisite, 306.

**414 Cognitive Development (5) W or Sp**

BEE

Exploration of the various aspects of cognitive development, with particular attention to the following areas: concept formation, intelligence and its measurement, creativity, cognitive styles, and language development. There also will be emphasis on alternative theoretical approaches to the general questions of cognitive development. Prerequisite, 306.

**416 Comparative Psychology (5) ASp**

HORTON, LOCKARD

Analysis of laboratory experiments, field investigations, and current theory of the behavior of animals from protozoa to man, including theoretical accounts of selected problems. (Formerly 316.) Prerequisite, 400.

**421 Neural Basis of Behavior (5) AS**

WOODBURNE

Anatomical and physiological principles involved in the integrative action of the nervous system and the results in behavior of this neural activity. Prerequisites, 100 or 190 and 10 credits in Zoology.

# PSYCHOLOGY

## 422 Physiological Psychology (5) W

LOUCKS

Physiological mechanisms basic to emotion, fatigue and sleep, learning and memory. Prerequisite, 421 or permission.

## 423 Sensory Basis of Behavior (5) ASp

HORTON

Sensory and perceptual phenomena; sensory equipment; theories of sense-organ function. Prerequisites, 421 or equivalent, or permission.

## 424 Psychophysiology of Vision (5) W or Sp

MAKOUS

The biological mechanisms whereby animals and man use light as a source of information about their environment. Prerequisite, 423 or permission.

## 425 Surgical and Histological Techniques (5) W

WOODBURNE

Practicum in important surgical and histological techniques used in psycho-physiological experimentation. Prerequisites, 421 and permission.

## 427 Conditioning and Learning (5) Sp

LOUCKS

A survey of the current literature concerning the experimental and theoretical aspects of classical conditioning and instrumental learning in humans and animals. Prerequisite, 15 credits in psychology.

## 430 Measurement in Psychology (5) W

LUNNEBORG

The development of specialized correlational techniques and their application to problems of construction and validation of psychological and educational tests. Prerequisite, 301 or permission.

## 435 Applied Experimental Psychology (3) A

CULBERT

A survey of experimental studies on the relation of human abilities and limitations to problems of design and operation of industrial machines, display systems, and special devices. Prerequisite, 100 or 190, or permission.

## 441 Perception (5) ASp

CULBERT

A consideration of the ways in which experience is organized. Perceptual aspects of the various sensory modalities, relations between physical and psychological dimensions, non-stimulus determiners of the perceived world, and mediational feedback are among the central topics treated experimentally and theoretically. Prerequisite, 100 or 190.

## 444 Social Influence and Attitude Change (3) A

CANON

Discussion of research on the nature and effects of social influence, with special emphasis on attitude formation and change, conformity, behavior, "brainwashing", prejudice, and propaganda. Prerequisite, 345.

## 445 Theories of Social Psychology (5) W

STOTLAND

Individual determinants of social behavior, processes, and outcomes of social interaction, their effects in the individual and groups. Prerequisites, 345 and senior or graduate major standing, or permission.

## 446 Objective Assessment of Personality (3) Sp

EDWARDS

Methods and techniques of observing and measuring personality variables. Problems of research design in personality and social psychology. Prerequisites, 205 and 301, or permission. (Extra credit may be earned for research activity by registering concurrently in 499 with the permission of the instructor.)

## 447 Psychology of Language (5) W

CULBERT

Psychological principles applied to linguistic development and organization; language in both its stimulus and response aspects. Prerequisite, 100 or 190.

## 448 Seminar in Psychology (5)

Study of selected research topics of contemporary interest. Prerequisites, major standing and permission.

## 450H Honors Seminar II (5) A

Intensive study of selected research problems of contemporary interest. Prerequisites, 350H and permission of departmental honors adviser.

## 451H-452H Honors Thesis (3-3) WSp

An original contribution to psychology of a theoretical or experimental nature. Prerequisites, 450H, senior standing, and permission of departmental honors adviser.

## 463 Decision Processes (5) W or Sp

BEACH

Major theories and approaches to decision theory will be discussed, with emphasis on those that regard decision as a branch of cognition. The classical studies and history of decision theory will be reviewed and current research will be discussed to suggest the present trends. Relationships between theory and applications will be stressed as will the value of viewing many traditional areas of psychology within a decision context. Prerequisite, Mathematics 105 or equivalent, and senior or graduate standing.

## 473 Information Processing Models (5) W

HUNT

Use of complex information processing systems as models of psychological phenomena; idea of an information processing system; computer programs as models; cybernetic systems approach to behavior; models based on formal neurons; models of complex behavior, including problem solving, concept learning, memory, and pattern recognition; social system models. Prerequisites, senior or graduate standing, 355 or 400 and Mathematics 114 or equivalents, or permission of instructor.

## 475 Computing in Behavioral Sciences (5) Sp

HUNT

The application of computers to research problems in the behavioral and social sciences; functional and performance characteristics of batch processing, interactive and control computing systems; computing languages; computer methods of data processing, control of experiments, and automated instruction. Prerequisites, upper-division or graduate standing in behavioral or social sciences, 301 or Mathematics 124 or equivalents, or permission of instructor.

## 498 Readings in Psychology (1-3, max. 9) A WSps

Reading in special interest areas under supervision of staff members. Discussion of reading in conference with instructor. The name of the staff member with whom research will be done should be indicated in registration. Prerequisite, permission.

## 499 Undergraduate Research (1-3, max. 9) A WSps

The name of the staff member with whom research will be done should be indicated in registration. Prerequisites, 301 and permission.

## Courses for Graduates Only

### SEMINARS AND SPECIAL TOPICS

*The content of the graduate seminars (numbered 540 through 560) offered by the Department changes from quarter to quarter. A list of offerings is published each quarter and can be obtained from the Department of Psychology.*

## 503, 504, 505, 506, 507, 508 Proseminar in Psychology (3,3,3,3,3,3) A,A,W,W,Sp,Sp

The proseminar meets each consecutive quarter. The topics may change from year to year, but normally will include learning, motivation, perception, physiological psychology, developmental psychology, personality, and social psychology. Required of all first-year graduate majors. (Formerly 500-501-502.)

## 514-515 Experimental Design (3-3) A,W

EDWARDS

The design of experiments and the analysis of experimental data in the behavioral sciences. Required of all first-year graduate majors. Must be taken in sequence. Prerequisite, 301 or permission.

## 516 Psychometric Techniques (3) Sp

LUNNEBORG

Topics in regression analysis, measurement reliability and validity, and the development of models for prediction, selection, and classification. For first-year graduate majors; either 516 or 517 must be taken subsequent to 515. Prerequisite, 515 or equivalent.



**517 Mathematical Psychology (3) Sp**

GALANTER, ROSE

Application of mathematics (drawn from calculus, set theory, finite mathematics, and probability) in the areas of psychophysics, learning, motivation, and social processes. For first-year graduate majors. Prerequisite, 515 or equivalent.

**518 Mathematical Models of Learning (3) W or Sp**

ROSE

The application of mathematical models in basic learning situations, such as partial reinforcement and discrimination-learning experiments, probability learning, and paired-associate learning. Open to undergraduates with permission of instructor. Prerequisites, 517 or Mathematics 391, or permission of instructor.

**520, 521, 522 Laboratory Methods in Psychology (3,3,3) A,W,Sp**

Actual practice in the design and conduct of laboratory experiments using both animal and human subjects. At least two laboratory courses are required of all first-year graduate majors; 406 or 441 may be substituted for one of these.

**531 Introduction to Multivariate Psychological Measurement (5) A**

HORST

Special quantitative techniques essential to understanding of multivariate psychological measurement theory. Elementary principles of matrix algebra basic to this theory and efficient computational routines are emphasized. Prerequisite, 301 or permission.

**532 Factor Analysis (5) Sp**

HORST

Mathematical and theoretical foundations; alternative methods of analysis; computational procedures; applications to psychological problems. Prerequisite, 531 or permission.

**533 Test Construction (5) A**

HORST

Correlation analysis; statistical bases of test construction and of the use of test batteries; practice in test construction. Prerequisite, 532 or permission.

**540 Seminar in Clinical Psychology (2) AWSp**

BECKER, SARASON, STROTHER

May be repeated for credit. Prerequisite, permission.

**541 Seminar in Cognitive Processes (2) Sp**

WELLS

May be repeated for credit. Prerequisite, permission.

**542 Seminar in Comparative Psychology (2) ASp**

HORTON, LOCKARD

May be repeated for credit. Prerequisite, permission.

**543 Seminar in Developmental Psychology (2) AWSp**

BEE, CAMPIONE, RABINOWITZ

May be repeated for credit. Prerequisite, permission.

**544 Seminar in Experimental Psychology (2)**

GALANTER, SMITH

May be repeated for credit. Prerequisite, permission.

**545 Seminar in Human Learning (2) W or Sp**

LUMSDAINE, MC KEEVER

May be repeated for credit. Prerequisite, permission.

**546 Seminar in Learning (2) W or Sp**

LOCKARD, MC KEEVER, SMITH

May be repeated for credit. Prerequisite, permission.

**547 Seminar in Motivation (2) ASp**

LOCKARD, SMITH

May be repeated for credit. Prerequisite, permission.

**548 Seminar in Perceptual Processes (2) W**

CULBERT

May be repeated for credit. Prerequisites, 441 and permission.

**549 Seminar in Physiological Psychology (2) ASp**

HORTON, LOUCKS, WOODBURN

May be repeated for credit. Prerequisite, permission.

**550 Seminar in Psycholinguistics (2) Sp**

CULBERT

May be repeated for credit. Prerequisites, 447 and permission.

**551 Seminar in Psychophysics (2) A or W**

GALANTER

May be repeated for credit. Prerequisite, permission.

**552 Seminar in Quantitative Techniques (2) WSp**

EDWARDS, HORST, LUNNEBORG, ROSE

May be repeated for credit. Prerequisite, permission.

**553 Seminar in Social Psychology (2) WSp**

CANON, STOTLAND

May be repeated for credit. Prerequisite, permission.

**554 Seminar in Decision Processes (2) WSp**

BEACH

May be repeated for credit. Prerequisite, permission.

**555 Seminar in Programmed Learning (2) W or Sp**

LUMSDAINE

May be repeated for credit. Prerequisite, permission.

**560 Seminar (\*) AWSpS**

May be repeated for credit. Prerequisite, permission.

**580 Problems of Developmental Psychology (3)**

A critical analysis of current theoretical problems of approaches to theory formulation, and review of some typical pieces of research in the field of child behavior and personality development. Prerequisites, 306 and permission.

**585 Experimental Problems in Clinical Psychology (5)**

SARASON, VAN EGEREN

Analysis of research and theories of concepts and processes of deviant behavior. Prerequisite, permission.

**586 Psychological Approaches to Rehabilitations (3) Sp**

SARASON

Survey of psychological approaches to the rehabilitation of persons with a variety of types of disabilities. Emphasis is placed on reactions to physical disability, the concept of work, the assessment of disabled persons, and the interaction between physical and mental disabilities. Prerequisite, graduate major standing.

**591, 592, 593 Clinical Methods (6,6,6) A,W,Sp**

SARASON, VAN EGEREN

Introduction to clinical psychological techniques including intelligence and personality tests and the interview within the contexts of actual clinical settings. Prerequisite, permission of instructor. Required of all graduate majors in the clinical psychology training program.

**594 Advanced Personality Theory (3) A**

VAN EGEREN

Theoretical problems in the study of personality development relating to the psychodynamics of personality organization. Required of all graduate majors in the clinical psychology training program. Prerequisite, 405 or permission.

**595 Psychopathology (3) A or W**

Major historical and contemporary theories of psychopathology and research in the main categories of the behavior disorders. Required of all graduate majors in the clinical psychology training program. Prerequisites, 594 and permission.

**596 Theories and Systems of Psychotherapy (3) A or Sp**

A review of some of the principal theories and systems. Prerequisites, 595 and permission. Required of all graduate majors in the clinical psychology training program.

**597 Field Work (3-5, max. 36) AWSpS**

SARASON, STROTHER, VAN EGEREN

Prerequisites, second-year graduate major standing and permission.

# PSYCHOLOGY

## 599 Readings in Psychology (\*) AWSpS

Selected topics. The name of the staff member with whom readings will be done should be indicated in registration. Prerequisite, permission of instructor.

## 600 Research (\*) AWSpS

The name of the staff member with whom nonthesis research will be done should be indicated in registration. Prerequisite, permission of instructor.

## 700 Thesis (\*) AWSpS

# PUBLIC AFFAIRS

## Courses for Graduates Only

### PUBLIC ADMINISTRATION

#### 501, 502, 503 The Administrative Process (3,3,3) A,W,Sp

KROLL

An analysis of the administrative process relying primarily upon case materials and emphasizing policy formation, organization behavior, the nature of administrative roles, and the mechanism of responsibility. Same as Political Science 570-571-572.

#### 511, 512, 513 Administrative Problems (3,3,3) A,W,Sp

SHIPMAN

Methods employed in the analysis of administrative problems, programs, organization, process, procedure, and staffing; the design of organizations and operations. Same as Political Science 576-577-578.

#### 521, 522, 523 Public Management (3,3,3) A,W,Sp

LYDEN

Expression of public policy through program activity, program planning, programming and scheduling, budgeting, staffing, fiscal and other operating controls, evaluations of effectiveness. Same as Political Science 573-574-575.

#### 541, 542, 543 Social Theory and the Public Policy Process (3,3,3) A,W,Sp

LYDEN

Theoretical and research approaches to systems of social interaction. Special emphasis on the role of complex organizations and goal-oriented actions in the public policy process

#### 551 Comparative Administrative Systems (3) Sp

KROLL

Methodological problems of research in comparative administration. Theoretical and substantive aspects of administrative systems in urban-industrial and developing nations. Same as Political Science 579.

## 600 Research (\*, max. 15)

# PUBLIC POLICY

#### 500 General Seminar (\*, max. 15) AWSp 532, 533 Seminar in National Security

Policy and Administration (3,3) W,Sp  
DENNY

Foreign and defense policy formation and execution. Administration of national security programs: White House, Congress, State and Defense Departments, special problems and case studies. Prerequisite, Political Science 528.

#### 590, 591, 592 Natural Resources Mid-Career Seminar (3,3,3) A,W,Sp

Interdisciplinary seminar in natural resources public policy problems for mid-career executives. Open to National Institute of Public Affairs Award Winners and others by special permission.

## 600 Research (\*)

# POLITICAL SCIENCE

#### 528 Seminar in National Security Policy Formation (3) A

DENNY

The principal elements of national security. Constitutional, historical, theoretical, and administrative analysis of United States foreign and defense policy formation and execution. Prerequisite, permission.

#### 562, 563, 564 Public Law (3,3,3) A,W,Sp

COLE

General legal concepts applicable to the conduct of governmental activities.

#### 580, 581, 582 Seminar in Metropolitan and Urban Planning Problems (3,3,3) A,W,Sp

WEBSTER

The metropolitan community: nature, characteristics, functions, governmental structure; intergovernmental relationships. Urban planning: theory, law and administration, policy determination, and public relations. Methods and devices for plan implementation. Drafting local ordinances for planning, zoning, subdivision control, and urban renewal.

#### 585, 586 Local, State, and Regional Politics and Administration (3,3) W,Sp

WARREN

Exploration and analysis of political and organizational behavior at the local, state, and regional levels of government, with emphasis upon methodology and field research.

# ECONOMICS

#### 400 Fundamentals of Micro-Theory (3) A

Fundamentals of micro-theory with emphasis on applications to public policy. Design primarily for graduate students majoring in fields other than economics. No credit if 300 has been taken for credit.

#### 401 Fundamentals of Macro-Theory (3) W

Fundamentals of macro-theory with emphasis on applications to public policy. Designed primarily for graduate students majoring in fields other than economics. No credit if 301 has been taken for credit.

#### 435 Natural Resource Utilization and Public Policy (5) W

CRUTCHFIELD

Special emphasis on elements of economic theory relating to resource oriented industries. Case studies in the theory and practice of resource management dealing with both stock and flow resources. Benefit-cost analysis and the evaluation of multipurpose projects.

#### 451 Public Finance and Taxation (5) A

TIEBOUT, SCHOEPLIN

#### 553 Economic Analysis and Government Programs (3) Sp

TIEBOUT, MC CAFFREE

Application of economic analysis to public enterprises and programs. Prerequisites, 400, 401, or equivalent.

*RADIOLOGICAL SCIENCES—See Interdisciplinary Graduate Degree Programs*

*RADIO-TELEVISION—See Communications*

# RADIOLOGY

#### 465 Diagnostic Radiology (\*, max. 2) AWSp FIGLEY

A series of lectures for medical students describing in general principle and some detail the applications of radiological methods to clinical diagnostic problems. Required for third-year medical students as a part of the third-year lecture series.

#### 475 Therapeutic Radiology (1) AWSp PARKER

A series of presentations for medical students with the Departments of Surgery, Medicine, and Pathology on the clinical aspects of the major human cancers and their control with surgery or radiation. Offered as a part of the fourth-year lecture series.

#### 493 Special Problems in Radiological Health (2 or 4, max. 8) WSp

BALTZO

Observation and participation in research and clinical use of radiation emitters. Prerequisite, permission.

#### 494 Clerkship: Diagnostic Radiology (\*) AWSp

FIGLEY, LEIGHTON, PHILLIPS

Observation, instruction, and supervised participation in clinical fluoroscopy, radiography, film interpretation, and X-ray conferences. For medical students only. Prerequisites, senior standing and permission.

## 495 Clerkship: Therapeutic Radiology (\*) AWSp

PARKER

Observation, instruction, and supervised participation in clinical radiation therapy including clinical examination, treatment planning and administration, and conferences. For medical students only. Prerequisites, senior standing and permission.

## 498 Undergraduate Thesis (\*)

The student may write a thesis in either therapeutic or diagnostic phases of radiology. For medical students only. Prerequisite, permission.

## 499 Undergraduate Research (\*) AWSp

FIGLEY

An opportunity to gain research experience through participation in various research programs in progress. Prerequisite, permission.

## 501-502 Biological Effects of Ionizing Radiation (2-2) A,W

JACKSON

Effects of ionizing radiation at the molecular, cellular, organ, and organism levels with emphasis on mammalian systems. Required for radiological science students. Prerequisite, permission.

## 501L-502L Laboratory in Radiation Biology (1-1) A,W

CHRISTENSEN

Laboratory study of the biological effects of ionizing radiation. Required for Radiological Science students. Prerequisite, permission.

## 504 Radiological Physics (2) Sp

WOOTTON

Application of physical concepts methodology and instrumentation in the study, production, and mensuration of ionizing radiations and their interactions with biological materials.

## 507 Radiation Hazards Analysis and Control (1) Sp

BALTZO

Methods and procedures are emphasized in areas pertaining to humane perspective, regenerative programs, contemporary radiological health problems, hazards analysis, instrumentation (application and interpretation), hot laboratory design, accident control, bioassay techniques. Prerequisite, 501-502, or permission.

## 510 Special Topics in Radiation Biology (2) Sp

CHRISTENSEN

A detailed study of current research of special significance to the development of radiation biology.

## 515 Chemical Mechanisms in Radiation Biology (2) A,Sp

CHRISTENSEN

Discussion of radiation-induced chemical reactions and their contribution to biological radiation damage including alterations in enzymes, viruses, bacteria, and mammalian cells.

## 517 Radiation Dosimetry (4) Sp

ROESCH, GLASS

The measurement of radiation energy loss relationships in gases and solids, detection techniques and circuits, units, consideration of human exposure limits. Prerequisite, permission.

## 520 Seminar (2)

## 550 Field Practice in Radiological Health (\*, max. 6) S

CHRISTENSEN

The student rotates through laboratories engaged in radiological health and radiation safety work to gain experience in the problems encountered in practice.

## 604 Research (\*, max. 12)

## REAL ESTATE

### Courses for Undergraduates

## 301 Urban Land Economics and Real Estate Institutions (5) AWSpS

LESSINGER, SEYFRIED

Economic principles underlying utilization of land; real property rights, institutions, and land tenure; market allocation of urban land uses and public control; analysis of location and development of residential, commercial, industrial, and financial districts.

## 410 Real Estate Valuation and Administration (5) WSp

LESSINGER, SEYFRIED

Functions and objectives of the industry. Characteristics and management problems of construction, brokerage, property management, and financial firms; urban land services; theory and principles of urban land valuation including appraisal theory and techniques. Prerequisite, 301.

## 495, 496 Research in Real Estate (3,3) A,W,Sp

LESSINGER, SEYFRIED

Open to qualified undergraduate students. Prerequisites, 301 and permission.

### Courses for Graduates Only

## 520 Seminar in Real Estate and Urban Land Economics (3) ASp

LESSINGER, SEYFRIED, WHEELER

Analysis and evaluation of land allocation

systems, institutional aspects of the real estate industry, and problems arising from competition of spatial units within urban markets. Prerequisite, permission.

## 521 Seminar in Real Estate Administration (3) W

The administrative approach to management problems in the real estate industry; analysis of the business functions of production, finance, and distribution of real estate services. Prerequisite, permission.

## 571-572 Research Reports (3-3) AWSpS

See Accounting for description.

## 604 Research (\*, max. 10) AWSpS

Prerequisite, permission.

## 700 Thesis (\*) AWSpS

## 702 Degree Final (6) AWSpS

Limited to students completing a nonthesis degree program.

*RECREATION EDUCATION—See Physical and Health Education*

## RISK AND INSURANCE

### Courses for Undergraduates

## 310 Fundamentals of Risk and Insurance (5) AWSp

WICKMAN

An overview for nonmajors. The influence of risk on economic and social activities. Significant risk exposure—destruction or confiscation of property—threat of adverse liability judgments; interruptibility of earned income by premature death, disability, retirement. Methods for evaluating hazards; insuring and transferring risks. Insurance as the most significant technique for dealing with loss exposures. Prerequisite, previous or concurrent completion of lower-division requirements.

## 320 Insurance Theory (3) W

WICKMAN

Theoretical basis of insurance; economic, legal, actuarial foundations. Role of insurance in an enterprise economy. Principles of insurance, including insurability, rate-making, financial and operational aspects are examined for theoretical significance. (Offered alternate years; (not offered 1967-68.)

## 330 Risk Analysis (5) A

WICKMAN

Recognition and evaluation of risks to business entities and individuals. Loss of assets or income due to physical destruction, liability judgments, death, disability. Analysis of environmental factors influencing these risks.

## RISK AND INSURANCE

### 432 Advanced Risk Problems I (3) Sp

WICKMAN

Exploration of alternative techniques for dealing with property and liability exposures; prevention, minimization, transfer of risk through insurance and other means. Discussion focuses on cases. (Offered alternate years; offered 1967-68.)

### 438 Advanced Risk Problems II (3) Sp

WICKMAN

Effective planning to meet financial consequences of premature death, disability, and retirement. Coordination of estate assets with insurance, employee benefits, and Social Security. Business continuation and fringe benefit planning. Discussion focuses on cases. (Offered alternate years; not offered 1967-68.)

### 480 Risk Management (3)

WICKMAN

Control of nonmarket risks as a managerial function. Cost of risk in business enterprise. Responsibility of the risk manager in the firm. Implications to the firm in selecting among alternative programs for managing nonmarket risks. Influence of competitive pressures and regulatory influences in the insurance industry. (Offered alternate years; offered 1967-68.) Prerequisite, permission.

### 499 Undergraduate Research (3, max. 6) AWSp

WICKMAN

Open only to qualified students. Individual investigation of risk and insurance problems. Prerequisite, permission.

## Courses for Graduates Only

### 520 Seminar in Risk and Insurance Theory (3) A

Considers theoretical aspects of the risk-bearing techniques. Economic, actuarial, legal, environmental bases for insurance. Reinsurance. (Offered alternate years; not offered 1967-68.) Prerequisite, permission. (Offered alternate years; offered 1967-68.)

### 571-572 Research Reports (3-3) AWSpS

See Accounting for description.

### 580 Seminar in Risk Control (3)

WICKMAN

An emerging enterprise function. Functional role and responsibilities. Techniques of risk control. Competitive, regulatory, environmental influences on risk control. Criteria for selecting risk control. Prerequisite, permission. (Offered alternate years; offered 1967-68.)

### 604 Research (\*, max. 10) AWSpS

Prerequisite, permission.

### 700 Thesis (\*) AWSpS

### 702 Degree Final (6) AWSpS

Limited to students completing a nonthesis degree program.

## ROMANCE LANGUAGES AND LITERATURE

(Courses in English translation appear at the end of the departmental listing.)

### ROMANCE LINGUISTICS AND LITERATURE, GENERAL AND COMPARATIVE

## Courses for Undergraduates

### 401 Introduction to Romance Linguistics (3) AWSpS

CONTRERAS, SAPORTA

Descriptive analysis of the phonological, morphological, and syntactical structures of the modern Romance languages. Prerequisite, the equivalent of two college years of a Romance language.

### 402 Introduction to Romance Linguistics (3) Sp

CONTRERAS

Comparative historical survey of the development of the principal Romance tongues. Prerequisite, Romance 401.

### 475DJ, 475EJ The Teaching of Foreign Literature (3, max. 6; 3, max. 6)

KELLER

The methodology of teaching a foreign literature, with demonstrations by the instructor and practice by students; preparation of lectures; study of discussion techniques. Offered jointly with the College of Education. Prerequisites, senior standing and permission.

## Courses for Graduates Only

### 505, 506 Advanced Romance Linguistics (3,3)

Advanced problems in the phonological, morphological, and syntactical analysis of the Romance languages. Descriptive, comparative, and historical considerations. Prerequisites, 401, 402.

### 521, 522 Seminar in Romance Linguistics (3,3) A,W

Specific problems in linguistic analysis of the Romance languages. Prerequisites, 401, 402.

### 531 Problems in Romance Linguistics (2-5, max. 10) AWSp

Group seminars, or individual conferences, are scheduled under this number to meet special needs. Prerequisite, permission of the Graduate Program Adviser.

### 549 Medieval Romance Paleography (3)

FIELD, FRIEDMAN

Prerequisite, 402, French 404, or permission.

### 572J, 573J Romance Language Teachers' Seminar (3,3) S

SIMPSON.

The teaching of foreign languages. Conducted as a workshop. Offered jointly with the College of Education.

### 581, 582 Methodology and Bibliography of Research (3,3) A,W

LEINER

Bibliographical resources for Romance literatures; recurrent types of research problems and the accumulating methodology; standards of evidence; the evaluation and organization of evidence; the philosophies of literary history and its relation to bibliography and criticism.

### 584, 585, 586 Seminar in Romance Culture (3,3,3) A,W,Sp

NOSTRAND

Individual and collective research in the evolution of concepts common to Romance literatures and cultures. Open to graduates of this and other departments.

### 590 Research in Comparative Romance Literature (2-5, max. 20) AWSp

Group seminars, or individual conferences, are scheduled under this number to meet special needs. Prerequisite, permission of the Graduate Program Adviser.

### 599 Research in Romance Linguistics (2-5, max. 15) AWSp

Group seminars, or individual conferences, are scheduled under this number to meet special needs. Prerequisite, permission of the Graduate Program Adviser.

### 700 Thesis (\*) AWSp

Prerequisite, permission of the Graduate Program Adviser.

### 702 Degree Final (6) AWSp

Limited to students completing a nonthesis degree program. Prerequisite, permission of the Graduate Program Adviser.

## CATALAN

### 535 Catalan Language and Literature (3)

FIELD, SIMPSON

## FRENCH

### 101-102, 103 Elementary (5-5,5) W,AWSp,AWSp

Methods and objectives are primarily oral-aural. Oral practice in the Language Laboratory is required. No credit is granted for 101-until -102 (or a more advanced course, as approved by the Department) has been completed satisfactorily. Prerequisite for -102: 101- or college equivalent, or placement test; for 103: -102 or college equivalent, or placement test.

### 126J, 127J French for the Elementary School (3,3)

Training in basic French grammar, pronunciation, and intonation with practical techniques for using French in the elementary classroom; organization of study units, songs, dialogues, and dramatizations. Open to those with little or no background in French. Offered jointly with the College of Education.

## 201, 202 Intermediate (5,5) AWSp,AWSp

Intensive practice in reading and writing. Systematic review of French grammar. Oral practice through imitation of assigned dialogues and free oral composition. Prerequisite for 201: 103 or college equivalent, or placement test; for 202: 201 or college equivalent, or placement test.

## 209 Elementary French Phonetics (3) S

For participants in the Study Abroad Program. Introduction to the sound system of French; training in correct perception and reproduction of sounds. Prerequisites, 103 or equivalent, and permission.

## 221 French Expository Prose (5) AWSp

For nonmajors only. Readings in and discussion of classical and modern French texts, primarily in the sciences and social sciences: Montesquieu, Comte, Seignobos, Bernard, and others. Recommended for students planning to pursue a scientific discipline. Satisfies the foreign language proficiency requirement for the College of Arts and Sciences. Prerequisite, 202 or college equivalent, or placement test.

## 222 Introduction to French Literature (5) AWSp

Transition between reading for content on the intermediate level and the critical reading ability required for more advanced courses in French literature. Introduction to problems of style, genre, and aesthetics. Prerequisite, 202 or college equivalent, or placement test.

## 230 Conversational French (2½ or 4, max. 8) S

For participants in the Living Language Group Program only. Prerequisites, 103 or equivalent, and permission.

## 237 Conversational French (2-8, max. 8) Sp

For participants in the Study Abroad Program. Prerequisites, 103 or college equivalent, and permission.

## 301, 302 Advanced Syntax and Composition (3,3) AW,WSp

Prerequisite for 301: 222 or college equivalent, or placement test; for 302: 301.

## 303 French Stylistics (3) ASp

Functional grammar review; creative written and oral composition and reading with special attention to problems of style. Prerequisite, 302.

## 304 Survey of French Literature: 1100-1635 (3) A

FIELD

Middle Ages through the Renaissance. Prerequisite, 222 or college equivalent, or placement test.

## 304H Survey of French Literature: 1100-1635 (1) A

Concurrent registration in 304H is required of "College Honors" and "With Distinction" students enrolled in 304. Prerequisite, permission of Honors Adviser.

## 305 Survey of French Literature: 1635-1800 (3) W

ELLRICH

Classical period, age of enlightenment, and pre-romanticism. Prerequisite, 222 or college equivalent, or placement test.

## 305H Survey of French Literature: 1635-1800 (1) W

Concurrent registration in 305H is required of "College Honors" and "With Distinction" students enrolled in 305. Prerequisite, permission of Honors Adviser.

## 306 Survey of French Literature: 1800-1960 (3) Sp

Romanticism, realism, naturalism, symbolism, and twentieth-century literature. Prerequisite, 222 or college equivalent, or placement test.

## 306H Survey of French Literature: 1800-1960 (1) Sp

Concurrent registration in 306H is required of "College Honors" and "With Distinction" students enrolled in 306. Prerequisite, permission of Honors Adviser.

## 307 Composition (3) S

For participants in the Study Abroad Program. Compositions on topical subjects of intermediate difficulty relating to the civilization of the French-speaking countries of Europe. Grammar review, as needed. Prerequisites, 222 or college equivalent, and permission.

## 308 Seventeenth-Century French Literature (3)

LEINER, WORTLEY

Readings in seventeenth-century drama, novel, and essay. Lectures and discussions on Baroque, classicism, and the history of genres. Prerequisite, 222 or college equivalent, or placement test.

## 309 Eighteenth-Century French Literature (3) W

HANZELI

Readings in eighteenth-century drama, novel, and essay. Lectures and discussions on Enlightenment, Rococo, and the history of genres.

## 310 Nineteenth-Century French Literature (3)

LEINER, WILSON

Major French literary figures and works of the nineteenth century. Prerequisite, 222 or college equivalent, or placement test.

## 311 Twentieth-Century French Literature (3)

KERN, VERNIER

Lectures and historical commentary. Readings and discussions in French of representative works of the twentieth century. Critical papers in French. (Students who took 309 for credit prior to Summer Quarter, 1966, cannot receive credit for 311.) Prerequisite, 222 or college equivalent, or placement test.

## 327 Advanced Conversation (2, max. 8) AWSp

Prerequisite, 222 or college equivalent, or placement test.

## 330 Conversational French (2½ or 4, max. 8) S

For participants in the Living Language Group Program only. Prerequisites, 222 or college equivalent, and permission.

## 337 Conversational French (2-8, max. 8) Sp or S

For participants in the Study Abroad Program. Prerequisites, 222 or college equivalent, and permission.

## 390 Supervised Study (2-5, max. 20) AWSp

Prerequisite, permission of the instructor and the Undergraduate French Adviser.

## 397 French-Speaking Europe and Its Literature (3 or 6) S

For participants in the Study Abroad Program. Readings on aspects of French literary tradition; discussion of social and cultural values as reflected in French literature. Field trips to sites of literary and historical interest. Substantial paper (written in French), and higher degree of participation, required for 6 credits. Prerequisites, 222 or college equivalent, and permission.

## 400 The Phonological Structure of French (3) A

HANZELI

Analysis of the French sound system from a linguistic point of view; phonology, morphology, and syntax. Prerequisite, Romance 401 or Linguistics 400.

## 401 The Morphological and Syntactic Structure of French (3) W

HANZELI

A linguistic study of French morphology and syntax. Prerequisite, Romance 401 or Linguistics 400.

## 404 Old French (3) A

FIELD

Designed for acquisition of reading facility in Old French through intensive study of selected texts. Prerequisite, Romance 401.

## 407 Advanced Composition (3) S

For participants in the Study Abroad Program. Compositions on topics of considerable complexity and difficulty relating to French civilization. Emphasis on matters of style rather than on grammar. Prerequisites, 301 or 304 or college equivalent, and permission.

## 408 Explication de Texte (3)

Close study of short pieces of French prose and poetry. The method consists of a literary analysis of the text from the different viewpoints: biographical, historical, etc. Lectures, discussion, and student *explications*.

# ROMANCE LANGUAGES AND LITERATURE

## 409 Advanced Phonetics (3) AWSp

CREORE

Training in diction and oral expression; interpretation of literary texts; phonetics as a teaching device. Prerequisite, 4 credits in 327 or equivalent.

## 420 Fiction: 1600-1680 (3)

LEINER

Prerequisites, 304, 305, and 306.

## 421 Fiction: 1680-1800 (3)

ELLRICH

Voltaire, Prévost, and Diderot. Prerequisites, 304, 305, and 306.

## 424 Fiction: 1800-1850 (3)

Balzac, Stendhal. Prerequisites, 304, 305, and 306.

## 425 Fiction: 1850-1900 (3)

DALE

Flaubert, Maupassant, Zola. Prerequisites, 304, 305, and 306.

## 426 Fiction: 1900-1950 (3)

KERN

Proust, Sartre, Camus. Prerequisites, 304, 305, and 306.

## 430 Advanced Conversational French (2½ or 4, max. 8) S

Continuation of 330. Advanced conversational problems. For participants in the Living Language Group Program only. Prerequisites, 330 or equivalent, and permission.

## 431 Poetry: Baroque (3)

LEINER

Prerequisites, 304, 305, and 306.

## 432 Poetry: Romantic (3)

DAVID

Prerequisites, 304, 305, and 306.

## 433 Parnassian and Symbolist Poetry (3)

Prerequisites, 304, 305, and 306.

## 434 Twentieth-Century Poetry (3)

C. WILSON

Prerequisites, 304, 305, and 306.

## 436 Poetry: Renaissance (3)

CREORE

Sixteenth-century poetry from Marot to D'Aubigné. Prerequisites, 304, 305, and 306.

## 437 Advanced Conversational French (2-8, max. 8)

For participants in the Study Abroad Program. Prerequisites, 327 or equivalent, and permission.

## 454 Nonfiction of the Classic Period (3)

WORTLEY

La Rochefoucauld and his contemporaries. Prerequisites, 304, 305, and 306.

## 455 Eighteenth-Century Nonfiction (3)

ELLRICH

Voltaire, Montesquieu, Rousseau. Prerequisites, 304, 305, and 306.

## 456 Nineteenth-Century Nonfiction (3)

Mme de Staël, Chateaubriand, and their contemporaries. Prerequisites, 304, 305, and 306.

## 457 Twentieth-Century Nonfiction (3)

Péguy, Maurras, and others. Prerequisites, 304, 305, and 306.

## 461 Seventeenth-Century Drama (3)

WORTLEY

Corneille, Racine, Molière. Prerequisites, 304, 305, and 306.

## 462 Eighteenth-Century Drama (3)

ELLRICH

Marivaux, La Chaussée, Voltaire. Prerequisites, 304, 305, and 306.

## 463 Nineteenth-Century Drama (3)

The French theater from Hugo to Becque. Prerequisites, 304, 305, and 306.

## 464 Twentieth-Century Drama (3)

LENSKI

Giraudoux, Sartre, Ionesco, and others. Prerequisites, 304, 305, and 306.

## 474 Application of Linguistics to the Teaching of French (3) Sp

HANZELI

Current theory and practical application of methods and techniques of teaching French to teachers of English. Prerequisites, 400 and 401.

## 490H Honors Seminar (5, max.10) AWSp

## 491H The French Moralists: Montaigne to Chamfort (3)

CHRISTOFIDES, ELLRICH

Selected readings, covering the development of French culture from the late Renaissance to the early Romantic period. Meetings will consist of lecture and discussion. Each student will present an oral *explication de texte*. A paper will be required and there will be a final exam.

## 497 French-Speaking Europe and Its Literature (3 or 6) S

For participants in the Study Abroad Program. Readings on aspects of French literary tradition; discussion of social and cultural values as reflected in French literature. Field trips to sites of literary and historical interest. Substantial paper (written in French), and higher degree of participation, required for 6 credits. Prerequisites, 304, 305, and 306, or college equivalent, and permission.

## Courses for Graduates Only

### 105 Elementary (5) AW

A course to prepare graduate students to pass the reading examination required for advanced degrees. Credit will be granted only to students who have received no previous credit in French. Students receiving credit in 105 may not later register for credit in 101-. Credits in 105 may not be applied toward an advanced degree. Prerequisite, graduate standing or permission of the Chairman of the Department.

### 106 Elementary (5) WSp

Continuation of 105. Students who have received credit for 102 and/or 103 may also receive credit for 106. Credits in 106 may not be applied toward an advanced degree. Prerequisite, 105 or permission of the Chairman of the Department.

### 513 Chanson de Geste (3, max. 9)

FIELD, FRIEDMAN

Prerequisite, 404, Romance 402, or permission.

### 514 Le Roman: Twelfth and Thirteenth Centuries (3, max. 9)

FIELD, FRIEDMAN

Prerequisite, 404, Romance 402, or permission.

### 520 Renaissance Prose: Rabelais (3)

KELLER

### 521 Studies in Fiction: 1660-1800 (3)

ELLRICH

### 524 Studies in Fiction: 1800-1850 (3)

### 525 Studies in Fiction: 1850-1900 (3)

### 526 Studies in Fiction: 1900-1950 (3)

KERN

### 527 Verse Narrative: Fourteenth and Fifteenth Centuries (3, max. 9)

FIELD, FRIEDMAN

Prerequisite, 404, Romance 402, or permission.

### 528 Prose Narrative: Fourteenth and Fifteenth Centuries (3, max. 9)

FIELD, FRIEDMAN

Prerequisite, 404, Romance 402, or permission.

### 530 Studies in Renaissance Poetry (3)

### 531 Renaissance Poetry: Ronsard (3)

CREORE

### 532 Studies in Nineteenth-Century Poetry (3)

### 533 Studies in Parnassian and Symbolist Poetry (3)

### 534 Studies in Twentieth-Century Poetry (3)

- 536 Lyric Poetry: Twelfth and Thirteenth Centuries (3, max. 9)**  
FIELD, FRIEDMAN  
Prerequisite, 404, Romance 402, or permission.
- 537 Lyric Poetry: Fourteenth and Fifteenth Centuries (3, max. 9)**  
FIELD, FRIEDMAN  
Prerequisite, 404, Romance 402, or permission.
- 540 Text Tradition and Edition (3, max. 9)**  
FIELD, FRIEDMAN  
Prerequisite, 404, Romance 402, or permission.
- 541, 542 History of the French Language (3,3)**  
A survey of the phonological, morphological, and syntactical development of the French language from its origins to the present.
- 550 Satiric and Didactic Literature: Eleventh through Thirteenth Centuries (3, max. 9)**  
FIELD, FRIEDMAN  
Prerequisite, 404, Romance 402, or permission.
- 551 Satiric and Didactic Literature: Fourteenth and Fifteenth Centuries (3, max. 9)**  
FIELD, FRIEDMAN  
Prerequisite, 404, Romance 402, or permission.
- 552 Renaissance Prose: Montaigne (3)**  
KELLER
- 554 Studies in Seventeenth-Century Nonfiction (3)**  
CHRISTOFIDES, LEINER
- 555 Studies in Eighteenth-Century Nonfiction (3)**  
ELLRICH
- 556 Studies in Nineteenth-Century Nonfiction (3)**
- 557 Studies in Twentieth-Century Nonfiction (3)**  
KERN
- 558 Twentieth-Century Ideas and Symbols (3)**  
DAVID
- 559 Historical Prose and Poetry (3, max. 9)**  
FIELD, FRIEDMAN  
Prerequisite, 404, Romance 402, or permission.
- 560 French Medieval Theatre (3, max. 9)**  
FIELD, FRIEDMAN  
Prerequisite, 404, Romance 402, or permission.

- 561 Studies in Seventeenth-Century Drama (3)**  
KERN
- 562 Studies in Eighteenth-Century Drama (3)**
- 563 Studies in Nineteenth-Century Drama (3)**
- 564 Studies in Twentieth-Century Drama (3)**
- 570 Seminar in Cinema (3)**  
DALE  
Prerequisite, permission of instructor.
- 575, 576, 577 Literary Criticism (3,3,3)**
- 590 Special Seminar and Conference (2-5, max. 20) AWSp**  
Group seminars, or individual conferences, are scheduled under this number to meet special needs. Prerequisite, permission of the Graduate Program Adviser.
- 600 Research (\*) AWSp**  
Prerequisite, permission of the Graduate Program Adviser.
- 700 Thesis (\*) AWSp**  
Prerequisite, permission of the Graduate Program Adviser.
- 702 Degree Final (6) AWSp**  
Limited to students completing a nonthesis degree program. Prerequisite, permission of the Graduate Program Adviser.
- ITALIAN**
- 101-102, 103 Elementary (5-5,5) A,W,Sp**
- 201, 202, 203 Intermediate (5,5,5) A,W,Sp**  
Intensive practice in speaking, reading, and writing. Functional review of grammar. Prerequisite for 201: 103 or college equivalent, or placement test; for 202: 201 or college equivalent, or placement test; for 203: 202 or college equivalent, or placement test.
- 301, 302 Advanced Syntax and Composition (3,3) A,W**  
Prerequisite, 203 or college equivalent or placement test for 301; 301 for 302.
- 303 Italian Stylistics (3) Sp**  
Functional grammar review; creative written and oral composition and reading, with special attention to problems of style. Prerequisite, 302.
- 304, 305, 306 Survey of Italian Literature (3,3,3) A,W,Sp**  
Prerequisite, 203 or college equivalent, or placement test.
- 327 Advanced Conversation (2, max. 8) AWSp**  
Prerequisite, 203 or college equivalent, or placement test.

- 390 Supervised Study (2-5, max. 20) AWSp**  
Prerequisite, permission of the instructor and the Undergraduate Italian Adviser.

## Courses for Graduates Only

- 512, 513, 514 Dante (3,3,3)**
- 531 Literary Problems (2-5, max. 20) AWSp**  
Group seminars, or individual conferences, are scheduled under this number to meet special needs. Prerequisite, permission of the Graduate Program Adviser. Field (see A-F below) must be specified in registration.
- A. Middle Ages and fourteenth century
  - B. Renaissance
  - C. Baroque
  - D. Eighteenth century
  - E. Nineteenth century
  - F. Twentieth century
- 541, 542 History of the Italian Language (3,3)**  
Phonological, morphological, and syntactical development of the Italian language from its origin to the present.
- 551, 552, 553 Seminar in Humanist and Renaissance Prose and Poetry (3,3,3)**
- 561, 562, 563 Italian Literature of the Nineteenth and Twentieth Centuries (3,3,3)**
- 600 Research (\*) AWSp**  
Prerequisite, permission of the Graduate Program Adviser.
- 700 Thesis (\*) AWSp**  
Prerequisite, permission of the Graduate Program Adviser.
- 702 Degree Final (6) AWSp**  
Limited to students completing a nonthesis degree program. Prerequisite, permission of the Graduate Program Adviser.
- PORTUGUESE**
- 101-102, 103 Elementary (5-5,5) A,W,Sp**
- 201, 202, 203 Intermediate (5,5,5) A,W,Sp**  
Modern texts, composition, conversation, and functional grammar. Students with advanced standing in Spanish courses may apply to instructor for permission to enter 301, instead of 201, after 103. Prerequisites, for 201: 103 or equivalent, or permission; for 202: 201; for 203: 202.
- 301, 302 Advanced Syntax and Composition (3,3) A,W**  
Students with advanced standing in Spanish courses may apply to instructor for permission to enter 301 after 103. Prerequisite for 301: 203 or equivalent, or permission; for 302: 301.

# ROMANCE LANGUAGES AND LITERATURE

## 303 Portuguese Stylistics (3) Sp

Functional grammar review; creative written and oral composition and reading with special attention to problems of style. Prerequisite, 302.

## 304 Survey of Luso-Brazilian Literature: Middle Ages and Renaissance (3) A GOETZINGER

Prerequisite, 203 or equivalent, or permission.

## 305 Survey of Luso-Brazilian Literature: Seventeenth, Eighteenth, and Early Nineteenth Centuries (3) W GOETZINGER

Prerequisite, 203 or equivalent, or permission.

## 306 Survey of Luso-Brazilian Literature: Late Nineteenth and Twentieth Centuries (3) Sp GOETZINGER

Prerequisite, 203 or equivalent, or permission.

## 327 Advanced Conversation (2, max. 8)

Prerequisite, 203 or equivalent, or permission.

## 390 Supervised Study (2-5, max. 20) AWSp GOETZINGER

Prerequisite, permission of the instructor and the Undergraduate Portuguese Adviser.

## 409 Portuguese Phonetics (3)

Phonetic structure of the Portuguese language as spoken in Portugal and Brazil; practice in Portuguese and Brazilian pronunciation. Prerequisite, 4 credits in 327 or equivalent, or permission.

## 424, 425, 426 Fiction: 1800-1950 (3,3,3) A,W,Sp GOETZINGER

Romanticism, realism, symbolism, and modernism in Portugal and Brazil. Eça de Queirós, Machado de Assis, twentieth-century novelists. Prerequisites, 304, 305, and 306.

## Course for Graduates Only

### 541, 542 History of the Portuguese Language (3,3)

Phonological, morphological, and syntactical development of the Portuguese language from its origin to the present. Prerequisite, Romance 401 or equivalent.

## PROVENÇAL

### 534 Old Provençal (3) FIELD, SIMPSON

## ROMANIAN

### 411J-412J Intensive Phonetics, Grammar, and Vocabulary (5-5) A,W AUGEROT

A comprehensive introduction to both spoken and literary Romanian. Offered jointly with the Far Eastern and Slavic Languages and Literature.

## 413J Readings in Romanian (5) Sp

AUGEROT

Designed to increase the student's vocabulary and enhance his knowledge of grammar through the reading of short fictional material in modern Romanian. Offered jointly with the Far Eastern and Slavic Languages and Literature. Prerequisites, 411J-412J.

## SPANISH

### 101-102, 103 Elementary (5-5,5) W,AWSp, AWSp

Methods and objectives are primarily oral-aural. Oral practice in the Language Laboratory is required. Prerequisite for -102: 101- or college equivalent, or placement test; for 103: -102 or college equivalent, or placement test.

### 128J, 129J Spanish for the Elementary School (3,3) S

Training in basic Spanish grammar, pronunciation, and intonation with practical techniques for using Spanish in the elementary classroom; organization of study units, songs, dialogues, and dramatizations. Open to those who have little or no background in Spanish. Offered jointly with the College of Education.

### 130 Elementary Conversational Spanish (1, max. 2) S

For teachers of elementary Spanish. Oral conversation practice and instruction in the preparation of audio-oral drill methods.

### 201, 202, 203 Intermediate (5,5,5) AWSp,AWSp,AWSp

Intensive practice in speaking, reading, and writing. Systematic review of Spanish grammar. Oral practice based on selected pieces of Spanish literature. Prerequisite for 201: 103 or college equivalent, or placement test; for 202: 201 or college equivalent, or placement test; for 203: 202 or college equivalent, or placement test.

### 230 Conversational Spanish (2½ or 4, max. 8) S

For participants in the Living Language Group Program only. Prerequisites, 103 or college equivalent, and permission.

### 237 Conversational Spanish (2 or 4 or 6) Sp

For participants in the Study Abroad Program. Prerequisites, 103 or college equivalent, and permission.

### 301, 302 Advanced Syntax and Composition (3,3) AW,WSp

Prerequisite for 301: 203 or college equivalent, or placement test; for 302: 301.

### 303 Spanish Stylistics (3) ASp

Functional grammar review; creative written and oral composition and reading with special attention to problems of style. Prerequisite, 302.

## 304 Survey of Spanish Literature: 1140-1498 (3) A

PENUELAS

Masterpieces of Spanish literature from *Poema de Mio Cid* to 1498. Prerequisite, 203 or college equivalent, or placement test.

## 305 Survey of Spanish Literature: 1498-1681 (3) W

SALINERO

Prerequisite, 203 or college equivalent, or placement test.

## 306 Survey of Spanish Literature: 1681 to the Present (3) Sp

PENUELAS

Prerequisite, 203 or equivalent, or placement test.

## 308 Spanish Literature of the Golden Age (3)

Extensive readings in prose, drama, and poetry. Prerequisite, 203 or college equivalent, or placement test.

## 309 Contemporary Spanish Literature (3)

PENUELAS

Extensive reading of the works of contemporary poets, novelists, and essayists. Prerequisite, 203 or college equivalent, or placement test.

## 310 Introduction to Spanish-American Literature (3)

An introduction to landmarks in the poetry, novel, and essay of Spanish America. Prerequisite, 203 or college equivalent, or placement test.

## 327 Advanced Conversation (2, max. 8) AWSp

Prerequisite, 203 or equivalent, or placement test.

## 330 Conversational Spanish (2½ or 4, max. 8) S

For participants in the Living Language Group Program only. Prerequisites, 203 or college equivalent, and permission.

## 337 Conversational Spanish (2 or 4 or 6) Sp

For participants in the Study Abroad Program. Prerequisites, 203 or equivalent, and permission.

## 390 Supervised Study (2-5, max. 20) AWSp

Prerequisite, permission of the instructor and the Undergraduate Spanish Adviser.

## 400 The Structure of Modern Spanish (3) W SAPORTA

Analysis of the spoken language from a linguistic point of view; phonological, morphological, and syntactic analysis. Prerequisites, 203, and Romance 401 or Linguistics 400.



## 409 Advanced Phonetics (3) AWSp

CONTRERAS, VARGAS-BARON

Analysis of sounds; training in correct and natural pronunciation. Prerequisite, 4 credits in 327 or equivalent.

## 410 Hispanic Poetry: Late Middle Ages through the Sixteenth Century (3)

SALINERO

Prerequisites, 304, 305, and 306.

## 411 Hispanic Poetry: Seventeenth through the Nineteenth Century (3)

Prerequisites, 304, 305, and 306.

## 412 Hispanic Poetry: The Twentieth Century (3)

PREDMORE

Prerequisites, 304, 305, and 306.

## 418 Cervantes and Modern Fiction (3)

SALINERO

A study of Cervantes' *Don Quijote* as a milestone in modern fiction. Prerequisites, 304, 305, and 306.

## 420 Spanish Literature of the Eighteenth Century (3)

PENUELAS

Study of the main literary currents and authors of the eighteenth century in Spain with emphasis on the ideological crisis of that time. Prerequisites, 304, 305, and 306.

## 430 Advanced Conversational Spanish (2½ or 4, max. 8) S

Continuation of 330. Advanced conversational problems primarily for teachers. For participants in the Living Language Group Program only. Prerequisites, 330 or college equivalent, and permission.

## 437 Advanced Conversational Spanish (2 or 4 or 6) S

For participants in the Study Abroad Program. Prerequisites, 327 or equivalent, and permission.

## 441, 442, 443 Drama (3,3,3)

WILSON

Historical development of the drama in Spain from its beginnings to the present. Selected texts, collateral reading, and reports. 441: 1150-1635. 442: 1635-1681. 443: 1681 to the present. Prerequisites, 304, 305, and 306.

## 451, 452, 453 Spanish Literature Since 1700 (3,3,3) A,W,Sp

PENUELAS

451: 1700 through the Romantic Period. 452: 1850-1898. 453: 1898 to the present. Prerequisites, 304, 305, and 306.

## 461, 462, 463 Spanish Literature of the Golden Era (3,3,3)

Poetry, drama, historical narrative, and prose fiction of the Golden Era from 1498 to 1681. 461: Poetry. 462: Drama. 463: Prose. Prerequisites, 304, 305, and 306.

## 471 Individual Authors (3, max. 9)

This course is devoted to one or more representative Spanish or Spanish-American authors. Prerequisites, 304, 305, and 306.

## 474 Application of Linguistics to the Teaching of Spanish (3) A

Current theory and practical application of methods and techniques of teaching Spanish, as based on the findings of linguistics.

## 481, 482, 483 Spanish-American Literature (3,3,3) A,W,Sp

BODDEN

General survey. 481: The colonial period and early years of independence. 482: The middle years of the nineteenth century. 483: The twentieth century. Prerequisites, 304, 305, and 306.

## 485 Romanticism, Realism, and Naturalism in Spanish America (3) A

VARGAS-BARON

Leading Romantic and Costumbrista authors (1810-1890). Prerequisites, 304, 305, and 306.

## 486 The Modernista Movement in Spanish-American Literature (3) W

VARGAS-BARON

The leading poets, essayists, and novelists of Spanish America (1890-1920). Prerequisites, 304, 305, and 306.

## 487 The Contemporary Spanish-American Novel (3) Sp

VARGAS-BARON

Prerequisites, 304, 305, and 306.

## 488 Cultural Background of Latin-American Literature (3)

Survey of ideas and art forms and their relationship to literature in four periods: pre-Columbian, colonial, early independence, and twentieth century. Prerequisite, 203.

## Courses for Graduates Only

### 105 Elementary (5)

A course to prepare graduate students to pass the reading examination required for advanced degrees. Credit will be granted only to students who have received no previous credit in Spanish. Students receiving credit in 105 may not later register for credit in 101-. Credits in 105 may not be applied toward an advanced degree. Prerequisite, graduate standing or permission of the Chairman of the Department. (Not offered 1967-68.)

### 106 Elementary (5)

Continuation of 105. Students who have received credit for -102 and/or 103 may also receive credit for 106. Credits in 106 may not be applied toward an advanced degree. Prerequisite, 105 or permission of the Chairman of the Department. (Not offered 1967-68.)

### 500 Seminar in Spanish Linguistics (3) Sp

SAPORTA

Problems in the phonological and grammatical analysis of modern Spanish. Prerequisite, 400.

## 511, 512, 513 Early Spanish Literature (3,3,3)

A detailed survey of early Spanish literature, from its beginning through the fifteenth century. Examination of primary texts of epic and lyric poetry, brief prose fiction, drama, the ballad, didactic materials, the histories.

## 515 The Contemporary Spanish-American Short Story (3)

GOETZINGER

## 521, 522 The Renaissance in Spain (3,3)

DIAZ-QUINONES

## 531 Literary Problems (2-5, max. 20) AWSp

Group seminars, or individual conferences, are scheduled under this number to meet special needs. Prerequisite, permission of the Graduate Program Adviser. Field (see A-H below) must be specified in registering. Maximum credit to be 5 in any one subdivision.

A. Middle Ages

B. Renaissance

C. Golden Age

D. Eighteenth century

E. Nineteenth century

F. Twentieth century

G. Spanish-American colonial literature

H. Latin America

## 541, 542 History of the Spanish Language (3,3) W,Sp

A survey of the phonological, morphological, and syntactical development of the Spanish language, with particular emphasis on early literary texts.

## 553 The Generation of '98 (3)

## 561 Spanish-American Literature from 1940 to the Present (3, max. 9)

## 562 Spanish Literature from 1940 to the Present (3)

PENUELAS

## 571 The Modern Essay (3)

VARGAS-BARON

## 572 Twentieth-Century Spanish Poetry (3)

PENUELAS, PREDMORE

## 573 Twentieth-Century Spanish-American Poetry (3)

GOETZINGER

## 575 Hispanic Literary Criticism (3)

## 600 Research (\*) AWSp

Prerequisite, permission of the Graduate Program Adviser.

## 700 Thesis (\*) AWSp

Prerequisite, permission of the Graduate Program Adviser.

## 702 Degree Final (6) AWSp

Limited to students completing a nonthesis degree program. Prerequisite, permission of the Graduate Program Adviser.

# ROMANCE LANGUAGES AND LITERATURE

## ENGLISH TRANSLATION

These courses are recommended as appropriate minor or supporting studies for students majoring in other departments. Courses in English translation are not applicable toward undergraduate or graduate majors in the Department of Romance Languages and Literature.

## Courses for Undergraduates

### FRENCH

- 416 *Rabelais and Montaigne in English* (3)
- 417 *Racine and Molière in English* (3)
- 418 *Literature of the Enlightenment in English* (3)
- 419 *Nineteenth-Century Fiction in English* (3)

### ITALIAN

- 318 *Italian Literature in English* (5)

- 384 *Renaissance Literature of Italy in English* (2)

- 481 *The Divine Comedy in English* (4)

A study of Dante's *Divine Comedy* in English translation, with consideration of its background and influence. May be counted as an elective in an English major.

## ROMANCE LITERATURE

- 460 *The Literature of the Renaissance in English* (5)

## SPANISH

- 315 *Latin-American Authors in English* (5)

- 345 *Spanish Literature of the Renaissance in English* (3)

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ROMANIAN—See *Far Eastern and Slavic/Romance Languages and Literature*

RUSSIAN—See *Far Eastern and Slavic Languages and Literature*

SANSKRIT—See *Far Eastern and Slavic Languages and Literature*

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## SCANDINAVIAN LANGUAGES AND LITERATURE

## Courses for Undergraduates

### DANISH

- 101-102, 103 *Elementary Danish* (5-5,5)  
A,W,Sp  
Fundamentals of oral and written Danish.

- 220 *Introduction to Danish Literature* (3) A  
Selected short stories by contemporary authors. Prerequisite, 103 or equivalent.

- 221 *Introduction to Danish Literature* (3) W  
Selected prose fiction. Prerequisite, 220 or equivalent.

- 222 *Introduction to Danish Literature* (3) Sp  
Kaj Munk and his dramas. Prerequisite, 221 or equivalent.

- 223, 224, 225 *Danish Conversation and Composition* (2,2,2) A,W,Sp  
Prerequisites, 103 for 223; 223 for 224; 224 for 225.

- 490 *Supervised Reading* (\*, max. 5) AWSp  
ARESTAD  
Students with an adequate reading knowledge of Danish pursue in this course a program of study in a selected area of Danish language, literature, or related fields. Conferences with the instructor; reports. Prerequisite, permission.

### NORWEGIAN

- 101-102, 103 *Elementary Norwegian* (5-5,5)  
AW,WSp,Sp  
ARESTAD  
Fundamentals of oral and written Norwegian.

- 220 *Introduction to Norwegian Literature* (3) A,W  
ARESTAD  
Ibsen's *A Doll's House* and one other play. Prerequisite, 103 or equivalent.

- 221 *Introduction to Norwegian Literature* (3) W,Sp  
Hamsun's *Victoria* and one other novel. Prerequisite, 220 or equivalent.

- 222 *Introduction to Norwegian Literature* (3) A,Sp  
Hamsun's *Pan* and selected short stories. Prerequisite, 221 or equivalent.

- 223, 224, 225 *Norwegian Conversation and Composition* (2,2,2) A,W,Sp  
Prerequisites, 103 for 223; 223 for 224; 224 for 225.

- 300 *Modern Norwegian Literature* (\*, max. 3) A  
ARESTAD  
Reading representative works of Ibsen and Bjørnson. Prerequisite, 222 or equivalent.

- 301 *Modern Norwegian Literature* (\*, max. 3) W  
ARESTAD  
Reading selected novels of Kielland, Hamsun, Undset. Prerequisite, 222 or equivalent.

- 302 *Modern Norwegian Literature* (\*, max. 3) Sp  
ARESTAD  
Reading representative poetry of Wergeland, Welhaven, Vogt, Bull, and Overland. Prerequisite, 222 or equivalent.

- 303, 304, 305 *Advanced Norwegian Conversation and Composition* (2,2,2)  
A,W,Sp  
Prerequisite, 225 or equivalent.

- 450 *History of Norwegian Literature* (3)  
ARESTAD  
A one-volume history serves as text. Representative literary works from the earliest times to the present are read to supplement the literary historical account and to show the evolution of the thought and form of the various genres. Prerequisite, 222 or equivalent.

- 490 *Supervised Reading* (\*, max. 10) AWSp  
ARESTAD  
Students with an adequate reading knowledge of Norwegian pursue in this course a program of study in a selected area of Norwegian language, literature or related fields. Conferences with the instructor; reports. Prerequisite, 302 or permission.

### SWEDISH

- 101-102, 103 *Elementary Swedish* (5-5,5)  
AW,WSp,Sp  
JOHNSON  
Fundamentals of oral and written Swedish.

- 220 *Introduction to Swedish Literature* (3) A,W  
JOHNSON  
Fröding and his poetry. Prerequisite, 103 or equivalent.

- 221 *Introduction to Swedish Literature* (3) W,Sp  
JOHNSON  
Hjalmar Söderberg and his short stories. Prerequisite, 220 or equivalent.

- 222 *Introduction to Swedish Literature* (3) A,Sp  
JOHNSON  
Malmberg and his short stories. Prerequisite, 221 or equivalent.

- 223, 224, 225 *Swedish Conversation and Composition* (2,2,2) A,W,Sp  
Prerequisites, 103 for 223; 223 for 224; 224 for 225.

- 300 *Modern Swedish Literature* (2) A  
JOHNSON  
An introduction to Lagerkvist's major works. Prerequisite, 222 or equivalent.

- 301 *Modern Swedish Literature* (2) W  
JOHNSON  
Martinson's *Aniara*. Prerequisite, 222 or equivalent.

## 302 Modern Swedish Literature (2) Sp

JOHNSON

Bellman or modern poetry. Prerequisite, 222 or equivalent.

## 303, 304, 305 Advanced Conversational Swedish (2,2,2) A,W,Sp

Prerequisite, 225 or equivalent.

## 306, 307, 308 Advanced Swedish Composition (1,1,1) A,W,Sp

Prerequisite, 225 or equivalent.

## 450 History of Swedish Literature (3) Sp

JOHNSON

A one-volume history serves as text. Representative literary works from the earliest times to the present are read to supplement the literary historical account and to show the evolution of the thought and form of the various genres. Prerequisite, 222 or equivalent.

## 490 Supervised Reading (\*, max. 12) AWSp

JOHNSON

Students with an adequate reading knowledge of Swedish pursue in this course a program of study in a selected area of Swedish language, literature or related fields. Conferences with the instructor; reports. Prerequisite, 302 or permission.

## SCANDINAVIAN COURSES IN ENGLISH

### 100 Modern Scandinavian Culture (2) AWSp

ARESTAD

The background for Scandinavian democracy of the present day, with special emphasis on the large peoples' movements of the nineteenth century and the role of literature and the arts in this development. Reading and discussion of a play by Ibsen and one by Strindberg.

### 230 Scandinavian Mythology (2) Sp

An introduction to the study of the mythology of the Germanic, and especially Scandinavian peoples. Emphasis on the source material, particularly the *Poetic Edda* and *Prose Edda*, and heroic legend, also historical and archeological material.

### 309 The Scandinavian Novel in English (2) W

Representative Old Icelandic sagas.

### 310 The Scandinavian Novel in English (2)

JOHNSON

The emigrant novel: Rölvaag, Bojer, Moberg.

### 311 The Scandinavian Novel in English (2)

ARESTAD

Representative novels and short stories of Jacobsen, Hamsun, Dinesen, Duun, and Lagerkvist.

### 382 Twentieth-Century Scandinavian Drama in English (2) Sp

JOHNSON

A study of representative Scandinavian plays of our time.

## 455 Introduction to Scandinavian Linguistics (3) Sp

Descriptive analysis of the phonological, morphological, and syntactical structures of the modern Scandinavian languages. Prerequisite, equivalent of two college years of a Scandinavian language.

## 480 Ibsen and His Major Plays in English (2) A

ARESTAD, JOHNSON

## 481 Strindberg and His Major Plays in English (2) W

JOHNSON

## Courses for Graduates Only

### 500, 501, 502 Old Icelandic (2,2,2) A,W,Sp

JOHNSON

### 503, 504 Advanced Old Icelandic (2,2) A,W

The study of the *Poetic Edda*. Prerequisite, 502 or equivalent.

### 506 Ibsen's Early Plays (3)

ARESTAD

(Offered alternate years; offered 1967-68.)

### 507 Ibsen's Later Plays (3) W

ARESTAD

(Offered alternate years; offered 1967-68.)

### 508 Nineteenth-Century Danish-Norwegian Novel (3) A

ARESTAD

(Offered alternate years; offered 1968-69.)

### 509 Twentieth-Century Danish-Norwegian Novel (3) W

ARESTAD

(Offered alternate years; offered 1968-69.)

### 510, 511, 512 Strindberg (3,3,3) A,W,Sp

JOHNSON

(Offered alternate years; offered 1967-68.)

### 515 Modern Danish and Norwegian Poetry (3) Sp

ARESTAD

(Offered alternate years; offered 1968-69.)

### 516 Modern Danish and Norwegian Drama (3) Sp

ARESTAD

(Offered alternate years; offered 1967-68.)

### 517 Modern Swedish Poetry (3) W

JOHNSON

### 518 The Swedish Novel (3) W

JOHNSON

### 519 Recent Swedish Drama (3) A

JOHNSON

## 600 Research (\*) AWSp

ARESTAD, JOHNSON

## 700 Thesis (\*) AWSp

JOHNSON, ARESTAD

## SECRETARIAL STUDIES

The Secretarial Studies program, administered by the Division of Evening and Extension Classes, offers courses that are designed to meet the needs of students who are preparing for positions as secretaries and administrative assistants, and those who wish to develop competency in typewriting, shorthand, and office machines. These courses also are required in partial fulfillment of the Business Education major and minor.

A *day student* may, in the process of normal day registration, register for a course scheduled for either daytime or evening without additional fee. An *evening student* may register for a daytime class through Evening Classes registration, on a space availability basis, and pay the Evening Classes fee.

### 111 Secretarial Studies (2) AWSp

BROWN, FRERICHS

Improvement of typewriting speed and accuracy; emphasis on business letters, business forms, and reports. Prerequisite, one or two semesters of high school typewriting or equivalent.

### 112 Secretarial Studies (2) AWSp

BROWN, FRERICHS

Continuation of 111. Emphasis on production typewriting. Prerequisite 111.

### 115 Office Machines (3) AWSp

WILSING

Instruction in the operation of full-bank and ten-key adding machines; rotary, printing, and key-driven calculators; introduction to digital computer (optional).

### 120 Gregg Shorthand (3) AS

BROWN, FRERICHS

Theory of Gregg shorthand. Students who present one or more units of shorthand as entrance credit may not receive credit for this course. Students with one or more high school units in shorthand should consult department advisers for proper course placement.

### 121 Gregg Shorthand (3) AW

FRERICHS

Students with one or more high school units in shorthand should consult department advisers for proper course placement. Prerequisite, 120- or permission.

### 122 Advanced Gregg Shorthand (3) Sp

BROWN, WILSING

New matter dictation and introduction to transcription. Prerequisite, -121 or permission.

## SECRETARIAL STUDIES

### 310 Advanced Secretarial Studies (5) A

BROWN

Advanced shorthand dictation and transcription; general office practice and procedures. Prerequisites, 112, 122, or permission.

### 311 Advanced Secretarial Studies (5) W

BROWN

Continuation of 310. Prerequisite, 310.

### 320 Secretarial Practice (5) Sp

FRERICHS

Advanced office procedure; automation in the office; integration of skills and knowledge acquired in basic secretarial studies. Prerequisite, 112.

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*SERBO-CROATIAN—See Far Eastern and Slavic Languages and Literature*

*SLAVIC—See Far Eastern and Slavic Languages and Literature*

*SOCIAL SCIENCE—See General and Interdepartmental*

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## SOCIAL WORK

### Courses for Undergraduates

#### 391 Supervised Study (2-6, max. 6) W

DULICA, KELLEY

Specialized academic and field study in agencies of selected social welfare problems. Emphasis is on the nature of the clientele and their problems, the kind of services offered to them, and the place of these services in total community programs. Prerequisite, 400 or permission.

#### 400 Field of Social Welfare (5) ASp

DUPLICA

The origin, development, and present status of social service programs, with particular emphasis on the relationship of program resources, human needs, and the methods through which services are provided. Prerequisite, upper-division standing.

#### 401 Principles of Interviewing (2) AWSpS

The interview as a basic method in helping people. Analysis of case records with objective of identifying processes and techniques of skillful interviewing; ways in which purpose and setting of the interview influence its nature and course. Prerequisite, upper-division standing.

### Courses for Graduates Only

#### 502, 503, 504 Social Welfare Organization (2,2,2) A,W,Sp

DUPLICA, PARSONS, SMITH

Historical origins of concepts, policies, and social welfare institutions; critical analysis of current public and private programs at all jurisdictional levels; use of social welfare concepts in planning.

#### 508 Integrative Seminar (2) WSp

A sixth-quarter course designed to help the student integrate knowledge and values from the several areas of the professional curriculum. Major emphasis is placed on ethical problems contained in current issues and the social worker's role in resolving them.

#### 509 Readings in Social Work (\*) AWSpS

Prerequisite, permission.

#### 510 Social Casework (2) A

ABRAHAMSON, MILLER, MUNDT, REISS

The casework process studied from a conceptual and value base together with generic principles which form the foundation of the methodological process. Consideration is also given to basic interviewing principles and the use of understanding concerning the motivations in human behavior as these apply to the casework process and its goals.

#### 511 Social Casework (2) W

ABRAHAMSON, MILLER, MUNDT, REISS

Continuation of generic casework theory, with emphasis on diagnosis and casework treatment. Prerequisite, 510.

#### 512 Social Casework (2) Sp

ABRAHAMSON, MILLER, MUNDT, REISS

Elaboration and intensification of basic casework concepts and their application in practice to various types of agencies. Prerequisite, 511.

#### 515 Field Instruction (4-8, max. 12) AWSp

Prerequisite, permission.

#### 520 Seminar (\*, max. 6) AWSp

Prerequisite, permission.

#### 521 Social Group Work (2) A,W

STAFF

Introduction to social group work as a method of social work. Special emphasis upon a beginning understanding of factors involved in helping individuals with their problems in the group.

#### 522 Social Group Work (2) W

STAFF

The social group worker's helping role in problem solving. Special emphasis upon the study and appraisal of individuals within the group and their total psycho-social-cultural developmental background. Study of formulating a working diagnosis on individual clients and the formulation of treatment goals. Prerequisite, 521.

#### 523 Social Group Work (2) Sp

STAFF

The social group worker's activity in utilizing group processes and structure to treat individuals within a group. Integration of study, diagnosis, and treatment in the processes of providing social work services. Prerequisite, 522.

#### 524 Advanced Social Group Work (2) A

MAIER

The use of programming as a means of diagnosis and treatment in the practice of social group work. The analysis and purposeful use of program media. Prerequisite, 523.

#### 525 Advanced Social Group Work (2) W

MAIER

The application of the social group work method with an emphasis upon differential treatment of individuals with psycho-social problems. Social group work within the context of a group living setting. The use of marginal interview. Collaborative and team work with other disciplines. Prerequisite, 524.

#### 526 Advanced Social Group Work (2) Sp

MAIER

The continuum of treatment with a review of beginning, central, and terminal phases of social group work. History and current trends in social group work. Prerequisite, 525.

#### 530 Advanced Social Casework (2) A

ABRAHAMSON, HUNT, MUNDT, REISS

Intensive study of the casework process to deepen and broaden the caseworker's knowledge and understanding of the dynamics of human behavior and to enable him to develop greater skill in interviewing. Prerequisite, 512.

#### 531 Advanced Social Casework (2) W

ABRAHAMSON, HUNT, MUNDT, REISS

Continuation of intensive study of case material, with particular emphasis on worker-client relationship reactions as these affect the diagnostic and treatment processes. Prerequisite, 530.

#### 532 Advanced Social Casework (2) Sp

ABRAHAMSON, HUNT, MUNDT, REISS

Intensive drill in case analysis, seeing the case as a whole, achieving a balanced perspective on the relationship between inner and outer forces, and planning appropriate treatment. Prerequisite, 531.

#### 533, 534 Trends in Social Work Practice (2,2) A,W

HUNT, RAY, REISS

Generic and differential factors in understanding and utilizing various administrative settings in social work practice. Study of developments and trends in social work practice. Prerequisite, permission.

#### 535 Advanced Field Instruction (4-8, max. 12) AWSp

Prerequisite, 515.

#### 550, 551, 552 Human Growth and Behavior (2,2,2) A,W,Sp

FARBER, HERRICK, R. MACDONALD, TAKAGI

The study and examination of man's social functioning through analysis of selected aspects of physical, emotional, social, and cultural influences upon normal growth and behavior.

**556J Social Aspects of Illness and Disability (2) WSp**

Physical growth and change of the individual as correlated with factors of emotional and social development; consideration of specific medical problems. Offered jointly with the Department of Physical Medicine and Rehabilitation. Prerequisite, permission.

**570 Administration of Social Agencies (2) AW**  
PARSONS

The importance of social work administration to social work practice; administrative behavior as it affects practice. Administrative organization and techniques which permeate all levels of staff, including pressures from within and without the social agency. Prerequisite, permission.

**572 Social Community Organization (2) AWSp**  
ELLIS, RAY

Understanding the social forces of the community, the process of community organization, and the role of the social worker in implementing community organization. Prerequisite, permission.

**573 Advanced Social Community Organization (2) A**  
RAY

Intensive study of community action situations involving social welfare program development, community welfare planning, and neighborhood citizen action to deepen the student's capacity for problem-solving in the community context. Prerequisites, 572 and permission.

**574 Advanced Social Community Organization (2) W**  
RAY

Study of traditional and newer planning and financing mechanisms for linking programs at the various levels: neighborhood, metropolitan area, state, national. Appropriate methods for effecting change in social conditions through the use of these mechanisms will be studied. Prerequisite, 573.

**575 Advanced Social Community Organization (2) Sp**  
RAY

Intensive study of the methods for: assessing resistant and supportive forces, creating action systems representative of appropriate segments of the community, sustaining a relationship with an action system over a period from identification of a problem to action, and evaluation of the outcome. Prerequisite, 574.

**587 Law and Social Welfare (2) W**  
GRONWOLD

The basis of law, its philosophy and development, its broad principles, and the procedure by which it operates; specific aspects of law pertinent to social work orientation, including law in relation to the family, children, guardianships, and acts against society, and property laws. Prerequisite, permission.

**590 Social Work Research (2) AWSp**  
GRISWOLD, HERRICK, NORTHWOOD

An introduction to the logic of scientific method with reference to techniques used in social research. Examples drawn from problems and practices in social work and social welfare.

**591, 592 Social Work Research (2,2)**  
NORTHWOOD

The sequence describes (a) specific research techniques and (b) how they are applied in social work. Each technique is placed in methodological and theoretical context by the examination of published research monographs, which show its use and limits. Prerequisite, 590 or its equivalent.

**593-594-595 Field Practice in Research (2-2-2)**

Field practice in a group project in lieu of an individual thesis (except for students in the special program). Includes development of research design, collection of data, tabulation and analysis, and report writing. Prerequisite, 590 or its equivalent.

**596-597 Field Research Practicum (4-4) Sp,S**  
NORTHWOOD

Research techniques and strategies employed in social work are examined in seminar and through specialized, supervised training in agencies and programs engaged in such work. For the Special Program in Social Work Research apply to Dean, School of Social Work. Implementation of the application is dependent upon the availability of resources. Stipends for the summer study may be available. Prerequisite, permission.

**700 Thesis (\*) AWSp**

**702 Degree Final (6)**

Limited to students completing a nonthesis degree program.

**SOCIOLOGY**

**501, 502, 503 Research Frontiers in Sociology (3,3,3) A,W,Sp**  
LARSEN

Review and analysis of research strategic requirements and opportunities in and between major fields of sociology. Formulation of M.A. thesis prospectus. Required of all entering graduate students and restricted to this group. Must be taken in sequence.

**Field I: SOCIOLOGICAL THEORY**

**110 Survey of Sociology (5) AWSp**  
CATTON

Basic principles of social relationships. Not open to students who have taken 310.

**310 General Sociology (5)**  
CATTON

Major concepts and the scientific point of view in dealing with social phenomena. For juniors and seniors only. Not open to students who have taken 110.

**410 History of Sociological Thought (5) W**  
CATTON

Contributions of individual theorists (from Comte to the present) to a coherent body of testable hypotheses; emphasis on cumulative development of concepts and principles, emergence of sociology as a science, probable future developments. Prerequisite, 110 or 310.

**411, 412, 413 Systematic Sociology (3,3,3) A,W,Sp**  
DODD

This sequence pursues acquaintance (411), competence (412), and creative use (413) with systematizing sociological methodology. Standard and frontier methods of logic, statistics, polling, modeling, cybernetics, values theory, etc., are studied in class projects, student theses, and in "Scient-scales." Students write papers for professional journals. Prerequisite, permission.

**414 Sociological Theory (5) Sp**  
COSTNER

Modern scientific theory applied to social behavior; sociology as a natural science. Prerequisite, 20 credits in social science.

**415 Theory of Social Organization (5) W**  
WAGER

State and usages of theory in social organization; importance of linkage between theory and methodology; major features of social organization demonstrated by intensive examination of representative theories of social organization with particular focus on complex forms. Prerequisite, 110 or 310.

**N510, N511, N512 Departmental Seminar (0,0,0) A,W,Sp**

Monthly meetings with reports on independent research by graduate students and staff members.

**Field II: RESEARCH METHODS AND SOCIAL STATISTICS**

**223 Social Statistics (5) AWSp**

Methods and sources for quantitative investigation. Prerequisite, 110 or 310.

**420 Methods of Sociological Research (5) A**  
FARIS

A general survey of the principal methods of research used in sociology, and of special issues and problems in methodology. Prerequisite, 223 or equivalent.

**421 Methodology: Case Studies and Interviewing (3)**  
CHAMBLISS

Prerequisites, 223 and 420.

**423 Advanced Social Statistics (5) A**  
COSTNER

Application of statistical methods to the analysis of sociological data. Prerequisite, 223.

## 425 Graphic Techniques in the Social Sciences (5) A

SCHMID

Theory and practice of presenting statistical data in graphic form. Construction of bar, line, pictorial, and other types of charts and graphs, and areal distribution maps, etc., used for research and publicity purposes in sociology, geography, economics, education, and community planning. Prerequisite, 223 or approved equivalent.

## 426 Methodology: Quantitative Techniques in Sociology (3) W

COSTER, LEIK

Measures of relationships among variables and among attributes; calculation techniques; application to typical sociological problems; interpretation. Prerequisites, 223 and 423, or equivalents. (Offered alternate years; offered 1967-68.)

## 427 Statistical Classification and Measurement (3) Sp

COSTER, LEIK

Application of statistical principles and methods to problems of classification and measurement in social research. Prerequisite, 423 or equivalent. (Offered alternate years; offered 1967-68.)

## 428-429 Sampling and Experimentation (3-3) W,Sp

COSTNER, LEIK

Application of statistical principles and methods to problems of sampling and experimentation in social research. Prerequisite, 423 or equivalent. (Offered alternate years.)

## 521, 522, 523 Seminar in Methods of Sociological Research (3,3,3) —,W,Sp

WAGER

Prerequisites, 223 and 420, or equivalents.

## 528 Seminar in Selected Statistical Problems in Social Research (3)

COSTNER

Prerequisite, 426.

## Field III: ECOLOGY AND DEMOGRAPHY

### 230 Introduction to Human Ecology (5) W

SCHMID

Factors and forces which determine the distribution of people and institutions. Primarily for freshmen and sophomores. Not open to students who have taken 430. Prerequisite, 110 or 310.

### 331 Population Problems (5) ASp

CAMPBELL

Population growth and distribution, population composition, population theory, urbanization. Determinants and consequences of fertility and mortality trends and migration in economically developed and underdeveloped areas.

### 430 Human Ecology (5) ASp

COHEN, SCHMID

Factors and forces which determine the distribution of people and institutions. Primarily for juniors and seniors. Not open to students who have taken 230. Prerequisite, 110 or 310.

### 530 Advanced Human Ecology (3) W

SCHMID

Prerequisites, 230 or 430, and 15 credits in social science.

### 531 Demography (3) Sp

SCHMID

Research problems in population and vital statistics. Prerequisites, 331 and 15 credits in social science, or permission.

## Field IV: SOCIAL INTERACTION

### 240 Group Behavior (5) AWSp

BURGESS, EMERSON, MIYAMOTO

Socialization of the individual; social processes; and interactions of persons in groups. Prerequisites, 110 or 310, and Psychology 100.

### 440 Primary Interaction and Personal Behavior (5) W

FARIS

Social sources of cooperative motives; social basis of the self; nature of primary groups; institutional roles; exceptional and unconventional roles; methodology. Prerequisite, 240 or equivalent.

### 442 Public Opinion (3) W

DODD

The nature of public opinion; formation and measurement of public opinion; the operation of public opinion polls. Prerequisite, 240 or equivalent.

### 443 Mass Communication (5) Sp

LARSEN

Control, structure, and functioning of mass media of communications as a force in social life; methods of research. Prerequisite, 240 or equivalent.

### 445 Social Movements (3) Sp

MIYAMOTO

Social movements as collective enterprises to establish new social orders; types, formation, and organization of movements. Prerequisite, 240 or equivalent.

### 447 Social Control (5) A

BURGESS

How social systems control the behavior of their constituent groups, and persons, through the socialization process, sanctions, power, allocation of status and rewards. Prerequisite, 110 or 310.

### 448 Sociometric Analysis and Group Structure (5) W

LEIK

Analysis of the theory and techniques used in the description and experimental investigation of group structure and process. Study of formation, organization, cohesion, and dis-

organization of social groups through sociometric techniques. Prerequisites, 223, 240, and senior standing.

### 540, 541 Seminar in Social Interaction (3,3) A,W

MIYAMOTO

Evaluation of studies in social interaction. Analyzes types of interaction, interaction models, and such major variables as roles, self-conception, and the influence of norms. Prerequisite, 440.

### 542 Seminar on Small Group Research (3) Sp

EMERSON, LEIK

Theories, methodology, and studies in the area of small group research. Covers such topics as interaction channels, group cohesion, group locomotion, and consensus in groups. Prerequisite, permission for nonmajors.

### 543 Communications Seminar (3) W

LARSON

Sociological research in mass communication. Emphasis on the role of groups in providing norms and networks in the flow of information and influence from the mass media. Prerequisite, 443 or equivalent.

### 544 Seminar on Social Power (3) A

EMERSON

An examination of basic principles concerning power, influence, and authority in small groups, organizations, and communities. Prerequisites, 240, 415, and 460.

## Field V: SOCIAL INSTITUTIONS

### 352 The Family (5) AWSp

The family as a social institution; personality development within the family; marriage adjustment; changing family patterns; disorganization and reorganization. Prerequisite, 110 or 310.

### 450 Contemporary American Institutions (5) ASp

SCOTT, WAGER

Origins and developments of major social institutions. Sociology of economic structure, political organization, religion, education, recreation, and other institutionalized patterns. Prerequisite, 110 or 310.

### 451 Social Change and Trends (5) Sp

CATTON

Basic trends in American life; frames of reference for analysis of social change; forces causing social change. Prerequisite, 15 credits in social science.

### 453 Social Factors of Marriage (3) A

SCOTT

Review and analysis of empirical research in courtship and marriage, marital adjustment, and specific areas of marriage and family life. Prerequisites, 223 and 352.

**455 Housing in the American Community (3)**  
COHEN

Sociological considerations in housing design; housing trends in relation to major components of the population; housing and residential areas in the community context.

**458 Institutional Forms and Processes (5) Sp**  
PARIS

The process of institutionalization and the general nature of institutions; relationship of institutions to persons; institutions and social control; social change and institutional disorganization. Prerequisites, 110 or 310, and upper-division standing.

**459 Comparative Social Systems: Africa (3) W**

VAN DEN BERGHE

A comparative approach to the social structure of literate and nonliterate societies with special emphasis on problems of social evolution, integration, and conflict. Africa south of the Sahara will be stressed. Prerequisite, senior standing in the social sciences.

**550, 551, 552 Marriage and the Family (3,3,3) —,—,Sp**

LEIK

Analysis of marriage and family patterns and problems, with initial emphasis on research findings and methods. Individual research on selected projects. Prerequisites, 352 and 453, or equivalents.

**Field VI: SOCIAL ORGANIZATION**

**362 Race Relations (5) AWSp**

BARTH, VAN DEN BERGHE

Interracial contacts and conflicts. Prerequisite, 110 or 310.

**365 Urban Community (5) WSp**

COHEN

Comparative and analytic study of organization and activities of urban groups. Prerequisite, 110 or 310.

**460 Social Differentiation (5) AW**

BARTH, GROSS, VAN DEN BERGHE

Analysis of societal organization based on sex, age, residence, occupation, community, class, caste, and race. Prerequisite, 110 or 310.

**463 American Negro Community (3) W**

BARTH

Internal structure of class and caste patterns; resultant personality and institutional development. Prerequisite, 110 or 310.

**466 Industrial Sociology (5) A**

GROSS

Changing focus of field; contrasting types of industrial organizations; industrial organizations as social systems; problems of social systems; the individual in the organization; union-management relations and organizational dynamics. Prerequisite, 110 or 310.

**467 Industry and the Community (3) W**

GROSS

Nature of the economy. Theories of industry-community relations. Varieties and types of relations between industry and community. Process of power. Impact of technological change. Levels of worker participation in the community. Integration of industry and other communal institutions. Prerequisite, 110 or 310.

**468 Sociology of Occupations and Professions (5) Sp**

WAGER

Frameworks for study of occupations and professions; occupational structure and mobility in American society and relation to adult socialization and career development; occupational and professional associations and society. Prerequisites, 240 and 15 credits in social science.

**562 Seminar in Comparative Race Relations (3)**

VAN DEN BERGHE

A cross-cultural approach to race and ethnic relations, including case studies from Africa and Latin America. Prerequisite, graduate standing in social sciences.

**566, 567 Industrial Sociology Seminar (3,3) W,Sp**

GROSS

Research training in industrial sociology. Readings and field projects. Prerequisite, 466 or equivalent.

**569J Social and Cultural Change: Africa (3)**

OTTENBERG, VAN DEN BERGHE, WINANS

Urbanization, stratification, technology, education, social and religious movements, and cultural pluralism in contemporary Africa. Offered jointly with the Department of Anthropology. Prerequisite, graduate standing in a social science department.

**Field VII: SOCIAL DISORGANIZATION**

**270 Social Disorganization and Deviant Behavior (5) AWSp**

AKERS, BURGESS

Analysis of the processes of social and personal disorganization and reorganization in relation to poverty, crime, suicide, family disorganization, mental disorders, and similar social problems. Prerequisite, 110 or 310.

**371 Criminology (5) AWSp**

AKERS, SHARP

Factors associated with crime and delinquency. Criminological theories. Survey of correctional facilities and programs. Visits to agencies and institutions. Prerequisite, 110 or 310.

**472 Juvenile Delinquency (5) W**

Factors in delinquency, juvenile courts, detention, probation. Programs of treatment and prevention. Volunteer services. Prerequisite, 371 or equivalent.

**473 Corrections (5) W**

Social control of crime. Police, courts, institutions, and correctional agencies for adult offenders. Individual and group therapies. Captive communities. Prerequisite, 371 or equivalent.

**474 Probation and Parole (3) W**

Probation and parole systems. Roles of judges, parole board members, and professional personnel. Criteria for parole selection. Attitudes toward probationers and parolees. Prerequisite, 473 or equivalent.

**475 Problems in the Administration of Correctional Programs (3)**

Correctional objectives, and relative effectiveness of alternative procedures aimed at their attainment. Participation in research designed to evaluate correctional policies. Observation of administrative methods. Prerequisites, 371 and 473, or equivalents.

**571 Correctional Communities (3) Sp**

Prisons and juvenile reformatories as communities. Prerequisites, 371 and 473.

**572 Analysis of Criminal Careers (3)**

Personal and social factors in criminal maturation and reformation. Prerequisites, 371 and 473, or equivalents.

**573 Crime Prevention (3)**

HAYNER

Critical consideration of programs for delinquency prevention. Prerequisites, 371 and 472.

**574 Seminar in Methods of Criminological Research (3)**

Provides training in the technical analysis of published research in criminology; designs and processes studies in parole prediction, prediction of prison adjustment, and prediction of treatment effect.

**Individual Study Courses**

The following courses are designed for advanced independent reading and research and may be taken in any of the seven fields, with the permission of a faculty member only.

**389 Reading in Selected Fields (2-5, max. 15) AWSp**

Open only to qualified undergraduate students by permission.

**496H, 497H, 498H Senior Seminar (3,3,3) A,W,Sp**

CATTON

Exploration of seven fields of sociological specialization; professional organization of sociologists; relation to other disciplines. For sociology majors only, primarily for honors students. Prerequisites, senior standing and permission.

## 499 Undergraduate Research (2-5, max. 15) AWSp

Open only to qualified undergraduate students by consent of instructor.

## 599 Reading in Selected Fields (1-6, max. 15) AWSp

Open only to qualified graduate students by permission.

## 600 Research (2-5) AWSp

Original field projects carefully planned and adequately reported. Certain projects can be carried on in connection with the Washington Institute for Sociological Research or the Office of Population Research. Open to qualified graduate students by permission.

## 700 Thesis (\*) AWSp

*SPANISH—See Romance Languages and Literature*

## SPEECH

### Courses for Undergraduates

#### GENERAL

#### 100 Basic Speech Improvement (5) AWSp

LA RUSSO

Training in the fundamentals of good speech, such as orderly thinking, emotional adjustment, adequate voice, distinct articulation, and effective oral use of language. Speech as man's primary means of communication, with emphasis on the more informal uses of speech in daily life. Frequent conferences with instructor.

#### 101 Speech for Teachers (3) AWSp

NELSON

A course in the fundamentals of speaking designed to meet the speech needs of elementary and secondary teachers. Required for the Provisional Teaching Certificate. Registration restricted to teacher candidates. Students taking Speech 101 may not receive credit for Speech 100 and vice versa.

#### 400 Backgrounds in Speech (3) A

RAHSKOPF

The nature of speech as an activity of daily life and as a field of study.

## 499 Undergraduate Research (1-5, max. 15) AWSp

Prerequisite, permission. Field must be indicated in registration.

- A. Voice and phonetics
- B. Public address
- C. Argument and discussion
- D. Oral interpretation
- E. Teaching of speech
- F. Radio-TV speech
- G. Speech correction
- H. Hearing

## VOICE AND PHONETICS

### 110, 111 Voice and Articulation

Improvement (2,2) AWSp, AWSp

110: Effective use of the voice in reading and speaking. Emphasis on the areas of projection, voice quality, speech rate, pitch, vocal variety, and clarity and accuracy of articulation. 111: Continuation of 110 with special emphasis on articulation, pronunciation, and a comparative study of speech styles. Prerequisite, 110. Both courses feature group and individual listening and speaking projects. A laboratory hour will be scheduled during the first week of class.

### 310 Voice Science (5) AWSp

BENNETT, TIFFANY

Study of the basic speech mechanism in action, and description of speech sounds. Emphasis is placed upon articulatory phonetics with a brief introduction to acoustic phonetics.

### 311 Anatomy of the Speech Mechanism (5) W

PALMER

Structure and function of the organs concerned with phonation, articulation, and hearing. Not open to students who have credit for 495. (Formerly 411.)

### 312 General Phonetics (5)

BENNETT

Phonetic and phonemic analysis of the sound system of the English language with special application to the problems of speech improvement and speech correction. (Offered alternate years; offered 1968-69.) (Formerly 211.)

### 415 Acoustic Phonetics (3) W

TIFFANY

Detailed description of the sound system of English with particular emphasis on variations of speech sounds in context and applications of acoustic phonetics. Prerequisite, 111 or 211 or 310, or permission.

## RHETORIC AND PUBLIC ADDRESS

### 220 Introduction to Public Speaking (5) AWSp

BOSMAJIAN

A beginning course in public speaking, emphasizing choice and organization of material, sound reasoning, audience analysis, oral style, and delivery. Frequent speeches before the class, followed by conferences with instructor. Not open to students who earned credit for speech 120 prior to Autumn Quarter, 1961. Special section for honors students offered Autumn Quarter only.

### 320 Public Speaking (5) AW

BURKS

Practice in preparation and presentation of a variety of types of public speeches based on study of their structure and form; emphasis on organization and delivery. Prerequisite, 220 or permission.

### 327 Extempore Speaking (3) Sp

Not open to speech majors or students who have taken 220 or 320.

### 420 Advanced Public Speaking (5) Sp

BASKERVILLE, BURKS

Preparation and delivery of longer public speeches. Emphasis on style, thought organization, and proof. Analysis of model speeches. Prerequisite, 220 or permission.

### 421 Persuasion (3) A

PENCE

Extended study of audience analysis with application of principles of attention and motivation to influencing audience attitudes and action. Practice in persuasive speaking. Prerequisite, 220 or 230 or permission.

### 425, 426 American Public Address (5,5) W,W

BASKERVILLE

Historical and critical study of principal speakers and speeches and of their relationship to American political, social, and intellectual life. A lecture, discussion, and reading course. 425: Revolutionary period to late nineteenth century; 426: late nineteenth century to the present. (Offered alternate years; 426 offered 1967-68; 425 offered 1968-69.)

### 428 British Public Address (5) Sp

STROTHER

Historical and critical study of principal speakers and speeches and of their relationship to British political and social life. Rhetorical analysis of speeches. (Offered alternate years; offered 1967-68.)

## ARGUMENT AND DISCUSSION

### 230 Essentials of Argument (5) AWSp

PENCE, STROTHER

Argument as a technique in the investigation of social problems; evidence, proof, refutation, persuasion; training in argumentative speaking.

### 235 Parliamentary Procedure (3) A

BOSMAJIAN

Principles and practice: a study of the historical bases and contemporary uses of parliamentary procedure; methods and practice in organizing and conducting public meetings.

### 332 Principles of Group Discussion (5) AWSp

CROWELL, NILSEN

Discussion as an everyday community activity, with emphasis on the informal cooperative problem-solving methods of committee, conference, and round-table groups. Prerequisite, 100 or 230, or permission.

### 335 Methods of Debate (3) W

Introduction to debate as a method of advocacy with study and practice of its more important forms. Concurrent registration in 339 not permitted. Prerequisite, 220 or 230, or permission.



**339 Forensic Workshop (1-3, max. 9) AWSp**

HALLE

Discussion of selected public questions before audiences on and off campus. No more than 3 credits may be earned in one year, and these should normally be distributed through at least two consecutive quarters. The student should confer with the workshop director before completing registration. Prerequisite, permission.

**432 Problems of Discussion Leadership (3) Sp**

CROWELL

A critical analysis of leadership in committee and conference, with emphasis on the development of speech effectiveness in the cooperative achievement of goals. Prerequisite, 332.

**ORAL INTERPRETATION OF LITERATURE**

**140 Oral Interpretation (5) AWSp**

LONG

Development and use of fundamental techniques for analysis and reading aloud of prose and poetry.

**240 Critical Approaches to Oral Interpretation (5) W**

LONG

A course relating oral interpretation performance and literary criticism through which the student may enhance his perception, appreciation, and communication of literature. Prerequisite, 140 or permission.

**345 Ensemble Oral Interpretation (3) Sp**

LONG

Ensemble interpretation as a classroom method in the study of speech and literature; selection and use of verse and prose texts suitable for ensemble reading. Prerequisite, 140 or permission.

**349 Readers Theatre (2, max. 10) AWSp**

POST

Presentation of literature before audiences on and off campus. Prerequisites, 140 and permission.

**440 Oral Interpretation of Poetry (3) W**

POST, LONG

Problems of interpretation pertaining to oral presentation of various types of poetry. Prerequisite, 140.

**442 Oral Interpretation of Fiction (3) A**

POST, KLYN

Study of fiction for purposes of developing understanding and appreciation of the literature, and ability to communicate its meanings to an audience. Prerequisite, 140. (Formerly 340.)

**444 Oral Interpretation of Modern Dramatic Literature (3) Sp**

POST, KLYN

Study of dramatic literature from Ibsen to the present, for purposes of developing understanding, appreciation, and ability to communicate its meaning. Prerequisite, 140.

**TEACHING OF SPEECH**

**359 Speech in the Classroom (2 or 3) WSp**

NELSON

The place of speech in education and the use of speech projects in teaching. Primarily for elementary majors in speech and nonmajors in either elementary or secondary level. Secondary emphasis offered Winter Quarter; elementary emphasis, Spring Quarter. May be taken for 2 credits through off-campus extension only. Prerequisites, junior standing and Education 288 or permission.

**457 Debate and Discussion Problems in High School and College (2½) S**

HALLE

Evaluation of debate and discussion in high school and college and consideration of methods of directing them; specific consideration of debate questions in current use; bibliographies, analyses, and briefs.

**RADIO-TV SPEECH**

**260 Radio-TV Speech (3) AWSp**

BIRD, HOGAN

The development and practice of speech techniques in radio and television broadcasting. Three lecture and discussion periods and two one-hour laboratory periods each week. Prerequisite, 110 or permission.

**361 Advanced Radio-TV Speech (3) W**

BIRD, HOGAN

Analysis of audience situations, group discussions, and audience participation programs. Prerequisite, 260 or permission.

**SPEECH PATHOLOGY**

**N79 Speech Clinic (0) AWSp**

MINER

Open to any University student with hearing difficulties or speech problems such as stuttering, lisping, or similar defects. Meetings are arranged after interview with the instructor for individual or group instruction.

**170 Directed Observation—Speech and Hearing Therapy (1) AWSp**

For premajors desiring general orientation in speech and hearing therapy.

**370, 371 Speech Correction (5,5) A,Sp,W**

CARRELL

Nature, etiology, and therapy of disorders of speech, 370: introduction, developmental and functional disorders, cleft palate. 371: dysphasia, dysarthria, dysphonia, stuttering. 370 prerequisite for 371 except by permission.

**373 Diagnostic Methods in Speech Correction (5) Sp**

WINGATE

Prerequisite, 371.

**374 Clinical Practice in Speech Correction (1-5, max. 15) AWSp**

MINER

Total undergraduate credits in 374 and 484 together cannot exceed 20 credits. Prere-

quisites, 371 and 373, which may be taken concurrently, and permission.

**475 Stuttering (3) Sp**

WINGATE

Nature, etiology, and treatment of stuttering. Prerequisite, 370 or permission.

**476 Language Development of the Child (3) A**

WINGATE

Principles of growth and development with emphasis on normal and abnormal speech and language development. (Offered alternate years; offered 1968-69.)

**477 Stuttering Therapy (2) W**

WINGATE

Prerequisite, 475 or permission. (Offered alternate years; offered 1967-68.)

**478 Interview Techniques for Speech and Hearing Rehabilitation (3) A**

WINGATE

(Offered alternate years; offered 1967-68.)

**479J Physical Medicine and Rehabilitation Information for Speech Pathology (3) A**

CARRELL

Orientation information for speech pathology students on rehabilitation principles and techniques. Offered jointly with the Department of Physical Medicine and Rehabilitation.

**AUDIOLOGY**

**480 Introduction to Audiology (5) A**

YANTIS

Description of normal audition; elementary structure and function of the hearing mechanisms; types of deficient hearing and their effects on speech.

**481, 482 Principles and Methods of Aural Rehabilitation (5,5) W,Sp**

PALMER

481: study of the principles of aural rehabilitation, with emphasis on the nature of the problems involved and the needs of individuals with hearing loss. 482: continued study of principles with emphasis upon the techniques of speech reading, auditory training, speech therapy for the hard of hearing as well as the instrumentation utilized. Prerequisite, 480; 481 prerequisite for 482 except by permission.

**484 Practicum in Audiology (1-5, max. 15) AWSp**

MINER

Total undergraduate credits in 374 and 484 together cannot exceed 20 credits. Prerequisites, 480, 481, and permission.

**485 Medical Background for Audiology (2) Sp**

Diseases and injuries of the ear resulting in reduced audition. Prerequisite, 480 or permission.

# SPEECH

## 487 Audiometry (3) W

YANTIS

Introduction to the theory and practice of the assessment of hearing function. Prerequisite, 480 or permission.

## 488 Hearing Aid Amplification (2) Sp

Study of acoustic amplification and pertinent audiologic techniques. Discussion of criteria in hearing-aid consultation. (Offered alternate years; not offered 1967-68.)

## Courses for Graduates Only

### N500 Departmental Seminar (0) AWSp

Reports of research by graduate students and staff members.

## 501 Introduction to Graduate Study in Speech (3) A

CROWELL

## 502 Research Methods in Speech Science and Audiology (3) W

TIFFANY

## 510 Experimental Phonetics (3) Sp

TIFFANY

Application of experimental methods to research in voice and phonetics; critical review of research literature. Prerequisite, 415 or permission. (Offered alternate years; not offered 1967-68.)

## 521 Studies in Greek and Roman Rhetoric (5) W

RAHSKOPF

Critical analysis of writings on rhetoric by Plato, Aristotle, Cicero, Quintilian, and others. (Formerly 423.)

## 522 Studies in Medieval and Renaissance Rhetoric (5) Sp

LARUSSO

A critical analysis of selected persons, works, and topics related to the development of rhetorical theory during the Middle Ages and the Renaissance. Prerequisite 521. (Offered alternate years; offered 1967-68.)

## 523 Studies in Modern Rhetoric (5) Sp

PENCE

Critical analysis of writings on rhetoric by Cox, Wilson, Bacon, Campbell, Blair, Whately, and others. Not open to students who received credit for 522 prior to Spring Quarter, 1957. (Offered alternate years; not offered 1967-68.)

## 524 Studies in Contemporary Rhetoric (3) Sp

NILSEN

Critical analysis of recent developments in and contributions to rhetorical thought. Prerequisite, graduate standing or permission. (Offered alternate years; offered 1967-68.)

## 525 Rhetorical Criticism (3 or 5)

BASKERVILLE

The history and method of rhetorical criticism. Application of critical standards to notable

British and American speeches. Prerequisites, 425, 426, or 428.

## 530 Experimental Problems in Public Address (3-5) W

PENCE

Analysis of theoretical considerations in audience and listening behavior; application of measurement techniques. Prerequisite, permission. (Offered alternate years; offered 1967-68.)

## 540 Studies in Oral Interpretation (3) A

Critical analysis of writings by Sheridan, Walker, Rush, Delsarte, Bell, Curry, Emerson, and others. Prerequisite, 440. (Offered alternate years; offered 1967-68.)

## 543 Studies in Theories of Performance and Criticism (3)

KLYN, LONG, POST

Analysis of performance theories as expressed in the writings of oral interpreters and literary critics.

## 550 Studies in Speech Education (3) Sp

NELSON

Philosophical, curricular, and methodological problems of speech instruction. (Offered alternate years; not offered 1967-68.)

## 570, 571, 572, 573 Organic Disorders of Speech (3,3,3,3) W,W,Sp,Sp

Etiology, diagnosis, and therapy. 570: morphogenic disorders, especially cleft palate and dental malocclusions. (Offered alternate years; offered 1968-69.) 571: dysarthria, especially cerebral palsy. (Offered alternate years; offered 1967-68.) 572: aphasia. (Offered alternate years; not offered 1967-68.) 573: pathologic disorders of voice. (Offered alternate years; offered 1967-68.) Prerequisite for each course, 371 or permission.

## 574 Advanced Practicum in Speech Pathology (1-5, max. 10) AWSp

MINER

Prerequisites, 374 and permission.

## 576 Communication Disorders in Mental Retardation and Neurological Impairment (3) A

## 578 Psychological Factors in Communication Disorders (2) A

WINGATE

Psychological factors in speech and hearing disorders. Prerequisite, Psychology 305 or permission. (Offered alternate years; offered 1967-68.)

## 580 Advanced Audiology (5) A

YANTIS

Methods, techniques, and instruments used in the measurement of auditory function. Review of research literature. Prerequisite, 480 or permission.

## 581 Physiological Acoustics (3) Sp

YANTIS

Study of pertinent literature and experimental techniques incident to the scientific study of the normal and abnormal auditory system. (Offered alternate years; offered 1967-68.) Prerequisite, permission.

## 582 Psychoacoustics (3) Sp

YANTIS

Review of instrumentation research techniques and significant literature pertinent to normal auditory sensitivity, pitch, loudness, and other attributes of auditory sensation. Prerequisite, permission. (Offered alternate years; not offered 1967-68.)

## 584 Advanced Practicum in Audiology (1-5, max. 10) AWSp

YANTIS

Prerequisites, 484 and permission.

## 587, 588, 589 Advanced Audiometry (2,2,2) W,W,Sp

YANTIS

Special diagnostic and predictive techniques for assessment of auditory function. 587: techniques of objective audiometry and evaluation of nonorganic hearing problems. (Offered alternate years; offered 1967-68.) 588: functional evaluation of the cochlear end-organ. (Offered alternate years; offered 1968-69.) 589: functional evaluation of the retrocochlear and central auditory systems. (Offered alternate years; offered 1967-68.) Prerequisite for each course, 487.

## 590 Seminar in Theory of Speech (2, max. 6) A

RAHSKOPF

Prerequisite, permission. (Offered alternate years; offered 1968-69.)

## 591 Seminar in Voice and Phonetics (2, max. 6) Sp

TIFFANY

Prerequisite, permission. (Offered alternate years; offered 1967-68.)

## 592 Seminar in Rhetoric and Public Address (2, max. 6) Sp

Prerequisite, permission.

## 593 Seminar in Argument and Discussion (2, max. 6) A

Prerequisite, permission. (Offered alternate years; offered 1967-68.)

## 594 Seminar in Oral Interpretation (2, max. 6) W

Prerequisite, permission. (Offered alternate years; offered 1968-69.)

## 595 Seminar in the Teaching of Speech (2, max. 6) W

NELSON

Prerequisite, permission. (Offered alternate years; offered 1967-68.)

## 597 Seminar in Speech Pathology (2, max. 6) Sp

Prerequisite, permission.

## 598 Seminar in Audiology (2, max. 6) W

Prerequisite, permission.

## 600 Research (\*) AWSp

## 700 Thesis (\*) AWSp

## 702 Degree Final (6) AWSp

Limited to students completing a nonthesis degree program.

## SURGERY

### Conjoint 426-427 Introduction to Physical Diagnosis (\*, max. 4, \*, max. 9)

(See Conjoint Courses.)

### 465 Clinical Clerkships (\*, max. 16)

Third-year students will be assigned to the surgical services of the King County Hospital, Veterans Administration Hospital, or University Hospital. The student will gain experience in both inpatient and outpatient care of the patient seen on the surgical service. The student's responsibility for inpatients will consist of a complete initial work-up, routine laboratory studies, and day-to-day participation in their diagnostic and therapeutic care. Particular attention will be given to the correlation of basic science material and clinical disease. Instruction in surgical pathology will be provided. Operating room experience will also be included. Seminars will be conducted weekly in each of the surgical specialty areas. Required for third-year medical students.

### 482 Externship in General Surgery (\*) AWSpS

BAKER, BELL, CANTRELL, MERENDINO,  
SPEIR, WEST

Students assigned inpatient cases on general surgery services. Responsible for patient work-ups, follow assigned patients to Operating Room. Participates in ward rounds, and surgical conferences. Selected hospitals. Elective for medical students. Prerequisite, permission of Department.

### 485 Cardiovascular Surgery (\*) AWSpS

DILLARD, MERENDINO, WINTERSCHIED

Students actively engage in the care and treatment of inpatient and outpatient surgical cardiovascular cases. They will work closely with the cardiovascular team on preoperative diagnostic studies, in the operating room, and postoperative patient care. Elective for medical students. Prerequisite, permission of Department.

### 486 Plastic Surgery Clerkship and Preceptorship (\*) AWSpS

DEVITO

Students will function intimately, as externs in all activities of plastic surgery service and staff at University Hospital and affiliated services. Elective for senior medical students. Prerequisite, permission of Department.

### 498 Undergraduate Thesis (\*) AWSpS

Offered to those students who have engaged in summer research in the Department of Surgery. Provides time for extension of such projects and opportunity to study and prepare for completion of thesis on selected surgical subjects. Elective for medical students. Prerequisites, summer research and permission of Department.

### 499 Undergraduate Research (\*) AWSpS

## Courses for Graduates Only

### 520 General Surgery Seminar (5) AWSpS

DILLARD, FLETCHER, HARKINS, MERENDINO,  
NYHUS, STEVENSON, WINTERSCHIED

Conferences, seminars, and round-table discussions of advanced surgical topics, related sciences, and recent literature in the field. Prerequisite, medical student or graduate student.

### 525 Seminar in Plastic and Maxillofacial Surgery (\*) AWSpS

DEVITO

One two-hour session per week will be devoted to a discussion of principles, practice, and scope of plastic and maxillofacial surgery. Elective for senior medical students and graduate students. Prerequisite, permission of Department.

### Conjoint 585 Surgical Anatomy (1-3, max. 12) (See Conjoint Courses.)

### 590 Surgical Experimental Techniques (5) AWSpS

DEVITO, DILLARD, FLETCHER, HARKINS,  
MERENDINO, NYHUS, STEVENSON,  
WINTERSCHIED

Basis for graduate research and advanced thesis work including supporting surgical laboratory techniques. Prerequisite, medical student or graduate student.

## 600 Research (\*) AWSpS

## 700 Thesis (\*) AWSpS

*SWEDISH—See Scandinavian Languages and Literature*

*THAI—See Far Eastern and Slavic Languages and Literature*

*TIBETAN—See Far Eastern and Slavic Languages and Literature*

## TRANSPORTATION

### Courses for Undergraduates

### 310 Principles of Transportation (5) AWSpS

W. I. LITTLE

Survey of the economic organization and functioning of the transportation industries. Impact on industrial location, prices, and markets. The nature of public policy in transportation.

### 372 Physical Distribution Management (3) ASpW

W. I. LITTLE

Management's responsibility for the movement of raw materials and finished products, including traffic management, plant location, materials handling, distribution warehousing, inventory control, and production scheduling. Prerequisite, 310.

### 440 Transportation Pricing (3) Sp

W. I. LITTLE

Conceptual framework and theoretical aspects of pricing services. Exercise of managerial discretion in price determination. Comparative evaluation of pricing among different modes. Problems in pricing. Prerequisite, 310.

### 471 Public Policy in Transportation (3) W

W. I. LITTLE

Appraisal from the public point of view. Content and effect on decision making by carrier and shipper firms. Procedures of administrative agencies regulating transportation firms.

### 481 Cases in Transportation Carrier Management (3) W

W. I. LITTLE

Carrier problems including financing, equipment purchase and utilization, labor relations, policy determination, purchasing controls, public relations, and rate negotiations. Prerequisite, 310.

### 491 Cases in Physical Distribution Management (3) Sp

Transportation problems and decisions from the buyer's viewpoint. Cases deal with analysis and selection of mode, both public and private. Costs and service considerations in assembly and distribution. Plant and warehouse location. Evaluation of market potential in view of transportation problems.

### 499 Undergraduate Research (3, max. 9) AWSp

Prerequisite, permission.

## Courses for Graduates Only

### 520, 521 Trends and Contemporary Problems in Transportation Management, National Policy, and Regulation (3,3) A,W

W. I. LITTLE

The impact of changing patterns and programs in transportation on the economy and individual firms. Primary and secondary source data and the interpretation of this information in researching transportation problems and arriving at solutions. Each quarter different aspects are emphasized. Prerequisite, permission.

### 571-572 Research Reports (3-3) AWSpS

See Accounting for description.

### 604 Research (\*, max. 10) AWSpS

Prerequisite, permission.

## 700 Thesis (\*) AWSpS

# TRANSPORTATION

## 702 Degree Final (6) AWSpS

Limited to students completing a nonthesis degree program.

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*TURKIC—See Far Eastern and Slavic Languages and Literature*

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## URBAN PLANNING

### Courses for Undergraduates

#### 400 Introduction to Urban Planning (3) AWSpS

STAFF

History, principles, theories of city growth and planning. Emphasis on city structure as a physical monument to contemporary culture. Present urban faults and remedial action.

#### 430 Quantitative Methods in Urban Planning (3) W

SCHULTZ

Methods of statistical analysis applied to urban planning; measurement and inference. Central tendency, correlation, trends, probability, surveys.

#### 451J Regional Planning and Development (3 or 5) Sp

MORRILL, THOMAS

Emphasis placed primarily on the process of implementing regional development policies in economically advanced and lesser developed countries. Resultant changes which occur in the distribution and structure of economic activities and settlement patterns are also studied and evaluated. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor. Offered jointly with the Department of Geography.

#### 479 The Urban Form (2) A

WOLFE

Examination of the physical patterns of urban areas related to the forces producing them. Observation, identification, and methods of recording aspects of the urban scene.

#### 480 Urban Planning Analysis I (3) W

WOLFE

The urban plan and plan making. Emphasis on comprehensive, coordinative urban planning. Various planning surveys and methodology and techniques discussed. Prerequisite, 400 or permission.

#### 481 Urban Planning Analysis II (3) Sp

NORTON

Factors relating to the timing, phasing, and programming of urban development. The bearing of amenity, density, etc., on the actual development process. Prerequisite, 480.

#### 482 Urban Community Facilities (2) W

NORTON

Relationships of goal structure and physical requirements of public facilities. Criteria

pertinent to schools, parks, utilities, etc., and their effect on the comprehensive plan. Prerequisite, urban planning or architecture major, or permission.

#### 485 Housing (3) A

GREY

Survey of housing and redevelopment problems, theories, standards, and practice. Prerequisite, 400 or permission.

#### 489 History of City Development (3) W

JOHNSTON

Analysis of city forms and designs emphasizing their relation to the culture of each period.

#### 490, 491, 492, 493 City Planning Design (7,7,7,7) AWSp, AWSp, AWSp, AWSp

Planning problems, with emphasis on urban design based on the interpretation of social, economic, and physical data. Prerequisite, Architecture 325 or permission.

#### 499 Special Projects in Urban Planning (5)

Preprofessional workshop. Emphasizes acquiring facility in the integration of analytical, programmatic, and communications techniques developed in other courses by means of several assigned problems.

### Courses for Graduates Only

#### 505 Seminar in Urban Renewal (2) W

GREY

Analysis of urban renewal needs and practices. Particular emphasis on problems encountered and on potential new directions of development.

#### 512 Fiscal Resources and Economic Activity (2) AW

TIEBOUT

Economic analysis as related to planning objectives. Analysis of the mechanics of the urban economy, especially as related to growth and the problems of local public finance. Prerequisite, permission. (Offered alternate years; offered 1967-68.)

#### 521 Comprehensive Planning Analysis (\*) Sp

GREY, SHINN

The information basis for planning. Methods of data interpretation pertaining to population, economic base, spatial requirements, location, and other operational problems encountered in city plan preparation. Prerequisite, 480 or permission.

#### 522 Metropolitan Planning Analysis (\*) A

NORTON, SCHULTZ

Investigative and analytical techniques appropriate to plan preparation at metropolitan or regional scales, including consideration and evaluation of methodologies and organizing concepts derived from other disciplines. Prerequisite, 521 or permission.

#### 524 Seminar in Urban Design (2) Sp

COPELAND

Studies of the various arrangements of urban forms that affect perceptual experiences. Ur-

ban design considerations of the location of structures, open space, movement channels, and methods of implementing public policy decisions affecting urban design. Prerequisite, 479.

#### 527J Information Systems for Planning and Research (3) A

HORWOOD

Computer programming technology and data systems design for large scale data inputs. Machine editing, data manipulation, and information retrieval. Laboratory problems adapted to specialized interests of students. No previous computer programming experience required. Offered jointly with the Departments of Geography and Civil Engineering.

#### 528J Automated Mapping and Graphing (3) W

HORWOOD

Problem-oriented computer languages for statistical and areal analysis. Laboratory problems adapted to specialized interests of students. Offered jointly with the Departments of Geography and Civil Engineering. Prerequisites, basic statistics and 527J, or permission.

#### 529J Computer Applications to Urban and Regional Analysis (3) Sp

HORWOOD

Simulation models and automated systems for the study of land use and related economic and demographic data. Machine methods of planning analysis and feedback review. Laboratory projects. Offered jointly with the Departments of Geography and Civil Engineering. Prerequisite, 528J or permission.

#### 530J Research Seminar: Geography and Development (3, max. 6) A

THOMAS

Offered jointly with the Department of Geography. (Not offered 1967-68.)

#### 540 Urban Planning Problems (5) Sp

COPELAND, SHINN

Laboratory in Urban Planning Methods and Techniques. Methods of schematic conceptualization. Presentation and manipulation of physical patterns in a case study area to develop optimal relationships. Prerequisite, 480 or permission.

#### 541 Urban Planning Problems (5) A

GREY, SHINN

Laboratory in Comprehensive Planning. The application of urban planning skills and techniques to the problem of formulating alternative comprehensive plans for a specific city. Prerequisite, 521 or permission.

#### 542 Urban Planning Problems (5) W

NORTON, SCHULTZ

Laboratory in Metropolitan Planning. Formulation of plans and developmental programs interrelating such region-wide concerns as natural resource base, transportation, industrial activity and location, environmental contamination, recreation, political constraints. Prerequisite, 522 or permission.

**543 Urban Planning Problems (5) W**

COPELAND, SHINN

Laboratory in Planning Design. The development of urban designs within the context of the total planning process. Specifically, the following areas will be emphasized: investigation, development, and application of survey techniques, analyses, programming, concepts and methods of implementation relative to urban design. Prerequisite, 523 or permission.

**544 Urban Planning Problems (5) Sp**

STAFF

Advanced Laboratory Problems. Intensive consideration of planning problems of topical significance. Prerequisite, permission.

**550 Research Seminar (2) W**

GREY, NORTON

Development and presentation of advanced topics of individual investigation.

**600 Research (\*) AWSp**

**700 Thesis (\*) AWSpS**

**UROLOGY**

**480 Urology Clerkship—Selective Elective: Neurological Surgery, Orthopedics, Urology (\*) AWSpS**

ANSELL, CHAPMAN, FORGAARD, MILLER, TREMBLAY, WOLF, ZINNER

Time is divided between inpatient and outpatient services of the above named specialties, affording students opportunity to explore in depth the various diagnostic techniques and therapeutic management offered to patients in these surgical specialties. Two specialties required for fourth-year medical students.

**483 Urology Research (\*) AWSpS**

ANSELL, CHAPMAN, ZINNER

The student participates in current urologic research projects under supervision of full-time staff. Certain specific problems may be elected by the student. Elective for medical students. Prerequisite, permission of sponsor and Department.

**484 Clinical Urology (\*) AWSpS**

ANSELL, CHAPMAN, FORGAARD, MILLER, TREMBLAY, WOLF, ZINNER

Student participates in the full activities of the service including ward rounds, conferences, diagnostic procedures, surgery, and case presentations and is assigned to one of three teaching hospitals where he shares with house staff the responsibility for the care of patients on this service. Elective for medical students. Prerequisite, permission of sponsor and Department.

**598 Seminar in Urology (\*) AWSpS**

ANSELL, CHAPMAN, WOLF, ZINNER

Problems in the field of urology discussed by various visiting members of the faculty of urology and of other departments to provide a well-rounded basic scientific and clinical presentation.

*VIETNAMESE—See Far Eastern and Slavic Languages and Literature*

**ZOOLOGY**

**Courses for Undergraduates**

*"Permission," in course descriptions below, refers to permission of instructor.*

**BIOLOGY**

**101-102 General Biology (5-5) A,W**

ILLG, KOHN, KRUCKEBERG, MEEUSE, ORIAN

Principles of living systems as viewed at levels from the subcellular to the community. Emphasis on structural and functional analysis of biological organization—its adaptedness, its genetic diversity, its energetics—leading to an evolutionary synthesis. The position of man in the biological world. For nonmajors and teaching majors in biology. (Credit will not be given for 101-102 if any two of the following courses, or their equivalents, have previously been taken: Zoology 111, 112; Botany 111, 112.)

**210, 211, 212 Introductory Biology (5,5,5) A,W,Sp**

CLELAND, DIXON, FARNER, GORBMAN, KELLY, SPOTTS

An introduction to the phenomena of life for students intending to go on to more advanced biology courses and into preprofessional programs. Emphasis is placed on features common to all living things: molecular and subcellular phenomena; cellular structure, metabolism and energetics; genetic regulation of development; the nature, functional properties, and evolution of plant and animal organisms and groups of organisms. Prerequisite, one year of college chemistry or permission.

**401 Cytology (3) AW**

HSU

Structure and function of the cell. Prerequisites, Botany 112 or Zoology, 112, Genetics 451, or permission.

**401L Cytology Laboratory (2) AW**

HSU

Prerequisites, 401 concurrently and permission.

**454 Evolutionary Mechanisms (3)**

KRUCKEBERG

Evolutionary change as determined by mutation, recombination, and selection. Effects of the genetic system, isolating mechanisms, hybridization, and polyploidy on speciation. Examples of micro- and megaevolutionary changes from plant and animal kingdoms. For advanced undergraduate and graduate students in the biological sciences. Prerequisite, Genetics 451 or equivalent. (Offered alternate years; not offered 1967-68.)

**472 Principles of Ecology (3) W**

EDMONDSON, ORIAN

Population biology, interactions between organisms in biological communities, relation-

ship of community to environment, principles of natural selection. Prerequisites, 15 credits in biological sciences and upper-division standing, or premission.

**472L Ecology Laboratory (3) Sp**

EDMONDSON, PAINE

Prerequisites, 472 and permission.

**473 Limnology (3) A**

EDMONDSON

Biological, physical, and chemical features of lakes and other inland waters. Prerequisites, 15 credits in biological sciences, one year of college chemistry, and upper-division standing.

**473L Limnology Laboratory (2) A**

EDMONDSON

Examination of biota of fresh waters, survey of limnological methods, and analysis of data. Prerequisites, 473 and permission.

**GENETICS**

(For course listing, see under large heading *Genetics*.)

**ZOOLOGY**

**111, 112 General Zoology (5,5) AW,WS**

GRIFFITHS, HAHN, MORTON, OSTERUD, PAINE

Introduction to general principles of zoology and to major groups of animals. 111: cell structure and function; mitosis; principles of embryology; invertebrate phyla through echinoderms. 112: annelids, mollusks, arthropods and chordates; gametogenesis and genetics; speciation and evolution; ecology. Intended primarily for majors and preprofessional students. Prerequisites, high school chemistry or one quarter of college chemistry for 111; 111 for 112.

**114 Evolution (2) A**

HATCH

General survey of evolution of animals, including man. For nonmajors.

**118 Survey of Physiology (5) A**

MARTIN

Elementary human physiology. For nonmajors.

**118L Elementary Physiology Laboratory (1) A**

MARTIN

Specifically for physical education majors. May be taken by others only with permission. Prerequisite, 118 concurrently.

**201 Cell Biology (4) Sp**

DEYRUP-OLSEN

Morphology, interaction, function and chemical architecture of cells and cell components; cells in immunological function and development. Prerequisites, 10 credits in biological sciences and 10 credits in general chemistry, or permission.

## 208 Elementary Human Physiology (5) Sp

GRIFFITHS

Each organ system is described and its function illustrated in the laboratory. Prerequisites, high school biology and freshman chemistry, or permission.

## 330 Natural History of Marine Invertebrates (5) Sp

KOHN

A field and laboratory course emphasizing the habits, habitats, identification, and interrelationships of marine animals. Prerequisite, permission.

## 331 Natural History of Freshwater Invertebrates (5) S

A laboratory and field course dealing with the occurrence, distribution, and ecological relationships of common freshwater invertebrates. Prerequisite, 112 or permission.

## 362 Natural History of Vertebrates (5) Sp

MORTON

A field and laboratory course on the natural history of fishes, amphibians, reptiles, birds, and mammals. (Alternates with 462.) Prerequisite, permission.

## 381 Microtechnique (4)

HSU

Critical evaluation of each step in microslide preparation. Prerequisites, 112 and permission.

## 400 General Physiology (3) A

FLOREY

Physico-chemical basis of animal physiology; membrane permeability, simple and complex ionic equilibria; bioelectricity; quantitative aspects of active transport, ionic regulation and respiration. General physiology of nerve and muscle tissue. Prerequisites, Chemistry 232, Physics 116 and 119, 10 credits in biological sciences; mathematics through simple differential equations recommended. Must be accompanied by 400L to satisfy requirements for the Bachelor of Science degree.

## 400L General Physiology Laboratory (3) A

FLOREY

Laboratory exercises and scientific writing. Quantitative experiments on osmoregulation, respiration, bioelectricity, nerve and muscle physiology. Must be taken concurrently with 400.

## 402 History of Zoology (3) A

HATCH

Prerequisite, 20 credits in zoology or permission.

## 403 Comparative Vertebrate Histology (5) Sp

CLONEY

Microscopic anatomy of the tissues and organs of vertebrates. Prerequisite, 112.

## 409 Ethology (3) W

ORIAN

Perception, nervous integration, movement, motivation, instinct, learning, and social be-

havior in animals, with emphasis upon their evolution and selective significance. Prerequisite, permission. (Offered 1967-68.)

## 409L Ethology Laboratory (2) Sp

ORIAN

Experiments with orientation, motivation, learning, and social behavior in animals, including special student research problems. Prerequisite, permission. (Offered 1967-68.)

## 423 Protozoology (5) Sp

OSTERUD

Introduction to protozoa exclusive of parasites, with emphasis on morphology (including fine structure and function), ecology, taxonomy, and life histories. Prerequisite, 20 credits in biological sciences or permission; cytology (Biology 401) recommended.

## 432 Marine Invertebrate Zoology (8) S

Morphology and phylogeny of marine invertebrates. (Offered at Friday Harbor Laboratories.) Not open to students who have had 433, 434. Prerequisite, 112.

## 433, 434 Invertebrate Zoology (5,5) W,Sp

KOHN, ILLG

Morphology and phylogeny of invertebrates exclusive of terrestrial arthropods. Not open to students who have had 432. Prerequisites, 112, and permission.

## 435 Parasitology (5) A

OSTERUD

A general course covering the principles of parasitism and the major groups of animal parasites. Prerequisite, 20 credits in biological sciences or permission.

## 438 Comparative Endocrinology (3) W

GORBMAN

Hormonal integration of living processes at all levels in animals: cells, organs, organisms, populations. Prerequisites, one year of zoology and permission; histology and organic chemistry recommended.

## 444 Entomology (5) Sp

HATCH

Structure, classification, and economic relationships of insects. Prerequisite, 112 or permission.

## 453-454 Comparative Anatomy of Chordates (5-5) A,W

SNYDER

Phylogeny of the chordates and evolution of their organ systems. Structural modifications are correlated with function. Prerequisite, 112.

## 456 Developmental Biology (5) A, Sp

FERNALD, CAHN

Introduction to properties and experimental analysis of developing systems, and a descriptive and comparative study of development with emphasis on chordates. Prerequisite, 112.

## 457 Methods and Problems in Development (5) W

CAHN

An integrated laboratory and literature analysis of current research areas in developmental biology. Includes cell and tissue culture, clonal analysis of differentiation, induction and cytodifferentiation *in vitro*, immunochemical and biochemical approaches to the study of development. Prerequisite, permission.

## 458 Vertebrate Physiology (5) W

MARTIN

Emphasis on mammalian organ systems. Prerequisites, organic or physical chemistry and 20 credits in biological sciences.

## 458L Vertebrate Physiology Laboratory (1) W

MARTIN

Must be accompanied by 458. Prerequisite, permission.

## 462 Vertebrate Systematics and Life Histories (5) Sp

ORIAN, SNYDER

Systematics, evolution, life history, distribution, behavior, and interrelationships of vertebrate animals. Prerequisite, permission.

## 464 Natural History of Birds (5) Sp

RICHARDSON

A lecture, laboratory, and field course. (Alternates with 465.) Prerequisites, 112 and permission.

## 465 Natural History of Mammals (5) Sp

RICHARDSON

A lecture, laboratory, and field course. (Offered alternate years.) Prerequisites, 112 and permission.

## 475 Zoogeography (3) W

RICHARDSON

Studies of terrestrial vertebrate and, to a lesser extent, invertebrate past and present distribution, especially in relation to environment and evolution. Prerequisite, 112.

## 490 Undergraduate Seminar (2, max. 6)

Supervised reading and group discussion on selected concepts of zoology. Prerequisite, 20 credits in zoology and permission.

## 491 Topics in Zoological Research (1) Sp.

KOHN

Undergraduate seminar on research problems currently under investigation by department faculty members. Includes discussions and laboratory demonstrations of aims, techniques, and results of zoological research. Prerequisites, upper-division standing and permission.

## 498 Special Problems in Zoology (1-5, max. 15) AWSp

Prerequisites, 30 credits in zoology and permission.

## Courses for Graduates Only

"Permission," in course description below, refers to permission of instructor.

## BIOLOGY

### 501 Advanced Cytology (5) Sp

HSU

Detailed study of the structure and function of the cell. Prerequisite, permission.

### 508 Cellular Physiology (3) W

WHITELEY

The cell membrane and permeability, cytoplasmic physiology, intracellular energetics and biosynthesis, physiology of cell division, cell movement. (Biology 508 and 509 may be elected separately, or in either sequence.) Prerequisite, Zoology 400 or permission.

### 508L Cellular Physiology Laboratory (2) W

WHITELEY

Prerequisites, concurrent registration in Biology 508 or 509, and permission.

### 509 Cellular Physiology (3) W

WHITELEY

Chemistry and physiology of the interkinetic and dividing nucleus, nucleocytoplasmic interactions, physiology of differentiated cells. (Biology 508 and 509 may be elected separately, or in either sequence.) Prerequisite, Zoology 400 or permission.

### 573 Topics in Limnology (3) W

EDMONDSON

Readings in the literature of limnology, with detailed discussion of modern problems. Prerequisite, permission. May be repeated for credit.

### 586 Analysis of Development (3) A

CAHN, CLONEY, MC CARTHY, PIOUS, RUTTER, SZOLLOSI, WHITELEY

An analysis of structural, physiological, and molecular levels of developmental processes including gametogenesis, fertilization, cell and tissue movements, induction, and cytodifferentiation. Prerequisites, Biochemistry 443 and Zoology 456 or permission.

## ZOOLOGY

### 503 Developmental Cytology (3)

CLONEY

Fine structure of cells and tissues with emphasis on changes occurring during ontogeny. Prerequisite, permission.

### 506 Topics in Experimental Embryology (2, max. 6) A

CAHN, CLONEY, FERNALD, GRIFFITHS, HSU, WHITELEY

Seminars and discussions of aspects of growth of special current interest. Prerequisite, permission.

### 516 Chemical Embryology (3) Sp

WHITELEY

Physiology of larval development; differentiation of macromolecular substances; cellular and tissue interactions; nuclear and hormonal control mechanisms in development. Prerequisite, permission.

### 516L Chemical Embryology Laboratory (2) Sp

WHITELEY

Must be accompanied by 516.

### 517 Chemical Embryology (3) Sp

WHITELEY

Sex determination; biochemistry of gametogenesis; sperm metabolism; fertilization; ooplasmic segregation; mechanisms and syntheses in cleavage. (Zoology 516 and 517 may be elected separately or in either sequence.) Prerequisite, permission.

### 517L Chemical Embryology Laboratory (2 or 3) Sp

WHITELEY

Must be accompanied by 517.

### 520, 521, 522 Seminar (1,1,1) A,W,Sp

### 533 Advanced Invertebrate Zoology (6) S

The rich and varied invertebrate fauna of the San Juan Archipelago is studied, emphasizing systematics and ecology, with opportunity for developing individual research problems. (Offered at Friday Harbor Laboratories.) Prerequisite, 10 credits in invertebrate zoology or equivalent.

### 534 Topics in Advanced Invertebrate Zoology (3, max. 15)

ILLG, KOHN

Advanced considerations in morphology, ecology, phylogeny of invertebrates; emphasizing current developments. Prerequisite, permission.

### 536 Comparative Invertebrate Embryology (6) S

Morphological and experimental studies of development of selected types of marine invertebrates. (Offered at Friday Harbor Laboratories.) Prerequisites, 433, 434, and 456.

### 537 Comparative Invertebrate Physiology (3) Sp

FLOREY

Selected chapters of comparative physiology of nerve, muscle, circulation, respiration, renal function, and hormone action. Prerequisites, 400 and 434, or permission.

### 537L Comparative Invertebrate Physiology Laboratory (2) Sp

FLOREY

Exercises in kymographic, oscilloscopic, and other recording of mechanical, electrical, and metabolic phenomena of invertebrate organ function. Must be accompanied by 537. Prerequisite, permission.

### 538 Advanced Invertebrate Physiology (6) S

Physiological bases of ecology, evolution, and tolerance to stress, as illustrated by many diverse forms. (Offered at Friday Harbor Laboratories.) Prerequisites, chemistry through organic and 10 credits in invertebrate zoology, or equivalent.

### 554 Advanced Vertebrate Morphology (3) A

SNYDER

Current problems and trends in vertebrate anatomy emphasizing functional relationships. Prerequisites, -454, 456, and permission.

### 572 Topics in Ecology (2 or 3) W

EDMONDSON, PAINE, KOHN, ORIAN

Graduate seminar on modern problems in ecology. Prerequisites, Biology 472 or equivalent, and permission.

### 574 Ecology of Marine Communities (3) A

PAINE

Density and distribution of marine populations treated quantitatively and from the standpoint of community energetics. Community organization with emphasis on trophic interactions and stability. Prerequisites, Biology 472 and permission.

### 578 Advanced Ecology (5) A

ORIAN, PAINE

Fundamental properties of populations; population regulation; community productivity and structure. Prerequisites, Biology 472 or equivalent, and permission.

### 581 Systematic Zoology (5) W

ILLG

History, principles, and procedures of zoological taxonomy; review of biological bases of phylogeny; history and principles of zoological nomenclature. Prerequisite, permission.

### 583 Advanced Techniques in Microscopy (5) A

CLONEY

Theory and use of light microscope, modern techniques of specimen preparation for morphological studies, photomicrography. Prerequisite, permission.

### 598 Seminar in General and Comparative Physiology (2) W

FLOREY

Study and discussion of classical and current literature in the field of general and comparative physiology. Prerequisites, 400, 433, 434, and permission.

### 600 Research (\*) AWSpS

### 700 Thesis (\*) AWSpS



# RULES AND REGULATIONS

It is the University's expectation that a student will follow University Rules and Regulations as they are stated in the Catalog. In instances where no appeal procedure is spelled out and the student is persuaded that a special set of circumstances makes appeal reasonable, he may appeal the application of specific rules or regulations to the Office of the Dean of the School or College in which he is enrolled in the case of an academic matter, or to the Office of the Dean of Students in the case of a nonacademic matter. These offices will render a decision on the appeal, arrange for a hearing where appropriate, or refer the student to the proper office for a decision.

The University and its colleges and schools reserve the right to change the 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 courses at any time.

A graduate student must satisfy the requirements for an advanced degree which are in force at the time the degree is to be awarded.

## University Policy on Student Records

All student records will be treated in a responsible manner and with due regard to the personal nature of the information they contain. The records of students held by the University are the property of the University. The practice of the University Registrar, however, is to honor a student's written request that the transcript of his official academic records not be released or information contained in these records not be disclosed.

The University of Washington reserves 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.

## DEFINITIONS OF GENERAL UNIVERSITY TERMS

### College

The University is made up of eight colleges, each of which offers a curriculum (sequence of courses) leading to the Bachelor of Arts or Bachelor of Sciences degree.



A college may include a number of schools, departments, and divisions. The College of Arts and Sciences, for example, includes six schools, twenty-four departments, and several divisions.

### **School**

Within the University are two types of schools, independent units (*i.e.*, Business Administration, Dentistry, Law, Medicine, Nursing, Social Work) offering professional training to students who may be required to complete a period of preprofessional study, and units within colleges which offer semiprofessional training in single fields of study (*i.e.*, Art, Communications, Drama, Home Economics, Music, Physical and Health Education).

The Graduate School coordinates the work of students who have already obtained a bachelor's degree, and have been admitted to the School for advanced work toward the master's or doctor's degree.

### **Department**

The unit of instructional organization in a particular science or art is called a department (*e.g.*, History). The department differs from the semiprofessional school in its tendency to place less emphasis on the application of subject matter.

### **Division**

When a field of study includes work offered by several of the more specialized units of the University, it is sometimes called a division. In such cases, a committee of departmental representatives plans and coordinates the program.

### **Institute**

The primary function of an institute is research and advanced study. The institute is usually associated closely with related departments because its staff is largely composed of the department's faculty members who divide their time between teaching and research. The Far Eastern and Russian Institute, for example, is associated with the Department of Far Eastern and Slavic Languages and Literature.

### **Course**

A course is a quarterly unit of study in a particular subject. Each course is listed by number and title under *Description of Courses*.

### **Hyphenated Course**

Course numbers separated by hyphens (*e.g.*, French 101-102) indicate courses for which no credit is given until both terms have been completed.

### **Prerequisites**

Courses to be completed or conditions to be met before one is eligible to enroll in a more advanced course are called prerequisites (*e.g.*, English Composition 101 is prerequisite to 102).

### **Credit**

A credit is a measurement of curricular work completed satisfactorily. Ordinarily, 1 credit is given at the University of Washington for one class attendance a week for a period of one quarter. However, in some courses, such as laboratory courses, two or three "clock hours" of attendance a week are required to earn 1 credit. A specified number of credits must be earned for a degree.

Colleges and universities which operate on a "semester basis," that is, divide the academic year into two parts exclusive of a summer session, give semester credit. Quarter credits multiplied by two-thirds equal semester credits. Semester credits multiplied by one and one-half equal quarter credits. For example, a student attending the University of Washington who earns 45 quarter credits during an academic year would have earned 30 semester credits at an institution operating on the semester plan.

### **Curriculum**

The pattern or sequence of courses a student takes in earning his degree is a curriculum. Curricula are outlined in this Catalog.

### **Prescribed and Elected Curricula**

In the professional schools and colleges and in most of the schools in the College of Arts and Sciences, the curriculum offered is a prescribed one. Professional training requires intensive study over a long period with few courses in unrelated elective areas. In the less professionalized departments, the elective curricula provide a broad educational background. Therefore, students majoring in these fields of study are given more freedom in choosing their elective credits.



## Lower-Division Courses

The four-year program of study is divided into lower division (freshman and sophomore) and upper division (junior and senior). Lower-division courses are given numbers below 300.

## Upper-Division Courses

Junior and senior courses which are given 300 and 400 numbers, respectively, are considered upper-division courses.

## Undergraduate

This term is applied to a student who has not yet received his bachelor's degree.

## Graduate

A student who has received his bachelor's degree and who is taking advanced work is a post-baccalaureate student. Professional schools usually adopt their college title such as medical student, law student, etc. The term "Graduate Student" is applied to a student who has been officially admitted to the Graduate School to take advanced work toward a master's or doctor's degree in the Graduate School.

## Premajor

The premajor category is provided in certain colleges for those students in the first or second year who have not made a definite choice of major in the college. These students may select, in consultation with an adviser, a program of studies which will meet the broad general requirements of the college and at the same time provide an experimentation and exploration in the subject areas of the college. Each program is planned according to the individual student's needs.

No one may continue beyond his sophomore year as a premajor.

## Major

A major indicates the department or subject in which a student specializes. The term *nonmajor*, which frequently appears in the description of courses, indicates a course designed primarily for students who are not specializing in that subject.

## Adviser

A member of the college faculty or staff who is appointed to assist students in both educational and personal plans is an adviser.

## Bulletin

A bulletin is an official publication issued by the University giving detailed information about such subjects as admissions policy, faculty personnel, courses offered, fees, etc.

## Residence (Resident)

This term has two meanings, neither of which refers to living on campus or at home while in attendance:

1. A "resident" is a student whose home, as defined by state law, is in Washington and therefore not subject to the additional fee required of nonresident students. (See *Appendix B*.)
2. A student "in residence" is enrolled in regular University classes as opposed to extension classes or correspondence study. Students regularly admitted to the University of Washington are considered to be "in residence" when enrolled in either day or evening classes.

## DEFINITIONS OF STUDENT CLASSIFICATIONS

### Classes

Credits are computed on the basis of the 180 minimum credits required for graduation, exclusive of the credits in physical education activity and lower-division ROTC courses. For general purposes, the following apply.

Freshman: 1-44 quarter credits

Sophomore: 45-89 quarter credits

Junior: 90-134 quarter credits

Senior: 135-180 or more quarter credits

Unclassified-5: A student holding a bachelor's degree but not admitted to the Graduate School.

Graduate: A student with a bachelor's degree who has applied for and been granted admission to the Graduate School.

## **Probation**

### **New Students**

Students with unsatisfactory scholastic records in their previous schools are occasionally admitted when special circumstances justify individual consideration by the Board of Admissions. Such students do not enter on probation. They must, however, maintain a cumulative grade-point average of at least 2.00 in all work completed at the University of Washington and, in addition, transfer students must present a graduation grade-point average of at least 2.00 in *all* courses, whether completed at the University of Washington or elsewhere.

### **Other Students**

See *Scholastic Standards Required for Graduation* in this section.

## **Matriculated**

A matriculated student is a student who has been formally admitted to the University and registered in one of its divisions, presumably in a program of studies leading to a degree or certificate.

## **Nonmatriculated**

A nonmatriculated student is one who has been permitted to enroll for credit in order to achieve a limited educational objective. Such students are not engaged in a program of studies which leads to a degree or teaching credential. Acceptance as a nonmatriculated student implies no commitment on the part of the University regarding regular admission at some later time. However, credits earned while in the nonmatriculated classification may apply toward requirements for the baccalaureate degree should a student later be accepted for a degree program. At least 45 credits must be earned in a matriculated status to meet graduation requirements.

Except for Visiting Graduate Students, whose admission and enrollment is authorized by the Dean of the Graduate School, nonmatriculated students may not enroll for courses numbered 500 and above.

Enrollment in daytime classes with nonmatriculated standing for the Summer Quarter Only is routinely available for currently employed school teachers and administrators with the understanding that credits earned in this classification may not apply toward a teaching or administrative credential. This arrangement also serves graduating high school seniors and

other undergraduate students in good standing at other colleges and universities seeking neither a degree nor certification from the University of Washington. For complete information, please consult the *Summer Quarter Bulletin*.

Enrollment in daytime classes during other quarters of the school year is at the discretion of the Board of Admissions. Applicants for nonmatriculated standing are considered individually and permitted to enroll on evidence of their probable success in achieving their limited educational objectives to the extent University facilities are available. Applicants with previous records of unsatisfactory scholarship are not ordinarily accepted as nonmatriculated students.

Nonmatriculated standing in the Evening Classes Program is available at the discretion of the Director, Evening and Extension Classes. For complete information, please consult the *Evening Classes Bulletin*.

Students may audit certain nonlaboratory courses or the lecture part of laboratory courses for no credit, provided they submit an Application for Admission form before the prescribed cut-off date and have the consent of the dean of the college and permission from the instructor concerned. This classification is open to mature individuals with the understanding that auditors may not take an examination in or obtain credit for audited courses except by taking the course later as a regular student and satisfying all of the requirements for credit.

Students who have been dropped for low scholarship or new applicants who do not qualify for admission may not register as auditors until they have been reinstated or accepted as regular students by the University. Auditors are not eligible for participation in student activities.

## **ADMISSION**

Correspondence regarding admission to any division of the University and the transfer of credit from another collegiate institution should be addressed to the Director of Admissions. (See sections on *Undergraduate Education* or *Graduate Study* for admission requirements and procedures.)

The Board of Admissions has been delegated to interpret and administer undergraduate admission regulations established by the University faculty. In general, admissibility is determined according to the applicant's



scholastic standing and the adequacy of his preparation for University study while in high school or another collegiate institution, with preference given, as necessary, to those with the greater probability of success in completing a degree program.

In determining the adequacy of an applicant's preparation, 5 quarter credits of elementary course work at the college level is considered equivalent to 1 high school unit in a given subject. The foregoing equivalency is used for purposes of admission only and a student who has not completed all of the high school courses specified for admission will be expected to select college-level courses which will provide a breadth of intellectual experience at least equivalent to that indicated by the subject matter criteria. The courses and number of credits to be allowed shall be determined by the student's college adviser after consideration of recommendations by the department in the University which presents courses in the subjects not included in the high school study.

## **Explanation of Terms Associated with Admission**

For purposes of admission, an applicant's scholastic achievement in secondary or higher schools is determined by a grade-point average computed on a 4.00 system. In determining the acceptability of transfer students, the University considers grades received in all college-level courses attempted which are appropriate for a baccalaureate degree.

The University recognizes diplomas awarded by high schools accredited by their respective regional accrediting associations, their state departments of public instruction, or their state universities. Recognition is given to degrees awarded by colleges and universities which are fully accredited by their regional accrediting associations. Transfer credit from institutions accredited for less than four years will not be accepted in excess of the accreditation of the school concerned.

An applicant who has not fulfilled the criteria specified for admission or whose education was received in an unaccredited school may request individual consideration by the Board of Admissions, Scholastic Standards, and Graduation. In such cases, the Board may require scores on tests of the College Entrance Examination Board or other evidence of probable success in a university program. Students accepted by the Board are expected to comply with any specifications outlined by the Board at the time of admission.

## **College Entrance Examination Board**

Scores on the Scholastic Aptitude Test of the College Entrance Examination Board are required of all out-of-state students applying for admission as freshman students. Arrangements for taking the test may be made by writing to the Educational Testing Service, Princeton, New Jersey. In making these arrangements, the applicant should request that the scores be sent to the Office of Admissions, University of Washington. In addition, the Office of Admissions should be informed as to when the tests will be taken in order that it may anticipate the arrival of the test scores.

## **Allowance of Transfer Credits**

a. The University of Washington reserves the right to accept or reject credits earned at other collegiate institutions. In general, it shall be the University's policy to accept credits earned at institutions fully accredited by their respective regional accrediting associations, provided that such credits have been acquired through university-level courses appropriate to the student's degree-curriculum at the University of Washington.

b. The advanced standing for which an applicant's training appears to fit him shall be granted tentatively on admission. Definite advanced standing shall not be determined until the end of the student's first quarter in residence.

c. Transfer of credit from institutions accredited for two-year programs only (community and junior colleges) shall apply on the University freshman and sophomore years only. A student who has completed a portion of his freshman and/or sophomore years in a four-year college may not transfer junior college credit in excess of that necessary to completion of the first two years in the University. In no case shall the transfer of junior college credit to the University exceed 90 quarter credits, exclusive of physical education activity credits.

d. The University reserves the right to accept or reject credits earned in educational programs sponsored by the Armed Forces. In general, careful consideration will be given to work completed according to recommendations made by the American Council of Education and other appropriate agencies and in terms of University degree requirements.

The maximum number of credits obtainable through completion of such programs shall be 30.

Such credits, when accepted, shall be included in the 90 extension credit maximum allowed toward the baccalaureate degree.

Within a given field of study, no student shall receive credit in subject matter more elementary than that for which he has previously received credit.

If a student repeats a course taken through the Armed Forces which was accepted for credit, the University credit shall be honored and the other canceled.

e. Credit may be granted only upon examination for work completed through Extended Secondary Programs approved by the Washington State Board of Education, institutions whose standing is unknown, independent study, and private teachers. (See *Examinations and Tests* in this section.)

f. Course work completed in unaccredited institutions may be validated or certified for credit through examinations described in the section, *Examinations and Tests*, or through an examination or other appropriate means to be determined by the chairman of the University's subject matter department concerned. The fee for this service shall be the same as that charged for the other examinations. Consult the Office of Admissions in regard to the appropriate procedure.

#### **Veterans and Children of Deceased Veterans**

Veterans and children of deceased veterans who wish to inquire about their eligibility for benefits, should contact the regional office of the Veterans Administration.

#### **Correspondence Study and Evening Classes**

Correspondence Study courses are available to all who can pursue the work with profit to themselves regardless of previous academic accomplishment. Evening Classes are open to individuals who meet the enrollment requirements outlined in the section on *Extension and Evening Classes*. See other sections in this catalog or consult the appropriate office for information regarding eligibility for course work, registration procedure, and regulations governing the application of correspondence or evening class credit toward a degree.

## **REGISTRATION**

No person may attend a University course in which he has not been registered as a student or enrolled as an auditor.

The only authority for an instructor to enroll a student in his class is the student's name on a class list or an official class card from the Registrar's Office.

## **Announcements**

Registration dates and procedures are announced to resident students via posters placed on campus bulletin boards, in official and informal notices in the *Daily*, in various University bulletins, and in the quarterly *Time Schedule*. Students should watch these sources for instructions for completing their registration.

New students, and returning students (those who have been out of school for one quarter or more), should familiarize themselves with the registration procedures contained in the various forms and bulletins available to them from the Office of Admissions and the Registrar. (See also the *Academic Calendar* in this Catalog.)

## **Addresses of Students**

The student will be held responsible for keeping his address up-to-date in the Registrar's Office by filling out a Change of Address card at the Information Window, Administration Building. *Delivery of official mail to the last address on record constitutes official notification to a student.*

## **Methods of Registration**

There are two methods of registration for Autumn, Winter, and Spring Quarters. *Advance Registration*, requiring no registration appointment, is a modified form of mail registration and is required of and open only to currently enrolled students (Summer Quarter excepted). *All students currently in school who plan to register for the succeeding quarter (Summer Quarter excepted) must register by Advance Registration and pay fees by the stated deadline, except:*

1. Students initially entering the Graduate School or the Schools of Law, Medicine, or Dentistry, and those initially granted Unclassified-5 status.
2. Students on scholastic probation who are prohibited from participating in Advance Registration by their academic deans. *These students must present an adviser-signed fee waiver card to Sections before the close of Advance Registration.*
3. Students whose Advance Registration is canceled when they are dropped for low scholarship, and who are subsequently reinstated and permitted to reregister.
4. Graduate students registering *in absentia*, with the approval of the Dean of the Graduate School.



5. Students who withdraw during the current quarter, who may then elect either Advance or In-Person Registration.

To register in advance, a student leaves his approved Official Program of Studies at Sections, 101 Administration Building (engineering students at 208 Guggenheim Hall), within the specified dates. His schedule of assignments are made in his absence. Every effort is made to comply with a student's request. If a course is closed, an alternate course, which has been approved by his adviser, is substituted. A copy of his assigned program is mailed to him with his Fee Card. His enrollment is completed when he pays his fees by mail by a stated deadline and turns in all Information Cards as directed.

More detailed instructions for registration are given in each quarter's *Time Schedule*.

A service charge of \$15.00 will be assessed when a student, eligible for *Advance Registration* for the succeeding quarter, does not qualify under one of the foregoing exceptions and fails to participate, and then applies for *In-Person Registration* for that quarter.

*In-Person Registration* is required of all new students and former students returning after an absence of one or more quarters (Summer Quarter excepted). Returning students must apply by the application deadline. A registration appointment is required, on which date the student pays his fees and takes his approved Official Program of Studies to Sections, 101 Administration Building (engineers go to 208 Guggenheim Hall) where he is given his class assignments. (See "Registration Appointments" in this section, and "Admission Procedure" in the *Undergraduate Education* section.)

Advising for *In-Person Registration* takes place after *Advance Registration* is closed.

## Late Registration

Permission to register late (on the first day of the quarter or thereafter) will be granted only at the discretion of the Registration Appeal Board. A service fee of \$15.00 will be assessed unless delay in registering is occasioned by officials of the University or prior arrangements have been made with the dean of the school or college concerned.

After the first seven calendar days of the quarter, the written approval of the instructors, whose classes the student wishes to enter, is also required.

## Financial Obligations

Outstanding financial obligations must be cleared before registration for any quarter can be completed. Students with library fines must clear them with the Library cashier. Students participating in Advance Registration will not be enrolled in classes until such clearance is obtained, and those registering In-Person will not be issued registration materials.

Lists of library fines are available in the lobby of the Administration Building and in the Main Library.

## Concurrent Registrations

### Extension Classes and Correspondence Study

A student registered for work in residence who wishes to receive credit for an extension or correspondence course in the same quarter shall register for such study with the Division of Evening and Extension Services or the Division of Correspondence Study.

No resident student may take an extension course without the consent of his dean. This permission, on forms furnished for the purpose, shall be filed with the Division of Evening and Extension Services or the Division of Correspondence Study, whichever is appropriate to the request.

### Concurrent Registrations at Other Collegiate Institutions

Courses taken concurrently at another collegiate institution while the student is in residence at the University of Washington may be credited toward his graduation from the University if accepted by the Department Chairman and Dean of the College in which the student is enrolled.

Such acceptance should be obtained by the student in writing prior to the quarter in which concurrent registration takes place.

Nothing in this rule shall make mandatory the granting of any credit by the University.

## Registration Appointments

*New students* are mailed a Registration Appointment with their Official Notice of Admission, with a detailed list of steps new students must take the first time they register. Additional directions are given each new student personally when he reports for registration.

*Returning students* may obtain an Application for Registration Appointment by writing or telephoning the Registrar's Office, or by applying in person, by the established application deadline appearing on campus bulletin boards and as indicated in this Catalog. (See *Academic Calendar*.) A service charge of \$15.00 will be assessed any student whose petition for exception to the application deadline is granted.

Registration materials are prepared after the Application for Registration is received and the Registration Appointment is issued. *Students in the Schools of Medicine, Dentistry, and Law must request registration appointments and file applications by the deadline for applying for a Registration Appointment.*

### Time Schedule

A *Time Schedule* listing all classes and sections offered is published prior to the registration period for each quarter. A copy of the current *Time Schedule* is available for each student at the Registrar's Office (engineering students at 208 Guggenheim). *Time Schedules* are also available for inspection in each adviser's office.

### Special Approvals Required (Permission Signatures)

Before reporting to Sections, a student may have one or more of these other steps to complete:

1. Seniors who are registering for a graduate course (500 or above) must have the approval of the instructor of the class and the Dean of the Graduate School. These approvals must be written on the student's Program of Studies form.
2. Graduate students must get the *signature of the Dean of the Graduate School* (except for advance registration) after they have obtained that of their adviser.
3. Students in the College of Education must obtain approval of their programs from the Education adviser, regardless of their majors.
4. All private music lessons (applied music courses) must be approved by the School of Music. The class section is also assigned by the School of Music on the student's Official Program.
5. All librarianship courses, except course 100, must be approved in writing on the student's Official Program at the School of Librarianship, 111 Library.

6. Students registering for any course for which a permission signature is specified in the *Time Schedule* should have this signature on their Program of Studies.

7. All former students who have not been in residence for a period of one year must report for a medical examination.

8. Students who have taken third-semester algebra in high school and who wish to register for Mathematics 104 (Plane Trigonometry) and/or Mathematics 105 (College Algebra) are required to take a qualifying test before they are permitted to register for these University courses. A card issued by the Department of Mathematics and filed with the student's adviser will be authority for registration in either of these courses.

9. Students registering for more than 13 credits must select an afternoon class meeting at 12:30 or after, if one is available. Only a daily class or two 2-hour laboratories, except lower-division ROTC and Physical Education Activity, will satisfy this afternoon class requirement. Waiver of the afternoon class requirement must be approved by the student's dean or his authorized representative.

### Change of Program

Changes of program involving "adds" and "drops," or changes for the convenience of the University, will be accepted by Sections during each quarter's change of program periods.

Students finding errors on their programs should report to Sections for adjustment without waiting for the Change of Program period.

No change of course or section involving an added course will be permitted when the student was assigned the course he requested, but not the section he requested.

No change of program to another course will be permitted because a student was assigned a listed alternate instead of a first choice.

Any student listing alternates on his requested program and completing *Advance Registration* by paying his fees, who was assigned less credits than requested because of unavailable sections, and who wishes to increase his registered credits up to the desired maximum, may add a course, without charge, during the stated change of program period.



No change of program involving entrance into a new course shall be permitted after the first seven calendar days of the quarter except with the consent of the dean of the college concerned and of the instructor whose class the student wishes to enter.

## Service Charge

A service charge of \$5.00 will be assessed for each change of program, or change of section, or withdrawal from a course, or any number of changes of program that are made at the same time, except when the change is made on the initiative of the University.

The authority for assessing the service charge concerning section changes, additions, and/or withdrawals rests with the dean of the school or college or his authorized representative.

## Change of Program Procedure

### For Adding or Dropping a Course

1. Consult your adviser and secure signed Change of Program card.
2. Get course approval signatures for added courses where necessary.
3. Present signed Change card to Window 3, Administration Building lobby, to receive a Change of Program Appointment.
4. Go to Sections, 101 Administration Building, on day and time of appointment. Engineering students go to 208 Guggenheim.

## Change of College (including a change to or from the Schools of Law, Medicine, and Dentistry)

Change of College forms may be obtained at Window 5, Administration Building Lobby, or at the office of the dean of the college the student wishes to leave. The request must be filled in by the student and then submitted to the office of the dean of that college for signature. The next step is to present the request form to the office of the dean of the college to which he seeks admission, for written approval. After these steps have been accomplished the completed form must be left immediately at Window 5 in the Administration Building Lobby.

Veterans and children of deceased veterans attending the University under Public Law 550, 894, or 634 must take certain other steps to ensure their continued en-

titlement to educational benefits. Consult Veterans Division.

A student currently in school may initiate a change of college at any time by obtaining on the appropriate forms the signatures of the dean of the college in which he is currently registered and the dean of the college that he wishes to enter.

## Change of Major

The College of Arts and Sciences requires two Change of Major forms which may be obtained at the Arts and Sciences Advisory Office, 102 Smith Hall. After both of these have been signed by chairmen of the old and new departments, the student must return them to 102 Smith for recording.

To change majors within the College of Education, students should obtain forms from an adviser in 207 Miller Hall. Business Administration students must also obtain special forms at 137 MacKenzie Hall.

In other colleges no special forms are used. To change a major the student is expected to confer with his adviser.

## Withdrawal from the University

Withdrawal from the University is voluntary severance by a student of his connection with the University. Except in the case of military withdrawal, it must be approved by the dean of his college.

### Nonmilitary Withdrawal

1. The student obtains a Request for Withdrawal From the University form from his adviser.
2. A Veteran attending school under P.L. 550 (Korean), 894 (Korean Disabled), 815 (Peace Time Disabled), or children of deceased veterans attending school under P.L. 634 obtains approval of the Veterans Division.
3. The student with a scholarship or loan awarded through the University must obtain the approval of the Scholarship and Loan Fiscal Office.
4. The student obtains chemistry and/or pharmacy laboratory check-out clearance if registered for courses in chemistry or pharmacy. A clearance is not given until the dean of the college has approved the withdrawal by signing the Withdrawal forms.



5. The ROTC student presents his Withdrawal form to the Personnel Section, ROTC Headquarters, and obtains a Clearance Sheet in duplicate. He takes this Clearance Sheet, with his uniform, to the appropriate Assistant Military Property Custodian. After obtaining his signature on the Clearance Sheet, the student takes it, with his textbooks, to his military instructor. Upon completion of turn-in of uniform and textbooks, he returns to ROTC headquarters for final clearance. A Clearance Sheet will not be given to a student until the dean of the college has approved the withdrawal by signing the Withdrawal forms.

6. The student then turns in all copies of the Withdrawal form at the Registrar's Office with his ASUW card, Athletic Admission ticket, chemistry and/or pharmacy laboratory check-out, and ROTC Headquarters clearance. Two weeks must elapse between payment and any refund due him, if payment was made by check.

7. A duplicate copy of the Withdrawal form is mailed to the parent if the student is an unmarried minor.

#### **Military Withdrawal**

If a student is inducted or enlists in the Armed Forces, he may take advantage of military withdrawal from the University under the following conditions:

1. A student who withdraws is granted credit for courses in which he has a C or better grade, and refund of fees, under the following schedule:

a. Withdrawal during the first third of the general class schedule for the quarter: No credit. Full refund.

b. Withdrawal during the second third of the general class schedule for the quarter: One-half credit, without letter grade, and with courses unspecified. Unspecified credit may later be converted to credit and grade by credit examination. One-half refund.

c. Withdrawal during the last third of the general class schedule for the quarter: Full credit, without letter grade, and with courses specified. (If withdrawal occurs during the last five days of the quarter, letter grades may be granted at the discretion of the instructors.) Letter grade may later be earned by credit examination. No refund.

2. If a student is in his last quarter before obtaining a degree from the University, he will be granted the degree provided:

a. That at the beginning of the quarter his cumulative grade-point average is high enough for graduation.

b. That his degree has been approved by his major professor, department chairman, and dean.

c. That his grades for the completed portion of the quarter are C or better in each course necessary for graduation.

This third proviso may be waived if the withdrawal occurs so soon after the beginning of the quarter that determination of a grade is impossible.

3. The student will be expected to attend classes and withdraw no more than fifteen calendar days before his date to report for duty.

4. The privilege of military withdrawal will be granted only to students whose induction or enlistment is for extended active duty, not for short-term National Guard or Reserve duty or annual active-duty requirement.

5. The provisions of military withdrawal apply to students enrolled in evening and extension classes as well as those in day school.

6. Should the foregoing provisions conflict with standards imposed upon a professional college or school by accrediting or licensing agencies, the dean or chairman of the college or school shall approve the conditions of military withdrawal.

#### **Withdrawal from a Course**

Withdrawal from a course is voluntary severance by the student of his connection with a course.

Withdrawals from courses accomplished by any method except those set forth in 1, 2, and 3 below are unofficial withdrawals. Unofficial withdrawals shall be entered on the student's record as EW and shall be assigned the value of E in computation of the student's cumulative grade-point average.

A charge of \$5.00 shall be imposed for each official withdrawal from a course.



## GRADES

The following system of grades is in effect at the University, subject to certain exceptions in the Schools of Medicine, Dentistry, and Law.

GRADE POINTS PER  
REGISTERED CREDIT

A—Honor	4
B—Good	3
C—Medium	2
D—Poor (low pass)	1
E—Failed, or was doing failing work at the time of official withdrawal from a course after the first fifteen calendar days of a quarter	0
I—Incomplete	0
N—Satisfactory, without grade	0
S—Passing grade for courses numbered 500 and above	0
PW—Official Withdrawal after the first fifteen calendar days of a quarter if student's work is satisfactory at the time of withdrawal	0
EW—Unofficial Withdrawal any time during the quarter (computed as E)	0
X—Grade not received from the instructor	0

### Failures

The grade of E shall be final. A student receiving the grade of E in a course may obtain credit for it only by re-registering for the course and repeating it, as prescribed in *Repeating of Courses* in this section.

### Incompletes

An Incomplete shall be given only in case the student has been in attendance and has done satisfactory work to within two weeks of the end of the quarter and has furnished proof satisfactory to his instructor that he cannot complete his work because of illness or other circumstances beyond his control. A written statement of the reason for the giving of the Incomplete, listing the work which the student will need to do to remove it, must be filed by the instructor with the head of the department or the dean of the college in which the course is given.

In order to obtain credit for the course a student must convert an Incomplete into a passing grade by the last day of his next quarter in residence. This rule may be waived by the dean of the college in which the course was offered only if the nature of the uncompleted work is such as to make the fulfillment of this requirement impossible. In no case can an Incomplete be converted to a passing grade after a lapse of two years or more. A fee of \$2.00 per course will be assessed for the re-

1. *During the first fifteen calendar days of the quarter:* To drop a course the student should consult his adviser and get his signature of approval on the yellow Change of Program Request form obtained at the advisory office. He should present the card at Sections and pay the \$5.00 charge when so instructed. It is wise to confer with the instructor before dropping a course.

2. *After the first fifteen calendar days of the quarter and prior to the seventh week of the quarter:* To drop a course, the student should consult his adviser and obtain his signature of approval on the yellow Change of Program Request form obtained at the advisory office. The written approval of the instructor of the course, and the dean of the college in which the withdrawing student is enrolled, must also be obtained. When all three signatures have been obtained, he should present the form at Sections and pay the \$5.00 charge when so instructed. *Sections cannot accept any withdrawal which the instructor and/or dean have refused to approve.*

If the withdrawing student's work in the course from which he has withdrawn is satisfactory, a PW shall be entered on his record; if his work is unsatisfactory, an E shall be entered on his record.

3. *After the first six calendar weeks of a quarter and before final examination week:* Official withdrawal shall be made only upon certification in writing to the Registrar by the dean of the college in which the withdrawing student is enrolled that, in the judgment of the dean, withdrawal is necessitated by the student's hardship.

Forms may be obtained at the office of the student's academic dean. The same system of grades applies as in paragraph 2 above.

4. No official withdrawal may be made during final examination week.

### Withdrawal From Army or Air ROTC

Students withdrawing from military training will take authority for withdrawal to the Personnel Section, ROTC Headquarters, and obtain clearance. Instructions for turning in of uniform and textbooks will be given to a student at the time a Clearance Sheet is prepared. A completed Clearance Sheet with withdrawal authority will be taken by the student to Sections, 101 Administration Building.

removal of each Incomplete, whether it is removed by examination or other means.

*To remove an Incomplete*, the student should:

1. Pay the required fee at the Cashier's Office in the Administration Building.
2. Present the receipt at the Information Window of the Registrar's Office in the Administration Building where he will be issued an Authorization Card.
3. Present the Authorization Card to the instructor concerned. (All Incomplete Removal Cards sent to the Registrar's Office must have the Authorization Card attached in order to be recorded.)

Incompletes which are not converted by removal are *never* changed to E grades.

#### **Grade of N**

The grade of N may be given in thesis, research, and hyphenated courses in which the grade is dependent upon the work of a final quarter. When the grade of N is given in a course it may indicate that the work has been completed to the end of the quarter in which the N is given. It shall carry with it no credit or grade until a regular grade is assigned. The use of the N grade shall be optional.

#### **Grade of PW**

Students making an official withdrawal during the first fifteen calendar days of a quarter shall be given no grade. Students who officially withdraw after the first fifteen calendar days of a quarter and are doing satisfactory work (D or better) in a course shall be given the grade of PW, which will count neither as registered hours nor as grade points. Students who withdraw after the first fifteen calendar days of a quarter and who are doing unsatisfactory work at the time of withdrawal, shall be given the grade of E.

#### **Grade of EW**

Students unofficially withdrawing from a course shall be given a grade of EW, which shall be assigned the value of E in the computation of grade-point averages.

#### **Change of Grade**

Except in cases of error no instructor may change a grade which he has turned in to the Registrar. If a student finds omissions or possible errors in his grade sheet, he must make application to the Registrar for a

review of his record not later than the last day of his next quarter in residence, and in no case after a lapse of two years. Time spent in military service will not be counted as part of the two-year limitation.

Once an "S" grade is given to a student, it continues as the permanent grade and should not later be changed into an A, B, C or any other grade.

#### **Repeating of Courses**

Schools of Medicine, Dentistry, and Law are excepted.

Any courses may be repeated regardless of the grade received. All grades for repeated courses will be computed in grade-point averages, but credit will only be allowed once for successful completion of a course.

#### **Schools of Medicine and Dentistry**

The system of grades for the School of Medicine shall be the same as prescribed for the University, except:

Medical student achievement in each course is reported by the Dean's Office to the Registrar as *P* (Pass), *A* (Excellent), *B* (Good), *C* (Average), *D* (Poor), or *E* (Failure).

*D* signifies that the work is of passing grade but poor. Warnings are sent to students who receive *D* in any quarter.

*E* signifies that the work is of failing grade. Students who receive an *E* in one major subject may be permitted to take additional work and a re-examination, if permission is granted by the instructor in the course, the Dean, and the Executive Committee. If the additional work and re-examination are satisfactory, the student's grade may be raised from *E* to *D* and promotion may be granted provided that the remainder of the work is satisfactory. If students receive *E* in more than one major subject in one year, they may not make up these deficiencies.

Each department keeps careful records of student work. At the end of each academic year the Executive Committee of the School of Medicine evaluates the accomplishment of the student during that year and determines his fitness for promotion. When general academic achievement is unsatisfactory in any year, the student is subject to dismissal from the School. Even though a student who has been dismissed from



the School of Medicine may succeed in passing a medical school course which he has previously failed by taking it as part of his course in another school or college, this is not regarded as evidence that a student's abilities justify readmitting him to Medical School. Students who have been dismissed because of low scholarship can be readmitted only by action of the Executive Committee; those who are readmitted are on probation and must maintain a quality of work consistently above the minimum requirements. The faculty of the School of Medicine does not favor repetition of courses in cases of low scholarship and will not permit a student to repeat a year of work except when illness or some other extenuating circumstance justifies an exception.

The School of Dentistry uses the University grade-point system: A = 4, B = 3, C = 2, D = 1, E = 0. Calculation of the grade-point average is made by multiplying the grade point received in a course by the number of credits earned in the course, totaling these values, and dividing by the total number of credits earned.

Students are notified of their grades at the end of each quarter.

A student who has less than a 2.00 grade-point average in the courses for which he is registered during any given quarter is referred to the Executive Committee of the School. If the work in a course is incomplete or inadequate, a grade of I may be given. This Incomplete must be removed before September 15 if the student is to advance into the next year's class.

### School of Law

1. In lieu of the letters A, B, C, D, and E, the numerical scale shall be substituted for the letter grades as follows:

A—85-100 B—77-84 C—68-76 D—60-67 E—0-59

2. No grade points shall be assigned to Law School grades.

3. A cumulative numerical average of 68 in law courses is required for graduation.

### Grade Reports

At the end of each quarter a grade report for the work of that quarter is prepared for each student (except for

students in the Schools of Law, Medicine, and Dentistry). Students may receive their copies by mail by depositing a self-addressed, stamped No. 10 envelope marked with the student's permanent number in the upper left-hand corner. Grade reports for those not leaving envelopes are available for distribution on the first day of the next quarter.

Copies of the quarterly grade reports are also distributed to each student's dean and major department.

At the end of each Summer Quarter, copies of each student's complete University of Washington record are prepared by the Registrar for all students who were in attendance at any time during the previous year.

### Grade Reports to Parents

Parents desiring quarterly reports on the academic progress of minor sons or daughters may request the Registrar's Office to place them on the parents' mailing list.

### Grade-Point Averages

The cumulative grade-point average includes only credits granted for courses taken in residence at the University of Washington, and specifically excludes transfer and extension credits and credits earned by examination.

### Computation of Grade-Point Averages

Grade-point (GPA) averages for graduation are computed by dividing the total cumulative grade points by the total credits attempted (TCA).

Letter grades are weighted as follows in computing a grade-point average: A = 4, B = 3, C = 2, D = 1, E = 0, EW = 0. The number of credits is multiplied by the letter value of the grade to give the grade points for each course. The sum of the grade points is then divided by the total credits attempted.

On the Quarterly Grade Report for students in the Graduate School all courses numbered 100 through 700, with the grades earned, are listed. However, *grade points* are *not* extended for 100- and 200-level courses and such courses are *not* included in quarter or cumulative grade-point averages. *Only* courses numbered 300 and above are included in the total quarter and cumulative credit and grade points, and in the computation of

the grade-point average for students in the Graduate School.

#### EXAMPLE I: A TYPICAL GRADE REPORT

##### Autumn Quarter

COURSE	CREDIT	GRADE	GRADE POINTS
ENGLISH 101	3	C (2) =	6
GEOLOGY 101	5	B (3) =	15
SPEECH 100	5	A (4) =	20
GEOGRAPHY 258	2	B (3) =	6
<hr/>			<hr/>
TOTAL CREDITS ATTEMPTED (TCA)	15		47
GRADE-POINT AVERAGE = $47 \div 15 = 3.13$			

It should be emphasized that the total credits attempted and not the credits earned toward graduation are used in computing a grade-point average.

#### EXAMPLE II: A FAILURE AND AN INCOMPLETE

##### Autumn Quarter

COURSE	CREDIT	GRADE	GRADE POINTS
ENGLISH 101	3	C (2) =	6
GEOLOGY 101	5*	E (0) =	0
SPEECH 100	5	B (3) =	15
PHYS. EDUC. 114	[1]†	I (1)	
<hr/>			<hr/>
TOTAL CREDITS ATTEMPTED (TCA)	13		21
GRADE-POINT AVERAGE = $21 \div 13 = 1.61$			

#### Credit by Examination

Credit by examination is not applicable to an advanced degree in the Graduate School.

Examinations for credit in courses offered by the University may be taken on work done by private study by a currently registered student who has been regularly admitted to the University. Credit examinations may also be taken to gain credit for courses taken in an unaccredited institution or in extended secondary programs after high school graduation at institutions which are authorized by the Washington State Board of Education. It is recommended that application for credit by examination for such work be made during the student's first quarter in residence.

No duplication of credit shall be permitted. No one may take an examination for a course in which he has received transfer credit or has been registered as an auditor or for credit at the University.

All credits secured by examination shall be counted as extension credits and shall be included in the 90 extension

\* The 5 registered credits in Geology 101 for which no credit was received are included in the TCA.

† The 1 registered credit in Phys. Educ. 114 in which an Incomplete was received is not included.

sion (nonmatriculated) credit maximum allowed toward the bachelor's degree of which only 10 credits may be earned in the senior year. No credit will be allowed by examination with a grade less than C.

Within a given field of study no student shall receive credit in subject matter more elementary than that for which he has previously received credit.

No student shall be permitted to repeat any examination for advanced credit.

No student shall receive credit by examination for lower-division courses in his native language.

Credit granted through examination is not included in the student's cumulative grade-point average. It will, however, be computed into the graduation grade-point average.

The procedure for authorizing, formulating, and conducting credit by examination shall be as follows:

1. A student who wishes to qualify for credit by examination shall apply to the Registrar for a certificate of eligibility. After this certificate has been approved and signed by the Registrar, the student shall present it for signed approval to an instructor responsible for the course in which the examination is to be taken, to the chairman of the department concerned, and to the dean of the college or school concerned. If such approvals are granted, the student shall then pay a charge of \$2.00 per credit to be gained by examination.
2. The department or school shall prepare appropriate examinations for credit and transmit them to the Registrar. The department or school shall submit with each examination any necessary list of authorized supplementary material. Each such list shall be issued to the examination proctors and to those taking the examination for which the list is prepared.
3. The chairman of the school or department giving the examination shall have the responsibility of approving it. In general, examinations shall be of sufficient scope to occupy the qualified student a minimum of three hours and a maximum of four hours in a test on a 3-, 4-, or 5- credit course; and a minimum of two and maximum of three hours in a test on a 1-, or 2-credit course.
4. The Registrar shall designate a time in each quarter during which all approved examinations shall be given.



Such examinations shall be supervised by the Bureau of Counseling and Testing.

5. No student shall be permitted to take in one day more than two examinations in 3-, 4-, or 5-credit courses, or more than three examinations in 1- or 2-credit courses. An additional day shall be permitted the student who takes more examinations. The student who requires this extra time shall make arrangements for it with the Testing Bureau.

6. Completed examinations shall be transmitted to the proper schools or departments for grading. Grade reports signed by the instructor and chairman or dean involved shall be sent to the Registrar for recording.

Credit examinations are given once each quarter. Applications may be filed two weeks after the opening of the quarter and must be filed not later than two weeks prior to the announced examination date. The date is announced through "Official Notices" in the *Daily* and the academic calendar. Interested students may obtain application forms and direction at 109 Administration Building.

Certification or validation examination for work at unaccredited schools is explained elsewhere in this catalog.

## SCHOLARSHIP RULES

### Academic Probation

Except as noted below, any undergraduate student shall be placed on academic probation when his cumulative grade-point average falls below 2.00. Such action will be recorded on the student's official academic record. Any undergraduate student whose grade-point average for the first quarter at the University falls below 2.00 shall be warned that his scholarship is unsatisfactory, and that if he fails to achieve a cumulative grade-point average of 2.00 by the end of the second quarter he will be placed on academic probation. The Registrar under delegated authority from the dean of the college in which the student is enrolled shall notify the student as soon as possible that either (a) his scholarship is unsatisfactory, or (b) he has been placed on scholastic probation. The student is reminded further that he should consult with his academic adviser immediately to discuss future academic plans.

### Effect of Academic Probation

Academic probation is essentially a warning to the student that he must show improvement if he is to remain in the University. University regulations regarding scholastic eligibility for participation in intercollegiate athletics and other student activities shall be recommended to the Senate by appropriate faculty committees.

### Removal from Academic Probation

An undergraduate student on academic probation will be removed from probation at the end of any quarter in which his cumulative grade-point average reaches 2.00 or better.

### Dismissal for Low Scholarship

Any undergraduate student on academic probation will be dropped (1) if he fails to attain at least a 2.00 for the following quarter's work, or (2) if he fails to attain a 2.00 cumulative average at the end of the two subsequent quarters. Any student dropped under this rule will be notified in writing of this action by the Registrar.

### Reinstatement

Only under exceptional circumstances will a student dropped under low scholarship rules be readmitted to the University. Such a student will be readmitted only at the discretion of the dean of the school or college to which he seeks admission. A student readmitted after being dropped under these rules will enter on academic probation. Such a student will be dropped (1) if he fails to attain a 2.00 for the following quarter's work, or (2) if he fails to attain a 2.00 cumulative average at the end of two quarters. He will be removed from probation at the end of the quarter in which his cumulative grade-point average reaches 2.00 or better.

### Seniors in Final Quarter

A senior who has completed the required number of credits for graduation, but whose work in what would normally be his final quarter places him on probation will not receive a degree until he has been removed from probation. A senior who has completed the required number of credits for graduation, but whose work in his last quarter results in his being dropped for low scholarship, shall not receive a degree until he has been readmitted and removed from probation.

## ALL-UNIVERSITY REQUIREMENTS FOR BACHELOR'S DEGREE

There are three types of requirements for the bachelor's degree. These are all-University, college or school, and departmental requirements. All-University requirements are listed here. Any college may make additional requirements for graduation. Those of colleges, schools, and departments will be found in the section of the college or school concerned.

### Catalog for Graduation Requirements

If less than ten years have elapsed since the date of a student's last entry into the school or college in which he is to graduate, he may choose to graduate under the requirements of either the catalog dated as of his last entry into the school or college, or that catalog covering his anticipated date of graduation. Catalog choice shall be subject to approval of the student's departmental chairman and dean.

If a student wishes to obtain a degree after a lapse of more than ten years from the last date of entry into the school or college in which he is to graduate, the catalog in effect at the date of his graduation will be used. These provisions do not apply to the requirements prescribed by the College of Education for Teaching Certificates.

Graduate students must satisfy the requirements for an advanced degree which are in force at the time the degree is to be awarded.

### Credits Required

To be eligible for graduation from the University with the bachelor's degree, a student shall satisfy all other specific requirements and shall offer a minimum of 180 academic credits. Unless he is excused from physical education, a candidate for graduation shall also offer three required (additional) academic credits in physical education activity courses. No more than the required number of such credits may be counted for graduation. Physical and health education requirements are described elsewhere in this Catalog.

### Scholastic Standards Required

To be eligible for the bachelor's degree, a student must earn a cumulative grade-point average of 2.00 for all work done at the University of Washington, and a 2.00 graduation grade-point average.

The *graduation* grade-point average is computed when the student has completed all work for his degree, and includes residence, transfer, extension, and credit-by-examination credits. Transfer, extension, and credit-by-examination credits cannot be used to raise the cumulative grade-point average above that required for graduation. However, the addition of these credits can prevent a student from graduating if, when they are computed into the graduation grade-point average, that average falls below 2.00.

### Senior-Year Residence

Senior standing is attained when 135 credits and the required credits in physical education have been earned. Of the work of the senior year (45 credits), at least 35 credits shall be earned in a minimum of three quarters in residence. The remaining 10 credits shall be earned in residence or as a nonmatriculated student, or in this University's correspondence study and extension courses.

Students in other colleges of the University who wish to receive simultaneously a degree from the College of Arts and Sciences or the School of Business Administration must receive approval from the dean of the college or school concerned at least three quarters before completing the requirements for the desired degree. The same requirement applies to the School of Nursing except that approval must be obtained from the Dean of the School of Nursing.

### Upper-Division Credits

Upper-division credits are those in courses with 300 and 400 numbers.

Transfer credits shall be accepted for upper-division credit *only* when earned at an accredited four-year, degree-granting institution. This rule shall apply to students who entered the University of Washington in the Autumn Quarter, 1958, or thereafter.

### Duplication of Credit

A student may not receive University credit for repetition of work at the same or at a more elementary level, if credit has been granted in an earlier course. This rule applies whether the earlier course was taken in high school or college, and whether, in the latter case, course numbers are or are not duplicated, except that when continuation of previous study is involved (*e.g.*, foreign language), proper placement for credit in University courses shall be determined by the department which presents the subject.



## Extension and Correspondence Study Credits

No more than 90 extension credits (credits earned as a nonmatriculated student) and/or correspondence study credits may be counted toward the bachelor's degree. No more than 45 credits gained in extension courses earned at other institutions may be counted toward the bachelor's degree.

At least the 45 credits of the senior year must be earned as a matriculated student. Of these, no more than 10 may be in extension courses offered by the University and none through the extension division of any other institution. (See *Credit by Examination* and *Armed Forces Training Schools Credit* in this section.)

## Degrees with Double Majors

Some colleges offer a bachelor's degree with double majors. The student's application for such a degree must show both majors and be approved by the major professors of both departments. Both majors will appear on the diploma and permanent record.

## Two Bachelor's Degrees at the Same Time

Two bachelor's degrees, with different majors, may be granted at the same time, but a minimum of 15 quarters shall have been occupied in the work for the two degrees, and the total number of academic credits shall reach a minimum of 45 credits in excess of the number normally required for a first bachelor's degree.

## Second Bachelor's Degree

A second bachelor's degree may be granted, but there shall be required for this degree a minimum of three additional quarters in residence. The minimum number of additional credits required for the second bachelor's degree shall be 45, and the minimum number of additional grade points shall be 90. Not more than 10 University of Washington extension credits (credits earned as a nonmatriculated student) and no credits gained by credit examinations or by acceptance of Armed Forces training schools credits shall constitute any part of the added program. The program for the second bachelor's degree shall meet the requirements outlined in the appropriate school or college section of the catalog which is current at the time of application for the second degree.

Students working for a second bachelor's degree are not registered in the Graduate School but in the academic division of the University having jurisdiction over the degree sought. For purposes of registration they will be called "Unclassified-5."

## Thesis or Dissertation

Two copies of the thesis, or dissertation, with forms signed by the chairman of the graduate student's Supervisory Committee must be deposited in the Graduate School Office at least two weeks before the end of the quarter in which the degree is to be conferred. Instructions for the preparation of theses and dissertations in acceptable form may be obtained at the Graduate School Office.

It is the responsibility of the student to determine whether or not a third copy of the thesis or dissertation must be filed with the supervising professor and/or with the office of his department. Each student is advised to retain a personal copy of the thesis or dissertation for his own use.

## Financial Obligations

All financial obligations to the University must be paid before the student is allowed to graduate.

## Filing Applications for Bachelor's Degrees

A student should file with the Registrar a written application for his degree, in triplicate, four quarters before his expected date of graduation. Students transferring to the University with senior standing should submit their applications during their first quarter in school. Each application shall be filed in the Registrar's Office and notice shall be sent to the student by the Registrar of the acceptance or rejection of his application. Each quarter the Registrar shall transmit the accepted list of candidates for degrees and certificates to be conferred at the end of that quarter to the dean of the appropriate college or school for his faculty's approval and recommendation to the Board of Regents. The list as approved by his faculty shall then be forwarded by such dean to the President with a recommendation to the Board of Regents that all who fulfill their outstanding requirements for graduation be awarded their respective degrees or certificates. No student shall receive a bachelor's degree, teaching certificate, or other certificate unless his name appears upon the list approved by the faculty of the appropriate school or college during the quarter in which the degree or certificate is to be granted.

It is the student's responsibility to file his application for a degree and/or certificate. Applications and diploma cards may be obtained at the Registrar's Office, or in the major department.



In filling out the application, with the assistance of his adviser, the student lists the courses for which he is registered during the present quarter and those he plans to take during each successive quarter. If he has requirements to be met, the specific courses must be listed on the application; elective courses may be entered as "electives, so many credits," without listing each specific course.

The signature of the department head or of an authorized faculty adviser must appear on the application in the space provided for "major professor." *A student in the College of Arts and Sciences* does not obtain his Dean's signature, but leaves the application for a degree along with the diploma card at the Registrar's Office after his adviser has signed it. The application is first approved by the Registrar; then it is sent to the Dean of the College for his signature. He returns it to the Registrar's Office for filing. *A student in any other college* leaves his application at his dean's office for his signature after obtaining the adviser's signature.

Upon the approval of the application, one copy is mailed to the student, one sent to his department or college office, and the third is retained in the Registrar's Office. Any required course listed on the approved application cannot be changed without submitting a petition for graduation properly signed by the department head. The petition form may be obtained at the Registrar's Office, or from the advisory office.

If the application is not approved, the Registrar's Office notifies the student of his deficiency so that he may make the necessary adjustment and re-submit his application.

### **Petitions**

Waivers of college or all-University graduation requirements are obtained only by petitioning the college graduation committee, which then passes the petition on to the University Graduation Committee, if an all-University requirement is involved. These petitions are obtained from the Registrar's Office, or the advisory office, and should be filed with the application for degree or as soon as possible after the need arises. The graduation committees meet only once each quarter; petitions should be filed as early in the quarter as possible. Directions for completing and obtaining the necessary signatures will be given at the time the petition form is handed to the student.

An exception from an all-University graduation require-

ment which is granted by the University Graduation Committee shall be void at the end of two calendar years from the date such exception is granted if all degree requirements have not been completed within that period.

### **Third- and Fourth-Year Military Training Courses**

A maximum of 18 credits earned in third- and fourth-year military training courses may be counted in the basic 180 credits required for graduation from the Colleges of Arts and Sciences, Education, Pharmacy, Fisheries, and the School of Business Administration (except for students in the Supply Corps). In the Colleges of Engineering and Forestry a maximum of 9 credits earned in these third- and fourth-year subjects may be used to satisfy unrestricted elective credits appearing in a curriculum. These third- and fourth-year credits may not be counted in the 60 upper-division credits required for the bachelor's degree.

### **Graduation Requirements for ROTC Students**

Students accepted for the third- and fourth-year advanced ROTC program must, as a prerequisite for graduation from the University, complete the advanced program unless excused or dismissed from this requirement by regulations prescribed by the Secretary of the Army, the Navy, or the Air Force, whoever has the authority in the individual case.

### **Advanced Degrees**

Information on and requirements for master's and doctor's degrees can be found in the *Graduate Study* section of this Catalog.

Each quarter the Dean of the Graduate School shall submit to the President a list of candidates for advanced degrees to be conferred at the end of the quarter, with a recommendation to the Board of Regents that all candidates who fulfill their outstanding requirements for graduation be awarded their respective degrees. No student shall receive an advanced degree unless his name appears upon the list for the quarter in which the degree is to be granted.

### **Physical Education Requirements**

All students shall complete three quarters of physical education activity courses, except:

1. Students who enter the University as sophomores, juniors, or seniors



2. Special students
3. Students registered for 6 credits or less
4. Students who have attained the age of twenty-five (A student who attains the age of twenty-five during a quarter in which he is registered for a required physical education activity course shall be held for the completion of that course.)
5. Veterans who have had one year or more of military service on active duty

All physical education activity courses carry academic credit.

All students shall complete the required courses in the first three quarters of residence immediately following admission to the University. Students who present acceptable credits for physical education activity courses taken in other colleges or universities may be exempted from all or part of the requirements.

No student may register for more than one physical education activity course in a single quarter. However, during the Summer Quarter a student may register for not more than one such course in each of the two terms of the Summer Quarter.

The physical education activity requirement may be waived for students who, because of physical condition, are exempted by the Graduation Committee upon the recommendation of the dean of the student's college or school.

Physical education activity credits are required in addition to the basic 180 credits necessary for graduation.

### Teaching Certificates

Persons seeking certification at the University of Washington must have been admitted to a baccalaureate degree program or as an Unclassified-5 or graduate student at the University of Washington. Requirements for teaching certificates shall be those prescribed by the College of Education at the time the certificate is to be granted.

#### Provisional Certificate

##### SPECIFIC REQUIREMENTS

Students expecting to apply for a Provisional Certificate should check immediately upon their arrival on the

campus with the College of Education, 207 Miller Hall, for specific requirements. Questions concerning these requirements should be taken to the advisory office of the College of Education in 207 Miller Hall for clarification.

#### APPLICATIONS

Applications for all certificates should be made at the beginning of the senior year along with application for the bachelor's degree. Application forms and directions for completing them may be obtained at 207 Miller Hall.

#### Standard Certificates

##### PETITIONS

All fifth-year students working toward the Standard Certificate, the Standard General Certificate, the Standard Elementary Certificate, or the Standard Secondary Certificate should contact an adviser at 207 Miller Hall *their first quarter* and make the appropriate petition for this certificate.

#### COURSE APPROVAL

All candidates for the Standard General Certificate must consult an adviser at 207 Miller Hall each quarter to obtain approval on all courses before proceeding to Sections to complete registration.

### Veterans and Children of Deceased or Totally Disabled Veterans

Those students who qualify under the applicable federal laws established for their education in institutions of higher learning should consult the Veterans Division Office on campus for complete information.

Under certain conditions, veterans of World Wars I or II who are not eligible for Veterans Administration educational benefits are fully or partially exempt from statutory charges. Consult with the Veterans Division Office on campus.

Veterans with disabilities may have available benefits. They should contact a training officer in the nearest Veterans Administration office.

## COMMENCEMENT

Formal Commencement exercises shall be held only at the close of the Spring Quarter. Diplomas shall be issued at the end of each quarter to such candidates as have completed graduation requirements at that time.

## **June Commencement Exercises**

### **Instructions to Participants**

During April of each year a leaflet of specific instructions is sent to all those entitled to participate in the coming Commencement exercises in June. Participants should follow instructions exactly and return any enclosed form by the deadline requested. Also, they should observe the directions for reserving caps and gowns.

### **Eligibility for Participation**

#### **BACHELOR'S DEGREES**

All who earned bachelor's degrees the preceding December or March or who are candidates for degrees in June or the coming August are entitled to participate in the exercises. Only the names of those who received degrees the preceding August, December, or March, and the candidates in June are listed in the Commencement program. The names of candidates for bachelor's degrees who have been accepted for graduation the coming August will not appear in the program.

#### **GRADUATE DEGREES**

All Candidates of the Graduate School for master's and doctor's degrees in June and those to whom degrees were granted the preceding August, December, and March are urged to be present. Only those Candidates who have actually completed their requirements during the year are eligible to participate.

#### **MEDICAL AND DENTAL DEGREES**

All candidates for doctor's degrees in June in the Schools of Medicine and Dentistry are required to be present in person unless excused by their respective deans.

## **Graduation Announcements**

The University Book Store handles official graduation announcements of the Senior Class.

## **Diploma Distribution**

Diplomas are ready about six weeks after the end of the quarter in which they are earned. Recipients are notified as soon as the diplomas are ready for distribution at the Registrar's Office. Upon request, the diploma will be mailed to the student.

## **TRANSCRIPTS**

### **University of Washington Transcripts**

Official copies of student academic records at the Uni-

versity of Washington which bear the official seal of the University and the signature of the Registrar are known as transcripts.

Students may order transcripts (payable in advance) from the Transcript Department of the Registrar's Office, 109 Administration Building. Except during the week following the end of each quarter, transcripts ordered before 10 a.m. Monday through Friday are made up and issued by 4 p.m. the same day. Those ordered after 10 a.m. are ready at 4 p.m. the next business day. (Service is slower for transcripts of work earned prior to Autumn Quarter, 1929.) *Grade* sheets (unofficial) may also be ordered at the Transcript Department, with advance payment.

*Transcripts or grade sheets may be withheld from any student whose record has been attached for failure to comply with University rules, procedures or obligations.*

### **Honorable Dismissal**

To be entitled to honorable dismissal, a student shall have satisfied all financial obligations to the University and shall have a satisfactory record of conduct.

Every transcript issued will bear a statement of honorable dismissal unless there is a disciplinary action appearing on the record.

### **Charges**

A charge of \$1.00, payable to the cashier in advance, is made for each transcript. Grade sheets are 50 cents. Typewritten title transcripts for all records of students entering the University prior to Autumn Quarter, 1929, are \$2.00 for each original copy.

### **Grade Report Copies**

Extra copies of the student's quarterly grade report may be ordered for 50 cents each, payable to the cashier in advance, at the Transcript Department.

## **Transcripts from Other Schools**

Transcripts covering a student's previous secondary and college education which have been submitted to the University as a requirement for admission become part of the official file and cannot be returned to the student. Any student desiring transcripts of his work earned elsewhere must order official transcripts from the institutions where the work was taken. The University of Washington does not issue or certify copies of transcripts from other institutions.



## FEES AND CHARGES

All tuition, special fees, rentals, and service charges are payable in United States dollars at the time of registration, except that new students (except new graduate students) must submit a \$50.00 advance payment of fees at the time they are admitted to the University. This advance payment is applied against the total tuition and fees collected from the student. The University reserves the right to change without notice any of its fees and charges.

### Tuition

*Resident students, full time,*  
per quarter \$115.00

*Resident students, part time,\**  
per quarter \$81.00

*Nonresident students, full time,*  
per quarter \$275.00

*Nonresident students, part time,\**  
per quarter \$211.00

### World War I or II Veterans

Under certain conditions a veteran of World War I or II who is not eligible for Veterans Administration benefits is fully or partly exempt from tuition charges.

Information concerning this exemption may be obtained from the Veterans Division Office.

*Auditors, per quarter* \$39.00

*On-Leave Registration Fee.* This fee of \$5.00, charged graduate students only, provides for a maximum on-leave registration period of three successive academic quarters or any part thereof, and is not refundable.

*Miscellaneous Charges.* A registration service charge of \$15.00 is assessed those students (1) who are eligible for Advance (mail) Registration but fail to participate or (2) who, after the established application deadline, are granted appointments or permits to register by In-Person Registration by action of the Registration Appeal Board. A late registration charge of \$15.00 is assessed any student granted permission to register after the last registration day before the opening of

Autumn, Winter, or Spring Quarters. A charge of \$5.00 is made Autumn, Winter, and Spring Quarters for each change of registration or change of section, or number of changes which are made simultaneously, except that there is no charge when the change is made on the initiative of the University.

*Additional Fees.* The following courses require the payment of a fee in addition to tuition: Physical Education Activity quarterly fees—bowling, \$5.00; canoeing, \$3.00; golf instruction, \$3.00.

*Athletic Admission Fee.* A ticket which admits its owner to all athletic events during the quarter or quarters covered: Autumn, Winter, and Spring Quarters, \$6.50; Winter and Spring Quarters, \$3.50; Spring Quarter, \$3.50.

*Graduation Fee.* Each student receiving a baccalaureate degree, an M.D. degree, or a D.D.S. degree is required to pay a graduation fee of \$10.00. Each graduate receiving an advanced degree or second University of Washington bachelor's degree is required to pay a graduation fee of \$5.00.

*Publication and Thesis Binding Fees.* Each recipient of a master's degree pays a fee of \$2.00 for the binding of one copy of his thesis. All doctoral Candidates pay a \$25.00 publication fee. This fee covers the binding of manuscript copies for the University Library and the microfilmed publication of the doctoral dissertation in full.

*Certificate Fees.* The fee for a certificate for postgraduate work in dentistry is \$5.00. The fee for a teaching certificate is \$2.50, and does not include the legal registration fee of \$1.00, which must be paid to the county school superintendent who first registers the certificate.

*Grade Report Fee.* One grade report is furnished each quarter without charge; a fee of 50 cents, payable in advance, is charged for each additional report.

*Transcript Fee.* A charge of \$1.00, payable in advance, is made for each mechanically reproduced transcript. Grade sheets (unofficial) are 50 cents per copy. Type-written title transcripts for all records of students entering prior to Autumn Quarter, 1929, are \$2.00 per copy.

*Replacement Fee.* Duplicate diploma (with paper folder) \$5.00; duplicate diploma (with leather folder) \$7.00; teaching certificate (typed copy) \$1.00.

\*Registered for 6 credits or less, exclusive of ROTC.

**Medical School Filing Fee.** A fee of \$5.00 is charged a nonresident student for filing an application for admission to the School of Medicine.

**Incomplete Removal Fee.** A fee of \$2.00 is charged for the removal while in residence of an Incomplete whether by examination or by other means. A fee of \$2.50, payable to the University of Washington, care of the Department of Correspondence Study, is charged for removal of Incompletes *in absentia*.

**Special Examination Fee.** A fee of \$1.00 is charged for each examination, exclusive of Incomplete removals, outside the regular schedule. The fee for the foreign language examination is \$6.00.

**Credit by Examination Fee.** In order to obtain credit for independent study, students may take an examination prepared by the department concerned. The fee is \$2.00 per credit hour. Proper forms must be obtained from the Office of the Registrar.

**Graduate Admission Application Fee.** A fee of \$5.00 (payable in United States dollars) must accompany each application for admission to the Graduate School as a regular graduate student or as a visiting graduate student. The fee is not refundable nor may it be credited against any other fee charged by the University.

**Office of School and College Placement Fee**

Initial registration	\$5.00
Maintenance on active list each subsequent year	\$2.50

**Certification of Credits from Unaccredited Schools Fee.** Credits earned after high school graduation and based on credentials from unaccredited schools offering specialized instruction, or from schools of unknown standing, are accepted only after certification by the department examiner, the executive officer of the department, the dean of the college or school concerned, and the Registrar. Students seeking such certification must obtain the proper forms in the Admissions Office and must pay a fee of \$5.00.

**Parking Fees—Students Quarterly Permits.**

Residence hall lots	\$12.50
Evening classes	6.00
For motorcycles and scooters	5.00
Daily Rate: Main campus lots	.50

**Washington Pre-College Testing Program.** A fee of \$5.00 is charged those students who have not previously

taken this grade-prediction test and who enter the University with less than 45 credits.

**Laboratory Pre-School Fee.** The fee for children in the Laboratory Pre-School for either the morning or afternoon program is \$81.00 per child per quarter.

**Deposits and Rentals**

**Breakage Ticket Deposit.** In certain laboratory courses a breakage ticket is required to pay for laboratory supplies and breakage of equipment. Tickets may be purchased at the Cashier's Office for \$3.00. Unused sections of breakage tickets may be returned to the Cashier for refunds.

**Military Uniform Deposit.** A deposit of \$25.00 is required of students in Army and Air Force ROTC, which is refundable when uniform is returned in good condition.

**Microscope Rental Fee.** A microscope rental fee of \$7.00 per quarter must be paid by those students in the Division of Health Sciences who rent microscopes.

**Pavilion Locker Fee (men).** A fee of \$2.00 per quarter or 75 cents per Summer Quarter is charged students registered for physical education. Faculty members and students who are not registered for physical education also may obtain lockers upon payment of the same fee. This fee is paid at Edmundson Pavilion.

**Refund of Fees**

All Autumn, Winter, and Spring Quarter fees (except those indicated as not subject to refund) will be refunded in full if complete withdrawal is made prior to the sixth day of instruction; one-half of said fees will be refunded if withdrawal is made during the first thirty calendar days, except for Air or Army ROTC uniform deposit. No refund will be made until the ASUW card and athletic ticket have been returned. Students registered for chemistry or pharmacy laboratory courses must obtain a check-out clearance from the stockroom custodian. This clearance must be presented at the Registrar's Office when withdrawal is made. At least two weeks must elapse between payment and refund of fees, if payment was made by check. Unless specific instructions are received by the Comptroller's Office regarding the fees refunded, all properly authorized refunds will be made to the student involved in the registration.



Students withdrawing under discipline forfeit all rights to the return of any portion of the fees.

Applications for refund may be refused unless they are made during the quarter in which the fees apply.

### Refund of ROTC Deposit

From the \$25.00 deposit there is a deduction of \$2.50 for cleaning returned uniforms. The balance, \$22.50, is refunded in full to those students who have completed one year or more of either the basic or the advanced Army ROTC courses when the uniform (with the exception of the shoes) is returned complete and undamaged. The shoes may be retained. Students not completing the first year of either the basic or the advanced courses may purchase the shoes at one half the current sales price, or return them along with the balance of their undamaged uniforms for a refund of \$22.50.

### Summer Quarter Fees

The University reserves the right to change the following fees without notice. *All fees must be paid at the time of registration.*

There is no additional fee for nonresident students during the Summer Quarter.

#### Full quarter

Full time (more than 6½ credits)	\$115.00
Part time (6½ credits or less but not more than 3½ credits in either term)	81.00

#### First term

Full time (more than 3½ credits)	\$85.00
Part time (3½ credits or less)	46.00

#### Second term

Full time (more than 3½ credits)	\$85.00
Part time (3½ credits or less)	46.00

#### Addition of second term before first day of second term

Full time (if full time first term)	\$30.00
Full time (if part time first term)	69.00
Part time (if full time first term)	30.00
Part time (if part time first term)	35.00

(Either term may be taken separately.)

**Auditors.** There is no reduction in fees for auditors.

**Registration Service and Change of Registration Charge.** A charge of \$3.00 is assessed students registering for either term for credit after instruction begins. A charge of \$2.00 is made for each change of registration or change of section, or number of changes which are made simultaneously. No charges are assessed for late registration or change of registration for which the University is responsible.

### Special Fees for Summer Quarter

**Law Library Fee.** The fee for the full quarter is \$10.00; for one term only, \$5.00. There is no reduction for auditors in law.

**Pack Forest Fees.** The fee is \$5.00 for taking courses at Pack Forest. The subsistence fee is approximately \$70.00 for meals during the session spent at Pack Forest.

**Music Fees.** The fees for instrumental or vocal individual instruction per term are \$12.50 for one-half hour weekly (1 credit), and \$25.00 for two half hours weekly (2 credits).

### Financial Delinquencies

Students failing to pay promptly amounts due the University may be excluded from classes and their credits withheld.

### Residence and Nonresidence

1. **Residence** in the state of Washington is not necessarily the equivalent of *domicile*. Domicile connotes a present intention to maintain permanent residence, together with physical presence in the state, whereas residence may be of a temporary nature.

2. In determining a student's intent with regard to his Washington domicile, consideration is given to whether he is a registered voter of the state of Washington. If the student is a minor, consideration is given to the father's place of voting registration, as the father determines the family's domicile. Voting in person or by absentee ballot in the state of previous domicile is considered inconsistent with and contradictory of intention to establish legal domicile in this state.

3. Temporary residence in the state merely for the purpose of attending school, performing duties while in the military service, or for reasons of health and pleasure is not a basis for the establishment of legal domicile.

A person stationed in the state of Washington in the performance of military duty may acquire a domicile only if he establishes a *bona fide* residence off his military post.

4. Conversely, a domicile in this state is not lost by temporary or occasional absence from the state to attend school, to perform military or other government service, or to pursue health or pleasure.

5. When the parents of a minor are deceased, his domicile follows that of his legally appointed guardian. When the parents are divorced, the minor's domicile is determined by that of the parent to whom custody has been awarded by the court.

6. A minor who is married is free to establish his domicile separate and apart from that of his parents.

7. The domicile of a married woman is determined by that of her husband.

8. Ordinarily an alien cannot establish residence unless he holds a permanent visa.

9. The children and spouses of federal employees residing within the state, the children and spouses of military personnel assigned to the University of Washington, and children and spouses of staff members of the University are considered as residents for tuition purposes.

## STUDENT CONDUCT AND DISCIPLINE

### Section 1. Student Conduct

a. *Standards:* Attendance at the University presupposes that students will observe the laws and deport themselves according to accepted standards of personal and group conduct. It presupposes further that they will abide by such rules, regulations, and procedures as are or may be established by the University for all students or by the various colleges, schools, and departments for their own students. Failure to observe such laws, standards, rules, regulations, or procedures shall render students subject to penalties, which may include dismissal from the University.

b. *Scholarship Cases:* The provisions of this and the following Sections do not apply to disciplinary matters arising solely out of scholarship.

### Section 2. Discipline

a. *Dean of Students:* The Dean of Students is the primary agent for the administration of discipline for unacceptable conduct or infraction of University rules in all matters except those which are the responsibilities of the schools or colleges and instructors, as described in subsection *b* of this Section.

#### b. Schools and Colleges:

(1) The dean and faculty of each school and college are responsible for the administration of discipline for infractions of rules and regulations of the school or college or for unacceptable conduct by students in matters relating to their academic or professional progress.

(2) The instructor is responsible for the maintenance of order and proper conduct in the classroom. He is authorized to take such summary steps as may be necessary to preserve order and to maintain the effective cooperation of the class in fulfilling the objectives of the course.

(3) When disciplinary action beyond that required to maintain order is indicated, the instructor must report the infraction to the chairman of the department involved, or to the dean in a nondepartmentalized school or college.

### Section 3. Interpretations and Procedures

a. *Interpretations:* A student charged with unacceptable conduct is entitled to a fair hearing. The procedures set forth below shall be interpreted and administered in such a way as to accomplish this objective. Disciplinary proceedings are not to be construed as adversary proceedings or judicial trials; but care should be taken to comply as fully as possible with the spirit and intent of the procedural safeguards set forth in this Part.

#### b. Preliminary Procedures:

(1) When disciplinary action is to be initiated by a faculty member under Section 2b(3) for classroom misconduct, a report of the occurrence shall be filed with the chairman of the department in which the course is offered, or, in nondepartmentalized schools and colleges, with the dean.

(2) All other instances of misconduct shall be reported to the chairman of the department, to the dean of a school or college in which the student is enrolled, and to the Dean of Students, in accordance with sub-section 3b(3).



(3) In all instances, under either (1) or (2), the department chairman shall notify his dean; the dean shall notify the Dean of Students and, if the student is enrolled in another school or college, the dean of that school or college. The Dean of Students shall notify the dean of the college in which the student is enrolled of all disciplinary action taken by his office or members of his staff.

(4) The dean concerned may initiate such disciplinary action as the circumstances warrant in accordance with the procedures set forth below. Notice of proposed action should be sent to other deans of the student involved.

(5) If the student, prior to notice and hearing under Section 3c, admits his misconduct to the department chairman or dean, the department chairman or dean shall prepare a written report, which shall

(i) set forth the charges and the admission of misconduct;

(ii) list the names of all persons who heard the admission;

(iii) show, if true, that the charges and the admission of misconduct were read to the student and that the student apparently understood the significance of his admission; and

(iv) describe what transpired at the interview and set forth the decision reached, including any recommendation of disciplinary action.

The case shall then proceed under Section 3c(5) insofar as pertinent.

**c. Procedures and Records:** Disciplinary and reviewing authorities, established under Section 4 hereof, shall be guided by the following principles:

(1) *Notice:* The student shall be informed by the disciplinary authority to whom his case has been assigned, at the earliest reasonable time of

(i) the charge against him;

(ii) the maximum consequence of his conduct, if proven;

(iii) the date for hearing; and

(iv) the fact that the decision of the disciplinary authority, if unfavorable to the student, will be reviewed in due course automatically.

Except in cases under Section 3b(5), this notice shall be given in writing, and also orally if possible, when expulsion or suspension from the University may be involved; otherwise, oral notice will suffice.

(2) *Hearing:* The student shall be given an opportunity to be heard by the disciplinary authority. In preparing for the hearing, he shall be permitted to examine the evidence against him, and, where pertinent, shall be given the names of those who will be witnesses against him. In the hearing he may present evidence, testimonial or documentary, in his behalf.

Since the student does not have the right of cross-examination, the disciplinary authority should assure itself of the absence of bias in, as well as the accuracy of, the evidence against the student.

Although not required in any case, it is recommended that in cases involving possible expulsion or suspension, a tape recording of the testimony be made and retained as a part of the record, especially when conflicting evidence is anticipated.

(3) *Preservation of Evidence:* Except in proceedings wherein the student is exonerated, all documentary or other physical evidence produced or considered and all recorded testimony shall be preserved, insofar as possible, for at least five years. No record of proceedings wherein the student is exonerated shall be maintained in the student's file or other University repository subsequent to the date of the student's graduation or other severance from the University, or school, college, or office concerned.

(4) *Determination—Procedure:*

(i) Every effort shall be made by the disciplinary authority to bring each case to as speedy a conclusion as justice permits.

(ii) The disciplinary authority shall *not* notify the student of its decision.

(iii) Within five days after the disciplinary authority has held the hearing, it shall file with the dean under whose jurisdiction it acted (1) a determination, in triplicate, setting forth conclusions and the reasons in support thereof; and (2) all documentary or physical evidence and any records of testimonial evidence which it has in its possession.



(5) *Review:* In all proceedings wherein the student is not exonerated, there shall be one automatic review by a reviewing authority established in accordance with Section 4 hereof.

Within five days after receiving the determination and the file in a case, the dean shall convene a reviewing authority for a day certain and forward the determination and the file to it for its consideration.

If the reviewing authority is satisfied with the determination of the case, it shall so report in writing to the dean. If it feels that a new or further hearing is warranted, it should so report to the dean in writing setting forth its reasons. The dean shall, in such case, refer the matter back to the disciplinary authority and instruct it to hold a new hearing accordingly. The matter shall then proceed once again in accordance with Section 3c(4) and (5), including review of the new determination.

If the determination of the disciplinary authority is sustained, and it calls for expulsion or suspension from the University, the dean shall forward the determination and the conclusions of the reviewing authority to the President of the University for his review. The President, after reviewing the record, shall indicate his approval of the action or his suggestions as to additional steps which should be taken in the matter, and notify the dean accordingly.

If disciplinary action is recommended and sustained by all reviewing authorities, the dean shall notify the student in writing of the decision reached. In the case of an unmarried student under twenty-one years of age who is expelled, suspended, or placed on disciplinary probation, the dean shall also send written notice of the action taken to the parents or guardian of the student.

If the student is exonerated, the dean shall notify the student in writing of this decision.

#### *Section 4. Establishment of Disciplinary and Reviewing Authorities*

a. *Disciplinary Authority:* The Dean of Students and the deans of each school or college shall establish a disciplinary authority or authorities in their respective areas for the consideration of matters arising under sections 1 and 2 hereof. Disciplinary authority may be placed in a department chairman or administrative officer, a committee of the faculty of the school or college concerned, a committee of the University Faculty, a student organization, or a student-faculty committee,

subject to such terms and conditions, not in conflict with this Part, as may be necessary to assure a sound disciplinary program.

#### *b. Reviewing Authority:*

(1) The Dean of Students and the deans of each school or college shall establish a reviewing authority or authorities in their respective areas for the review of matters arising under this Part. Reviewing authority may be exercised by the Dean, or may be delegated to a department chairman or administrative officer or to a committee or committees of not less than three, nor more than five, full-time members of the faculty.

(2) The President may delegate his reviewing authority in any manner consistent with the spirit and purpose of this Part.

c. *Disqualification:* Disciplinary and reviewing authority shall not be delegated to a member of the faculty or staff of the University in any case in which he is or may be a witness or is otherwise personally involved, or in addition, with respect to review, in any case in which he has acted as the disciplinary authority.

#### *Section 5. Maintenance of Records*

a. Records of all disciplinary cases shall be kept by the school, college, or office concerned.

b. The dean of a school or college shall report to the Dean of Students, in writing, all cases in which disciplinary action is taken and shall inform the Registrar of any action affecting a student's official standing in the University, with instructions as to what shall be noted on the student's official record.

c. The Dean of Students shall notify the dean of the school in which the student is enrolled and the Registrar of any disciplinary action taken by the members of his staff, which is to be recorded on the student's official record, and shall keep accurate records of all disciplinary cases handled by, or reported to, his office.

d. The Dean of Students shall receive and maintain central records of all disciplinary actions taken by any University agency. These records should be consulted by disciplinary authorities for records of previous misconduct before taking disciplinary action in any case.

e. The stipulations in Section 3c(3) apply to paragraphs a, b, c, and d.



*Section 6. Disciplinary Terms and Procedures*

The following definitions of administrative and disciplinary terms and reporting procedures have been established to provide consistency in the application of penalties and in the maintenance of records and administrative actions.

a. *Disciplinary Warning*: Notification to a student that his conduct has been unacceptable or that he has been in violation of University rules or regulations. Warnings must be in writing. They imply that further unacceptable conduct or violation of rules will result in one of the more serious actions described below. While "disciplinary warning" is not noted on the student's official record in the Registrar's files, the action should be reported to the dean of the school or college concerned and to the Dean of Students in order to assure completeness of the student's disciplinary record.

b. *Reprimand*: Formal action censuring a student for unacceptable conduct or violation of University rules or regulations. The student and the Dean of Students are notified in writing of this action by the officer or agency taking the action, and the Registrar is requested to enter the action temporarily on the student's academic record. Subsequently, at the discretion of the disciplinary agency, the entry may be made a part of the student's permanent record or may be removed. Disposition of the entry must be made by the disciplinary agency involved and must be reported in writing to the Registrar and the Dean of Students.

c. *Disciplinary Probation*: Formal action by authorized disciplinary agencies of a school or college or by the Office of the Dean of Students for unacceptable conduct or violation of University rules or regulations. This action is subject to review as provided in Section 3, Paragraph C (5). Disciplinary probation prohibits the student from participation in any extracurricular activity (including intercollegiate athletics) and warns that any further misconduct during the term of the probation will automatically raise the question of dismissal. Special conditions and limitations may be imposed, and the duration of the penalty should be specified. The student and the Dean of Students are notified of the action in writing by the officer or agency taking the action and the Registrar is requested to enter the action temporarily on the student's academic record. The action is effective immediately on notice to the student. At the discretion of the disciplinary authority, the entry may be made permanent on the student's record or may be removed when the term and conditions of the probation have been met or upon gradu-

ation. Disposition of the entry must be made by the disciplinary agency involved and must be reported in writing to the Registrar and the Dean of Students.

d. *Suspension*: Formal action by an authorized disciplinary agency dismissing a student temporarily from the University for unacceptable conduct or violation of University rules or regulations. Suspension may be for a stated or for an indefinite period, but the implication of the action is that the student may eventually return if evidence or other assurance is presented that the unacceptable conduct will not be repeated. The notification suspending the student must state the conditions to be met and whether the action is to be noted permanently on the student's record. All suspensions must have the prior approval of the President as required by Section 3, Paragraph C (5). The student and the Dean of Students are notified in writing of the action taken, the terms of the suspension and any conditions involved, and the Registrar is requested to enter the action on the student's academic record. Final disposition of the entry must be made by the disciplinary agency involved and reported in writing to the Registrar, the dean of the school or college involved, and the Dean of Students. There is no refund of fees for the quarter in which the action is taken. Readmission shall be as provided in Section 7 "Readmission."

e. *Expulsion*: Discretionary action by an authorized disciplinary agency dismissing a student permanently for flagrantly unacceptable conduct or violation of University rules or regulations. Unlike suspension, no term is involved, the action always becomes effective on notice. Expulsions must have the prior approval of the President of the University as required by Section 3, Paragraph C (5). The student and the Dean of Students are notified in writing of the action taken, and the Registrar is requested to enter the action permanently on the student's academic record.

f. *Hold (Administrative)*: Attachment of a student's record to assure compliance with University rules, procedures, or obligations. The "hold" may be placed on the student's record by the authorized University office responsible for enforcement of the rule, procedure, or obligation involved. The authorized office must request the Registrar in writing to place a "hold" on the student's record. The student will not be permitted to register for any subsequent quarter or obtain a transcript of his record except on the written release of the office which placed the "hold."

g. *Registration Cancelled (Administrative)*: Privileges of attendance withdrawn, effective immediately on notice:

(1) By order of the Health Center for health reasons (fees refundable, within time and to amount permitted by withdrawal regulations, only when dismissal is not occasioned by willful neglect, failure, or refusal to comply with Health Center rules as to examinations, X rays, quarantine, treatment, etc.)

(2) By order of the Comptroller for financial delinquencies. (Handled as a withdrawal for recording purposes.)

(3) By order of the dean of a school or college or the Dean of Students for failure to comply with rules, regulations, or instructions.

The order cancelling a registration must be addressed in writing to the Registrar, and the action must be reported in writing to the student involved, to the dean of the school or college in which he is enrolled, and to the Dean of Students. The Registrar automatically will place a "hold" on the student's record to prevent registration for future quarters and the issuance of transcripts.

h. *Monetary Fines*: The Dean of Students is authorized to assess monetary fines against individual students and recognized student organizations.

#### *Section 7. Readmission after Dismissal for Nonacademic Conduct*

Any petition for readmission by a student dismissed for disciplinary reasons other than poor scholarship must be addressed to the office that took the initial action. Such a petition must be in writing and must state in detail the reasons why the penalty should be reconsidered. Since the President of the University participates in all disciplinary decisions dismissing students from the University, decisions on such petitions for readmission must be reviewed and approved by the President before being announced to the petitioner.

#### **Financial Delinquency**

The Comptroller shall attach the credits of students who are delinquent in meeting their financial obligation to the University.

A student whose credits are attached for any reason may not attend for a succeeding quarter, obtain a

transcript of record, or obtain his diploma until a written release is received from the Comptroller or appropriate authority.

## **LEAVES OF ABSENCE FROM CLASSES**

Students are responsible for maintaining regular attendance at classes or making arrangements satisfactory to their instructors if they must be absent.

A student absent because of sickness or for personal reasons, who has not made previous arrangements for excuse, shall explain the cause of his absence to his instructor. His instructor shall decide whether this verbal explanation constitutes a legitimate excuse. Reports coming to University offices from a student or his family during the course of an absence should be referred to the dean of the college or school in which the student is enrolled, who will notify instructors and maintain records of such reports.

#### **Special situations:**

1. A leave of absence from the University which involves excuse from classes may be granted by the dean of the college or school in which the student is enrolled, or in a manner to be determined by the dean.

2. Students anticipating absence from classes for participation in recognized student activities may be granted leaves of absence by the Dean of Students on the recommendation of appropriate faculty committees.

In all cases of absence, with or without leave, students must bear in mind that they are responsible for arranging with their instructors to make up work missed.

## **TUTORING**

No person shall tutor for compensation in a course with which he has any connection as part of the teaching staff.

Approval for tutoring for compensation shall be secured from the head of the department concerned on a form provided, which shall include the names of the student or students and the tutor. If the tutor is of the rank of instructor or higher the approval of the dean concerned shall also be secured.



Students wishing a tutor should apply to the department concerned for names of advanced students qualified to tutor in particular subjects.

## **STUDENT ACTIVITIES**

### **Eligibility Rules**

The following rules regarding eligibility for participation in student activities have been established by the faculty:

#### **Major Activity**

To be eligible to participate in any major activity a student shall:

1. Be regularly enrolled and not on academic or disciplinary probation.
2. Be enrolled for a minimum of 10 academic credits exclusive of credits in Evening or Extension Classes, in Correspondence Study, in basic ROTC courses, and in physical education activity.
3. Not have been declared ineligible by the dean of his college on the grounds that participation in the activity is detrimental to his scholarship.

#### **Minor Activity**

To be eligible for any minor activity, a student shall not have been declared ineligible:

1. By the dean of his college on the grounds that participation in the activity is detrimental to his scholarship, or
2. For disciplinary reasons.

The *Handbook for Student Organizations* contains a list of activities designated as "major" for purposes of academic eligibility.

#### **Intercollegiate Athletics**

No student shall represent the University of Washington in any athletic contest unless he meets the requirements of the Athletic Association of Western Universities eligibility rules governing intercollegiate athletics. A portion of these rules are that a student must:

1. Be registered in school and carrying at least 12 credits the quarter of participation.
2. Progress toward graduation—must have earned 36 degree quarter credits since the commencement of his

last previous season of competition in his respective sport.

Additional information on intercollegiate athletic eligibility may be obtained from the Department of Athletics Office, 212 Tubby Graves Building.

#### **Intramural Athletics**

There are no academic restrictions on participation in intramural competition.

### **Student Publications**

Only those publications approved by a committee appointed by the President of the University may use the good will of the University in soliciting advertising.

Permission to issue student publications shall be obtained from the President's Office.

The editor of any student publication shall be held responsible for all matter which appears in that publication. A correspondent of any other publication shall be held similarly responsible for all items contributed by him to that publication.

No edition of the *University of Washington Daily* by special editors shall be permitted except by express permission of the ASUW Publications Board.

## **USE OF CAMPUS AND BUILDINGS**

### **General Policy**

Because the University of Washington is an educational institution provided and maintained by the people of the state, its campus, buildings, properties, and facilities shall be reserved at all times for those activities which either are related directly to its educational mission or are justifiable on the basis of their contributions to the cultural, social, or economic development of the state.

### **Limitations of Use**

Under the principle stated above, the campus buildings, properties, and facilities of the University, including those of the Associated Students of the University of Washington, may be used only for:

1. The regularly established teaching, research, or public service activities of the University and its departments or related agencies.

2. Cultural, educational, or recreational activities of the students or of the faculty or staff.

3. Short courses, conferences, seminars, or similar events, conducted either in the public service or for the advancement of specific departmental professional interests, when arranged under the sponsorship of the University or its departments.

4. Public events of a cultural or professional nature brought to the campus at the request of University departments or committees and presented with their active sponsorship and active participation.

5. Activities or programs sponsored by educational institutions, by state or federal agencies, by charitable agencies or civic or community organizations whose activities are of widespread public service and of a character appropriate to the University.

Primary consideration shall be given at all times to activities specifically related to the University's mission, and no arrangements shall be made that may interfere with, or operate to the detriment of, the University's own teaching, research, or public service programs. The use of exterior audio amplifying equipment is not permitted on the campus except for official University functions approved by the Office of the President.

In general, the facilities of the University shall not be rented to, or used by, private or commercial organizations or associations, nor shall the facilities be rented to persons or organizations conducting the programs for private gain.

University facilities may not be used for commercial sales, advertising, or promotional activities except when such activities clearly serve educational objectives (as in display of books of interest to the academic community or in the display or demonstration of technical or research equipment) and when they are conducted under the sponsorship or at the request of a University department or office or of the ASUW.

University facilities may not be used for purposes of political campaigning by or for candidates for public office except for student-sponsored activities.

Activities of commercial or political nature will not be approved if they involve the use of promotional signs or posters on buildings, trees, walls, or bulletin boards, or the distribution of samples outside rooms or facilities to which access may be granted.

In accordance with the limitations imposed by the Constitution of the State of Washington, the facilities of the University may not be used for purposes of religious worship, exercise, or instruction. Recognized student religious organizations may use the facilities of the University for social, recreational, cultural, and educational purposes, as may any other recognized student groups, subject to the limitations noted above.

University facilities are available to recognized student groups, subject to these general policies and to the rules and regulations of the University governing student affairs.

Noncommercial handbills, leaflets, and similar materials may be distributed by regularly enrolled students, by members of recognized student organizations and by University personnel in campus areas outside University buildings and in meeting rooms that have been reserved for their use, so long as such distribution does not interfere with or operate to the detriment of the conduct of University affairs or the free flow of traffic. Such materials must bear identification as to publishing agency and distributing organization or individual. Materials that may be dropped or left lying about must be promptly removed by the persons or organizations responsible for their distribution. Persons and organizations not connected with the University may not distribute handbills and similar materials.

Inquiries concerning the use of University facilities may be directed to the Advisory Committee on the Use of University Facilities, 400 Administration Building, Ext. 3-2560.

### **Making Room Reservations**

Campus colleges and departments may make reservations directly with the Room Assignments Secretary, Registrar's Office.

Student groups desiring room reservations should apply to the ASUW Activities Office, 205 Student Union Building. The Program Secretary will clear the request and make reservations for required space.

Off-campus organizations requesting reservations for the use of University facilities may obtain forms for submission of such requests by calling the Room Assignments Secretary.

If an assigned room will not be needed, the office that has made room assignments should be notified immediately.



## FACULTY INDEX

The first 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 present academic rank. Members of the Graduate School faculty are designated by an asterisk.

All appointments shown are as of Sept. 1, 1966.

### A

- AAGAARD, GEORGE N., 1954, *Professor of Medicine*; B.S., 1934, M.B., 1936, M.D., 1937, Minnesota
- AASHEIM, GEORDIS M., 1960 (1965), *Assistant Professor of Anesthesiology*; *Veterans Administration Hospital*; B.A., 1951, Saskatoon; M.D., 1955, Toronto.
- ABERNATHY, RUTH, 1967, *Professor of Physical Education*; *Chairman, Department of Physical Education for Women*; A.B., 1929, Oklahoma; M.A., 1931, Ph.D., 1943, Columbia
- ABRAHAMSON, ARTHUR CLARENCE,\* 1956 (1963), *Professor of Social Work*; B.A., 1942, Augustana; M.A., 1947, Minnesota
- ADAMS, ROBERT PARDEE,\* 1947 (1966), *Professor of English*; B.A., 1931, Oberlin; Ph.D., 1937, Chicago
- ADRIAANSZ, WILLIAM,\* 1965, *Assistant Professor of Music*; Ph.D., 1965, UCLA
- AHLERS, ELEANOR E.,\* 1966, *Associate Professor of Librarianship*; B.L.S., 1942, Denver; M.A., 1957, Washington
- AHLSTROM, HARLOW G.,\* 1962 (1966), *Associate Professor of Aeronautics and Astronautics*; B.S. in A.E., 1957, M.S. in A.E., 1959, Washington; Ph.D., 1963, California Institute of Technology
- AKAMATSU, TOSHIO, 1963 (1966), *Assistant Professor of Anesthesiology*; B.A., 1955, M.D., 1959, Minnesota
- AKERS, RONALD L., 1965, *Assistant Professor of Sociology*; B.S., 1960, Indiana State; M.A., 1961, Kent State; Ph.D., 1966, Kentucky
- AKESON, WAYNE H.,\* 1961 (1965), *Associate Professor of Orthopedics*; M.D., 1953, Chicago
- ALBRECHT, ROBERT G., 1960 (1963), *Assistant Professor of Architecture*; B.S. in C.E., 1956, Washington; M.S. in C.E., 1960, Massachusetts Institute of Technology
- ALBRECHT, ROBERT WILLIAM,\* 1961 (1966), *Associate Professor of Nuclear Engineering and Electrical Engineering*; B.S. in E.E., 1957, Purdue; M.S. in N.E., 1958, Ph.D., 1961, Michigan
- ALDEN, DAURIL,\* 1959 (1964), *Associate Professor of History*; A.B., 1950, M.A., 1952, Ph.D., 1959, California
- ALDEN, RICHARD S., 1961 (1963), *Assistant Professor of Architecture*; B.Arch., 1957, Washington; M.Arch., 1960, Yale
- ALDRICH, ROBERT A., 1956, *Professor of Pediatrics*; B.A., 1939, Amherst; M.B., 1943, M.D., 1944, Northwestern
- ALEXANDER, DANIEL E., 1954 (1961), *Associate Professor of General Engineering*; B.S. in M.E., 1947, M.S. in M.E., 1954, Washington
- ALEXANDER, EDWARD,\* 1960 (1964), *Assistant Professor of English*; B.A., 1957, Columbia; M.A., 1959, Ph.D., 1963, Minnesota
- ALEXANDER, E. RUSSELL,\* 1961 (1965), *Associate Professor of Preventive Medicine and Pediatrics*; Ph.B., 1948, S.B., 1950, M.D., 1953, Chicago
- ALEXANDRO, FRANK JOHN, JR.,\* 1964, *Assistant Professor of Electrical Engineering*; B.E.E., 1956, M.E.E., 1959, D.Sc., 1964, New York University
- ALLAN, GEORGE GRAHAM, 1966, *Associate Professor of Fiber Science*; Dipl., 1951, Assoc., 1952, Strathclyde; B.Sc., 1952, Ph.D., 1956, Glasgow
- ALLEN, GERALD D., 1962 (1965), *Assistant Professor of Anesthesiology and Oral Surgery*; M.B., B.S., 1948, Durham; F.F.A.R.C.S., 1959, London
- ALLEN, KATHERINE EILEEN, 1959, *Lecturer and Head Teacher in the Laboratory Pre-School*; B.S., 1963, Washington
- ALLEDOERFER, CARL BARNETT,\* 1951, *Professor of Mathematics*; B.S., 1932, Haverford; B.A., 1934, M.A., 1939, Oxford; Ph.D., 1937, Princeton
- ALPS, GLEN EARL,\* 1945 (1962), *Professor of Art*; B.A., 1940, Colorado State College of Education; M.F.A., 1947, Washington
- ALVORD, ELLSWORTH C., JR.,\* 1960 (1962), *Professor of Pathology*; B.S., 1944, Haverford; M.D., 1946, Cornell

- AMES, WILLIAM E.,\* 1957 (1963), *Associate Professor of Communications*; B.S., 1948, *South Dakota State*; M.S., 1952, *Iowa State*; Ph.D., 1962, *Minnesota*
- AMIS, DOROTHY BRUNER, 1964, *Instructor in Medical-Surgical Nursing*; Diploma, 1946, *Sacred Heart Hospital School of Nursing, Washington*; B.S., 1954, M.A., 1962, *Pennsylvania*
- AMOSS, HAROLD L.,\* 1965, *Lecturer in Anthropology*; B.A., 1942, *North Carolina*; M.A., 1947, *New Mexico*; Ph.D., 1951, *California*
- ANCKER-JOHNSON, BETSY, 1963 (1964), *Research Associate Professor of Electrical Engineering*; B.A., 1949, *Wellesley*; Ph.D., 1953, *Tuebingen University (Germany)*
- ANDERSEN, WILLIAM R., 1964, *Associate Professor of Law*; Assistant Dean, *School of Law*; B.S.L., 1964, LL.B., 1965, *Denver*; LL.M., 1958, *Yale*
- ANDERSON, ARTHUR G., JR.,\* 1946 (1957), *Professor of Chemistry*; A.B., 1940, *Illinois*; M.S., 1942, Ph.D., 1944, *Michigan*
- ANDERSON, BERTON EMMETT,\* 1948 (1957), *Professor of Dental Science and Literature*; D.M.D., 1925, *Oregon*
- ANDERSON, DONALD LORRAINE,\* 1947 (1957), *Professor of Mining Engineering*; B.S., 1938, *St. Francis Xavier*; B.Sc. in Min.E., 1941, *Illinois*
- ANDERSON, FREDERICK NEIL,\* 1945 (1959), *Associate Professor of Art*; B.A., 1943, *Washington*; M.F.A., 1954, *Minnesota*
- ANDERSON, GEORGE CAMERON, 1958 (1965), *Research Associate Professor of Oceanography*; B.A., 1947, M.A., 1949, *British Columbia*; Ph.D., 1954, *Washington*
- ANDERSON, JAY W., 1956 (1961), *Assistant Professor of Mechanical Engineering*; B.S. in M.E., 1955, M.S. in M.E., 1961, *Washington*
- ANDERSON, JOHN RICHARD, 1965, *Instructor in Speech*; B.S., 1964, *Pacific*; M.A., 1965, *Washington State*
- ANDERSON, ROBERT ARNOLD,\* 1965, *Assistant Professor of Educational Administration*; B.S., 1952, Ph.D., 1964, *Minnesota*
- ANDERSON, SYLVIA FINLAY, 1920 (1947), *Assistant Professor Emeritus of English*; B.A., 1919, M.A., 1923, *Washington*
- ANDERSON, ZOE L., 1966, *Instructor in Maternal Child Nursing*; B.S., 1964, *Stanford*; M.N., 1966, *Washington*
- ANKELE, FELICE, 1927 (1952), *Assistant Professor Emeritus of German*; B.A., 1925, M.A., 1926, Ph.D., 1936, *Washington*
- ANSELL, JULIAN S.,\* 1959 (1965), *Professor of Urology*; Chairman, *Department of Urology*; B.A., 1947, *Bowdoin*; M.D., 1951, *Tufts*; Ph.D., 1959, *Minnesota*
- ARCHBOLD, THOMAS FRANK,\* 1961, *Assistant Professor of Metallurgical Engineering*; B.S. Met.E., 1955, M.S., 1957, Ph.D., 1961, *Purdue*
- ARCHER, STEPHEN H.,\* 1956 (1965), *Professor of Finance*; Chairman, *Department of Finance and Statistics*; B.A., 1949, M.A., 1953, Ph.D., 1958, *Minnesota*
- ARENAS, CLAUDIO, 1966, *Instructor in Urban Planning*; A.B., 1958, *Texas Western*; M.U.P., 1961, *Washington*
- ARESTAD, SVERRE,\* 1937 (1958), *Professor of Scandinavian Languages*; B.A., 1929, Ph.D., 1938, *Washington*
- ARMSTRONG, HUBERT E., JR., 1966, *Instructor in Psychiatry (Psychologist)*; B.A., 1957, *Willamette*; Ph.D., 1963, *Syracuse*
- ARLIN, MARIAN L., 1964, *Instructor in Home Economics*; B.S., 1941, *Washington State*; M.S. in H.Ec., 1964, *Washington*
- ARSOVE, MAYNARD GOODWIN,\* 1951 (1961), *Professor of Mathematics*; B.S., 1943, *Lehigh*; Sc.M., 1948, Ph.D., 1950, *Brown*
- ATCHISON, FLOYD R., *Technical Sergeant, USAF*, 1965, *Instructor in Aerospace Studies*
- ATKINS, JOHN R., 1964, *Acting Assistant Professor of Anthropology and Nursing*; B.S., 1950, *Northwestern*; A.M., 1954, *Pennsylvania*
- AUGEROT, JAMES E., 1963 (1965), *Predoc-torial Instructor in Slavic Linguistics*; B.A., 1956, M.A., 1959, *New Mexico Highlands*
- AVANN, SHERWIN PARKER,\* 1946 (1962), *Associate Professor of Mathematics*; B.S., 1938, *Washington*; M.S., 1940, Ph.D., 1942, *California Institute of Technology*
- AZAR, EMILE, 1966, *Instructor in Operative Dentistry*; D.D.S., 1961, *Damascus University*

## B

- BABB, ALBERT LESLIE,\* 1952 (1960), *Professor of Nuclear Engineering and Chemical Engineering*; Chairman, *Department of Nuclear Engineering*; Director, *Nuclear Reactor Laboratories*; B.A.Sc., 1948, *British Columbia*; M.S., 1949, Ph.D., 1951, *Illinois*
- BABB, WARREN,\* 1955, *Assistant Professor of Music*; B.A., 1938, M.A., 1939, *Harvard*
- BACON, PHILLIP,\* 1966, *Professor of Geography*; A.B., 1946, *Miami*; M.A., 1951, Ed. D. in Soc. Sci., 1955, *George Peabody College for Teachers*
- BADGLEY, FRANKLIN ILSLEY,\* 1950 (1959), *Associate Professor of Atmospheric Sciences*; B.S., 1935, *Chicago*; M.S., 1948, Ph.D., 1951, *New York*
- BAILY, ATHOL ROMAYNE,\* 1949 (1964), *Professor of Industrial Education*; B.S., 1931, *Kansas State Teachers College*; M.A., 1936, Ed.D., 1949, *Missouri*
- BAKER, MARGARET, 1955 (1961), *Lecturer in Speech*; B.R.E., 1929, *Boston University*; M.A., 1935, *Washington*
- BAKER, MARSHALL,\* 1962 (1966), *Professor of Physics*; B.A., 1953, Ph.D., 1958, *Harvard*
- BAKKER, CORNELIS B., 1960 (1963), *Assistant Professor of Psychiatry*; M.D., 1952, *Utrecht (Netherlands)*
- BALISE, PETER LOUIS, JR.,\* 1950 (1961), *Professor of Mechanical Engineering*; S.B., 1948, S.M., 1950, *Massachusetts Institute of Technology*
- BALLANTINE, JOHN PERRY, 1926 (1937), *Professor Emeritus of Mathematics*; A.B., 1918, *Harvard*; Ph.D., 1923, *Chicago*
- BAITZO, RALPH M., 1955, *Lecturer in Radiology*; B.A., 1950, M.S., 1962, *Washington*
- BANSE, KARL,\* 1960 (1966), *Professor of Oceanography*; Ph.D., 1955, *Kiel*
- BARDEEN, JAMES MAXWELL, 1966, *Assistant Professor of Astronomy*; A.B., 1960, *Harvard*; Ph.D., 1965, *California Institute of Technology*
- BARKSDALE, JULIAN DEVREAU,\* 1936 (1949), *Professor of Geology*; B.A., 1930, *Stanford*; Ph.D., 1936, *Yale*
- BARNARD, KATHRYN E., 1963 (1965), *Assistant Professor of Maternal-Child Health Nursing*; B.S.N., 1960, *Nebraska*; M.S.N., 1962, C.A.G.S., 1963, *Boston University*
- BARNES, CLIFFORD ADRIAN,\* 1947 (1955), *Professor of Oceanography*; B.S., 1930, Ph.D., 1936, *Washington*
- BARNOWE, THEODORE J.,\* 1947 (1955), *Professor of Human Relations and Administration*; B.A., 1939, *Morningside (Iowa)*; M.A., 1940, Ph.D., 1946, *Washington*
- BARRICELLI, NILS A., 1964, *Research Associate Professor of Genetics*; Lic. Liceale, 1932, *University of Rome*; D.Sc., 1936, *University of Rome*
- BARTH, ERNEST A.T.,\* 1955 (1964), *Associate Professor of Sociology*; A.B., *Rochester*, 1950; M.A., 1953, Ph.D., 1956, *North Carolina*
- BARTLETT, FRANCIS G., 1956 (1962), *Associate Professor of General Engineering*; B.S.E. in Nav.Arch. and Marine Engrg., 1952, M.S.E. in Nav. Arch. and Marine Engrg., 1956, *Michigan*
- BARZEL, YORAM,\* 1961 (1966), *Associate Professor of Economics*; B.A., 1953, M.A., 1956, *Hebrew University (Jerusalem)*; Ph.D., 1961, *Chicago*
- BASARABA, NEIL, 1965 (1966), *Assistant Professor of Periodontics and Endodontics*; D.D.S., 1955, *Alberta*; M.S.D., 1966, *Washington*
- BASKERVILLE, BARNET,\* 1948 (1960), *Professor of Speech*; Chairman, *Department of Speech*; B.A., 1940, M.A., 1944, *Washington*; Ph.D., 1948, *Northwestern*
- BASSETT, DAVID L.,\* 1959, *Professor of Biological Structure*; A.B., 1934, M.D., 1939, *Stanford*
- BASSETT, LOWELL, R., 1966, *Assistant Professor of Economics*; B.S.M.E., *Carnegie Institute of Technology*; M.S., 1964, *Purdue*
- BATEY, MARJORIE,\* 1956 (1964), *Associate Professor of Psychiatric Nursing*; Diploma, 1947, *Sacred Heart Hospital School of Nursing, Washington*; B.S., 1953, *Washington*; M.S., 1956, *Colorado*
- BATIE, HARRIETT VIRGINIA, 1941 (1954), *Assistant Professor Emeritus of Education*; B.S., 1935, *Hastings College*; M.A., 1945, Ph.D., 1953, *Washington*
- BAUER, HARRY C.,\* 1945 (1947), *Professor of Librarianship*; Secretary to the Faculty; A.B., 1927, M.S., 1929, *Washington University*; Certificate of Librarianship, 1931, *St. Louis Library School*
- BAUER, WOLF, 1954, *Lecturer in Ceramic Engineering*; B.S. in Cer.E., 1935, *Washington*
- BAUM, DAVID, 1961 (1964), *Assistant Professor of Pediatrics*; A.B., 1951, *Dartmouth*; M.D., 1955, *Cornell*



- BAUMGAERTEL, GERHARD,\* 1962, *Associate Professor of Germanic Literature*; M.A., 1953, Brown; Ph.D., 1954, Tübingen (Germany)
- BAYLINK, DAVID J., 1966, *Instructor in Medicine*; B.A., 1963, Walla Walla College; M.D., 1957, Loma Linda
- BEACH, LEE ROY, 1966, *Assistant Professor of Psychology*; B.A., 1957, M.A., 1959, Ph.D., 1961, Colorado
- BEAL, MAUD LAYTON, 1933 (1952), *Assistant Professor Emeritus of English*; B.A., 1926, M.A., 1929, Washington
- BEALE, JAMES MACARTHUR, JR.,\* 1948 (1958), *Associate Professor of Music*; B.A., 1945, Harvard; B.Mus., 1946, M.Mus., 1947, Yale
- BEATY, HARRY N., 1965, *Instructor in Medicine*; B.A., 1954, M.D., 1958, Washington
- BEAUMONT, ROSS ALLEN,\* 1940 (1954), *Professor of Mathematics*; A.B., 1936, M.S., 1937, Michigan; Ph.D., 1940, Illinois
- BEAVER, JAMES E., 1965, *Associate Professor of Law*; B.A., 1952, Wesleyan; J.D., 1958, Chicago
- BECKER, CLARENCE, 1963 (1965), *Assistant Professor of Fisheries*; B.S., 1954, M.S., 1955, Oregon State; Ph.D., 1964, Washington
- BECKER, JOSEPH,\* 1965 (1966), *Associate Professor of Psychology and Psychiatry (Psychologist)*; A.B., 1950, M.A., 1952, George Washington; Ph.D., 1958, Duke
- BECKWITH, J. BRUCE, 1964, *Assistant Professor of Pathology*; B.A., 1954, Whitman; M.D., 1959, Washington
- BEDER, OSCAR EDWARD,\* 1952 (1960), *Professor of Dentistry*; Director, Maxillofacial Prosthesis Clinic; B.S., 1936, Rutgers; D.D.S., 1941, Columbia
- BEE, HELEN LUCILLE,\* 1965, *Assistant Professor of Psychology*; A.B., 1960, Radcliffe; Ph.D., 1964, Stanford
- BEHLER, ERNEST,\* 1965 (1966), *Professor of Germanic Languages*; Ph.D. 1951, Munich
- BELL, EARL J., 1966, *Assistant Professor of Statistics*; B.A., 1952, B.S., 1957, Ph.D., 1965, California (Berkeley)
- BELL, F. HEWARD, 1931, *Part-time Lecturer in Fisheries*; B.A., 1924, British Columbia
- BELL, JOHN W.,\* 1959 (1960), *Professor of Surgery*; B.S., 1942, Washington; M.D., 1945, Northwestern
- BELL, MILO CARSNER,\* 1953 (1963), *Professor of Fisheries*; B.S., 1930, Washington
- BENDITT, EARL P.,\* 1957, *Professor of Pathology*; Chairman, Department of Pathology; B.A., 1937, Swarthmore; M.D., 1941, Harvard
- BENNE, MAE MAXINE,\* 1965, *Assistant Professor of Librarianship*; B.S., 1950, Nebraska; M.S., 1955, Illinois
- BENNETT, BLAIR M.,\* 1950 (1962), *Associate Professor of Preventive Medicine*; A.B., 1938, Georgetown; M.A., 1941, Columbia; Ph.D., 1950, California
- BENNETT, DELMOND,\* 1963 (1964), *Assistant Professor of Speech*; B.A., 1953, M.A., 1958, Ph.D., 1963, Washington
- BENNETT, LEE COTTON, JR., 1966, *Assistant Professor of Oceanography*; B.A., 1955, Haverford; M.A., 1958, Temple; Ph.D., 1966, Bryn Mawr
- BENNETT, RAYMOND C., 1955, *Lecturer in Physical Education*; Golf Coach; Certificate, Metropolitan Business College
- BENNINGTON, JAMES L., 1964, *Assistant Professor of Pathology*; M.D., 1959, M.S., 1962, Chicago
- BENSHOOF, KENNETH, 1963, *Instructor in Music*; B.A., 1957, Washington; M.A., 1963, San Francisco State
- BENSON, EDNA GRACE, 1927 (1954), *Associate Professor Emeritus of Commercial Art*; B.A., 1909, M.A., 1923, Columbia
- BENSON, MERRITT ELIHU,\* 1931 (1948), *Professor of Communications*; LL.B., 1930, Minnesota; B.A., 1942, Washington
- BENTLEY, G. NELSON,\* 1952 (1957) *Assistant Professor of English*; A.B., 1941, M.A., 1945, Michigan
- BENTZ, PATRICIA M., 1965, *Acting Instructor in Medical-Surgical Nursing*; B.S., Nurs., 1961, Washington
- BERG, JOHN CALVIN,\* 1964, *Assistant Professor of Chemical Engineering*; B.S., 1960, Carnegie Institute of Technology; Ph.D., 1964, California
- BERG, KENNETH B.,\* 1950 (1957), *Professor of Accounting*; B.S., 1939, North Dakota; M.S., 1941, Ph.D., 1952, Illinois; C.P.A., 1954, State of Washington
- BERGMAN, ABRAHAM B., 1964, *Assistant Professor of Pediatrics*; B.A., 1954, Reed; M.D., 1958, Western Reserve
- BERGSETH, FREDERICK ROBERT,\* 1947 (1957), *Professor of Electrical Engineering*; B.S. in E.E., 1937, Washington; S.M. in E.E., 1938, Massachusetts Institute of Technology
- BERGSMA, WILLIAM,\* 1963, *Professor of Music*; Director, School of Music; B.A., 1942, M.M., 1943, Eastman School of Music, Rochester
- BERLIN, IRVING N., 1965, *Professor of Psychiatry and Pediatrics*; Director, Division of Child Psychiatry; A.B., 1939, California (Los Angeles); M.D., 1943, California
- BEST, JAMES J., 1966, *Assistant Professor of Political Science*; B.A., 1960, Chicago; M.A., 1962, Tufts; Ph.D., 1965, North Carolina
- BESTOR, ARTHUR,\* 1962, *Professor of History*; Ph.B., 1930, Ph.D., 1938, Yale; M.A., 1956, Oxford; LL.D., 1959, Lincoln (Pennsylvania)
- BETHEL, JAMES S.,\* 1962, *Professor of Forestry*; Dean, College of Forestry; B.S.F., 1937, Washington; M.F., 1939, D.F., 1947, Duke
- BEVAN, DONALD EDWARD,\* (1964), *Associate Professor of Fisheries and Associate Dean, College of Fisheries*; B.S., 1948, Ph.D., 1959, Washington
- BEVAN, PATRICIA C., 1964, *Lecturer in Microbiology*; B.S., 1958, M.S., 1965, Washington
- BEVIS, L. DOROTHY,\* 1947 (1962), *Professor of Librarianship*; Associate Director, School of Librarianship; B.A., 1927, Pomona; B.S., in L.S., 1947, Southern California; M.A., 1951, Washington
- BIERMAN, EDWIN L., 1962 (1963), *Associate Professor of Medicine*; A.B., 1951, Brooklyn; M.D., 1955, Cornell
- BILANCIA, PHILIP R., 1966, *Associate Professor of Law*; B.A., 1956, Queens College; LL.B., 1959, Yale
- BINGHAM, MARGARET N., 1963, *Research Instructor in Medicine*; M.D., 1940, Oregon
- BIRD, WINFRED WYLAM,\* 1928 (1946), *Associate Professor of Speech*; A.B., 1926, Lawrence College (Wisconsin); Ph.D., 1938, Iowa
- BIRNBAUM, ZYGMUNT WILLIAM,\* 1939 (1950), *Professor of Mathematics*; Director, Laboratory of Statistical Research; LL.M., 1925, Ph.D., 1929, John Casimir (Lwow, Poland)
- BJORKSTAM, JOHN LUDWIG,\* 1955 (1965), *Professor of Electrical Engineering*; B.S. in E.E., 1949, M.S. in E.E., 1952, Ph.D., 1958, Washington
- BLACK, RICHARD G., 1964, *Research Instructor in Surgery (Neurosurgery)*, B.A.Sc., 1954, M.D., 1960, M.A., 1964, Toronto
- BLACKMON, JOHN R., 1962 (1964), *Assistant Professor of Medicine*; B.S., 1952, Mount Union; M.D., 1956, Western Reserve
- BLAIR, JOHN SANBORN,\* 1952 (1961), *Professor of Physics*; B.S., 1943, Yale; M.S., 1949, Ph.D., 1951, Illinois
- BLANDAU, RICHARD J.,\* 1949 (1951), *Professor of Biological Structure*; A.B., 1935, Linfield College; Ph.D., 1939, Brown; M.D., 1948, Rochester
- BLASER, HENRY WESTON,\* 1946 (1948), *Associate Professor of Botany*; B.S., 1931, A.M., 1933, Temple; Ph.D., 1940, Cornell
- BLUMENTHAL, ROBERT McCALLUM,\* 1956 (1965), *Professor of Mathematics*; B.A., 1952, Oberlin; Ph.D., 1956, Cornell
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EVANS, ELEANOR, 1944 (1946), *Assistant Professor of Psychology*; Lecturer in Education; B.S., 1934, Illinois; M.E., 1940, Winnetka Teachers College

EVANS, ELLIS DALE,\* 1964, *Assistant Professor of Education*; B.M.Ed., 1956, Kansas; M.S.Ed., 1962, Ed.D., 1964, Indiana

EVANS, ROBERT S., 1951 (1959), *Professor of Medicine*; B.S., 1934, Washington; M.D., 1938, Harvard

EVANS, ROGER J., 1966, *Assistant Professor of Civil Engineering*; B.Sc., 1955, Birmingham (England); S.C.M., 1959, Brown; Ph.D., 1965, California (Berkeley)

EVERETT, GAITHER B., 1965, *Instructor of Fixed Partial Dentures*; D.D.S., 1963, Washington

EVERETT, NEWTON B.,\* 1946 (1961), *Professor of Biological Structure*; Chairman, Department of Biological Structure; B.S., 1937, M.S., 1938, North Texas State; Ph.D., 1942, Michigan

EYMBERTS, JOHN HENRY JOSEPH, 1962, *Assistant Professor of Social Work*; Diploma, 1949, Eindhoven (Netherlands); B.A., 1956, Saskatchewan; M.S.W., 1957, McGill

EYSENBACH, MARY, 1966, *Assistant Professor of Economics*; B.A., 1954, Reed; B.A. (Honors) 1956, M.A., 1960, Oxford

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FAIRSERVIS, WALTER A., JR.,\* 1962, *Associate Professor of Anthropology*; Director, Thomas Burke Memorial Washington State Museum; B.A., 1943, M.A., 1949, Columbia; M.A., 1951, Ph.D., 1958, Harvard

FALES, MARTHA H., 1959 (1964), *Associate Professor of Dental Hygiene*; Director, Department of Dental Hygiene; R.D.H., 1935, A.B.Ed., 1943, Michigan

FALLS, GREGORY ALEXANDER,\* 1961, *Professor of Drama*; Director, School of Drama; B.A., 1943, Park-College; M.A., 1949, Ph.D., 1953, Northwestern

FARBER, ARTHUR S.,\* 1964, *Associate Professor of Social Work*; B.A., 1938, Brooklyn College; M.S., 1941, Columbia University

FARIS, ROBERT E. LEE,\* 1948, *Professor of Sociology*; Ph.B., 1928, M.A., 1930, Ph.D., 1931, Chicago

FARNER, DONALD SANKEY,\* 1965, *Professor of Zoophysiology*; Chairman, Department of Zoology; B.S., 1937, Hamline; M.A., 1939, Ph.D., 1941, Wisconsin

FARQUHARSON, FREDERICK BURT, 1925 (1963), *Professor Emeritus of Civil Engineering*; B.S. in M.E., 1923, M.E., 1927, Washington

FARR, DOUGLAS PAUL, 1962 (1966), *Assistant Professor of English*; A.B., 1960, Utah; A.M., 1961, Chicago

FARRAR, LANCELOT L., JR., 1967, *Assistant Professor of History*; B.A., 1954, Princeton; D.Phil., 1961, Oxford

FARWELL, GEORGE WELLS,\* 1948 (1959), *Professor of Physics*; Assistant Vice President of the University; S.B., 1941, Harvard; Ph.D., 1948, Chicago

FEA, HENRY ROBERT,\* 1954 (1964), *Professor of Education*; B.A., 1942, B.Ed., 1947, M.Ed., 1948, Saskatchewan; Ph.D., 1950, California

FENN, MARGARET P.,\* 1953 (1964), *Associate Professor of Human Relations*; B.S., 1942, LaCrosse State Teachers; M.B.A., 1950, D.B.A., 1963, Washington

FENSTER, L. FRITZ, 1963 (1964), *Assistant Professor of Medicine*; B.A., 1953, Stanford; M.D., 1957, Harvard

FERNALD, ROBERT LESLIE,\* 1946 (1959), *Associate Professor of Zoology*; Director of Friday Harbor Laboratories; A.B., 1937, Monmouth College; Ph.D., 1941, California

FERRIER, PIERRE, 1964 (1966), *Associate Professor of Pediatrics*; M.D., 1952, Geneva

FERRILL, ARTHUR L.,\* 1964, *Assistant Professor of History*; B.A., 1960, Wichita; M.A., 1961, Ph.D., 1964, Illinois

FIALKOW, PHILIP J., 1965, *Assistant Professor of Medicine*; A.B., 1956, Pennsylvania; M.D., 1960, Massachusetts

FIELD, WILLIAM HUGH,\* 1964 (1965), *Assistant Professor of French Language and Literature*; M.A., 1951, University of Edinburgh (Scotland); Ph.D., 1965, Chicago

FIELDS, PAUL E.,\* 1953 (1966), *Professor of Psychology*; A.B., 1926, A.M., Ohio Wesleyan; Ph.D., 1930, Ohio State

FIGGE, DAVID C., 1956, *Associate Professor of Obstetrics and Gynecology*; B.S., 1949, M.D., 1950, Northwestern

FIGLEY, MELVIN M.,\* 1958, *Professor of Radiology*; Chairman, Department of Radiology; M.D., 1944, Harvard

FINCH, CLEMENT A., 1949 (1955), *Professor of Medicine*; B.S., 1936, Union College; M.D., 1941, Rochester

FINK, B. RAYMOND, 1964, *Professor of Anesthesiology*; M.B., B.S., London; M.R.C.S., 1938, England

FIREY, JOSEPH CARL,\* 1954 (1961), *Professor of Mechanical Engineering*; B.S. in M.E., 1940, Washington; M.S. in M.E., 1941, Wisconsin

FISCHER, EDMOND H.,\* 1953 (1961), *Professor of Biochemistry*; B.A., 1943, M.A., 1944, Ph.D., 1947, Geneva

FISCHER, FRANK O., Colonel, 1963, *Professor of Military Science*; B.S., in Military Science, 1959, Maryland

FISHER, LLOYD D., JR., 1966, *Assistant Professor of Mathematics*; S.B., 1961, Massachusetts Institute of Technology; M.A., 1965, Ph.D., 1966, Dartmouth

FISCHER, LOUIS,\* 1926 (1945), *Professor of Pharmaceutical Chemistry*; Associate Dean; Chairman, Department of Pharmaceutical Chemistry; B.S., 1926, Ph.C., 1926, M.S., 1928, Ph.D., 1933, Washington

FISCHER, WILLI, 1966, *Assistant Professor of Germanic Languages*; M.A., 1962, Washington

FISH, JOHN O., 1960, *Part-time Instructor in Preventive Medicine*; B.S., 1949, Washington; M.P.H., 1959, Michigan

FISHER, ALICE L., 1961, *Lecturer in Public Health Nursing*; B.S.N., 1930, Minnesota; M.S.P.H., 1936, Michigan

FITE, RALPH D., 1965, *Lecturer in Architecture and Urban Planning*; B.S.M.E., 1947, B.S.I.E., 1950, Washington

FITZGERALD, PATRICIA A., 1966, *Research Instructor in Medical-Surgical Nursing*; B.S., 1955, Georgetown; M.N., 1966, Washington

FITZMAURICE, GERALD F., 1964, *Visiting Lecturer in Architecture*; B.S., 1949, Seattle

FLAHERTY, MARVIN J., 1965, *Lecturer in Architecture and Urban Planning*; B.A., 1958, M.B.A., 1959, Washington

FLEAGLE, ROBERT GUTHRIE,\* 1948 (1956), *Professor of Atmospheric Sciences*; A.B., 1940, Johns Hopkins; M.S., 1944, Ph.D., 1949, New York

FLEMING, DOUGLAS KNOWLES, 1965, *Assistant Professor of Geography*; B.A., 1944, Princeton; Ph.D., 1965, Washington

FLEMING, RICHARD HOWELL,\* 1951, *Professor of Oceanography*; Chairman, Department of Oceanography; B.A., 1929, M.A., 1931, British Columbia; Ph.D., 1935, California

FLETCHER, GEORGE P., 1966, *Assistant Professor of Law*; A.B., 1960, California (Berkeley); J.D., 1964, M.C.L., 1965, Chicago

FLETCHER, ROBERT L., 1956 (1960), *Professor of Law*; A.B., 1939, LL.B., 1947, Stanford

FLETCHER, T. LLOYD, 1948 (1965), *Research Professor of Surgery (Chemist)*; A.B., 1937, M.A., 1938, Clark (Massachusetts); Ph.D., 1949, Wisconsin

FLOREY, ERNST,\* 1956 (1963), *Professor of Zoology*; Curator in Comparative Physiology, Thomas Burke Memorial Washington State Museum; Ph.D., 1950, Graz (Austria)

FLOYD, JOHN EARL,\* 1962 (1966), *Associate Professor of Economics*; B.Comm., 1959, M.A., 1962, Ph.D., 1964, Chicago

FOLTZ, ELTON L.,\* 1950 (1964), *Professor of Neurological Surgery*; B.S., 1941, Michigan State; M.D., 1943, Michigan

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FORD, PAUL WILLIAM,\* 1957 (1959), *Assistant Professor of Mechanical Engineering*; B.Ind.E., 1956, General Motors Institute; M.S. in M.E., 1959, Washington



FORDYCE, WILBERT E.,\* 1959, *Associate Professor of Physical Medicine and Rehabilitation*; B.S., 1948; M.S., 1951; Ph.D., 1953, Washington

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FORTSON, EDWARD NORVAL, 1965, *Assistant Professor of Physics*; B.S., 1957, Duke; Ph.D., 1963, Harvard

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FOURNEY, M. E., 1964, *Research Assistant Professor of Aeronautics and Astronautics*; B.S. in A.E., 1958, West Virginia; M.S. in A.E., 1959, Ph.D. in A.E., 1963, California Institute of Technology

FOUTY, ROBERT A., 1966, *Assistant Professor of Pathology*; M.D., 1956, Washington

FOWLER, DAVID C.,\* 1952 (1963), *Professor of English*; B.A., 1942, Florida; M.A., 1947, Ph.D., 1949, Chicago

FOWLER, ROY S., JR., 1965, *Instructor in Physical Medicine & Rehabilitation*; B.A., 1960, Willamette; M.S., 1963, Ph.D., 1965, Washington

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FREEHILL, MAURICE FRANCIS,\* 1962, *Professor of Educational Psychology*; B.Ed., 1946, Alberta; M.A., 1947, Ed.D., 1948, Stanford

FRENCH, WENDELL L.,\* 1958 (1962), *Professor of Personnel and Industrial Relations*; *Chairman, Department of Policy, Personnel Relations, and Production*; B.A., 1948, M.P.S., 1949, D.Ed., 1956, Harvard

FRERICHS, ALBERTA J., 1955 (1956), *Lecturer in Secretarial Studies*; B.Sc., 1940, Nebraska State Teachers College; M.Ed., 1951, Nebraska

FREUND, FELIX G., 1963 (1965), *Assistant Professor of Anesthesiology*; B.A., 1935, Colegio Nacional (San Isidro); M.D., 1948, Universidad Nacional de Buenos Aires Medical School

FRIEDMAN, LIONEL J.,\* 1961, *Associate Professor of French Language and Literature*; B.A., 1943, M.A., 1946, Ph.D., 1950, Harvard

FRIEDRICH, PIA, 1965, *Lecturer in Italian Language and Literature*; Ph.D., 1946, Università degli Studi (Torino)

FRITSCHEN, LEO JOSEPH, 1966, *Associate Professor of Forest Meteorology*; *Lecturer in Atmospheric Sciences*; B.S., 1952, M.S., 1958, Kansas State; Ph.D., 1960, Iowa State

FRY, LOUIS R.,\* 1962 (1965), *Assistant Professor of Orthopedics*; B.A., 1951, Denison University; M.D., 1955, Temple

FULLER, RICHARD, *Research Professor of Geology*; B.S., 1924, Ph.D., 1930, Washington

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FUNK, EDWARD C., 1965, *Assistant Professor of Oral Surgery*; D.M.D., 1947, B.A., 1952, Oregon; M.S., 1955, Minnesota

FUTTERMAN, SIDNEY, *Associate Professor of Ophthalmology*; B.S., 1950, M.S., 1952, Ph.D., 1954, George Washington University

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GALANTER, EUGENE HARRISON,\* 1962, *Professor of Psychology*; A.B., 1950, Swarthmore; A.M., 1951, Ph.D., 1953, Pennsylvania

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GALLAGHER, MARIAN G.,\* 1944 (1953), *Professor of Law*; *Law Librarian*; B.A., 1935, LL.B., 1937, B.A. in L.S., 1939, Washington

GALLANT, JONATHAN A.,\* 1961, *Associate Professor of Genetics*; B.S., 1957, Haverford; Ph.D., 1961, Johns Hopkins

GALLE, KURT ROBERT,\* 1960, *Associate Professor of Mechanical Engineering*; B.S. in A.E., 1946, B.S. in M.E., 1947, M.S. in M.E., 1949, Ph.D., 1951, Purdue

GALSTAUN, VANICK SAMUEL,\* 1950 (1959), *Assistant Professor of Drama*; B.A., 1946, San Francisco State College; M.A., 1948, Washington

GALT, ALAN, 1966, *Instructor in Germanic Languages*; B.A., 1961, Washington; M.A., 1963, Indiana

GANEV, THEODOR,\* 1963, *Professor of Mathematics*; *Master*, 1949, Bucharest; *Doctor*, 1962, Paris

GANGOLLI, RAMESH ANAND,\* 1962 (1965), *Associate Professor of Mathematics*; B.A., 1954, Elphinstone College (Bombay); B.A., 1957, Cambridge; Ph.D., 1961, Massachusetts Institute of Technology

GANZER, VICTOR MARTIN,\* 1947 (1953), *Professor of Aeronautics and Astronautics*; B.A. in Math, 1933, Augustana (Illinois); B.S. in A.E., 1941, Washington

GARCIA-PRADA, CARLOS, 1925 (1957), *Professor Emeritus of Spanish Language and Literature*; Ph.B., 1918, Colegio Del Rosario (Bogotá); M.A., 1924, Michigan; Ph.D., 1929, Universidad Nacional (Bogotá)

GARDNER, HOWARD S., 1966, *Professor of Chemical Engineering and of Pulp and Paper Technology*; S.B., 1930, S.M., 1931, Sc.D., 1946, M.I.T.

GARFIAS, ROBERT ADOLPH,\* 1962 (1966), *Assistant Professor of Music and Anthropology*; B.A., 1956, San Francisco State; M.A., 1958, Ph.D., 1965, UCLA

GARFIELD, VIOLA EDMUNDSON,\* 1937 (1955), *Associate Professor of Anthropology*; B.A., 1928, M.A., 1931, Washington; Ph.D., 1939, Columbia

GARLID, KERMIT L.,\* 1960 (1966), *Associate Professor of Nuclear and Chemical Engineering*; B.S., 1950, River Falls State (Wisconsin); B.Ch.E., 1956, Ph.D., 1961, Minnesota

GARLINGHOUSE, MARY JEAN, 1966, *Instructor in Nursing*; A.B., 1960, B.S., 1965, Kansas; M.N., 1966, Washington

GARRISON, JAMES S., 1966, *Assistant Professor of Human Relations and Policy and Administration*; A.B., 1960, M.B.A., 1962, Washington

GARTLER, STANLEY M.,\* 1957 (1961), *Professor of Medicine and Genetics*; B.S., 1948, California (Los Angeles); Ph.D., 1952, California

GASSTER, MICHAEL, 1966, *Acting Associate Professor of History*; B.S.S., 1951, City College (New York); M.A., 1953, Columbia; Ph.D., 1962, Washington

GEBALLE, RONALD,\* 1946 (1959), *Professor of Physics*; *Chairman, Department of Physics*; B.S., 1938, M.S., 1940, Ph.D., 1943, California

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GEISSMAR, ELSE JOHANNA-MARIE, 1947 (1961), *Associate Professor of Music*; L.R.A.M., 1937, Royal Academy (London); M.Mus., 1944, Michigan

GEITGEY, DORIS A., 1966, *Associate Professor of Nursing*; B.A., 1942, Toledo; Diploma, 1948, Los Angeles County Hospital School of Nursing; M.S., 1951, Immaculate Heart College (Los Angeles); Ed.D., 1966, California

GERHART, JAMES BASIL,\* 1956 (1965), *Professor of Physics*; B.S., 1950, California Institute of Technology; M.A., 1952, Ph.D., 1954, Princeton

GEROW, EDWIN M., 1964, *Assistant Professor of Sanskrit and Indian Literature*; B.A., 1952, University of Chicago; Ph.D., 1962, University of Chicago

GERSHEVSKY, NOAH DAVID, 1943 (1957), *Associate Professor of Russian Language*; B.S. in Met., 1930, Montana School of Mines

GERSTENBERGER, DONNA LORINE,\* 1960 (1965), *Associate Professor of English*; A.B., 1951, Whitman; M.A., 1952, Ph.D., 1958, Oklahoma



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- GIBLIN, ELIZABETH C.,\* 1951 (1965), *Professor of Medical-Surgical Nursing; B.S.N., 1943, M.N., 1954, Washington; Ed.D., 1959, Colorado*
- GILES, FREDERIC T.,\* 1961, *Coordinator of College Relations and Professor of Higher Education; B.Ed., 1939, Eastern Washington College of Education; M.A., 1946, State College of Washington; Ed.D., 1961, Washington State*
- GILLINGHAM, JOHN BENTON,\* 1947 (1960), *Associate Professor of Economics; A.B., 1939, Washington State; M.A., 1942, Wisconsin*
- GLICKSBERG, IRVING LEONARD,\* 1962, *Professor of Mathematics; B.A., 1945, Ph.D., 1951, California (Los Angeles)*
- GLICKSTEIN, MITCHELL,\* 1961 (1965), *Associate Professor of Physiology, Biophysics, and Biological Structure; B.A., 1951, Ph.D., 1958, Chicago*
- GLOMSET, JOHN A., 1960 (1964), *Research Associate Professor of Medicine; M.D., 1960, Uppsala*
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- GOERING, RALPH W., 1964, *Instructor in Obstetrics and Gynecology; B.S., 1951, Bethel; M.D., 1958, Puerto Rico*
- GOETZINGER, JUDITH BERNARD,\* 1964, *Assistant Professor of Spanish and Portuguese Language and Literature; B.A., 1958, M.A., 1959, Ph.D., 1963, Wisconsin*
- GOLDBERG, LEONARD D.,\* 1947 (1963), *Professor of General Business; B.A., 1943, J.D., 1945, Chicago; admitted to practice in Illinois and Washington*
- GOLDE, HELLMUT,\* 1959 (1964), *Associate Professor of Electrical Engineering; Dip.-Ing., 1953, Technische Hochschule (Germany); M.S., 1955, Ph.D., 1959, Stanford*
- GOLDENBERG, VICTOR E., 1966, *Assistant Professor of Pathology; B.A., 1950, Moreno National College (Argentina); M.D., 1956, National University of Buenos Aires*
- GOLDSTEIN, ALLEN A.,\* 1964 (1965), *Professor and Assistant Director of Research Computer Laboratory; B.A., 1947, St. John's College; M.A., 1952, Ph.D., 1954, Georgetown University*
- GOLDSWORTHY, PATRICK D., 1952 (1957), *Research Assistant Professor of Medicine; A.B., 1941, M.A., 1947, Ph.D., 1952, California*
- GOODER, ARNOLD D., 1965, *Lecturer in Communications; B.A., 1960, M.A., 1964, Michigan State*
- GOODNER, CHARLES J., 1962, *Assistant Professor of Medicine; B.A., 1951, Reed; M.D., 1955, Utah*
- GOODRICH, FOREST J., 1914 (1959), *Professor Emeritus of Pharmacognosy; Dean Emeritus, College of Pharmacy; Ph.C., 1913, B.S., 1914, M.S., 1917, Ph.D., 1927, Washington*
- GOODSPEED, GEORGE EDWARD, 1919 (1957), *Professor Emeritus of Geology; B.S. in Min.E., 1910, Massachusetts Institute of Technology*
- GONZALES, BOYER,\* 1954, *Professor of Art; Director, School of Art; Director, Henry Art Gallery; B.S. in Arch., 1931, Virginia; student of McFee and Kuniyoshi*
- GORBMAN, AUBREY,\* 1963, *Professor of Zoology; A.B., 1935, M.S., 1936, Wayne; Ph.D., 1940, California*
- GORDON, ALBERT McC.,\* 1964 (1965), *Assistant Professor of Physiology and Biophysics; B.S., 1956, Rochester; Ph.D., 1961, Cornell*
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- GORDON, HERBERT P., 1966, *Assistant Professor of Oral Biology; B.S., 1952, D.D.S., 1954, Pittsburgh; Ph.D., 1966, Pennsylvania*
- GORDON, LAWRENCE H.,\* 1962, *Assistant Professor of Surgery (Orthopedics); B.A., 1951, M.D., 1955, Stanford*
- GORDON, MILTON P.,\* 1959 (1966), *Professor of Biochemistry; B.A., 1950, Minnesota; Ph.D., 1953, Illinois*
- GORDON, RICHARD C., 1965, *Assistant Professor of Oral Surgery; A.B., 1956, D.D.S., 1960, M.S., 1964, Michigan*
- GORE, WILLIAM J., 1966, *Professor of Political Science; A.B., 1948, Washington; M.P.A., 1950, Ph.D., 1952, Southern California*
- GOTTFRIED, ALEX,\* 1950 (1961), *Associate Professor of Political Science; B.Ed., 1941, A.M., 1948, Ph.D., 1952, Chicago*
- GOULD, FLORENCE JONES,\* 1948 (1958), *Associate Professor of English; A.B., 1928, M.A., 1931, Oregon*
- GOUTERMAN, MARTIN PAUL,\* 1966, *Associate Professor of Chemistry; B.A., 1951, M.S., 1955, Ph.D., 1958, Chicago*
- GOVE, ANTONINA FILONOV, 1964, *Assistant Professor of Slavic Linguistics; B.A., 1959, M.A., 1961, Washington*
- GRAESCH, PATRICK J., 1962 (1965), *Research Instructor in Anesthesiology; B.S.E.E., 1962, Washington*
- GRAHAM, C. BENJAMIN, 1963 (1965), *Assistant Professor of Radiology and Pediatrics; B.A., 1954, Illinois; M.D., 1958, Washington*
- GRANBERG, GRACE GRINDALL, 1960 (1965), *Assistant Professor of Home Economics; B.S. in H.Ec., 1934, M.S. in H.Ec., 1960, Washington*
- GRANEY, DANIEL O., 1966, *Instructor in Biological Structure; A.A., 1957, A.B., 1958, M.A., 1962, Ph.D., 1965, California*
- GRATHWOHL, HARRISON L.,\* 1958 (1960), *Associate Professor of Marketing; B.S., 1951, M.B.A., 1952, D.B.A., 1957, Indiana*
- GRAY, CAROL J., 1964, *Acting Instructor in Medical-Surgical Nursing; Diploma, 1955, Abington Memorial Hospital School of Nursing, Pennsylvania; B.S., 1962, Columbia; M.N., 1964, Washington*
- GRAY, FLORENCE,\* 1945 (1959), *Associate Professor of Nursing; B.S.N., 1945, M.S., 1950, Washington*
- GRAY, ROBERT SIMPSON,\* 1939 (1961), *Associate Professor of Drama; B.A., 1936, M.A., 1938, Washington*
- GRAYSTON, J. THOMAS,\* 1960, *Professor of Preventive Medicine; Chairman, Department of Preventive Medicine; B.S., 1947, M.D., 1948, M.S., 1952, Chicago*
- GREEN, JANETTE MAY, 1965, *Instructor in Physical Education; Diploma, 1957, 1960, University of London*
- GREEN, JOHN R., 1961, *Instructor in Medicine; M.D., 1961, Chicago*
- GREENGO, ROBERT E.,\* 1957 (1962), *Associate Professor of Anthropology; A.B., 1948, M.A., 1951, California; Ph.D., 1957, Harvard*
- GREENHOOT, JERRY H., 1966, *Instructor in Neurological Surgery; B.A., 1958, M.D., 1962, California (Los Angeles)*
- GREENLEAF, SUSAN JANE, 1965, *Instructor in Maternal-Child Nursing; B.S.N., 1963, Washington; M.S., 1965, Colorado*
- GREGORY, NORMAN,\* 1946 (1957), *Professor of Chemistry; B.S., 1940, M.S., 1941, Washington; Ph.D., 1943, Ohio State*
- GREINER, WILLIAM R.,\* 1960 (1964), *Associate Professor of General Business; B.A., 1956, Wesleyan; M.A., 1959, LL.B., 1960, Yale; admitted to practice in Connecticut*
- GREKOFF, GEORGE V., 1962, *Lecturer in Russian and Linguistics; B.A., 1949, M.A., 1956, California (Berkeley)*
- GRESSENS, RANDALL L.,\* 1965, *Assistant Professor of Geology; B.S., 1960, New Mexico; Ph.D., 1964, Florida State*
- GREY, ARTHUR L. JR.,\* 1964, *Professor of Urban Planning; A.B., 1943, San Jose State; Ph.D., 1954, California*
- GRIBANOVSKY, PAUL V., 1960, *Pre-Doctoral Instructor, Russian; B.A., 1963, M.A., 1965, Washington*
- GRIFFITH, MALCOLM A., 1966, *Assistant Professor of English; B.A., 1958, Oberlin; M.A., 1962, Ph.D., 1966, Ohio State*
- GRIFFITHS, GORDON,\* 1959, *Professor of History; A.B., 1936, Ph.D., 1942, California; B.A., 1939, M.A., 1946, Oxford*
- GRIFFITHS, W. MARY, 1961 (1966), *Acting Associate Professor of Zoology; B.Sc., 1937, London; M.A., 1942, Ph.D., 1953, California*
- GRIMSRUD, LARS, 1957 (1965), *Assistant Professor of Nuclear Engineering; M.S.M.E., 1955, Norwegian Institute of Technology; M.S., 1957, Ph.D., 1965, Washington*
- GRISWOLD, M. JOHN,\* 1962 (1964), *Assistant Professor of Social Work; B.A., 1940, Montana State; M.A., 1947, Ph.D., 1952, Washington*
- GROMAN, NEAL B.,\* 1950 (1963), *Professor of Microbiology; B.S., 1947, Ph.D., 1950, Chicago*
- GRONAS, DONALD G., 1966, *Instructor in Prosthodontics; D.D.S., 1964, Michigan*
- GRONDAL, BROR LEONARD, 1913 (1959), *Professor Emeritus of Forest Products; B.A., 1910, Bethany College (Kansas); M.S.F., 1913, Washington; D.Sc. (Hon.), 1943, Bethany College; Ph.D. (Hon.), 1951, Crown Zellerbach Paper School*



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- PINTER, ROBERT BARTHOLOMEW, 1964, *Assistant Professor of Electrical Engineering*; B.S. in E.E., 1959, M.S., 1960, Marquette; Ph.D., 1964, Northwestern
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- RENSBERGER, JOHN M., 1966, *Assistant Professor of Geology*; B.A., 1955, *Colorado*; Ph.D., 1966, *California (Berkeley)*
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- REY, WILLIAM HENRY,\* 1950 (1959), *Professor of Germanic Literature*; Chairman, *Department of Germanic Languages and Literature*; Ph.D., 1937, *Frankfurt*
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- ROBERTSON, WILLIAM O., 1963, *Associate Professor of Pediatrics and Medicine*; Medical Director, *University Hospital*; Associate Dean, *School of Medicine*; B.A., 1946, M.D., 1949, *Rochester*
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- ROMAN, HERSCHEL L.,\* 1942 (1952), *Professor of Genetics*; Chairman, *Department of Genetics*; A.B., 1936, Ph.D., 1942, *Missouri*
- ROMBAUER, MARJORIE DICK, 1960 (1963), *Assistant Professor of Law*; B.A., 1958, LL.B., 1960, *Washington*
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- ROSE, NORMAN JENISCH, 1966, *Assistant Professor of Chemistry*; B.A., 1957, *Knox*; Ph.D., 1960, *Illinois*



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- SCHOLZ, ROBERT F., 1966, *Assistant Professor of History*; B.A., 1961, Ph.D., 1966, Minnesota
- SCHOMAKER, VERNER,\* 1965, *Professor of Chemistry*; Chairman, Department of Chemistry; B.S., 1934, M.S., 1935, Nebraska; Ph.D., 1938, California Institute of Technology
- SCHRIEBER, ALBERT N.,\* 1948 (1956), *Professor of Policy and Administration, and Production*; B.S., M.E., 1938, Illinois Institute of Technology; M.B.A., 1947, Harvard
- SCHROEDER, MARGUERITE P., 1964, *Assistant Professor of Home Economics*; B.S., 1940, Iowa State; M.S., 1943, Minnesota
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