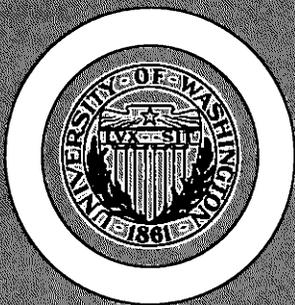


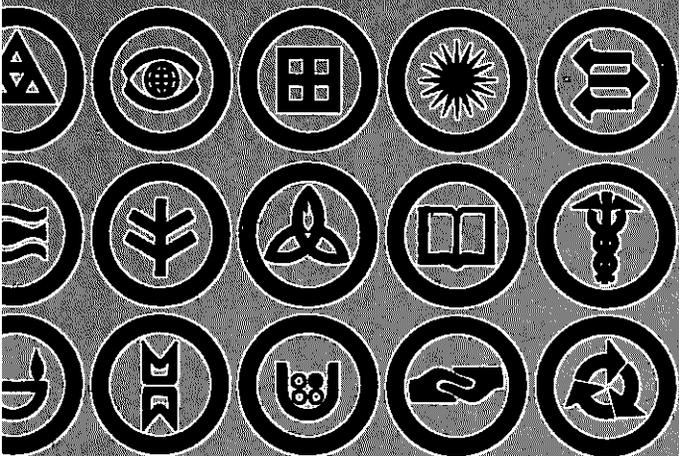
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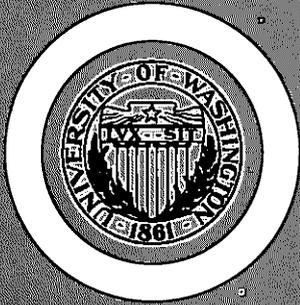


UNIVERSITY OF WASHINGTON

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GENERAL CATALOG ISSUE





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ACADEMIC CALENDAR 1964-65

AUTUMN QUARTER, 1964

Registration	September 1-24
Classes begin	September 28
State Admissions Day holiday	November 11
Thanksgiving recess	November 25-30
Final examinations	December 10-17

WINTER QUARTER, 1965

Advance registration	November 2-20
Returning and new student registration	December 28-30
Classes begin	January 4
Washington's Birthday holiday	February 22
Final examinations	March 15-19

SPRING QUARTER, 1965

Advance registration	February 1-19
Returning and new student registration	March 23-25
Classes begin	March 29
Memorial Day holiday	May 31
Final examinations	June 7-11

SUMMER QUARTER, 1965

Registration	June 1-3, 10-18
First term classes begin	June 21
Independence Day holiday	July 5
First term final examinations	July 21
Second term classes begin	July 22
Second term final examinations	August 20

This calendar includes only key dates for each term. Detailed dates are printed in the *Time Schedule*.

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's enrollment totals about twenty-one thousand students. Of this number, some sixteen thousand three hundred are undergraduates; the remainder are 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 home communities. The remaining students enter from high schools, colleges, and universities from every state and territory of the United States and foreign countries. During the current year, over one thousand noncitizens from more than eighty countries have enrolled, which ranks the University eighteenth in the nation in size of foreign student population.

The largest groups at the University are the Freshman Class, with an enrollment of 5,537, and the professional schools and Graduate School, which together enroll 4,563 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 1963 was 3.10. Women comprise 35 per cent of the student population. Married students numbered 2,529 in the undergraduate program and 2,526 in graduate study in Autumn Quarter, 1963.

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 United States. 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 1963, the full-time academic staff of the University numbered approximately thirteen hundred.

Academic Standing

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.

The 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 accepts students upon completion of three-fourths of the undergraduate credits required for a bachelor's degree. Degree programs in social work, public affairs, librarianship, radiological sciences, and geophysics 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, each college offers programs con-

sistent with the highest national academic and professional standards. 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.

Adult and Continuing Education

College of Architecture and Urban Planning

Architecture
Landscape Architecture
Urban Planning
Building Technology and Administration

College of Arts and Sciences

American Studies
Anthropology
Art
Astronomy
Atmospheric Sciences
Basic Medical Science
Biology
Botany
Chemistry
Classics
Communications (mass media)
Advertising
Journalism
Radio-Television
Comparative Literature
Dental Hygiene, Preprofessional Program
Dentistry, Preprofessional Program
Drama
Economics
Economic Theory
Money, Banking, and Cycles
Government Regulation, Public Utilities
Labor Economics
Public Finance and Taxation
Economic History
International Trade
Comparative Systems and Development

Statistics and Econometrics
English
Far Eastern and Russian (social sciences)
Far Eastern and Slavic Languages and Literature
General Education
General Studies
Genetics
Geography
Geology
Germanic Languages and Literature
History
Home Economics
Law, Preprofessional Program
Linguistics
Mathematics
Medical Technology
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

College of Business Administration

Accounting
Business and Its Environment
Business Education
Business Law
Business Statistics and Operations Research
Finance
General Business
Human Relations in Business and Industry
International Business Law, Preprofessional Program
Marketing
Personnel and Industrial Relations
Policy and Administration
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**College of Forestry**

Forestry Management
Logging Engineering
Forest Products

Graduate School of Public Affairs**School of Law****School of Librarianship****School of Medicine**

Basic Health Sciences
Conjoint Courses and Medical Practice
Clinical Medical Sciences

School of Nursing**College of Pharmacy****ROTC (Military, Air, Naval Science)****School of Social Work****Degrees**

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

*Aeronautics and Astronautics
*Anthropology
Architecture
Art
*Atmospheric Sciences
*Biochemistry
*Biological Structure
*Botany
*Business Administration
*Ceramic Engineering
*Chemical Engineering
*Chemistry
*Civil Engineering
*Classics
Communications
*Comparative Literature
Dentistry
Drama
*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
*Metallurgy
*Microbiology
Mining Engineering
*Music
*Nuclear Engineering
Nursing
*Oceanography
*Pathology
*Pharmacology
*Pharmacy
*Philosophy
Physical and Health Education
*Physics
*Physiology and Biophysics
*Political Science

*Asterisk indicates doctoral program.

Preventive Medicine
 *Psychology
 Public Affairs
 Radiological Sciences
 *Romance Languages and Literature
 Scandinavian Languages and Literature
 Social Work
 *Sociology
 *Speech
 Surgery
 Urban Planning
 *Zoology

Bachelor of Science in Pharmacy B.S.Pharm.
 Bachelor of Science in Physical
 Therapy B.S.(Phys.Therapy)
 Bachelor of Urban Planning B.Urban Plan.

DEGREES AND CERTIFICATES

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 Home Economics B.A.H.Ec.
 Bachelor of Arts in Music B.A. in Music
 Bachelor of Fine Arts B.F.A.
 Bachelor of Landscape Architecture B.L.Arch.
 Bachelor of Laws LL.B.
 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.(Fisheries)
 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)

Graduate Degrees

Master of Arts M.A.
 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 Arts in Teaching Mathematics M.A.T.
 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
 Science 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.Nur.
 Master of Public Administration M.Pub.Admn.
 Master of Social Work M.Soc.Wk.
 Master of Urban Planning M.Urban Plan.
 Doctor of Business Administration D.B.A.
 Doctor of Education Ed.D.
 Doctor of Musical Arts D.Mus.Arts
 Doctor of Philosophy Ph.D.



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

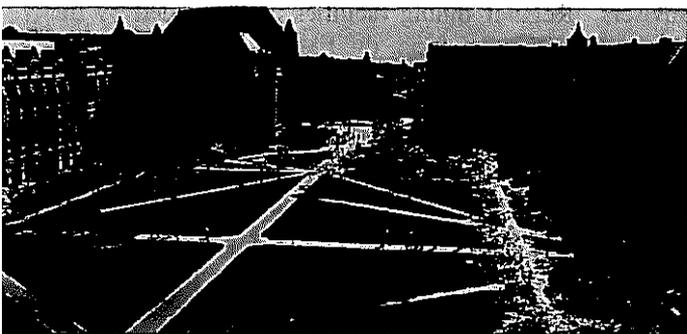
Sessions

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. (For information on the Summer School program, write for the *Summer School Bulletin*.)

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.

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 contain over 1,300,000 volumes and acquire 75,000 more each year. The libraries currently receive 22,000 periodicals. The Henry M. Suzzallo Library houses the main collection, the general catalog, current periodicals, the Undergraduate Library and the Reserve Book Room, the General Reference and Bibliography Service, the Humanities Reference Service, the Social Sciences Reference Service, the Government Documents Center, and the Science Reading Room.

Among special collections are the Northwest Collection, Manuscripts Collection, Newspaper Collection, Microform Collection, and the Human Relations Area Files. The Pacific Northwest Bibliographic Center maintains a catalog for libraries in Washington, Oregon, Idaho, Montana, and British Columbia. Branch libraries for special academic subjects are located in other buildings. Particularly notable among the library holdings are the books and manuscripts in the Northwest collection, works on oceanography, fisheries, and forestry; depositories of documents of the United States government, United Nations agencies, the Canadian government, and the European Communities; and materials in Russian, Japanese, Chinese, Korean, and Tibetan. It currently receives all significant publications published in India and Pakistan.

A collection of 80,000 volumes chosen for the general education of undergraduate students is housed in a special section of Henry Suzzallo Library and is designated as the Undergraduate Library. Volumes are arranged by subject on open shelves, allowing the intellectually curious to browse unhampered by walls and artificial barriers. The graduate student is further encouraged in his studies by specially designed study desks assigned to him.

The Library maintains a microform collection of voluminous newspaper files and of rare and out-of-print editions. The equipment necessary for reading these materials is provided by the library in the microform

room. The library also maintains a photocopy service so that the student may obtain copies of pages from manuscripts or books.

To further research and study, the library participates in interlibrary loans with libraries throughout the United States. Thus, if scholarly material is not available locally, it may be borrowed from another library. As a member of the Association of Research Libraries, the library participates in the planning of programs to develop university research and specialized libraries and their use.

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.



Henry Art Gallery

The Henry Art Gallery offers a program of rotating exhibitions of recent work in painting, sculpture, printmaking, 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.

University Theaters

Three University theaters, 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 theater-in-the-round productions in which the Penthouse Theater specializes.

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.

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 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.

Athletic facilities include the University of Washington Stadium, with a seating capacity of 55,600, the home of the Husky football and track teams. Clarence S. "Hec" Edmundson Pavilion, seating 11,500 persons, is the center for men's physical education activities and intercollegiate basketball. The Pavilion has facilities for handball, wrestling, volleyball, gymnastics, and other sports, in addition to the swimming pool and an intramural practice gym. Hiram Conibear Crew House, located on the shore of Lake Washington just north of the Pavilion, is one of the most modern college crew houses in the country. Graves Field, home of the Husky baseball teams, is also used for football practice, track, and archery. 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 small golf course is also maintained on the campus.

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.

STUDENT HOUSING

In order to encourage students to participate more fully in the academic community, extensive residence programs have been developed. All students are encouraged to live in University-recognized living facilities as far as accommodations allow, particularly during their freshman year. Although they are not required to live on campus, women under the age of twenty-one must have their parents' approval of any housing arrangements.

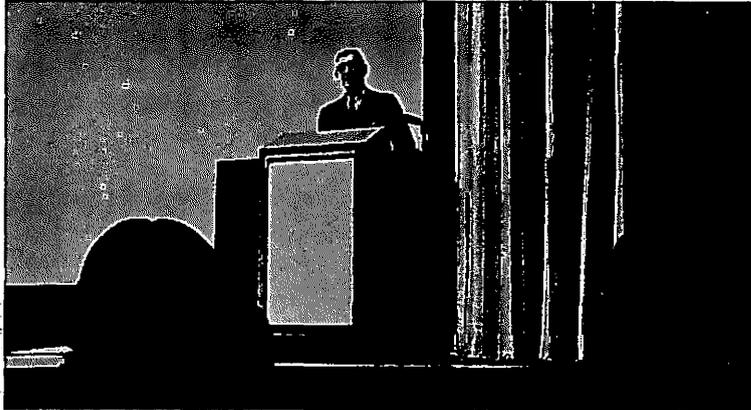
Accommodations in University residence halls are offered in three housing facilities—the Men's Residence Halls, the Women's Residence Halls, and Haggett Hall, a new, coeducational unit. The University also maintains apartment-style housing units for married students or single students over twenty-one years of age. Fraternities and sororities, although not operated by the University, provide another type of residence.

Residence Halls

MEN. Halls for men are Lander and Terry Halls, and the new coeducational unit, Haggett Hall. All rooms are double, with twin beds and individual desks and wardrobes. The halls are divided into living groups, or "houses," of approximately one hundred men, each with its own student government organization. With the help of resident advisers, these groups are coordinated in an over-all hall organization, and plan social, athletic, and educational programs for their members. The residence halls contain ample study and recreational areas, which include lounges, game areas, music, hobby, and photography rooms.

WOMEN. Women may live in the Women's Residence Halls, Hansee and McCarty Halls, or the new coeducational residence, Haggett Hall. As in the Men's Residence Halls, there are "houses" of approximately one hundred students who elect their own student government. Each house is served by a resident adviser and has its own lounge, dining area, study





rooms, kitchenettes, laundry rooms, and other conveniences.

Men's Cooperative

At present, there is one men's cooperative on the University campus—Allerlei House. Accommodating a small number of men students who live and work together, this residence operates as a recognized University organization.

Fraternities and Sororities

Twenty sororities and 32 fraternities are recognized at the University of Washington. All maintain chapter houses near the campus. Each house has complete living facilities and provides experience in group planning and living.

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 who advise house leaders in all phases of chapter life and operation. Activities of the fraternities and sororities are coordinated and governed by a 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.

University Housing for Married Students

The University maintains an apartment building directly off-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.

Religious Living Units

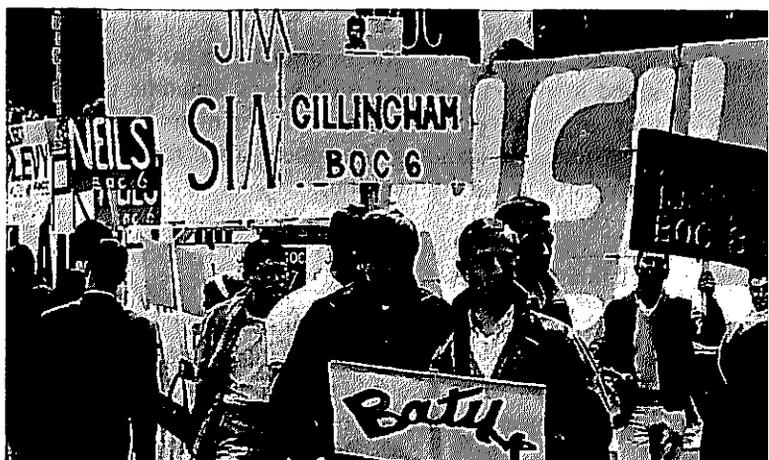
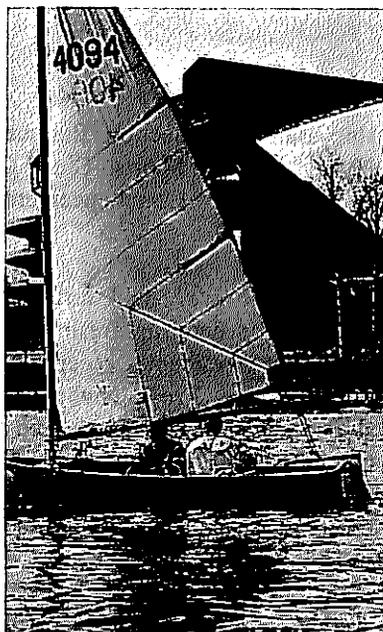
Wesley House (Methodist) and Newman Club (Catholic) also provide housing for students at the University of Washington. Their primary purpose is to offer an environment consistent with religious ideals and to encourage maximum scholastic achievement.

Living-Language Group

Russian House is a semicooperative 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.

General Housing Information

For general information concerning housing, write or contact the Office of Student Residences, 4039 15th N.E., Seattle, Washington 98105.



CAMPUS ACTIVITIES

The University of Washington offers a stimulating variety of extracurricular activities. Programs are provided through "continuing education" seminar series sponsored by various departments, and lectures, music, drama, art, recreation, athletics, and student organizations make for a diverse "after-hours" campus life.

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, and concerts, and approximately 35 to 40 lectures. Also included are ballets, foreign films, world travel films, and opera.

Athletics

During the last academic year, more than eleven thousand individuals participated in intramural activities, including 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.

The intramural department of the University also maintains a canoe house on the shore of Lake Washington where canoes are available for student rental.

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 theater to contemporary drama. Tryouts for all University dramatic productions are open to the entire student body. In addition, the Readers Theater 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 Theater, 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 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.

Students are encouraged to become active in at least one of the more than two 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*, a newspaper published four times a week, the *Tyee* yearbook; and *Assay*, a journal of creative writing.

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, Seattle Symphony concerts, the Dance Drama of the Physical Education Department, Parents' Week End, Governor's Day, the Christmas Concert, ASUW Christmas Party, Scholar-

ship Banquet, Election Banquet, Fine Arts Festival, Husky Winter Sports Club Carnival, Junior Class Variety Show, Commencement in June, and many others.

University Preview, held during the first week of Autumn Quarter for entering freshmen, includes a welcoming assembly, President's reception, tours of Henry Suzallo Library, Frosh Night at the HUB to introduce students to programs sponsored by the different ASUW committees, a transfer-student program, AMS and AWS assemblies. A preview Lecture Series featuring outstanding faculty members continues the orientation process.

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.



STUDENT SERVICES

Academic Advising

Almost every faculty member participates in academic advising through personal discussions with students outside the classroom about such concerns as professional development and educational objectives. 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.

Formal advising services are also 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. However, the utilization of these services rests upon the initiative of students in arranging for the appropriate consultation services.

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 scholarships, loans, fraternities, sororities, special programs of living groups, and selective service regulations. Information and special assistance are also available to 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 avail-

able 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

At present, the University of Washington sponsors summer language study programs in Europe but does not sponsor programs during the academic year. Since study experience in another country can provide a worthwhile contribution for the serious student to his degree program, the University has instituted an advisory service to help the student plan a program and evaluate the possibility of securing academic credits.

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. Students may be referred to the Center by any of the faculty or professional staff members of the University, or may elect to make appointments with the Center on their own initiative.

Bureau of Testing

In addition to providing a variety of educational and psychological testing services for various 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, admin-

istering 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 Student Health Service in Hall Health Center as a medical care facility for students. The clinics are open from 8 to 5 Monday through Friday throughout the year, and offer general medical care and specialist consultation of several types. A 35-bed hospital unit operates from September 15 through June 15; night emergency service is also available during the regular school year.

There is no charge for professional services through the Student Health Service. However, students must pay for outpatient prescription medicines and drugs. 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 appropriate 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. Minimum requirement for placement registration is one full quarter in residence.

Financial Aids

The state of Washington, through legislative appropriations for operations of the University, subsidizes the education of each student by approximately \$1,000 a year. In addition, the University has a broad program of financial assistance both for undergraduate and graduate students.

Three types of financial aid—scholarships, loans, and part-time employment—are available to able students with financial need.

Information concerning financial aid for undergraduate students is available from the University of Washington Office of Financial Aids, 333 Student Union Building, 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 Education* 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.

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.

ADMISSION PROCEDURE

Application

Applications for admission and questions regarding admission should be addressed to: The Director of Admissions, University of Washington, Seattle, Washington 98105.



The first step in being admitted to the University of Washington is to complete the appropriate application form, available at all high schools and community colleges in the state of Washington, or from the Director of Admissions. In requesting an application, the student should state briefly the amount of high school and college training he has had and the general field of academic work in which he is interested.

Admission Deadlines

Applications and required transcripts should be filed with the Office of Admissions prior to the following dates, in order to be assured of consideration for admission to the quarter for which the application is being made: July 15 for Autumn Quarter; December 1 for Winter Quarter; March 1 for Spring Quarter; May 15 for Summer Quarter.

Students applying for admission as freshmen for Autumn Quarter will be best served if their applications reach the University as soon as possible after completion of the seventh high school semester.

Campus Visitation

The University encourages prospective students to visit the campus either singly or in groups. Individual counseling sessions, group tours, and where practical, class visitations will be arranged by counselors in the Office of High School Relations for those students who can schedule their arrival between 9 a.m. and 12 noon and 1 and 4 p.m., Monday through Friday. Charge for parking on campus is 50 cents and individual students should request the traffic director at the gate of entry to direct them to the Office of High School Relations.

Arrangements for group visitation should be made at least one week in advance of arrival by writing or calling: University of Washington, Office of High School Relations, 101 Meany Hall, Seattle, Washington 98105; telephone 543-4873.

Freshmen

The University encourages the high school student to plan his college work early. Application for admission is accepted after the applicant completes the seventh semester of high school, on the assumption that his final grades will be consistent with his record at the date of application. See *Undergraduate Education* for additional information.

Undergraduates with College Experience

An undergraduate student with a good academic record in another institution of recognized standing is eligible to apply for admission to the University. Acceptance is determined by his previous academic record and his proposed curriculum. See *Undergraduate Education* for additional information.

Graduate Students

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 is the applicant's ability, as decided by the University, to progress satisfactorily in a graduate degree program. See *Graduate Education* section for additional information.

Foreign Students

A prospective student from a foreign country who meets the admissions criteria outlined in subsequent sections of this catalog should write to the Office of Admissions at least one year before the academic year in which he hopes to be admitted. He will be sent

instructions and an application which he should complete and return no later than February 1. After the application is approved, a certificate of eligibility to enter the University will be mailed. No prospective student should plan to leave his country before obtaining this certificate of eligibility, since it will be needed when he applies for a passport and student visa, and again when he arrives at the University.

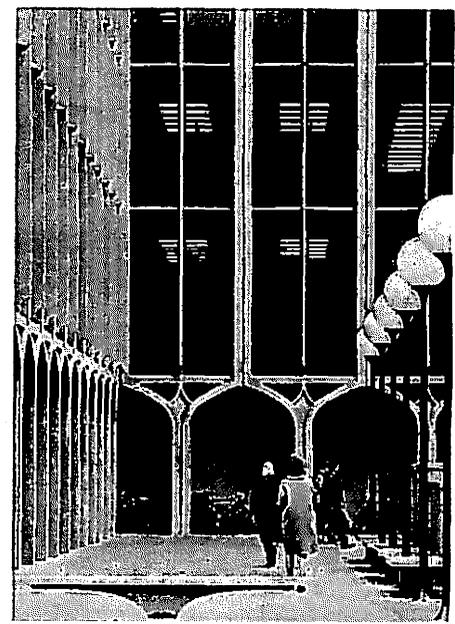
The prospective foreign student will save time and money by preparing himself in English before coming to the United States. When he arrives at the University, he will be tested in the use of oral and written English, and, if unable to use the language well, will be required to enroll for special English training and to limit his study program until he can use English effectively.

Housing Reservations

Application for the Residence Halls may be made prior to acceptance for admission by the University and early application is encouraged. Applications for housing for married students may be made after the notice of acceptance is issued. Former students may make application for housing for married students after their applications for readmission have been completed.

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.





Fees for 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 students¹

TUITION FEE	\$35.00
INCIDENTAL FEE	56.50
STUDENT ACTIVITIES FEE	2.50
BUILDING FUND FEE	6.00
TOTAL FEES	\$100.00

Part-Time Students (max. 6 credits exclusive of ROTC)²

TUITION FEE	\$35.00
INCIDENTAL FEE	39.00
STUDENT ACTIVITIES FEE	*
BUILDING FUND FEE	*
TOTAL FEES	\$74.00

Ex-service Personnel of World Wars I and II (Chapter 46, Laws of 1945)

Full-Time

TUITION FEE	\$
INCIDENTAL FEE	56.50
STUDENT ACTIVITIES FEE	2.50
BUILDING FUND FEE	6.00
TOTAL FEES	\$65.00

Part-Time (max. 6 credits)³

TUITION FEE	\$
INCIDENTAL FEE	39.00
STUDENT ACTIVITIES FEE	*
BUILDING FUND FEE	*
TOTAL FEES	\$39.00

On-Leave Students (for graduate students only)⁴

TUITION FEE	\$
INCIDENTAL FEE	5.00
STUDENT ACTIVITIES FEE	
BUILDING FUND FEE	
TOTAL FEE	\$5.00

Auditors

TUITION FEE	\$
INCIDENTAL FEE	39.00
STUDENT ACTIVITIES FEE	*
BUILDING FUND FEE	*
TOTAL FEES	\$39.00

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

² Load hour equivalents of noncredit courses must be counted in the 6 credits.

³ See *Veterans Information* section to determine eligibility.

⁴ See *Graduate School* section for an explanation of fee.

*Student Activities Fee and Building Fund Fee are optional for

Fees for 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 Administration Building, for a change of classification. Examples of Autumn, Winter, or Spring Quarter fees are listed below.

Full-Time Students (undergraduate and graduate) except Medical and Dental students¹

TUITION FEE	\$105.00
INCIDENTAL FEE	86.50
STUDENT ACTIVITIES FEE	2.50
BUILDING FUND FEE	6.00
TOTAL FEES	\$200.00

Part-Time Students (max. 6 credits exclusive of ROTC)²

TUITION FEE	\$105.00
INCIDENTAL FEE	69.00
STUDENT ACTIVITIES FEE	*
BUILDING FUND FEE	*
TOTAL FEES	\$174.00

Ex-service Personnel of World Wars I and II (Chapter 46, Laws of 1945)

Full-Time

TUITION FEE	\$52.50
INCIDENTAL FEE	86.50
STUDENT ACTIVITIES FEE	2.50
BUILDING FUND FEE	6.00
TOTAL FEES	\$147.50

Part-Time (max. 6 credits)³

TUITION FEE	\$52.50
INCIDENTAL FEE	69.00
STUDENT ACTIVITIES FEE	*
BUILDING FUND FEE	*
TOTAL FEES	\$121.50

On-Leave Students (for graduate students only)⁴

TUITION FEE	\$
INCIDENTAL FEE	5.00
STUDENT ACTIVITIES FEE	
BUILDING FUND FEE	
TOTAL FEES	\$5.00

Auditors

TUITION FEE	\$
INCIDENTAL FEE	39.00
STUDENT ACTIVITIES FEE	*
BUILDING FUND FEE	*
TOTAL FEES	\$39.00

part-time students, but are required for part-time students who purchase athletic admission tickets.

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.

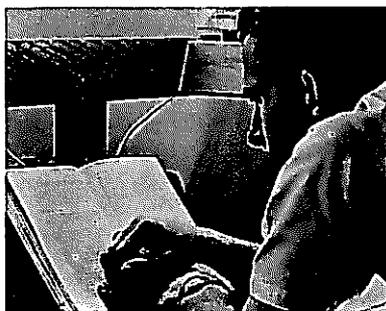
Fee schedules for resident and nonresident students apply to the academic year (Autumn, Winter, and Spring Quarters). Summer fees are listed in the *Summer Quarter Bulletin*.

Fees, Extra Service Charges, and Rental

All fees, extra service charges, and rentals are payable in United States dollars at the time of registration; in addition, new undergraduate students must submit a \$50.00 advance payment at the time they are admitted to the University. This advance payment is applied against the total tuition and fees collection from the student, but is not refundable in the event of failure to register. The University reserves the right to change any of its fees and charges without notice.

An extra service charge is levied against the student who (1) fails to participate in advance mail registration when he is eligible to do so, or (2) fails to meet the established application deadline and must be granted a special appointment or permit to register by mail through the action of the Registration Appeal Board.

A late registration charge of \$15.00 is also assessed the student granted special permission to register (by action of the Registration Appeal Board) after the final registration date prior to the opening day 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 made simultaneously, unless the change is initiated by the University. Additional special fees are listed in *Appendix A*.



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.

Refund of Fees

If a complete withdrawal is made during the first three calendar days of the quarter, all fees are refunded in full; one-half the amount will be refunded if withdrawal

is made during the first thirty calendar days. Students withdrawing under disciplinary action are not eligible for refunds. Applications for refund may be refused unless made during the quarter in which the fees apply. If payment is made by check, at least two weeks must elapse between payment and refund.

Resident Status for Tuition Purposes

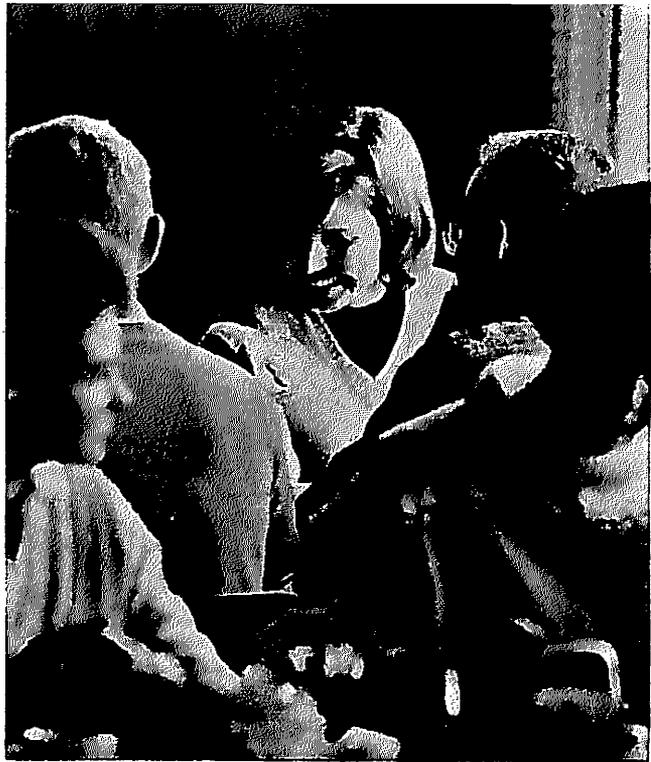
A *resident student* is one who has been domiciled in the state for a period of one year prior to the beginning of the quarter for which he registers. If the student is a minor, his domicile is normally determined by that of his parents, who must fulfill the requirement of the one year of Washington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

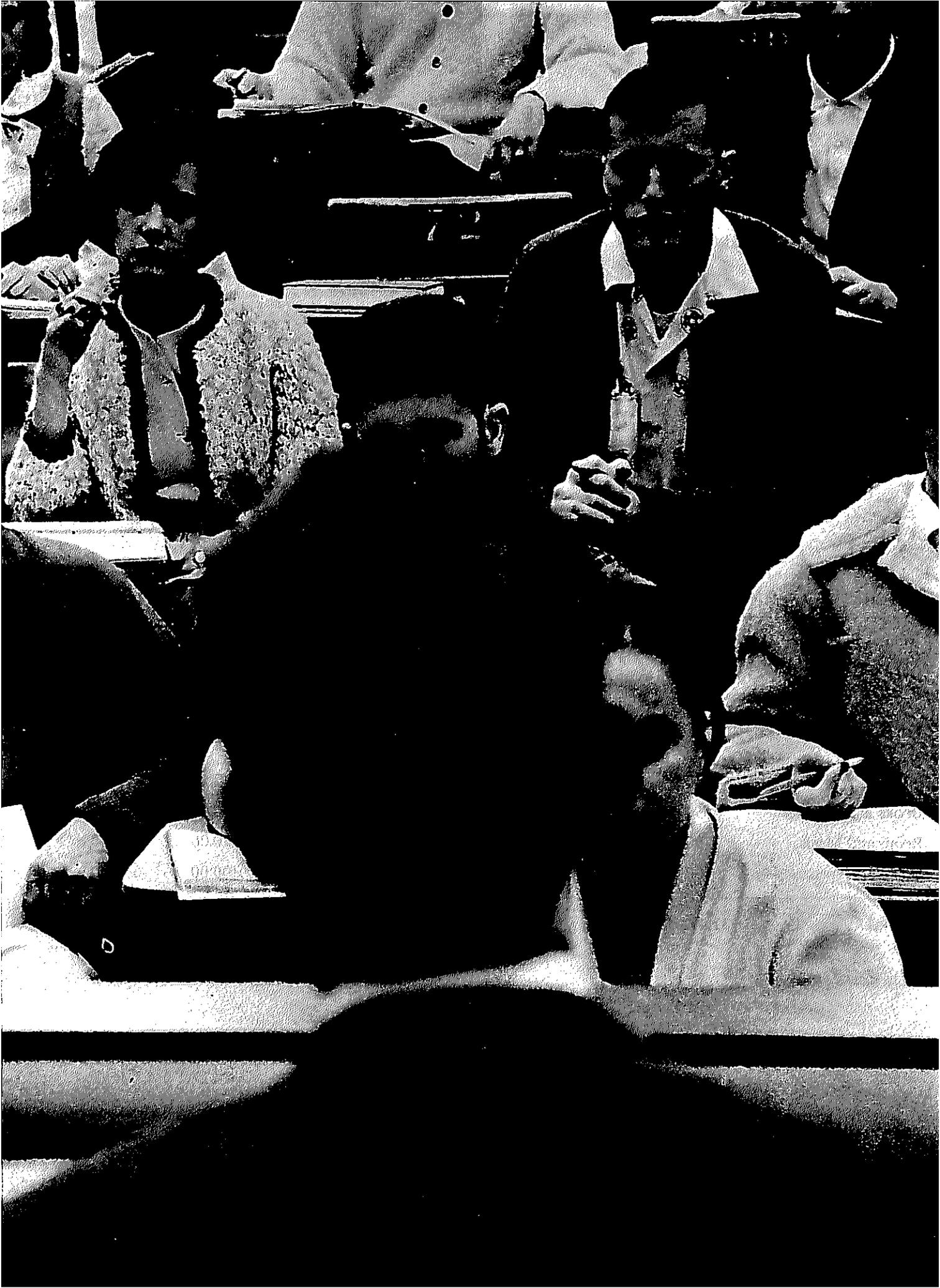
Estimated Expenses

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 Residence Halls:	Women's Residence Hall: Hansee	Living at Home	In Fraternity or Sorority	
	Lander, Terry Women's Residence Hall: McCarty Coeducational Residence Hall: Haggett			Living at Home	Living in House
Tuition, Incidental, Student Activities, and Building Fund Fees	\$300.00	\$300.00	\$300.00	\$300.00	\$300.00
Athletic Admission Ticket (optional)	6.50	6.50	6.50	6.50	6.50
Health and Accident Insurance (optional)	17.25	17.25	17.25	17.25	17.25
Books and Supplies	90.00	90.00	90.00	90.00	90.00
Room and Meals	780.00	720.00	***	370.00	810.00
Personal Expenses	300.00	300.00	300.00	300.00	300.00
TOTAL	\$1,493.75	\$1,433.75	\$713.75	\$1,083.75	\$1,523.75





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 pre-professional 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 can 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

Application for Admission Forms are available at all Washington high schools and community colleges and from the Office of Admissions, University of Washington, Seattle, Washington 98105.

An applicant for admission (with either freshman or advanced standing) should complete the form according to the instructions printed on it, and ask his high school principal and the registrar of each college attended to send a transcript of his record directly to the University's Office of Admissions.

There are many advantages in applying early, and the prospective student is urged to plan well in advance of his actual enrollment. Each application receives

careful attention and the student who is clearly qualified may be granted early admission to the University.

The University urges the student to visit the campus in Seattle. The Office of High School Relations, 101 Meany Hall, is open mornings Monday through Friday from 8 to 12 and from 1 to 5 in the afternoon. Trained counselors are available for consultation, and guided tours of the campus and its facilities are given throughout the year.

Scholastic Criteria

The University welcomes applications for admission from students whose scholastic records indicate their probable success in a university program. The most reliable criteria are the applicant's scholastic standing and the adequacy of his preparation in high school and/or college, and those who fulfill these criteria will be accepted insofar as University resources permit. Should there be more applicants than can be accommodated, preference must be given to those with the greater probability of success, with priority given according to the date on which complete credentials are filed in the Office of Admissions.

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 be selective in his choice of high school electives, since the University gives this part of a student's record the same careful attention as his 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. This computation is based on a 4-point system and includes all courses attempted except physical education activity and other partial credit 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 student 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.

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.

Freshman Admission

If the student is applying for Autumn Quarter, he should submit his application at the end of the first semester of his senior year (seventh semester).

Admission of Transfer Students

An applicant for advanced standing, who has completed at least one full year of college work, is required to present a cumulative and last-term grade-point average of no less than 2.30 for the College of Engineering; 2.20 for the College of Education; and 2.00 (C) for all other colleges. The applicant who has completed fewer than 45 quarter credits in college must also present a high school grade-point average of at least 2.50.

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



The transfer student is expected to have the same high school preparation as the student who enters as a freshman, or to present college credits in the area of his high school deficiency. The student with more than 45 acceptable credits should present a cumulative and last-term college grade-point average of at least 2.00.

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

Admission of Nonresidents

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

Admissibility of nonresident applicants for admission with undergraduate standing (including those holding the bachelor's degree) 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 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.

Applications for admission and other supporting credentials should be submitted as soon as possible after the opening of the student's final term at his previous school.

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

Admission of Veterans and Children of Deceased Veterans

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

Admission of Special Students

A non-high school graduate who is at least twenty-one years of age and a legal resident of the state of Washington may be accepted as a special student by the Board of Admissions when his incomplete scholastic record and other evidence suggest that he will have a reasonable chance of success in the University. A special student will be re-classified as a regular degree candidate when the dean of his college is satisfied that he has rounded out his background as necessary and has established a generally satisfactory record in residence.

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

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 student from a non-English speaking country will be required to pass an English examination upon his arrival at the University. If he should fail this examination, he will not be allowed to enroll until he has improved his English competence.

The foreign applicant should write to the Office of Admissions to request an application form. He should include in his letter: (a) the name of the school in which he is currently enrolled or last attended, with the diploma, degree, or certificate most recently awarded him; (b) the average grade he has received in his last two years of study, in terms of the grading system used on his official transcript; and (c) his degree objective and the field of study in which he is primarily interested.

In order to be considered for admission, a foreign student's credentials should be filed before February 1 to be assured of being considered for admission the following Autumn Quarter.

GENERAL REQUIREMENTS

Examinations

Washington Pre-College Testing Program

The differential guidance test battery, 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. The tests are not a factor in determining the admissibility of a student.

All high school seniors in the state of Washington are urged to take this "grade prediction" 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 student 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), or 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. All prospective University students are strongly encouraged to take this section of the CEEB as well as any of the achievement tests.

Mathematics Placement Tests

The student's mastery of intermediate algebra and planè geometry is evaluated by a section of the Pre-College Testing Program which determines his placement in appropriate University mathematics classes. A satisfactory score on this section permits him to enroll in Mathematics 104 (Plane Trigonometry), Mathematics 105 (College Algebra), or Mathematics 155 (College Algebra for Business Students).

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, 105, or 155. The student who has completed the third semester of high school algebra will not receive credit for Mathematics 101.

The grade-prediction tests cover 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 Pre-College Testing Program 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 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 de-

termines 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 will 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 pass this aptitude test and, if he qualifies, may elect to take the honors graphics sequence, General Engineering 104 and 105.

Advanced Credit Examinations

To receive advanced credit 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.

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.

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.

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.

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

(e) *Exemptions:* (1) Medical (this must be approved by the Student Health Service). (2) Students who are twenty-five years or older. (3) Students who enter the University with academic standing of sophomore or above, special students, and those students registered for 6 or less credits. (4) Students who have had one year or more of military service on active duty. (In order to qualify, the student must present his service record at 101 Administration Building.)



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.

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.

Health Examinations

A health history and physician's report of a physical examination, and a chest X ray, are required of the student who is entering regular University classes for the first time (whether or not he has previously attended



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 Colleges of Arts and Sciences, Business Administration, and Engineering. (See appropriate college 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 Army, Navy, and Air Force 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 in the final grades for at least 12 of 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

These are awarded to sophomores, juniors, and seniors for excellence in scholarship in their freshman, sophomore, and junior years, respectively, and are presented 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 Honors

Awarded to recipients of a first bachelor's degree (Bachelor of Laws is excepted), Baccalaureate Honors are based on the student's entire scholastic record. In recent years, the distinction of *summa cum laude* has signified a minimum grade-point average of 3.90, *magna cum laude* an average of 3.60, and *cum laude* an average of 3.35. Students successfully completing the College of Arts and Sciences Honors Program are awarded a bachelor's degree "With College Honors" in the major field. Students completing the honors curriculum in a single department are graduated "With Distinction" in the major field. Baccalaureate Honors are published in the Commencement Program and inscribed on the student's diploma.

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. University faculty and staff, representing a variety of careers and professions, are happy to discuss the qualifications and prospects of a particular field with the interested student.

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.

Graduate Enrollment

If the student is within 6 credits of obtaining his baccalaureate degree, and is otherwise acceptable, he may enroll simultaneously in 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.



ACADEMIC REQUIREMENTS

Credit Load

A full-time student at the University is expected to carry the normal number of 15 credits per quarter, exclusive 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 a prescribed curriculum, exclusive of physical education activity and military science courses.

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.

For veteran's administration quarterly credit requirement for veterans on Public Laws 550, 634, 815, 894, see the *Rules and Regulations*, Veteran's section, in this Catalog.

Minimum Grade Points

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

The undergraduate with three or more quarters is expected to maintain a cumulative 2.00 minimum grade-point average, and is placed on academic probation if he falls below this standard. The entering undergraduate (whether a freshman or a transfer student) is placed on probation when he fails to achieve a cumulative 1.80 minimum grade point during his first two quarters, after which time he is expected to raise his cumulative average to the 2.00 all-University standard. (It should be noted that some colleges and some degree programs require a higher minimum average.)

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.

The student on academic probation for failure to achieve the minimum grade-point average is subject to cancellation of registration.

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 in residence at the University of Washington, normally the senior year, earning at least 45 credits in courses given by the University.
- (b) Have earned a minimum of 180 academic credits, exclusive of the credits required to complete physical education activities. Of the academic credits, a minimum of 60 in upper-division courses (numbered 300 and above) is required for graduation.
- (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.

The prospective candidate for a second bachelor's degree must earn at least 45 additional credits in residence and meet the requirements of the college and program in which he is enrolled.

TEACHER CERTIFICATION

To earn the Washington State Professional Certificate the student must complete a suitable major, a baccalaureate degree, and selected professional requirements. Elementary school preparation includes, in addition, the completion of a minor in elementary education. Majors accepted for certification include: anthropology, art, biology, business education, chemistry, drama, economics, English, Far Eastern, French, geography, geology, German, health education, history, home economics, industrial education, journalism, Latin, mathematics, music, physical education, physics, political science, psychology, Russian, sociology, Spanish, speech, and speech and hearing therapy.



RESERVE OFFICERS TRAINING PROGRAMS

The Departments of Military Science, Naval Science, and Air Science 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 either Army or Air Force ROTC.

The Army and Air Force programs consist 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 or Air Force. The entire four-year program of the Department of Naval Science is available only for selected students and leads to a commission in the Navy or Marine Corps.

Students who apply and are selected for the Navy ROTC program and for the advanced course in the Army or Air Force ROTC 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

Willard H. Heinlein, James O. Kendrick, Jr., Laddie B. Logan, Harold Solinsky

Instructors

Frank F. Camacho, Jr., Willis G. Hiatt, Robert L. Yarberry, Elwyn H. Butler

The basic program of the Department of Military Science consists of six quarters of instruction on basic military subjects. One hour of classroom instruction per week during the freshman year and two hours of classroom instruction per week during the sophomore year are required. In addition to the classroom instruction, one hour of Leadership Laboratory is required per week throughout the basic program.

After completing the basic program, students may apply for entrance to the advanced Army ROTC program which leads to a reserve or regular commission in the United States Army as a second lieutenant. Applicants are screened by a selection board for acceptance for advance course schooling. Each student selected must:

1. Have successfully completed the two-year basic ROTC program, or if a veteran, complete as much of the basic Army ROTC program as determined by the Professor of Military Science.
2. Have passed a prescribed aptitude test.
3. Have passed a physical examination given by the United States Army at no expense to the candidate.

The two-year advanced Army ROTC program requires three hours of classroom work plus one hour of Leadership Laboratory per week during each quarter the first year. One academic substitute is also required. The second year consists of two hours of classroom instruction plus one hour of Leadership Laboratory per week during Autumn and Winter Quarters; three hours of



classroom instruction plus one hour of Leadership Laboratory per week, Spring Quarter. Two academic substitutes are required the second year. Normally, these will be required or elective upper-division subjects directly applicable to the cadet's major field of study, and will be related to writing, speaking, mathematics, international politics and/or governments, or to science comprehension. They must be approved by the Professor of Military Science.

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.

Advanced Army ROTC students are paid subsistence allowances of approximately \$27.00 a month. While attending summer camp they are paid at the rate of \$78.00 a month and are furnished travel to and from the camp, subsistence, housing, uniforms, and medical attention.

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. The Army provides all textbooks used in the ROTC courses. 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. Robert A. Schelling, USN
309 Clark Hall

Associate Professors

William S. Mills III, Norbert H. Bednarek, William E. Riley, Stanley E. Sharp, Vernon D. Shirley, Bobby E. Smith, Walter F. Wright

Instructors

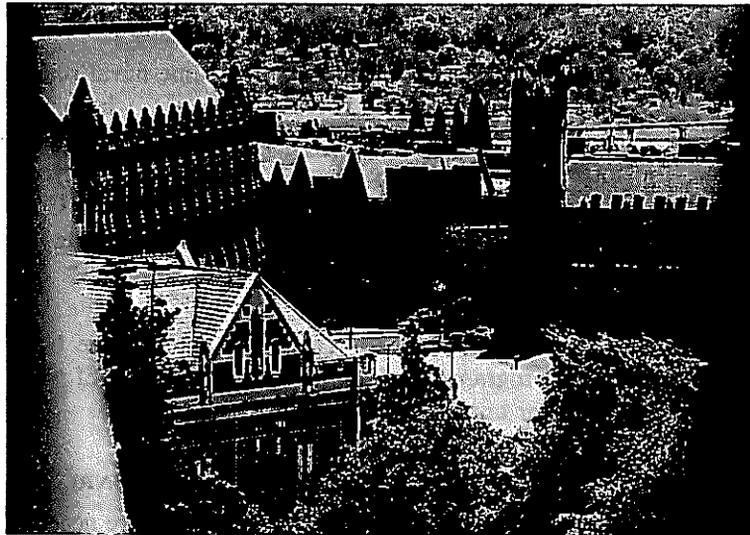
Donald W. Craig, Raymond R. Daly, Robert F. Deegan, Martin Ladd, Jr., Raymond W. Pool, Edward Springer

The Department of Naval Science offers to selected students a four-year program, taken concurrently with their work toward a baccalaureate degree, which prepares them for regular or reserve commissions in the United States Navy or Marine Corps.

Naval ROTC Contract Program (Naval ROTC Students)

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

Naval ROTC students must, with the consent of their parents, agree to complete the four-year course unless released by the Secretary of the Navy. They are required 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.



Entrance to the Naval ROTC program entitles students to deferment from the draft under the Selective Service Act of 1948 as amended.

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 July 1 of the year of entrance.
- (3) Meet physical requirements.
- (4) Be unmarried and agree to remain unmarried until commissioned.

Naval ROTC students have the status of civilians entering into a mutual agreement with the Navy, and are in training for commissions in the Naval Reserve or Marine Corps Reserve. They pay their own college expenses but receive a subsistence of 90 cents a day during their junior and senior years, including the intervening summer. The Navy furnishes the uniforms and books used in naval science courses.

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

Students in the Naval ROTC may enter any University curriculum that can normally be completed in four years. Students working toward a bachelor's degree in certain prescribed fields which may require more than four years for completion, are also eligible for entrance to the program.

All Naval ROTC students take the same naval science courses during the first two years. Students who plan to be commissioned in the Marine Corps take Marine Corps subjects 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.

High school graduates interested in entering the Naval ROTC program should write to the Professor of Naval Science or apply at Clark Hall.

Naval ROTC Regular Program (Midshipmen, USNR)

Each year a limited number of young men are accepted for the Naval ROTC regular program, following nationwide 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 retainer pay. Upon graduation they are commissioned as regular officers in the United States Navy or Marine Corps.

Qualifications and draft deferment are, in general, as listed above for the Naval ROTC Contract Program.

Application must be made in November for entrance into the program the following autumn.

Further information about the regular Naval ROTC Program may be obtained from the University of Washington, Naval ROTC Unit.

Air Science

Professor of Air Science

Lt. Col. Albert S. Babinec
Physics Annex 3

Assistant Professors

Kenneth L. Dyer, Jr., Matthew Hudson, Terrill E. Waiss

Instructors

Duane L. Gray, Jim N. McHenry, Darrell R. Parker,
Lindle M. Scott, George E. Vice

The basic program of the Department of Air Science consists of six quarters of military classroom instruction on the Foundations of Air Power. These are offered in conjunction with Leadership Laboratory, which is required each of the six quarters of the basic program and is conducted one hour each week.

After completing the basic program, students may apply for entrance to the advanced Air Force ROTC, which is designed to select and train college men as future Air Force officers. A number of students, including veterans, are selected for the advanced program, and each student selected must:

1. Successfully complete the two-year basic Air Force ROTC program, or, if a veteran, complete as much of the basic program as determined by the Professor of Air Science.
2. Attend a Summer Training Unit, normally between the junior and senior years.
3. Complete the advanced program as a prerequisite for graduation from the University.

The two-year advanced course requires classroom attendance or supervised research four hours a week, plus one hour of Leadership Laboratory. In the first year of the advanced course, cadets study the nature of war; development of airpower in the United States; mission and organization of the Defense Department; Air Force concepts, doctrine, and employment; astronautics and space operations; and the future development of aerospace power. Between the junior and senior years, advanced course cadets attend a four-week Summer Training Unit. During the senior year, cadets participate in a study of global relations of special concern to the Air Force officer, with attention to such aspects as weather, navigation, geography, international relations, and their service as commissioned officers.

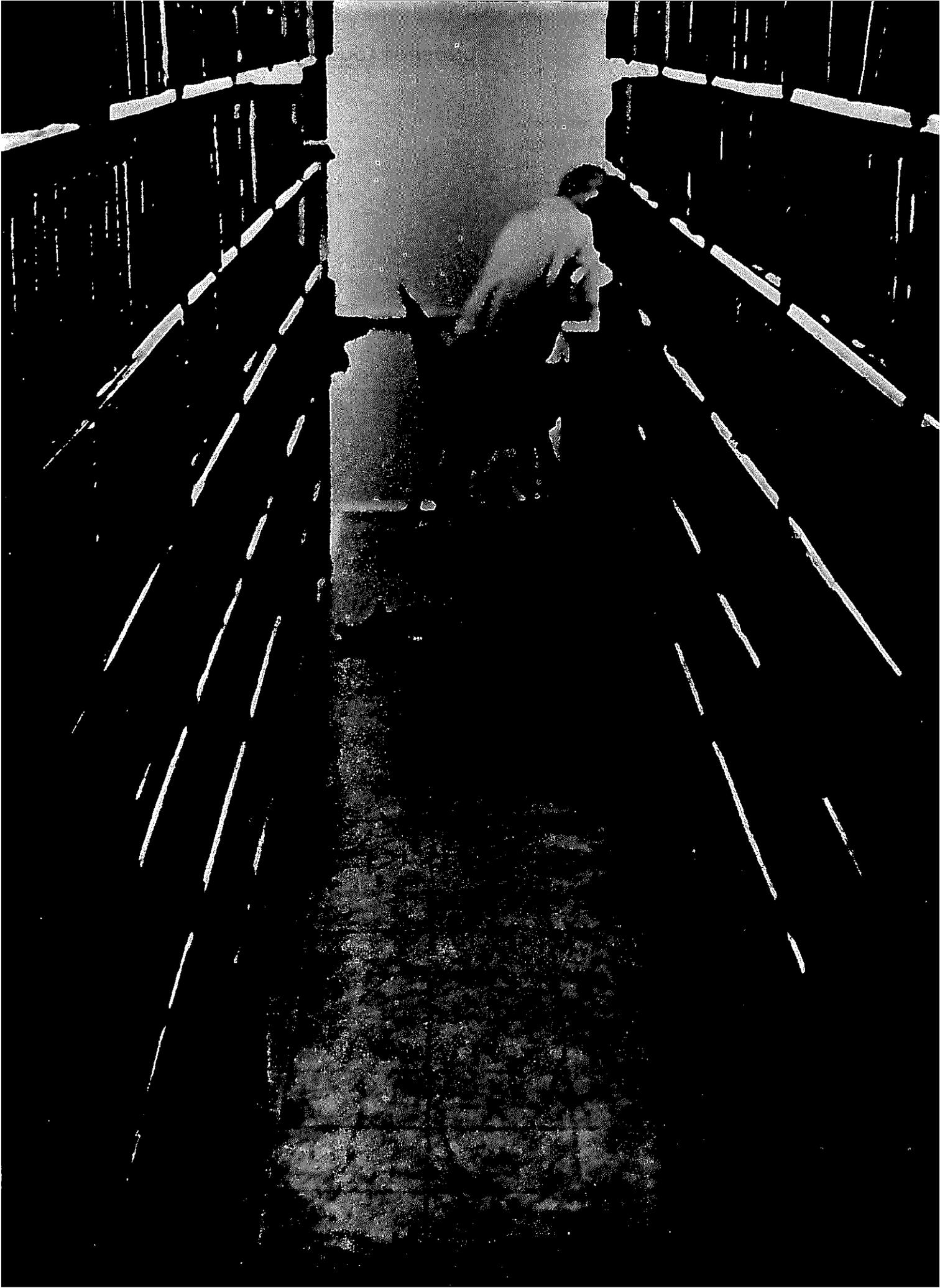


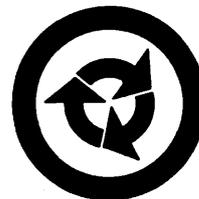
Advanced Air Force ROTC students are paid subsistence allowances of approximately \$27.00 a month. While attending Summer Training Unit they are paid at the rate of \$78.00 a month, and are furnished travel to and from the unit, subsistence, housing, uniforms, and medical attention.



Students in the basic program are furnished complete uniforms of the type worn by Air Force enlisted personnel. Students in the advanced program are furnished officer uniforms, which become their personal property when commissioned. Uniforms must be worn to all Leadership Laboratory periods and may be required for other AFROTC classes. The Air Force furnishes all textbooks used in Air Science courses. 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 Air Science, Physics Annex 3, Seattle, Washington 98105.





GRADUATE EDUCATION 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
George W. Farwell, Ph.D.
Associate Dean of the Graduate School
Edward C. Lingafelter, Ph.D.
Associate Dean of the Graduate School
Edward L. Ullman, 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*
A. R. Hilten, Jr., *Group I*
Ruth E. Penington, *Group II*
E. A. Uehling, *Group III*
W. R. Murphey, *Group IV*
Jim Rosenzweig, *Group V*
E. H. Dill, *Group VI*
L. H. Jensen, *Group VII*
Florence T. Hall, *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

A. C. Hamilton, Andrew R. Hilten, Jr. (*Chairman*),

John B. McDiarmid, William H. Rey, Thomas G. Rosenmeyer

Group II

William Bergsma, A. S. Edelstein, Gregory Falls, Ruth E. Penington (*Chairman*), Victor Steinbrueck

Group III

Allen C. Delacy, G. D. Halsey, Victor Klee, M. Rattray, Edwin H. Uehling (*Chairman*)

Group IV

Arthur Bestor, S. W. Bijou, J. Richard Huber, W. R. Murphey (*Chairman*), Clarence Schrag

Group V

Philip J. Bourque, Guy G. Gordon, Alice H. Hayden, Charles N. Henning, J. Rosenzweig (*Chairman*)

Group VI

Ellis H. Dill (*Chairman*), S. P. Gessel, Billy J. Hartz, L. N. Johanson, Walter E. Rogers

Group VII

W. H. Akeson, Neal B. Groman, Lyle H. Jensen (*Chairman*), R. T. Prehn, Lowell White

Group VIII

Elizabeth C. Giblin, Florence T. Hall (*Chairman*), Marguerite Hunt, L. W. Rising, Saul Schluger

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

GRADUATE EDUCATION

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-four 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 some seven hundred senior professors. About four thousand graduate students are now in residence, seeking their master's or doctoral degrees in the Graduate School at the University of Washington, and some three hundred postdoctoral students are also 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 further to 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

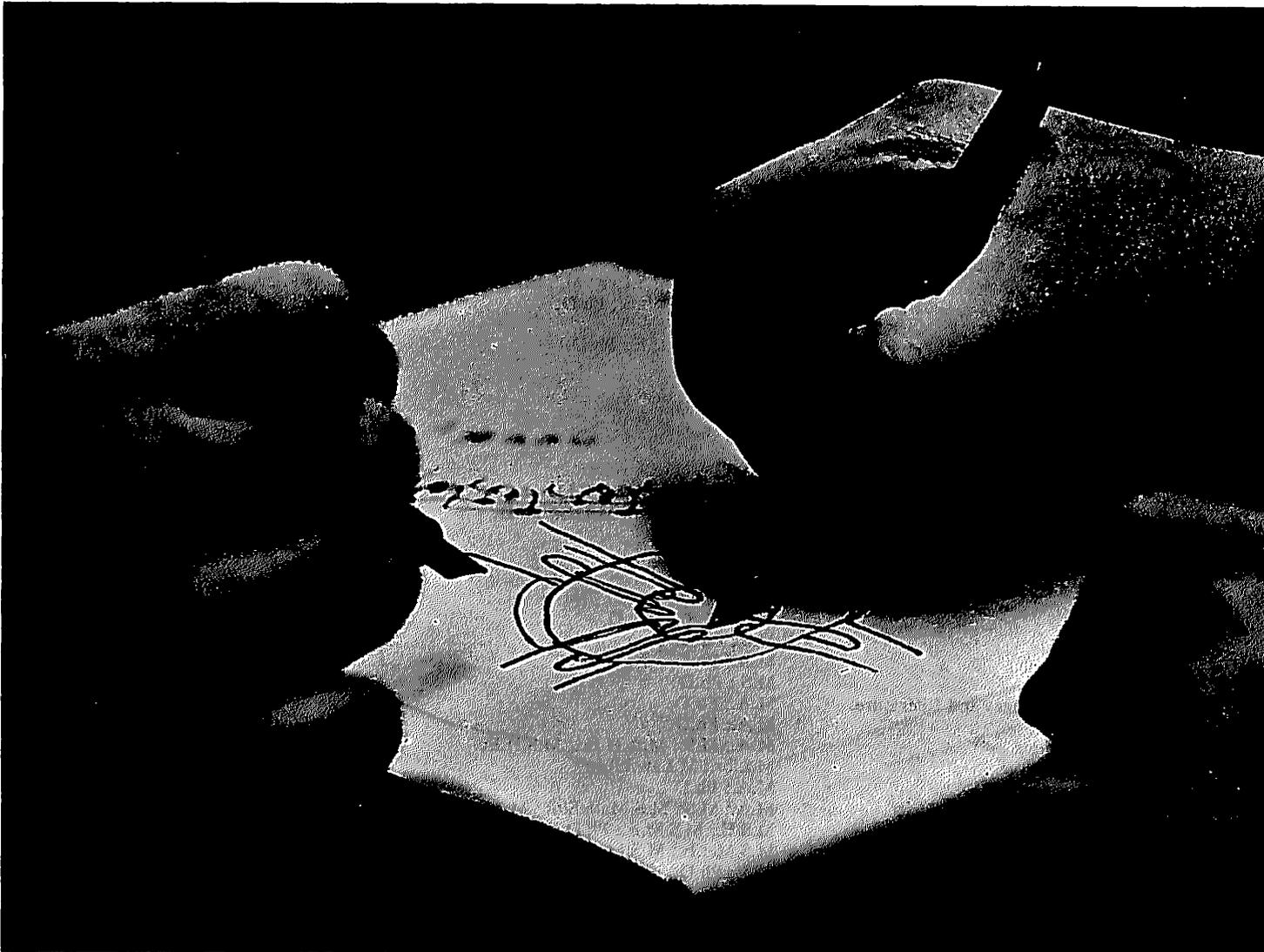
of Master at the end of one or two years of study, or Doctor at the end of three or more years of study. Students who have completed advanced degree programs usually serve as teachers, research or administrative leaders, or professional practitioners in their respective fields.

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 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-four 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.

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.	R. J. H. Bollard	E. H. Dill
Anthropology	M.A.; Ph.D.	Kenneth E. Read	Isabel S. Caro
Architecture	M.Arch.	R. H. Dietz	N. J. Johnston
Art	M.F.A.	Wendell Brazeau	Boyer Gonzales
Atmospheric Sciences	M.S.; Ph.D.	R. G. Fleagle	F. I. Badgley
Biochemistry	M.S.; Ph.D.	Earl W. Davie	Milton P. Gordon
Biological Structure	M.S.; Ph.D.	L. H. Jensen	R. J. Blandeau
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.	Drury A. Pifer	James I. Mueller
Chemical Engineering	M.S.E.; M.S.Ch.E.; Ph.D.	R. W. Moulton	C. A. Sleicher, Jr.
Chemistry	M.S.; Ph.D.	George W. Cady	Victorian Sivertz
Civil Engineering	M.S.E.; M.S.C.E.; Ph.D.	S. Sergev	C. H. Norris
Classics	M.A.; Ph.D.	J. B. McDiarmid	W. C. Grummel
Communications	M.A.Com.	W. E. Ames	M. Samuelson
Comparative Literature	M.A.; Ph.D.	Frank W. Jones	
Dentistry	M.S.Den.	Saul Schluger	A. W. Moore
Drama	M.A.	Gregory A. Falls	James Crider
Economics	M.A.; Ph.D.	D. A. Worcester	J. B. Gillingham
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.	A. C. Hamilton	Andrew R. Hillen, Jr.
Far Eastern and Slavic Languages and Literature	M.A.; Ph.D.	George E. Taylor	K. C. Hsiao
Fisheries	M.S.; Ph.D.	Richard Van Cleve	A. C. DeLacy
Forestry	M.F.; M.S.F.; Ph.D.	James S. Bethel	David M. Scott
Genetics	M.S.; Ph.D.	H. L. Roman	
Geography	M.A.; Ph.D.	J. C. Sherman	M. D. Thomas
Geology	M.S.; Ph.D.	Howard A. Coombs	V. S. Mallory
Germanic Languages and Literature	M.A.; Ph.D.	William H. Rey	Carroll E. Reed
History	M.A.; Ph.D.	Dauril Alden	Thomas J. Pressly
Home Economics	M.A.; M.S.; M.A.H.Ec.; M.S.H.Ec.	Mary L. Johnson	Florence T. Hall
Librarianship	M.Libr.; M.Law Libr.	Irving Lieberman	L. D. Bevis
Linguistics	M.A.; Ph.D.	Carroll E. Reed	W. F. Wyatt Jr.
Mathematics	M.A.; M.S.; M.S.Math.Stat.; M.A.T. Ph.D.	J. P. Jans	R. Blumenthal
Mechanical Engineering	M.S.E.; M.S.M.E.; Ph.D.	Blake D. Mills	C. J. Kippenhan
Metallurgical Engineering	M.S.Met.E.; M.S.Met.; M.S.E.; Ph.D.	Drury A. Pifer	D. H. Polonis
Microbiology	M.S.; Ph.D.	Howard C. Douglas	N. B. Groman
Mineral Engineering	M.S.Min.E.; M.S.CoalMin.E.; M.S.E.	Drury A. Pifer	D. L. Anderson
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.	Katherine J. Hoffman	Mary S. Tschudin
Oceanography	M.S.; Ph.D.	J. S. Creager	M. Grant Gross, Jr.
Pathology	Ph.D.	George M. Martin	E. A. Smuckler
Pharmacology	M.S.; Ph.D.	J. M. Dille	Theodore West
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.	Russell K. Cutler	N. F. Kunde
Physical and Health Education (Women)	M.S.Phy.Ed.; M.S.	Ruth M. Wilson	Katharine Fox
Physics	M.S.; Ph.D.	J. S. Blair	M. N. McDermott
Physiology and Biophysics	M.S.; Ph.D.	Thelma T. Kennedy	H. D. Patton
Political Science	M.A.; Ph.D.	Hugh A. Bone	Kenneth C. Cole
Preventive Medicine	M.S. Prev. Med.	J. Thomas Grayston	Edward P. Perrin
Psychology	M.S.; Ph.D.	George P. Horton	Louise B. Heathers
Public Affairs	M.Pub.Admn.	George Shipman	Brewster C. Denny
Radiological Sciences	M.S.Rad.Sci.	Kenneth Jackson	L. Donaldson;
			Ralph Baltzo
Romance Languages and Literature	M.A.; Ph.D.	A. E. Creore	M. Penuelas
Scandinavian Languages and Literature	M.A.	Sverre Arestad	W. 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.	Horace Rahskopf	Laura I. Crowell
		(General)	
		James A. Carrell	
		(Speech and Hearing Therapy)	
Surgery	M.S.	L. M. Nyhus	J. Ansell
Urban Planning	M.UrbanPlan.	M. R. Wolfe	Thomas Norton
Zoology	M.S.; Ph.D.	Alan J. Kohn	Aubrey Gorbman



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 24, 1964, and on January 23, April 10, and August 7, 1965. *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.

Although the normal load in graduate work is 12 credits, 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. Courses numbered below 300 are not applicable to residence or course credit for advanced degrees.

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.

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 as a Full-time Student or as a Part-time Student, or enrolled as an On-leave Student. Registration for courses through the Division of Evening and Extension Classes or the Division of Correspondence Study 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 five-dollar 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 three 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* en-

title 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 no-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. If the student expects to be away from the University for only the Summer Quarter, he petitions and enrolls in the usual manner as an On-leave Student Summer Quarter only and pays no fee. 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. Half of the 36 credits for the master's degree must be for work numbered 500 and above.
 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 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*. When the application is received, the student's record and his current registration will be reviewed in the Graduate School office, and he and the Graduate Program Adviser in his department will be notified promptly as to whether or not he will have satisfied the requirements for the degree at the end of the quarter. 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. Failure to meet the requirements of the Graduate School or of the faculty in his Department will necessarily prolong the student's candidacy for his degree. 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 candidate may demonstrate his present capacities and future promise for scholarly work.

Summary of Requirements

In order to qualify for the doctor's degree, the candidate 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. 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.

5. 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.

6. Pass creditably a Final Examination, which is usually devoted to the dissertation and the field with which it is concerned.

7. All work for the doctor's degree must be completed within ten years. This includes applicable work from the master's degree and work transferred from other institutions.

8. Must be registered as a regular Full-time or Part-time Student at the University for the quarter in which the degree is to be conferred.

9. Students must 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 one quarter 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 his 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 advanced 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 Enrollment Application," 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 Enrollment Application," and correspondence regarding admission should be addressed to the University of Washington, Office of Admissions, Seattle, Washington 98105.

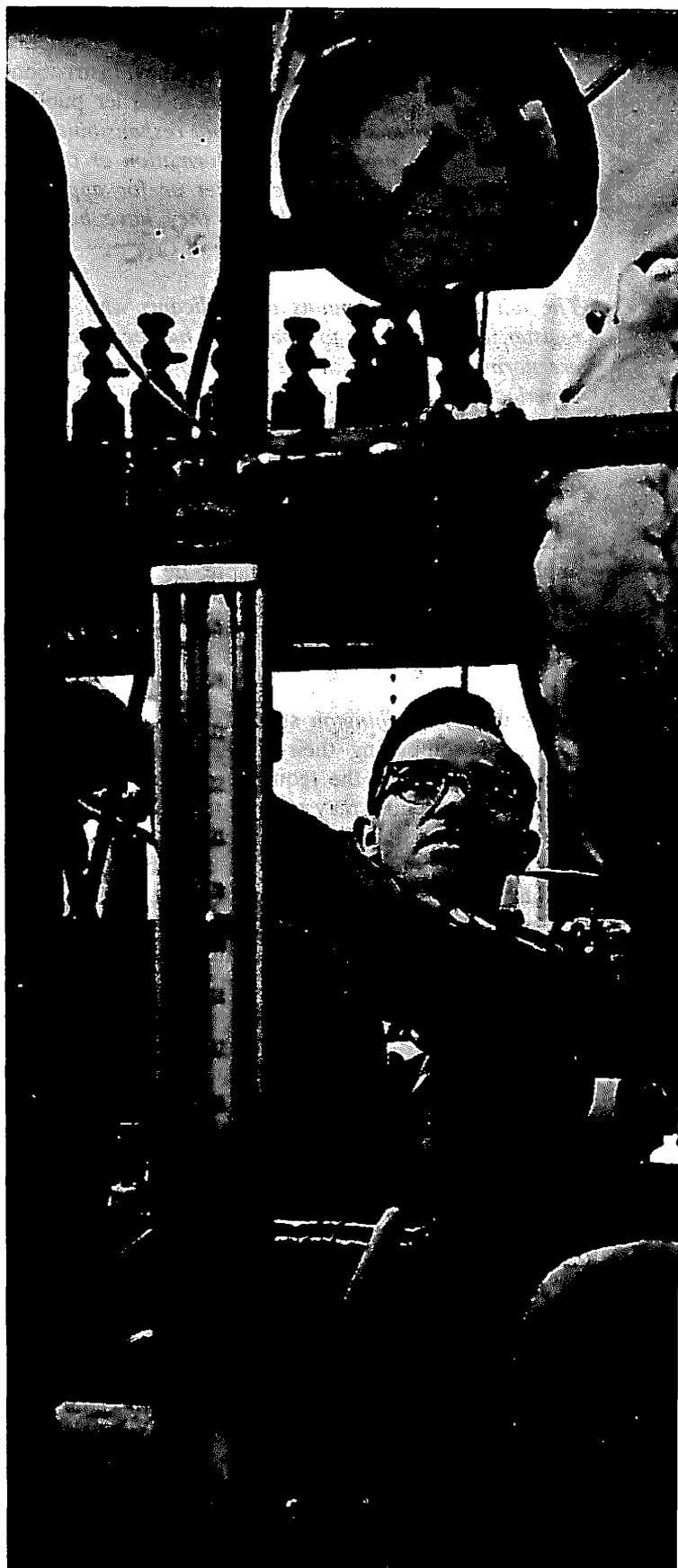
Each application for admission to the Graduate School as a Regular Graduate Student or as a Visiting Graduate Student is subject to an application fee of five dollars (\$5.00). Payment must accompany the application (U.S. dollars only). This fee is not refundable and is not credited against any other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



A leaflet giving general information and instructions for registration is mailed to new students with the notice of admission. In the event of a discrepancy, instructions in the leaflet supersede those found in earlier publications. *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 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 six 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 six credits in graduate courses in addition to their six 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 March 1 to be considered for admission Autumn Quarter, or six months before the opening of another quarter in which they wish to enroll. 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 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 the 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 Enrollment Application" 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; June 15 for Summer Quarter.

Unclassified Five Students

A student admitted to Unclassified Five status is *not* in the Graduate School. He must have a bachelor's degree and may be admitted to Unclassified Five status in one of the undergraduate colleges to pursue the following objectives: (1) to qualify for a second bachelor's degree, (2) to qualify for a teaching certificate, (3) to strengthen academic record for later application to the Graduate School, or (4) to take additional undergraduate courses for some other purpose.

Ordinarily students in Unclassified Five status may not register for courses numbered 500 and above. Courses completed while in the Unclassified Five status may not be applied later to an advanced degree in the Graduate School.

Second Bachelor's Degree

Students who wish to obtain a second bachelor's degree register as Unclassified Five Students in the undergraduate college from which they expect to obtain the degree, 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 the Dean of the Graduate School; (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 *Official 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 the Graduate School Office. 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.

Registered Credits Allowed Each Quarter

The maximum load for graduate students is regarded as 15 credits per quarter; 12 credits constitute a normal load. 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 six credits.

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

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 and the Dean of the Graduate School. 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). Awards and appointments are usually made about April 1 or earlier. Application forms may be secured by writing to the Graduate School.

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	*Graduate Student Classification for Eligibility	1964-65 Stipend for Half-Time Service (20 hours per week)	
		One Month	Academic Year
Teaching Assistant or Research Assistant or Graduate Staff Assistant	} Premaster or Intermediate or Candidate	\$280	\$2,520
Predoctoral Teaching Associate I or Predoctoral Research Associate I or Predoctoral Staff Associate I			
Predoctoral Teaching Associate II or Predoctoral Research Associate II or Predoctoral Staff Associate II	} Intermediate or Candidate	\$300	\$2,700
	} Candidate	\$320	\$2,880

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

**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.

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 1964-65 academic year these appointments carry a minimum stipend of \$340 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 students to these positions may not be made until after the position itself has been specifically approved. Stipends for these appointments for the 1964-65 academic year range from \$280 per month to \$320 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 and also certain scholarships are available through the Graduate School or graduate departments to outstanding graduate students in all fields of study leading to advanced degrees. Application should be made by February 15.

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 both the Cooperative Graduate Fellowship Program and the Program of Summer Fellowships for Graduate Teaching Assistants. The University also participates in the National Science Foundation Graduate Fellowship Program.

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 admin-

istered 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

Emergency and long-term loans are available through the Office of the Dean of Students. Applications for a loan should be made at least six weeks before the money is needed.

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.

The Office of University Research has been established in the Graduate School to assist in the further development of the research activities of the University and the community. Its two main responsibilities are (1) to aid members of the faculty in developing and maintaining their several research programs, and (2) to provide a central point of contact for off-campus agencies turning to the University for research assistance.

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 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.

The Graduate School is the academic agency of the University responsible for the administration of research funds supported by grants or contracts and for the final review and transmission of research proposals to outside agencies.

Research cooperation with business or industry may be developed through the Office of University Research. This cooperation usually takes one of two forms. In one of these, a faculty member provides advice or other assistance toward the solution of a business or industrial problem in accordance with the terms of a consulting agreement. In the other, sponsorship of a research project is assumed by an outside agency through a research grant or a research contract established between the agency and the University. The Office of University Research is prepared to assist in the initiation of either type of arrangement. Requests for information and assistance should be addressed to: University of Washington, The Coordinator, Office of University Research, Graduate School, Seattle, Washington 98105.



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.

Bureau of Governmental Research and Services

Director

Donald H. Webster, Ph.D.
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.

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

The Center for Graduate Study at Hanford, located at Richland, Washington, is an off-campus facility operated by the University of Washington and administered in collaboration with Washington State University and Oregon State University. The facility is available for graduate study and research to students associated with the collaborating universities, as well as other institutions of higher learning 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 and other institutions.

Currently, upper-division and graduate-level 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 the General Electric Company, 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 institutions of higher learning.

Most of the students and faculty of the Graduate Center are employees of the Atomic Energy Commission or its prime contractor, the General Electric Company, 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 *Graduate Center's Bulletin*, containing general information and course offerings, should be addressed to: The Director, Center for Graduate Study at Hanford, University of Washington, 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 degree of Doctor of Philosophy.

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.
201 Johnson Hall

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 summer, the Laboratories offer an oppor-



tunity 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. An annual bulletin is published describing the summer program and the facilities 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.

Laboratory of Radiation Biology

Director

Lauren R. Donaldson, Ph.D.
110 Fisheries Center

Associate Director

Allyn H. Seymour, Ph.D.
110 Fisheries Center

The Laboratory of Radiation Biology, a research unit supported by the U.S. Atomic Energy Commission and administered through the Graduate School, conducts long-term investigations of the biological distribution and effects of radioactivity in the environment, particularly the aquatic environment.

Research programs are conducted in various parts of the Pacific Ocean, at a field station at Fern Lake in Kitsap County, and in the Laboratory's home facilities. In its graduate training aspects, the work of the Laboratory helps fill the need for specialists trained in the techniques of environmental radiobiology and prepared to undertake studies requiring knowledge of both the physical and biological sciences.

Graduate students desiring training should hold degrees in the biological sciences with supporting course work in physics, chemistry, and mathematics, or degrees in chemistry or physics with supporting work in the biological sciences.

Requests for information or for admission to activities should be addressed to: University of Washington, The Director, Laboratory of Radiation Biology, Seattle, Washington 98105.

Office of Scholarly Journals

Acting 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, Graduate School, Seattle, Washington 98105.

Research Computer Laboratory

Director

David B. Dekker, Ph.D.
Research Computer Laboratory

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

The facilities include an IBM 650, an IBM 709 with a 32K core, twelve tape units, complete off-line tape-to-card, card-to-tape, and tape-to-printer equipment, an IBM 1401 and IBM 7094 and 7040 high speed digital computing machinery.

The Research Computer Laboratory is administered by the Dean of the Graduate School with the aid of a committee of the faculty of the University of Washington and 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 Laboratory should be addressed to: University of Washington, The Director, Research Computer Laboratory, 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-fifth 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

The concept of learning as an enduring process is realized through a sustained continuing education program for adults.

Continuing Education at the University of Washington 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 Continuing Education works closely with the academic departments, many of its programs are of direct interest to the undergraduate, as well as to the employed adult, since the programs include both credit and noncredit classes. The Division of Evening and Extension Classes offers late afternoon and evening classes carrying residence credit for those students who have been regularly admitted to the University, and it is possible to obtain, in some fields, most of the credits toward a bachelor's degree.

The Division also offers classes carrying extension credit for persons *not* admitted to the University, who are at least twenty years of age and high school gradu-

ates. In addition, the Division of Correspondence Study offers some two hundred home study courses for extension credit, in which more than forty-five hundred students are currently enrolled.

Noncredit activities, many conducted on a state-wide basis, are administered by the Division of Extension Services, including informal courses, short courses and conferences, television courses, liberal arts seminars, and lectures and concerts by visiting artists and lecturers, as well as many concerts and operas sponsored by the School of Music.

These programs and services are available to all undergraduates, as well as to graduate and professional students, and are an important aspect of the total educational experience of these students.

Division of Evening and Extension Classes

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.

Though the programs are primarily intended for those persons unable to attend during the day, evening classes are often of value to the day student who wishes to supplement his schedule. Evening class students fall into three categories:

- (1) The student who has been admitted to the University and is pursuing an approved course of study;
- (2) The student who has *not* been admitted to the University but who is either (a) in good standing at an accredited university or college, or (b) a high school graduate at least twenty years old who has not attended any university or college;
- (3) The student who does not wish to take courses for academic credit.

A bulletin listing the courses may be obtained from the office of the Division of Evening and Extension Classes, located in Lewis Hall.

Division of Correspondence Study

This program is designed to meet the needs of those who wish to take college level courses, but find it difficult or impossible to attend formal day or evening classes. In many instances, correspondence study is useful to the undergraduate who, for one reason or another, may wish to pursue a part of his course of study by this method. Courses are prepared by regular members of the faculty.

Subject to certain restrictions, correspondence courses may be offered as extension credits toward a bachelor's degree or teaching certificate. Credit courses are offered in nearly every field, and undergraduate research courses for summer study can be adapted to suit almost any area of interest.

Courses combining lectures and correspondence study are also offered in the Seattle area, and special arrangements can be made with the Division to set up courses suitable for group study and discussion.

In addition, noncredit mathematics courses required for University entrance are available to adults who do not have required high school mathematics credits but who wish to qualify for admission.

A bulletin listing the courses may be obtained from the office of the Division of Correspondence Study, located in Lewis Hall.

Division of Extension Services

Lectures and Concerts

Unusual musical events and lecturers 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.

Short Courses and Conferences

Institutes, conferences, and seminars involving both student and off-campus groups are arranged through this office, which also works with various technical 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.

Informal Courses

Presented quarterly, Informal Courses often survey a particular field of interest from a broader perspective than the more detailed and specialized day classes. In many instances, a panel of faculty members individually presents a series of viewpoints on a general theme, and participants have the opportunity to discuss issues raised by the lecturers. The informal course is carefully planned for the purpose of broadening background knowledge of our culture and tradition, and can be of particular value to the interested undergraduate.

Telecourses

Another Continuing Education activity frequently useful to the undergraduate is the Telecourse program. 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 the state of Washington as well as to stations in other parts of the country. As an aid to those who follow a series, a study guide prepared by the instructor can be purchased by the viewer.

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



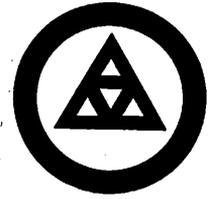
and University faculty members together in an informal setting which encourages and stimulates a free exchange of ideas. In addition to the adult seminars, a number of seminars for high school students are presented annually.

Information about any of the preceding activities may be obtained from the Director of Extension Services in Lewis Hall.

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 which have 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, 1964, fifty-two communities had requested and received assistance from the Bureau.





ARCHITECTURE AND URBAN PLANNING

Dean

Robert H. Dietz
204 Architecture

Professors

Robert H. Dietz, Arthur P. Herrman, Alfred Jensen (emeritus), Victor Steinbrueck, Myer R. Wolfe

Associate Professors

Richard Haag, Norman J. Johnston, Keith R. Kolb, Wendell H. Lovett, Omer L. Mithun, Ibsen A. Nelsen, Donald G. Radcliffe, John A. Rohrer, John R. Sproule, Daniel M. Streissguth, Phillip Thiel, Gerard R. Torrence, William C. Wherrette

Assistant Professors

Robert G. Albrecht, Richard S. Alden, Robert A. Chervenak, Jacob W. Curtis, Phillip L. Jacobson, Thomas J. Norton, Donald K. Sakuma, Robert Sasanoff, T. Kenneth Tang, Robert J. Reichert (acting)

Lecturers

George A. Hartman, Robert Koski, Thomas A. Leonidas, Robert J. Patton, Robert P. Shomler (visiting), Richard M. Stern, Carl L. Timpe, Gordon B. Varey, Nathan Wilkinson, Jr., Gerald A. Williams, David H. Wright

Visiting Faculty

Juan A. A. Casasco, Rudolf W. Doernach, Gerald F. Fitzmaurice, Arthur L. Grey, Stefan Ott, Gerald Pomeroy, Gary H. Winkel

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 business 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 College offers three five-year professional degree programs leading to bachelor's degrees in architecture, landscape architecture, and urban planning, and also offers work leading to the four-year degree of Bachelor of Science in Building Technology and Administration. At the graduate level, the College offers Master 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 Fair 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 main Suzzallo Library) with an extensive collection of architectural and urban planning materials. Included are approximately 5,800 books, 6,000 pamphlets, 160 current periodicals, and 10,000 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 profession. A social organization as well as a student society, *Atelier* schedules a number of social events, including an annual ball. The group also sponsors a publication which features student work and significant materials from outside sources.

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 scholarships and medals are awarded annually to architectural students who demonstrate outstanding scholastic ability, general excellence, and significant design mastery. Medals are presented by the American Institute of Architects; Alpha Rho Chi (national social fraternity of architecture); and the faculty of the College.

For further information concerning scholarships, consult the *Handbook of Scholarships* available in the Office of Financial Aids in the Student Union Building on campus (telephone 543-5000), or by writing the Office of Financial Aids, University of Washington, Seattle, Washington 98105.

Undergraduate Programs

Adviser

Norman J. Johnston
206 Architecture Hall

Admission as Freshmen

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.



Admission to the Professional Program

Admission to the program (last three years) is selective and based upon the recommendations of the admission committees of the College. Each applicant must appear for a personal interview.

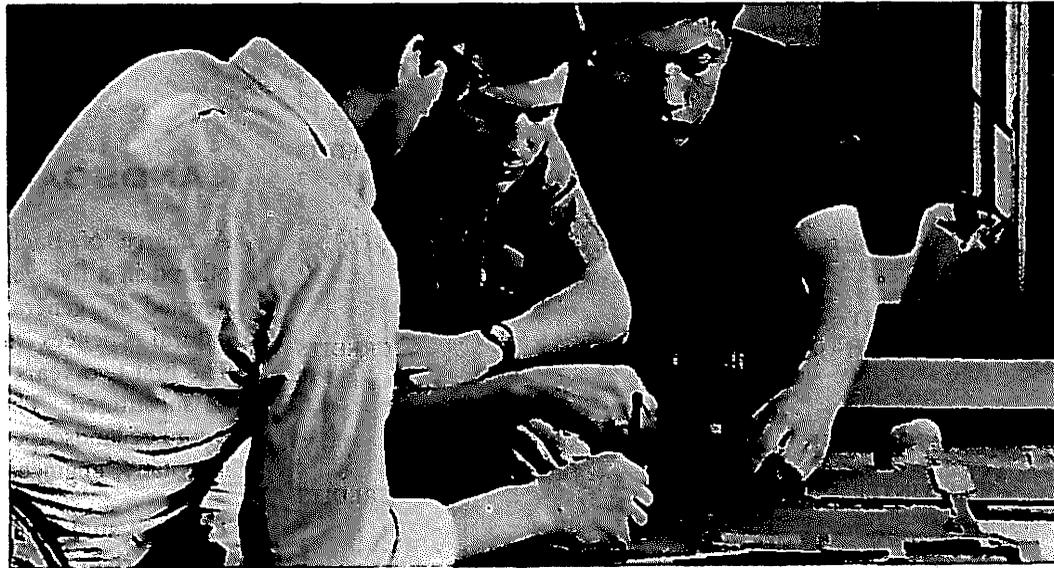
Graduation Requirements

For graduation with a degree of Bachelor of Architecture, Bachelor of Landscape Architecture, or Bachelor of Urban Planning, the College requires satisfying the curriculum involved, a minimum of 225 credits, and three quarters of physical education activity; for the degree of Bachelor of Science in Building Technology and Administration similar satisfaction of curriculum is required with a minimum of 180 credits and three

quarters of physical education activity. The student majoring in architecture, landscape architecture, or urban planning 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 (except urban planning students).

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.



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.

Program of Study

Chairman

Daniel M. Streissguth

204 Architecture

The five-year curriculum leading to the degree of Bachelor of Architecture is outlined below.

TWO-YEAR PROFESSIONAL REQUIREMENTS

First Year

AUTUMN QUARTER		CREDITS
ARCH 106	INTRODUCTION	5
ART 105	FREEHAND DRAWING	3
ENGL 101	COMPOSITION	3
MATH 104	TRIGONOMETRY	2
APPROVED ELECTIVE		2
PHYS. EDUC. ACTIVITY		1

WINTER QUARTER		CREDITS
ART 106	FREEHAND DRAWING	3
ENGL 102	COMPOSITION	3
MATH 105	ALGEBRA	5
APPROVED ELECTIVE		5
PHYS. EDUC. ACTIVITY		1

SPRING QUARTER		CREDITS
ART	ELECTIVE	3
ENGL 103	COMPOSITION	3
SOC 110	SURVEY	3
APPROVED ELECTIVE		5
PHYS. EDUC. ACTIVITY		1

Second Year

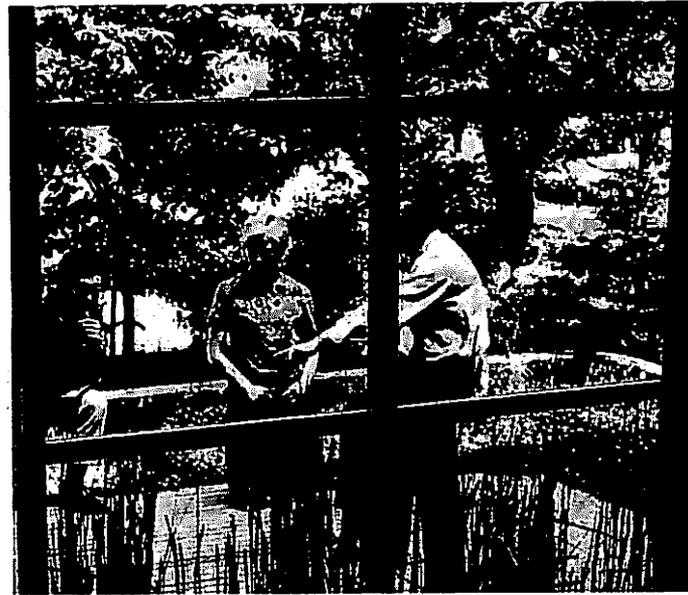
AUTUMN QUARTER		CREDITS
ARCH 124	DESIGN GR I	6
PHYS 101	GENERAL	4
PHYS 107	GENERAL LAB	1
APPROVED ELECTIVE		5

WINTER QUARTER		CREDITS
ARCH 125	DESIGN GR I	6
ART 258	WATER COLOR	3
PHYS 102	GENERAL	4
PHYS 108	GENERAL LAB	1
APPROVED ELECTIVE		2

SPRING QUARTER		CREDITS
ARCH 126	DESIGN GR I	6
ART 259	ADV. WATER COLOR	3
PHYS 103	GENERAL	4
PHYS 109	GENERAL LAB	1
APPROVED ELECTIVE		2

Three-Year Professional Requirements

Subject material of the three-year professional curriculum includes offerings in architectural design, history, theory, structure, mechanical equipment, contract drawings, specifications, materials, illumination, acoustics, building economics, professional practice, landscape architecture, urban planning, and approved electives.



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 recreation 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 listed below. Richard Haag is in charge.

TWO-YEAR PREPROFESSIONAL REQUIREMENTS

First Year

AUTUMN QUARTER		CREDITS
ARCH 106	INTRODUCTION	5
ART 105	FREEHAND DRAWING	3
ENGL 101	COMPOSITION	3



MATH 104	TRIGONOMETRY	3
APPROVED ELECTIVE		2
PHYS. EDUC. ACTIVITY		1

WINTER QUARTER		CREDITS
ART 106	FREEHAND DRAWING	3
ENGL 102	COMPOSITION	3
MATH 105	ALGEBRA	5
APPROVED ELECTIVE		5
PHYS. EDUC. ACTIVITY		1

SPRING QUARTER		CREDITS
ART	ELECTIVE	3
ENGL 103	COMPOSITION	3
SOC 110	SURVEY	3
APPROVED ELECTIVE		5
PHYS. EDUC. ACTIVITY		1

Second Year		
AUTUMN QUARTER		CREDITS
ARCH 124	DESIGN GR I	6
BIOL 101J	GENERAL	5
GEOL 101	GENERAL	5

WINTER QUARTER		CREDITS
ARCH 125	DESIGN GR I	6
BIOL 102J	GENERAL	5
ART 258	WATER COLOR	3
APPROVED ELECTIVE		2

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

SPRING QUARTER		CREDITS
ARCH 126	DESIGN GR I	6
ART 272	SCULPTURE	3
BOT 113	ELEM BOTANY	5
APPROVED ELECTIVE		2

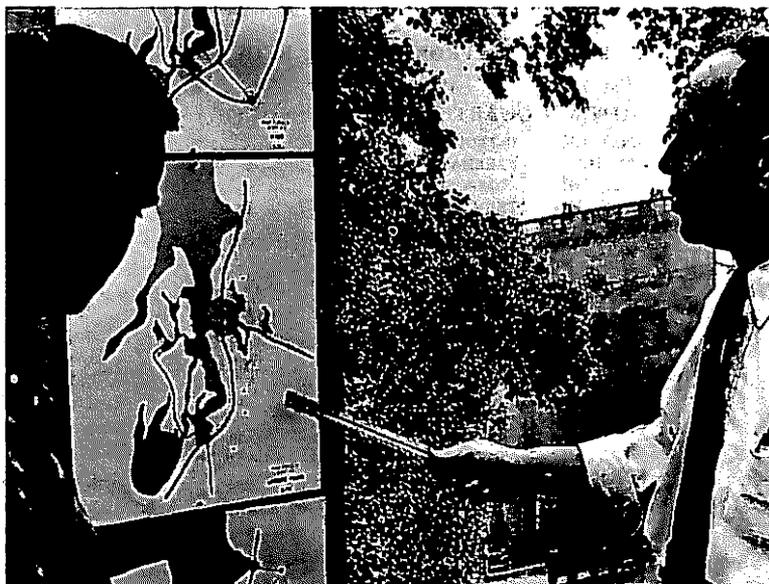
THREE-YEAR PROFESSIONAL REQUIREMENTS

Subject material of the three-year professional curriculum includes offerings in architectural and landscape architectural design, history, theory and perception, surveying, construction, botany, forest recreation and forestry, art, anthropology, urban planning, geography, sociology, and approved electives.

URBAN PLANNING

It is important that a professional planner have an integrated understanding of his community and of its purposes and problems. Therefore, 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 Urban Planning 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 are offered by the College of Architecture and Urban Planning. The undergraduate program is a five-year course of study which leads to a Bachelor of Urban Planning degree. The graduate program, which leads to the degree of Master of Urban Planning, normally covers a two-year period. The educational objectives of the undergraduate and graduate programs are similar in that both are concerned with urban studies and techniques and methods of urban planning, but the emphases of the two curricula are somewhat different. The undergraduate program is intended for the student



who is primarily interested in the design and physical planning aspects of urban planning. Considerable attention is given to the elements of physical planning, including the development of useful and aesthetic patterns in space and structure, and of design precepts for large groups of buildings and entire cities. The program begins with two years of preprofessional training which is common to the architecture and landscape architecture program. In the following three years, the professional training progressively emphasizes factors affecting the use of land and elements of the urban planning process.

The graduate program, on the other hand, is also concerned with broader areas of planning research and administration. This program draws students from a variety of undergraduate backgrounds such as sociology, geography, political science, civil engineering, and architecture. Selected urban study and technique courses are taken to provide a basis for the 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.

Program of Study

The five-year curriculum leading to the degree of Bachelor of Urban Planning is outlined below. Myer R. Wolfe is in charge.

TWO-YEAR PREPROFESSIONAL REQUIREMENTS

First Year

AUTUMN QUARTER		CREDITS
ARCH 106	INTRODUCTION	5
ART 105	FREEHAND DRAWING	3
ENGL 101	COMPOSITION	3
MATH 104	TRIGONOMETRY	3
APPROVED ELECTIVE		2
PHYS. EDUC. ACTIVITY		1

WINTER QUARTER		CREDITS
ART 106	FREEHAND DRAWING	3
ENGL 102	COMPOSITION	3
MATH 105	ALGEBRA	5
APPROVED ELECTIVE		5
PHYS. EDUC. ACTIVITY		1

SPRING QUARTER		CREDITS
ART LAB	ELECTIVE	3
ENGL 103	COMPOSITION	3
SOC 110	SURVEY	3
APPROVED ELECTIVE		5
PHYS. EDUC. ACTIVITY		1

Second Year

AUTUMN QUARTER		CREDITS
ARCH 124	DESIGN GR I	6
PHYS 101	GENERAL	4
PHYS 107	GENERAL LAB	1
APPROVED ELECTIVES		5

WINTER QUARTER		CREDITS
ARCH 125	DESIGN GR I	6
ART 258	WATER COLOR	3
PHYS 102	GENERAL	4
PHYS 108	GENERAL LAB	1
APPROVED ELECTIVE		2

SPRING QUARTER		CREDITS
ARCH 126	DESIGN GR I	6
ART 259	ADV WATER COLOR	3
PHYS 103	GENERAL	4
PHYS 109	GENERAL LAB	1
APPROVED ELECTIVE		2

THREE-YEAR PROFESSIONAL REQUIREMENTS

Subject material of the three-year professional curriculum includes offerings in architectural and city planning design, history, urban form, housing, surveying, urban planning analysis, public finance and taxation, traffic engineering, urban land economics, municipal government and administration, landscape architecture, economics, community facilities, sociology, urban geography, and approved electives.



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 this 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.

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. Phillip L. Jacobson is in charge.

FIRST TWO-YEAR REQUIREMENTS

First Year

AUTUMN QUARTER		CREDITS
ARCH 106	INTRODUCTION	5
ENGL 101	COMPOSITION	3
MATH 104	TRIGONOMETRY	3
PHIL 100	INTRODUCTION	5
PHYS. EDUC. ACTIVITY	. . . . .	1

WINTER QUARTER		CREDITS
ENGL 102	COMPOSITION	3
MATH 105	ALGEBRA	5
PSYCH 100	GENERAL	5
APPROVED ELECTIVE	. . . . .	3
PHYS. EDUC. ACTIVITY	. . . . .	1

SPRING QUARTER		CREDITS
CHEM 100	CHEMICAL SCIENCE OR 101 GENERAL	5
ENGL 103	COMPOSITION	3
SOC 110	SURVEY	5
APPROVED ELECTIVE	. . . . .	3
PHYS. EDUC. ACTIVITY	. . . . .	1

Second Year

AUTUMN QUARTER		CREDITS
ARCH 303	HISTORY	3
ACCTG 210	FUNDAMENTALS	3
PHYS 101	GENERAL	4
PHYS 107	GENERAL LAB	1
BT & A 201	BLDG MATERIALS	3
APPROVED ELECTIVE	. . . . .	5

WINTER QUARTER		CREDITS
ECON 200	INTRODUCTION OR 211 GENERAL	5 or 3
ACCTG 220	FUNDAMENTALS	3
PHYS 102	GENERAL	4
PHYS 108	GENERAL LAB	1
APPROVED ELECTIVE	. . . . .	3 or 5

SPRING QUARTER		CREDITS
ECON 340	LABOR	5
ACCTG 230	BASIC ACCTG ANAL	3
PHYS 103	GENERAL	4
PHYS 109	GENERAL LAB	1
APPROVED ELECTIVE	. . . . .	3

ADDITIONAL REQUIREMENTS

The remaining two years of the curriculum include offerings in structures, mechanical equipment, urban planning, business law, real estate, production, history of building, building industry organization, building equipment and techniques, estimating, building financing, and approved electives.

Graduate Programs

Graduate Program Advisers

Robert H. Dietz, Architecture
204 Architecture Hall

Myer R. Wolfe, Urban Planning
205 Architecture Hall

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. Seminars and research focus upon a study of the interaction of these forces and their resultant effect upon architecture. The student is permitted to select his study in various areas of interest with special emphasis on civic design, planning, and building organization in education and health facilities. Such supplementary courses will be offered from those listed in this catalog as the Graduate Program Adviser deems appropriate to an individual's program.

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 Education* section. For graduate study, the approval of both the College of Architecture and Urban Planning and the Graduate School is necessary.

ARCHITECTURE

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. In addition, he must produce scholastic evidence of his proficiency in design, planning, structures, mechanics, aesthetics, and history to the Supervisory Committee of the faculty of the College of Architecture and Urban Planning. 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.

Graduate work in Architecture normally takes one year. A degree of Master of Architecture will be awarded upon satisfactory completion of 36 or more credits, which will include 9 credits for a master's thesis. A foreign language is not required. A minimum of one school year (three quarters of full-time registration or the equivalent) in residence is required of students seeking a degree of Master of Architecture. Although the master's thesis may be prepared and presented during the three quarters' residence period, such procedure will not be encouraged in order that more time and effort can be devoted to required subject material during the academic year.

Further inquiries regarding the program should be addressed to: Prof. Robert H. Dietz, Dean, College of Architecture and Urban Planning.

Program of Study

PROFESSIONAL COURSES

ARCH 524, 525, 526 ADVANCED ARCHITECTURAL STUDIES (6, 6, 6)
ARCH 560, 561, 562 GRADUATE SEMINAR (3, 3, 3)
ARCH 600 RESEARCH (*)
ARCH 700 THESIS (*)

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

ELECTIVES

URB PLANNING 479 THE URBAN FORM (2)
URB PLANNING 480 URBAN PLANNING ANALYSIS I (3)
URB PLANNING 482 URBAN COMMUNITY FACILITIES (2)
URB PLANNING 485 HOUSING (2)
URB PLANNING 490 CITY PLANNING DESIGN (7)
ECON 350 PUBLIC FINANCE AND TAXATION I (5)
POL SCI 375 PROBLEMS OF MUNICIPAL GOVERNMENT AND ADMINISTRATION (5)
REAL ESTATE 301 URBAN LAND ECONOMICS AND REAL ESTATE INSTITUTIONS (5)

Typical Program for Graduate Students in Architecture

AUTUMN QUARTER		CREDITS
ARCH 524	ADV ARCH STUDIES	6
ARCH 560	GRAD SEMINAR	3
ARCH 600	RESEARCH (OPTIONAL)	*
	FOUNDATION COURSES OR ELECTIVE	3
IN ADDITION: ARCH 700 THESIS		9

WINTER QUARTER		CREDITS
ARCH 525	ADV ARCH STUDIES	6
ARCH 561	GRAD SEMINAR	3
ARCH 600	RESEARCH (OPTIONAL)	*
	FOUNDATION COURSES OR ELECTIVE	3

SPRING QUARTER		CREDITS
ARCH 526	ADV ARCH STUDIES	6
ARCH 562	GRAD SEMINAR	3
ARCH 600	RESEARCH (OPTIONAL)	*
	FOUNDATION COURSES OR ELECTIVE	3

* Credit to be arranged



URBAN PLANNING

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 requesting the Urban Planning Curriculum Prospectus from the Department.

Program of Study

FOUNDATION COURSES

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

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 credit toward the master's degree will be granted for these courses.

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).

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

- †PROBLEMS OF MUNICIPAL GOVERNMENT AND ADMINISTRATION (POLITICAL SCIENCE 375)
- STATE AND LOCAL 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

- SEMINAR IN URBAN RENEWAL (URBAN PLANNING 505)
- URBAN DESIGN, ANALYSIS SEMINAR (URBAN PLANNING 500)
- HISTORY OF ARCHITECTURE (ARCHITECTURE 303)
- INTRODUCTION TO ENVIRONMENTAL HEALTH (PREVENTIVE MEDICINE 422)
- TRAFFIC ENGINEERING—FUNDAMENTALS (CIVIL ENGINEERING 410)

Techniques

- CRITICAL PATH METHODS OF CONSTRUCTION SCHEDULING (CIVIL ENGINEERING 405)
- QUANTITATIVE METHODS FOR URBAN ANALYSIS (CIVIL ENGINEERING 501)
- COMPUTER APPLICATIONS TO URBAN ANALYSIS (CIVIL ENGINEERING 502)
- DATA SYSTEMS DEVELOPMENT FOR ENVIRONMENTAL STUDIES (CIVIL ENGINEERING 503)
- HIGHWAY 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)
- *CARTOGRAPHY (GEOGRAPHY 360)
- † SOCIAL STATISTICS (SOCIOLOGY 223)

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) WOLFE, NORTON, KOSKI
- URB P 479 THE URBAN FORM (2) WOLFE
- URB P 480, 481 URBAN PLANNING ANALYSIS I AND II (3,3) WOLFE, NORTON
- URB P 482 URBAN PLANNING FACILITIES (2) NORTON
- URB P 485 HOUSING (2) (OR EQUIVALENT)
- URB P 500 URBAN DESIGN ANALYSIS SEMINAR (2) (ELECTIVE) WOLFE
- URB P 505 SEMINAR IN URBAN RENEWAL (2) (ELECTIVE) WOLFE
- URB P 590, 591, 592 URBAN PLANNING PROBLEMS (5,5,5) NORTON
- URB P 593 URBAN PLANNING PROBLEMS (5) (ELECTIVE)
- URB P 600 RESEARCH (*)
- URB P 700 THESIS (*)
- C E 521 SEMINAR IN URBAN TRANSPORTATION PLANNING (2) HARWOOD
- POL S 581, 582 SEMINAR IN METROPOLITAN AND URBAN PLANNING PROBLEMS (3,3) WEBSTER
- SOC 530 ADVANCED HUMAN ECOLOGY (3) SCHMID
- OR SOC 531 DEMOGRAPHY (3) SCHMID
- R EST 520 SEMINAR IN REAL ESTATE AND URBAN LAND ECONOMICS (3) SEYFRIED
- OR GEOG 510 RESEARCH SEMINAR: SETTLEMENT AND URBAN GEOGRAPHY (3, MAX. 9) ULLMAN

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

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





ARTS AND SCIENCES

Dean
Solomon Katz
124 Thomson Hall

Associate Deans
Philip W. Cartwright
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, or Bachelor of Science, as well as graduate study leading to the degrees of Master of Arts, Master of Science, and Doctor of Philosophy.

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, Geophysics, 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 program 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. Dr. Millard Rogers is the director of the Center and Dr. Richard McKinnon is associate director.

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. Two bureaus conducting research in government and politics are affiliated with the Department of Political Science. These agencies are 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; and the University of Washington Center for Education in Politics, which fosters political research, promotes participation in political organizations through legislative internships, and sponsors conferences and workshops in practical politics. 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 147 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 Graff 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.

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 $\frac{1}{2}$ unit of algebra in the electives. Foreign language units beyond the minimum specified 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.

UNDERGRADUATE PROGRAMS

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, 102 Smith 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, on the other hand, 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 are required to consult the College Advisory Office, 101 Smith Hall, at least three days before their official registration dates, and will be directed to the University Testing Bureau or to the appropriate language department 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 mathe-

matics 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 200, 404, 405, 413; Radio-TV 270, 271, 373
 Comparative Literature: all undergraduate courses
 Drama 101, 102, 103, 146, 151, 152, 230, 247, 248, 253, 325, 331, 338, 395J, 404, 416, 421, 422, 423, 455, 461, 471, 472, 473, 474, 475, 476, 492
 English: all undergraduate courses except 101, 102, 103, 150, 151, 303
 Far Eastern and Russian Institute 382J, 384J
 Far Eastern and Slavic Languages and Literature: all undergraduate courses
 Germanic Languages and Literature: all undergraduate courses
 History 316, 317, 382J, 414, 420, 429, 442, 443
 Home Economics 240 or 347, 322, 329, 429, 432, 433
 Humanities 101, 102, 103, 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, 414, 415, 424, 425, 434, 435, 436, 476
 Philosophy: all undergraduate courses except 110, 120, 230, 231, 410, 460, 463, 465, 470
 Physical Education 283, 351, 352, 355
 Romance Languages and Literature: all undergraduate courses
 Scandinavian Languages and Literature: all undergraduate courses
 Speech 100, 110, 111, 140, 220, 320, 340, 345, 349, 400, 420, 421, 440

Social Sciences

Anthropology: all undergraduate courses except 201, 380, 431, 433, 455J, 480, 481, 482
 Architecture and Urban Planning: Urban Planning 482, 485
 Business Administration: Business Law 201; Human Relations 365 or 460; General Business 101, 444;

Policy and Administration 440; International Business 310
 Communications: Advertising 226; Communications 201, 303, 312, 402, 406, 411, 414, 415, 470, 480; Journalism 320
 Economics: all undergraduate courses
 Education 209, 288
 Far Eastern and Russian Institute: all undergraduate courses except 382J, 384J
 General Studies 455-456
 Geography: all undergraduate courses
 History: all undergraduate courses except 316, 317, 382J, 384J, 414, 420, 429, 442, 443
 Home Economics 350, 354, 356, 454, 457
 Linguistics 451J, 452J, 462J, 463J
 Philosophy 110, 120, 230, 231, 410, 460, 463, 465
 Physical and Health Education: Recreation Education 294; Health Education 250
 Political Science: all undergraduate courses
 Psychology: all undergraduate courses except 301, 316, 421, 422, 423, 498
 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, 436

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, 103, 104, 114, 497J
 Microbiology 201, 301, 400
 Oceanography: all undergraduate courses except 110, 111, 112
 Physical Education 293, 322, 480
 Physics: all undergraduate courses
 Psychology 316, 421, 422, 423
 Speech 310, 411, 415
 Zoology: all undergraduate courses

THE SPECIAL LIST

Of the required credits in each of the three groups of courses—the Humanities, Social Sciences, and Natural Sciences—the student is required to choose 15 from among certain courses specifically designated in a smaller list. This list, called “The Special List,” comprises courses most useful for introduction to the fundamental aspects of a subject. No course offered by the student’s major department may be used to satisfy this requirement. In many departments, alternative possibilities are open to the student, depending upon the amount of time he wishes to spend upon the subject and how far he wishes to pursue it; in the list which follows, these alternatives are separated by semicolons.

Humanities

Fine Arts

Architecture 100, 101, 105
Art 100; or no more than 9 credits from 105, 106, 107, 109, 110, 111; 129; or 212, 213, 214; or Humanities 102
Drama 101, 102, 103; or 151, 146
Liberal Arts 111
Music 101, 102, 103; 121, 122, 123; 107, 108, 117, 118, 119, 314, 315, 316; Humanities 102

Language and Literature

Chinese 320
Classics 210, 426, 427
Danish 220, 221, 222
English 110 (Humanities 101); or 257, 258; or 264, 265, 266, 267; Humanities 201
French 304, 305, 306
German 310, 311, 312
Greek 201, 202, 203
Latin 201, 202, 203
Norwegian 220, 221, 222
Russian 320 or 421
Spanish 304, 305, 306
Speech 100 or 220; 140
Swedish 220, 221, 222

Philosophy

Philosophy 100 (Humanities 103)

Social Sciences

History

Social Science 101, 102, 103; or History 101, 102; or 305, 306, 307; 241

Philosophy

Philosophy 110

Behavioral Sciences

Anthropology 100; or 202, 203
Business Law 201
Economics 200, 201
Far Eastern 110 or 310
Geography 100, 207, 375
Political Science 201, 203, 311
Psychology 100 or 190; 191, 306, 345
Psychiatry 267; or 450, 451
Sociology 110 or 310

Natural Sciences

Physical Sciences

Chemistry 100, 101, 102; or 140, 141, 150, 151, 160; or 101, 231, 232, 241, 242
Physics 110, 111, 112; or 101, 102, 103, 107, 108, 109; or 121, 122, 123, 131, 132, 133; or 440

Earth Sciences

Astronomy 101
Atmospheric Sciences 101 or 301
Geology 101, 102, 103, 205
Oceanography 101 or 203

Biological Sciences

Biology 101J-102J
Botany 111, 112, 113
Microbiology 201, 301
Zoology 111, 112, 114; 118 or 208; 201

Mathematics

Mathematics 105; or 155, 156; 124, 125; 126; or 134, 135, 136; or 201, 202, 203

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 Collège 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.

General Information

Students should apply for bachelor's degrees 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 before 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 (Smith 104) 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, and 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 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 336 Mackenzie 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.

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 Education* section of this catalog, as well as the requirements established by the department 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, 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.

Interdepartmental programs in geophysics and in radiological sciences are administered by special committees.

Graduate programs leading to the degree of Doctor of Philosophy are available in the fields of anthropology, atmospheric sciences, botany, chemistry, classics, comparative literature, economics, English, Far Eastern and Slavic languages and literature, genetics, geography, geology, geophysics, Germanic languages and literature, history, linguistics, mathematics, music, oceanography, philosophy, physics, political science, psychology, Romance languages and literature, sociology, speech, and zoology.

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

101-102 Smith 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.

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: dental hygiene, dentistry, law, 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.

Dental Hygiene, Preprofessional Program

The two-year pre-dental 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 and distribution requirements 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.

Law, Preprofessional Program

Students at the University who plan to enter the University School of Law may qualify for entrance by (1) obtaining a bachelor's degree before entrance, or (2) completing three-fourths of the work (136 credits) required for a bachelor's degree with a 2.50 grade-point average. The grade point of 2.50 does not include the physical education activity and lower-division military training grades. Students should consult the *School of Law* section for a description of the program in Law.

Any student who plans to enter the prelaw program is advised to select a major as soon as possible. Students who enter the School of Law after three years of undergraduate work and who have completed at least the third year (45 credits) in residence at the University of Washington may qualify for a bachelor's degree after one year in the School of Law. First-year University of Washington School of Law 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 a 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 laboratories. The prescribed preparatory program consists of two years of preprofessional training in the College of Arts and Sciences with an emphasis upon certain courses in chemistry and biology. The third year and the 18-month period of instruction are completed in the medical technology section. 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 requirements 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 by the end of the third year, and to complete the requirements for the bachelor's degree through his major department. 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, will be expected to meet the basic proficiency and distribution requirements of the College. 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. Students who entered this program in Autumn Quarter, 1963, or thereafter, will be expected to meet the basic proficiency and distribution requirements of the College. 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
108 Smith 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. One organized major program in the area of the behavioral sciences focuses on an understanding of *Social Relations*, both between individuals and in larger groups. Course work required in this major comes mainly from anthropology, psychology, sociology, economics, and philosophy. For students whose field of major interest is that of *Social Welfare*, or who anticipate graduate study in the School of Social Work, a second organized major program in the area of the behavioral and social sciences includes course work and some relevant field experience. The 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. A third area program, *Latin American Studies*, focuses on a particular geographical and cultural area of the world. This major combines the study of the Spanish and Portuguese languages and their literature, with courses related to the Latin American area in the fields of anthropology, history, geography, political science, economics, and sociology.

To be admitted to any of the organized major programs offered in General Studies the student must have maintained at least a 2.00 grade-point average in his previous educational experience.

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* under General Studies which has been constructed to his individual needs. 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 addressed to the Director of General Studies, 108 Smith 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 science. 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 field. Transfer to General Studies must be completed not later than the third quarter before graduation.

AMERICAN STUDIES

Committee

Arthur Bestor (Chairman, History), George Bluestone (English), 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. Under a grant from the U.S. Department of State, the University of Washington cooperates with the University of the Philippines in developing the program of American studies at the latter institution. A standing Committee on American Studies coordinates the work in the field both on the campus and overseas.

Students at the University of Washington, both undergraduate and graduate, may plan programs of study in which the focus is upon American civilization. Because the requirements of the various departments are flexible and their policies are such as to encourage interdisciplinary study, the University of Washington as a matter of policy leaves to the several departments the planning and final approval of all programs, instead of creating special degree programs in American studies.

The members of the Committee on American Studies are available as consultants to students contemplating such programs.

The courses listed below are called to the attention of students who wish to plan programs emphasizing American studies.

Anthropology 210 North American Indians (3)
Anthropology 311 Indian Cultures of the Pacific Northwest (3)
Anthropology 415 The Character of Eskimo Life (3)
Drama 476 History of American Drama (5)
Economics 200 Introduction to Economics (1)
Economics 201 Principles of Economics (5)
Economics 260 American Economic History (5)
Economics 330 Government and Business (5)
Economics 440J Manufacturing (3 or 5). Offered jointly with the Department of Geography.
Economics 442 The American Labor Movement (5)
Economics 462 Economic History of the United States to the Civil War (5)
Economics 463 Economic History of the United States from the Civil War to the Present (5)
English 267 American Masterpieces: Beginnings to 1900 (5)
English 361 American Literature: Beginnings to 1840 (5)
English 362 American Literature: 1840-1860 (5)
English 363 American Literature: 1860-1900 (5)
English 434 American Literature: 1900-1930 (5)
English 435 American Literature: Since 1930 (5)
Geography 301 Anglo-America (5)
Geography 302 The Pacific Northwest (3)
Geography 325 Historical Geography of America (3)
Geography 402 United States (5)
Geography 440J Manufacturing (3 or 5). Offered jointly with the Department of Economics.
Geography 444 Geography of Water Resources (3 or 5)
Geography 448 Geography of Transportation (3 or 5)
Geography 477 Urban Geography (3 or 5)
History 241 Survey of the History of the United States (5)
History 341 Foundations of American Civilization (5)
History 342 American Civilization: The First Century of Independence (5)
History 343 Modern American Civilization from 1877 (5)
History 442 The Colonial Mind (5)

History 443 The Intellectual History of the United States (5)
History 445-446 American Constitutional History (5-5)
History 447 History of the Civil War and Reconstruction (5)
History 450 Twentieth-Century America (5)
History 458 The United States in World Affairs, 1776-1865 (5)
History 459 The United States in World Affairs, 1865 to the Present (5)
History 463 The Westward Movement (5)
History 464 History of Washington and the Pacific Northwest (5)
Music 347 Music in the United States (2)
Music 348 Twentieth-Century Music in the Americas (2)
Philosophy 424 Recent American Philosophy (3)
Political Science 202 American Government and Politics (5)
Political Science 351 The American Democracy (5)
Political Science 370 Government and the American Economy (5)
Political Science 412 American Political Thought (5)
Political Science 450 Political Parties and Elections (5)
Political Science 451 The Legislative Process (5)
Political Science 460 Introduction to Constitutional Law (5)
Sociology 352 The Family (5)
Sociology 362 Race Relations (5)
Sociology 365 Urban Community (5)
Sociology 371 Criminology (5)
Sociology 450 Contemporary American Institutions (5)
Speech 425, 426 American Public Address (5,5)

COMPARATIVE LITERATURE

Chairman

Frank Jones

119 Parrington Hall

This program, which leads to the Bachelor of Arts, Master of Arts, and Doctor of Philosophy degrees, includes courses in Comparative Literature, conducted by the chairman of the program and an interdepartmental staff, and courses in English and other literatures, offered by the Departments of Classics, English, Far Eastern and Slavic, Germanic, Romance and



Scandinavian Languages and Literature. The program as a whole is described in the Departmental Programs, and departmental offerings in foreign literature in English translation are listed under the several departments.

DEPARTMENTAL PROGRAMS

AMERICAN STUDIES

Chairman

Arthur Bestor
315A Smith Hall

For the program offered in American Studies see Interdepartmental Programs in this section.

ANTHROPOLOGY

Chairman

Kenneth E. Read
345 Savery Hall

Professors

Erna Gunther, Melville Jacobs, Alex D. Krieger, Fangkuei Li, Nicholas N. Poppe, Verne F. Ray, Kenneth E. Read, Derek F. Roberts, Ralph L. Roys, Melford E. Spiro, James B. Watson

Associate Professors

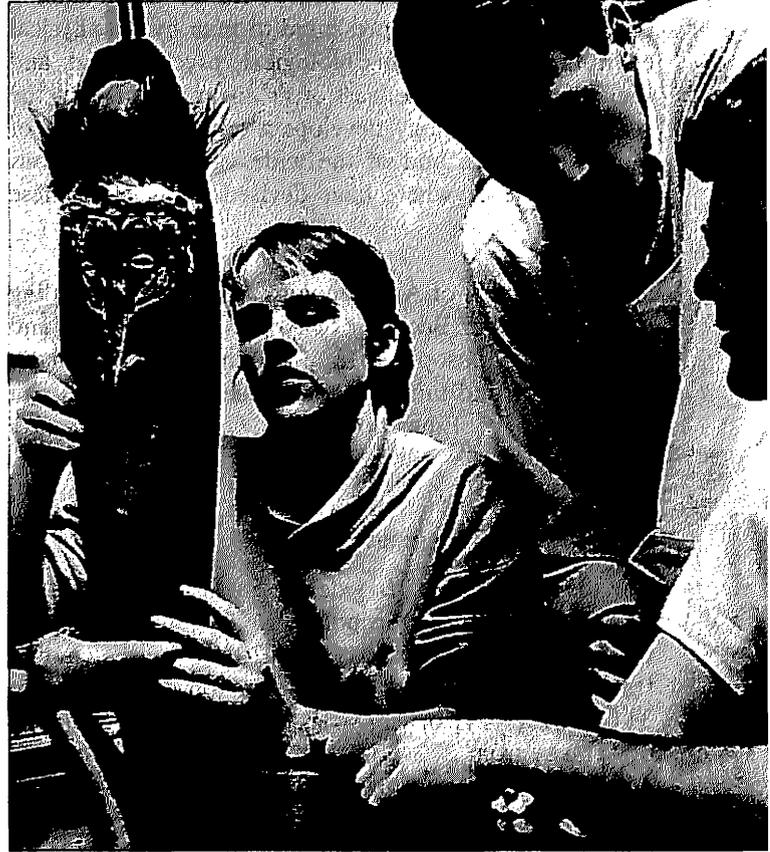
Walter A. Fairservis, Jr., Viola E. Garfield, Robert E. Greengo, Edward B. Harper, Simon Ottenberg

Assistant Professors

Isabel S. Caro, Raymond D. Fogelson, Luyse Köllnhöfer (visiting), Charles A. Valentine III

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 cultures 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 general laws of 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 *College of Arts and Sciences* section.)

The Department emphasizes the relationships between these branches of anthropology, while allowing the student to specialize in specific fields of interest. However, such specialization applies principally to graduate students who have demonstrated an adequate grasp of the materials of general anthropology. In the interests of a general, liberal education, undergraduate majors are expected to acquire a broad understanding of the five fields mentioned above.

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. These applications usually require the attainment of an advanced degree through graduate study. But apart from such professional possibilities, the undergraduate curriculum provides the student with an understanding of the many problems presented to man by his physical environment, and by his biological, psychological, and social nature. Not the least of its advantages is that the study of anthropology develops a critical awareness of our own culture and of the wide variety of solutions which men everywhere have devised for meeting these problems.

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

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; one regional course from 311 or 315, 314J or 317, 412, 415, 418; one archaeology course from 272, 274; the general language course, 450; one physical anthropology course from 480, 481, 482; two topical courses from 332 or 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 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 honors 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

The Department offers programs leading to the degrees of Master of Arts and Doctor of Philosophy. Students



who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate School* section. In addition to the information requested on the Application for Admission to the Graduate School, each applicant is expected to secure letters of recommendation from two professors under whom he has studied. These letters are to be mailed directly to the Graduate Program Adviser, Department of Anthropology. All applications, together with their supporting documents and letters of recommendation, are considered by the Department as well as by the Graduate School of the University.

The requirements for both advanced degrees include the following: the student must demonstrate a basic proficiency in all fields of anthropology by passing a comprehensive examination based on a sequence of required courses. The examination is given at the end of the Autumn and Spring Quarters of each year and is normally taken by a student at the end of the third quarter of full residence. The fields are: archaeology, linguistics, physical anthropology, ethnology, and social anthropology. In addition, students working for advanced degrees are expected to acquire special proficiency in one of the above branches of anthropology. A part of the graduate work may, with permission, be devoted to a minor in a related field.

Prospective candidates for the Master of Arts degree must pass the comprehensive examination referred to above, complete an approved program of courses and readings, submit an acceptable thesis, and pass an oral examination. The examination will cover the thesis and the student's chosen field of specialization.

The requirements for a minor in anthropology for the master's degree are 19 credits in courses numbered 400 or above, 10 of which must be in two of the three courses numbered Anthropology 500, 501, 502. The remaining 9 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 13.

For the degree of Doctor of Philosophy, students must complete an approved program of courses and, in addition to the comprehensive examination taken at the end of the first year, must pass successively a written qualifying examination, an oral General Examination for admission to candidacy, and a Final Examination. Both the qualifying examination and the General Examination cover the students chosen field of specialization.

The written qualifying examination is normally taken at the end of the second year of graduate study, and the General Examination is taken as soon as possible after passing the qualifying examination. Passing the General Examination constitutes admission to candidacy for the Ph.D. The foregoing language requirements must be satisfied at least three quarters before the General Examination.

Field work is required of all students working for the Ph.D. The dissertation, normally based on field research, will be in one of the candidate's three fields of concentration, and the final examination, which is an oral examination, is devoted to the dissertation and the field with which it is concerned.

Special permission is required for a student to proceed directly to the doctorate without taking a master's degree.

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

Director

Boyer Gonzales
102 Art Building

Professors

Glen E. Alps, Wendell P. Brazeau, Everett G. Du Pen, Hope L. Foote, Boyer Gonzales, Raymond L. Hill (emeritus), Pauline Johnson, Ambrose M. Patterson (emeritus), Ruth E. Penington, George Tsutakawa

Associate Professors

Frederick N. Anderson, Edna G. Benson (emeritus), Paul A. Bonifas (emeritus), John W. Erickson, Steven D. Fuller, C. Louis Hafermehl, William J. Hixson, Alden C. Mason, Spencer A. Moseley, Viola H. Patterson, Charles W. Smith, Robert Sperry, Lawrence D. Steefel, Jr., Valentine S. Welman

Assistant Professors

Elizabeth L. Curtis (emeritus), Warren T. Hill, Robert C. Jones, Howard W. Kottler, David O. Merrill, Harold W. Myers, Eugene C. Pizzuto, Richard M. Proctor, Robert W. Speiers

Instructors

Michael D. Dailey, Paul R. Jenkins, Michael C. Spafford

Lecturers

Irwin S. Caplan, Frank Del Giudice, Stephen Dunthorne, Theodore L. Rand, T. Gervais Reed, Millard B. Rogers

Man's thoughts or ideas are sometimes communicated most effectively through visual or plastic forms. The expression may be functional, as in the graphic arts, industrial design, and ceramics; or it may be either an intellectual or mathematical expression, or personal and subjective, as in creative painting or sculpture.

In our complex intercultural society of today, communication is increasingly important, and art as a significant media has assumed a major function in society. Ideas and thoughts expressed in visual form reach a wider audience than the written symbols of communication, and may bridge cultural differences more easily.

The School of Art offers the history, techniques, and theory necessary for a student to use the media constructively and meaningfully. Programs are offered in major areas of specialization with an accompanying liberal arts education for qualified students whose goal is a professional career; more general programs are offered for those students who want personal enrichment and a broadening of their cultural background through the understanding and use of the visual arts.

The School of Art offers courses leading to the degrees of Bachelor of Arts, Bachelor of Fine Arts, and Master of Fine Arts.

The School reserves the right to retain student work for temporary or permanent exhibition.

Undergraduate Programs

Adviser

Stephen Dunthorne
104 Art Building

Admission

For undergraduate students, the School provides curricula in General Art and Art Education which lead to a Bachelor of Arts degree, and curricula in ceramic art, graphic design, art history, 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.

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: Art 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

The requirements for the candidates for this degree are as follows:

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); Art 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); 283, 320, 326, 327, 341J, 342J, 382, 383, 384, 386, 387, 388, 402J, 404J, 423, 424, 425, 426, 428 (art history); 201, 202, 203, 353, 354 (ceramics); 111, 253, 254, 255, 340, 369, 370, 371 (design); 265, 266, 267 (drawing); 205, 366, 367, 368, 410 (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, 324 (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 or 362, 463, 464 or 465; 8 to 12 credits from 205, 261, 350, 351 or 352, 367; and 6 to 10 credits from 300, 302, 303, 304, 305.

CURRICULUM IN ART HISTORY

The requirements are 26 credits in art composed of Art 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 and plan his program in consultation with a faculty adviser in the School of Art.

Students who plan to undertake graduate work in art history should acquire a reading knowledge of French and German. Those planning to do advanced 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.

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, and 9 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, 481, and 15 credits in 498 (graphic design); 256, 257, 258, 265, 266, 267, 350, 352, 360, 361, 362; and 12 elective credits in art; Psychology 100; Economics 200; Advertising 226.

CURRICULUM IN INDUSTRIAL DESIGN

The requirements are 156 credits, composed of 86 credits in art, 12 credits in architecture, and 57 other credits. The following art courses are required: 105, 106, 107, 109, 110, 129 (first year program); 212, 213, 214, 320, 326 (art history); 316, 317, 318, 445, 446, 447 (industrial design); 201, 205, 253, 254, 272, 282, 357, 498; and 9 approved art electives; Architecture 314, 315, 316; Mechanical Engineering 201, 202, 203, 342, 410; General Engineering 101, 351; Economics 200; Business Law 307; Advertising 226, 340; Speech 327; 15 credits in physics; Psychology 100; Marketing 301.

CURRICULUM IN INTERIOR DESIGN

The requirements are 130 credits, composed of 75 credits in art, 22 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, 326; 254, 258, 280, 281, 282, 310, 311, 312, 472, 473, 474; 28 elective credits in art or humanities; Architecture 100, 101, 124, 125, 126; 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 101; 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, 375, 376, 377, 307, 308, 309, 463, 464, 465 (painting); 111, 272, 273, 274, 350, 351, 352; and 22 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); 111, 256, 257, 258, 265, 266, 267, 272, 273, 274, 322, 360, 361, 362; and 20 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

Admission

The School of Art offers courses leading to the degree of Master of Fine Arts. 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.

Master of Fine Arts

In addition to Graduate School general admission requirements, students desiring to pursue a course of study leading to the Master of Fine Arts 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.

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, fabric, or other equivalent project 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.

More detailed information regarding the Master of Fine Arts degree is contained in the leaflet "Master of Fine Arts Procedure and Requirements," prepared by the School of Art and available upon request.

ASTRONOMY

Professor

Theodor S. Jacobsen
Observatory

There is no curriculum leading to a degree in astronomy. Courses in astronomy are given as general interest courses for students in all fields.

ATMOSPHERIC SCIENCES

Chairman

Phil E. Church
201F Atmospheric Sciences Building

Professors

Konrad J. Buettner, Phil E. Church, Robert G. Fleagle,
Richard J. Reed, Masahisa Suguina

Associate Professors

Franklin I. Badgley, Kenneth O. Bennington, Joost A.
Businger, Norbert Untersteiner

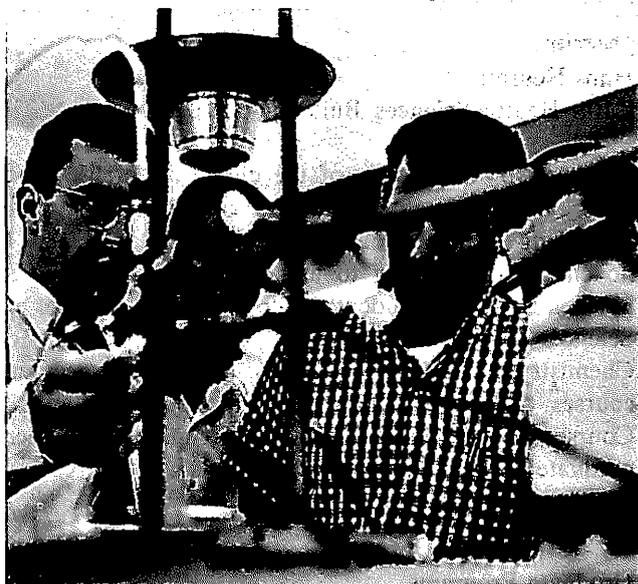
Assistant Professor

Peter V. Hobbs

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, particular attention being paid to the wide range of subjects of current research interest within the Department.



Undergraduate Programs

Advisers

Phil E. Church

201F Atmospheric Sciences Building

Richard J. Reed

201C Atmospheric Sciences Building

GRADUATION REQUIREMENTS

Bachelor of Arts

A curriculum which includes the branches of physical, synoptic, and dynamic meteorology and climatology is offered for undergraduate students working toward the bachelor's degree.

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 325 and its 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 134, 135, 136, 235, 236, Physics 121, 122, 123).

In order to obtain the honors degree, the candidate must satisfy all the regular degree requirements of the Department and must in addition earn a minimum of 6 credits in Atmospheric Sciences 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: Atmospheric Sciences 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, 317, and 420 (Science in Civilization: Antiquity to 1600), (Science in Civilization: Science in Modern Society), (Science and the Enlightenment); and Philosophy 456, 460, and 470 (Metaphysics), (Introduction to the Philosophy of Science), (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 Adviser

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 School* section. The complete program for an advanced degree must be approved by the staff.

Master of Science

The program of study and research is intended to enable the student throughout his scientific career to grow with his field, to recognize and understand new concepts, and to master new procedures as they emerge in the literature.

The minimum course requirements are: 27 graduate credits exclusive of research or thesis, of which three 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

The degree of Doctor of Philosophy signifies understanding of the nature of knowledge normally attained only through the original solution of a problem of substantial scientific importance.

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, is composed of a written examination which tests mastery of general and theoretical meteorology and of relevant mathematical methods, and an oral examination which tests depth of under-

standing 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
C408 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

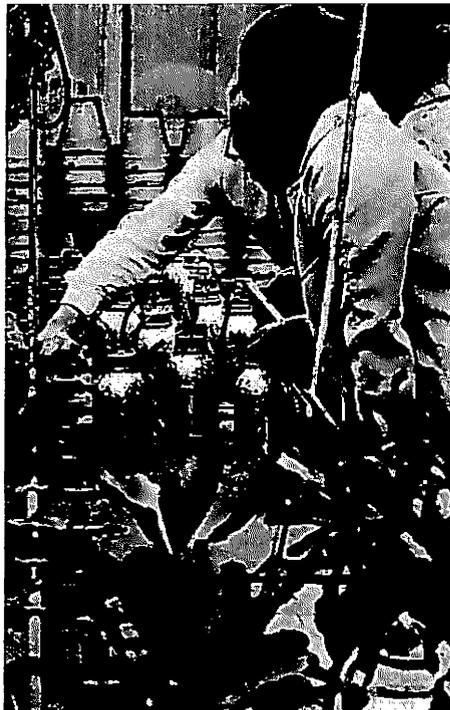
Graduate Program Adviser

Earl W. Davie
D413 Health Sciences Building

Students who intend to work toward the Master of Science and Doctor of Philosophy degrees in biochemistry should consult the *Graduate School* and *School of Medicine* sections.

BIOLOGY

Courses in biology are administered jointly by the Departments of Botany, Genetics, 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

R. B. Walker
342 Johnson Hall

Professors

C. Leo Hitchcock, Bastian J. D. Meeuse, Daniel E. Stuntz, Richard B. Walker, Arthur R. Kruckeberg

Associate Professors

H. Weston Blaser, Robert E. Cleland

Assistant Professor

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. Since 111 and 114 are beginning courses covering some of the same materials, only one of them may be taken for credit. Likewise, it is not permissible to take both 112 and 115 for credit. All biology courses may be used for botany credit.

Students registering in 111 will be examined with respect to their background in biology and other sciences, and special arrangements made to encourage the progress of those students who have exceptional preparation.

Undergraduate Programs

Adviser

Charles L. Hitchcock
343 Johnson Hall

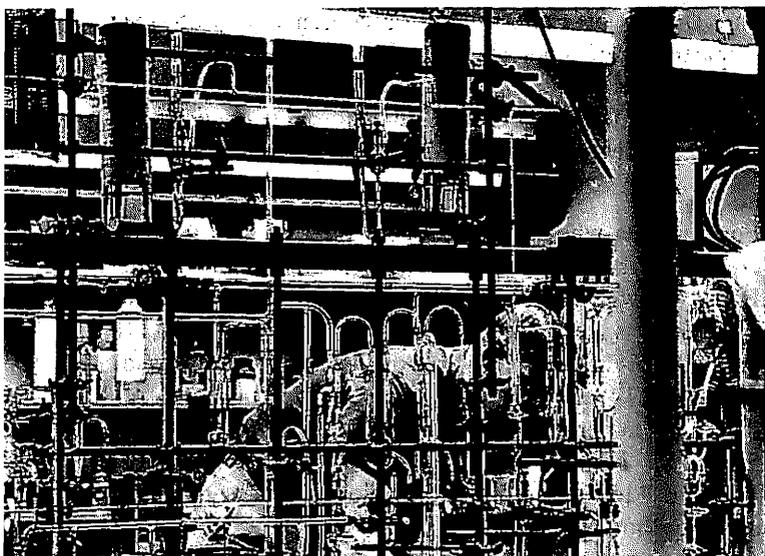
Bachelor of Science: 40 credits in botany are required for the Bachelor of Science degree. Courses must include 111, 112, 113; 371 or 472; Biology 451; and a minimum of one year of college chemistry, including organic chemistry. More advanced organic chemistry is recommended in lieu of Chemistry 102 for students contemplating postgraduate 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 Education* section. Organic chemistry is a requirement for an advanced degree in the Department of Botany; Chemistry 335, 336, 337 are recommended.



CHEMISTRY

Chairman

George H. Cady
200 Bagley Hall

Professors

Arthur G. Anderson, Jr., George H. Cady, Hyp J. Dauben, David F. Eggers, Arthur W. Fairhall, Norman W. Gregory, George D. Halsey, Jr., Edward C. Lingafelter, Jr., Yeshayau Pocker, Benton S. Rabinovitch, David M. Ritter, Rex J. Robinson, Wolfgang M. Schubert, H. V. Tartar (emeritus)

Associate Professors

Alden L. Crittenden, Victorian Sivertz, Leon J. Slutsky, George H. Stout, Robert Vandenbosch

Assistant Professors

William S. Chilton, Ernest R. Davidson, Gershon Vincow

Lecturer

Frank E. Ware

Chemistry is a branch of natural science and 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. Since chemistry is both "pure" and "applied," many different careers ranging from "ivory tower" science to industrial research or administration are open to those trained in the field.

Many students study chemistry as a service course which supplies part of the background for medicine, engineering, or other scientific or technical subjects. Since science is an important part of modern culture, some of the courses are useful as good natural science electives for students majoring in one of the humanities or social sciences.

The Department of Chemistry offers courses leading to the degrees of Bachelor of Science, Bachelor of Arts, Master of Science, and Doctor of Philosophy.

Undergraduate Programs

Adviser

V. Sivertz
200 Bagley Hall

Admission

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 *College of Education* section.

Students planning to major in chemistry are advised to take in high school 2 units of German, at least three 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.

Programs leading to the Bachelor of Science degree are designed to prepare the student for a professional career in such diverse fields as chemical physics, nuclear chemistry, instrumental analysis, industrial chemistry, biochemistry, and the chemistry of medicinal as well as in the fields of 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, 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, 103; one year of physics, including laboratory; and mathematics through 224, or equivalent. The preceding chemistry courses and 458 constitute the 48 credits of required chemistry courses.

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 481, 482, 483, 484, 499; Physics 320, 323, 325, 326, 327, 371, 372, 461, 462, 463; Mathematics 322, 324, 325, 401, 402, 403, 404, 427, 428, 429; or other

electives such as Electrical Engineering 400; Microbiology 301, 400; Atmospheric Sciences 301; Genetics 451, etc.

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), 10 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; mathematics through 126. German, French, or Russian are the recommended foreign languages. A grade of C or better should be obtained in each of the required chemistry courses.

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 wishing a liberal education with some concentration in science.

Honors in Chemistry

Adviser

Ernest R. Davidson
41C Bagley Hall

Members of the College of Arts and Sciences Honors Program may receive a bachelor's degree "With Honors in Chemistry" if they fulfill the requirements of that program during the freshman and sophomore years, in addition to 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."

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. In addition he must include in his curriculum at least 15 credits selected from the following: (1) Honors section work in Chemistry 337, 345, 346, 347, 410, 426, 445, 446, 457, 458 (in some of these courses honors work is available only by special arrangement); (2) any courses numbered 500 and above; (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 an acceptable senior thesis to the professor who supervises his work.

Candidates for a Bachelor of Arts honors degree must complete at least one upper-division honors course (3 credits or more) outside the science group. Any additional upper-division courses in this category may be used as part of the 15-credit requirement mentioned above. In addition the candidate must prepare an honors paper on a topic selected in consultation with the chemistry honors adviser.

Graduate Programs

Graduate Program Adviser

George H. Cady
101 Bagley Hall

Admission

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate School* section. Prospective candidates for advanced degrees are expected to take the qualifying and cumulative examinations. The qualifying or entrance examinations are designed to assess the student's knowledge and understanding of the material normally contained in an undergraduate program with a major in chemistry. These examinations are usually given Monday and Tuesday preceding the opening of Autumn Quarter and may be repeated during the first week of Winter Quarter and toward the end of Spring Quarter. All parts of this examination should be passed within a year. The cumulative examinations, given six times during each academic year, are general examinations in the student's area of specialization (analytical, inorganic, organic, or physical chemistry) and are designed to stimulate independent study and thought. They attempt to evaluate the breadth of knowledge gained from courses, seminars, and literature, and the student's ability to apply this knowledge to diverse problems.

Students working for the Master of Science degree usually present German as their foreign language. The General Examination requirement for the degree of Doctor of Philosophy is satisfied when six cumulative examinations have been passed. The language requirement may be satisfied by passing examinations in German and in either Russian or French.



CLASSICS

Chairman

John B. McDiarmid
218 Denny Hall

Professors

Harvey B. Densmore (emeritus), John B. McDiarmid,
William M. Read, Thomas G. Rosenmeyer

Associate Professors

William C. Grummel, Paul Pascal

Assistant Professors

Colin N. Edmonson, Ernest A. Fredricksmeier, Wil-
liam F. Wyatt, Jr.

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.

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 credits in upper-division Greek courses; 18 credits in upper-division Latin courses.

GREEK MAJOR

27 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, 430, 435, 440), ancient history (Social Science 101,

History 201-202, 401, 402, 403, 404), and the history of ancient philosophy (Philosophy 320, 431, 433).

LATIN MAJOR

27 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, 430, 435, 440), ancient history (Social Science 101, History 201-202, 401, 402, 403, 404), and the history of ancient philosophy (Philosophy 320, 431, 433).

Honors in Classics, Latin, or Greek

Adviser

William F. Wyatt, Jr.
228B Denny Hall

Members of the College Honors Program 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 201-202.

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 Greek or Latin 599 (Graduate Reading).

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

William E. Ames
133 Communications Building

Professors

Merritt E. Benson, Byron H. Christian, Milo Ryan,
Willard F. Shadel, Henry Ladd Smith, Daniel S.
Warner

Associate Professors

William E. Ames, Howard M. Brier, Pat Cranston,
Alex Edelstein, Merrill Samuelson

Assistant Professors

Peter Clarke, Robert A. Denis, Willis L. Winter, Jr.

The study of communication deals with the change of behavior potential by the transmission of information. Such change can be studied as a psychological process or as the *sine qua non* of social organization.



The School's primary concern is with the functions of the mass media in modern society—with their roles in supporting the democratic process, socializing the young and the alien, coordinating adjustment to environmental change, and facilitating the distribution of goods and services. The study of communication as a social and political factor includes analyses of how the transmission of information changes audience behavior and how communicators themselves are influenced by culture, personality, and social institutions. Preparation for practice in the media requires the development of professional values based on a consciousness of social function, as well as the mastery of communication skills, both of investigation and of exposition.

The School of Communications, through its sequences in advertising, journalism, and radio-television, offers professional training through various curricula in these fields, leading to the degree of Bachelor of Arts. The School also offers courses leading to the degree of Master of Arts in Communications or toward the minor for the doctoral degree in another department.



Undergraduate Programs

Adviser

Howard M. Brier
118 Communications Building

ADMISSION

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.

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 minimum 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 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.

Programs of Study

Courses designed to give breadth to the program and required of all majors within the School of Commu-

nications are as follows: 22 credits, including Communications 201, 226, 320, Journalism 200 or Radio-Television 270, a course in historical studies and social institutions, a course in communications theory and research, and a course in international and political studies. All courses enumerated are included in the 22 credits, not just those specified by course number.

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-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 the *College of Education* section.

Radio-Television: In addition to the requirements for all Communications majors, students in the radio-television sequence are required to take Radio-Television 260, 350, 352, 376, 450, 477, and two upper-division courses within the School of Communications.

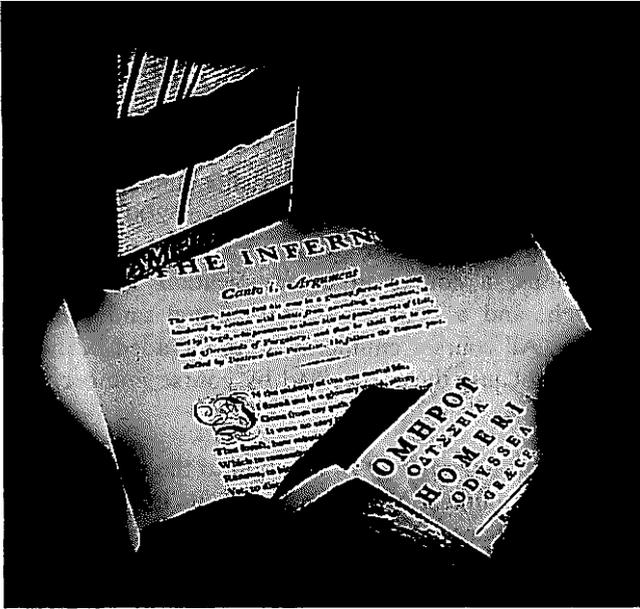
Graduate Programs

Graduate Program Adviser

William E. Ames
133 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 Director of the School.



COMPARATIVE LITERATURE

Chairman

Frank Jones
119 Parrington Hall

(The program is centered administratively in the Department of English.)

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 with the aid of an advisory committee representing the Departments of Classics, English, Far Eastern and Slavic Languages and Literature, Germanic Languages and Literature, Romance Languages and Literatures, and Scandinavian Languages and Literature.

Undergraduate Programs

Adviser

Frank Jones
119 Parrington 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 Programs

Graduate Program Adviser

Frank Jones
119 Parrington Hall

Admission

Prospective candidates for the degree of Master of Arts with a major in Comparative Literature should ordinarily present a Bachelor of Arts degree in English, in a foreign language, or in Comparative Literature.

Master of Arts

Course requirements are 35 credits (of which 25 must be in courses numbered 500 or above); 10 credits in Comparative Literature (including Comparative Literature 510 or 511) and 25 credits in two or more literatures or related fields. With the permission of the chairman of the program and the departments concerned, a thesis may be presented for 10 of the 35 credits.

By the time the student has fulfilled the course requirements, and before he takes the M.A. examination, he must pass the graduate reading tests in at least two of the languages included in the program: Chinese, Danish, French, German, Greek, Italian, Japanese, Korean, Latin, Norwegian, Russian, Spanish, and Swedish. The student's native language may not be one of those by which he meets this requirement.

The student must pass a written examination consisting of questions on two or more literatures and on the relations between them.



Doctor of Philosophy

The degree of Doctor of Philosophy with a major in Comparative Literature is awarded through the student's major department and his Supervisory Committee. The following departments are authorized to sponsor prospective candidates: Classics, English, Far Eastern and Slavic Languages and Literature, Germanic Languages and Literature, and Romance Languages and Literature.

Before taking his qualifying examination, the student must complete a minimum of 70 credits in graduate course work. These must include Comparative Literature 510 and 511; 35 credits in the student's major literature (including English 505 if the major literature is English); and 25 credits in his minor field or fields. The major literature must be one of the following: Chinese, English, French, German, Greek, Italian, Japanese, Latin, Russian, Spanish. The minor field may be in any of the languages listed under the M.A. requirements.

The student must know at least two languages in the program sufficiently well for graduate study of their literatures. The languages are those listed under the M.A. requirements.

The qualifying examination is to be taken within three quarters (Summer Quarter excepted) after completing course work. It is based on the assumption that the reading and study of the student have prepared him for the following: a critical essay of about 5,000 words on a comparative topic; a written examination testing the student's knowledge of a genre as represented in the major and minor literatures; and the oral General Examination in the major and minor fields.

The Graduate Program Adviser in the student's major department will recommend a dissertation committee to the Dean of the Graduate School. The student may request any member of the graduate faculty in his major or minor field as supervisor of his dissertation. The supervisor will not be a member of the dissertation committee.

The oral Final Examination on the dissertation, and on the field or fields with which it is concerned, must be completed at least two weeks before the end of the quarter in which the degree is to be granted.



DRAMA

Director

Gregory A. Falls
113 Drama-TV Building

Professors

John A. Conway, Gregory A. Falls, Donal F. Harrington

Associate Professors

Robert S. Gray, Agnes M. Haaga, Warren C. Lounsbury, Duncan Ross, Geraldine Brain Siks

Assistant Professors

Kenneth M. Carr, James R. Crider, Vanick S. Galstaun

Lecturers

Alanson B. Davis, Aurora Valentinetti, Lois Aden

The study of drama is concerned with the theater arts: acting, directing, designing, and playwriting, together with theater 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 theater 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 theater arts.

Drama is one of the fine arts, and many students elect courses as an introduction in one of 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 study for a professional career, either in professional theater or in educational theater.

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 57 credits in "core courses": 101, 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, and 452; or Design-Technical 414, 415, 418, and 419; or Children's Drama 338, 431, 435, and 438. All drama majors are also expected to complete English 324 and 325 or 326 (Shakespeare, 10 credits).

Elementary education majors in drama are required to complete 45 credits as follows: 101, 146, 151, 152, 230, 247, 253, 316, 325, 331, 338, 435, 438, 438L, 461, 461L, 498, and 5 credits in a drama course numbered 470 or 480, or an approved cognate in another department.

Graduate Programs

Graduate Program Adviser

Gregory A. Falls
113 Drama-TV Building

Admission

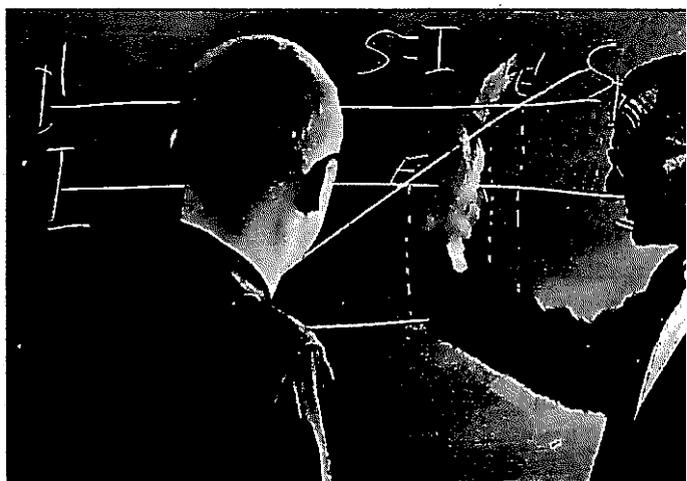
It is assumed that all prospective candidates have completed the equivalent of our undergraduate drama requirements. Advanced placement examinations in acting, speech, theater technical practices, and theater history are given each Summer and Autumn Quarter for graduate students who may have equivalent theater

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 degree students are required to complete 36 credits including Drama 498, 501, 700, and 5 credits in drama courses numbered 470, 480, 570, or 580, 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, and 513; Children's Drama 435L, 438L, 451, 452, and 530.

Drama 700 (Thesis) may be either a production or a research thesis.



ECONOMICS

Chairman

J. Benton Gillingham
301 Guthrie Hall

Professors

Philip W. Cartwright, James A. Crutchfield, Jr., Donald F. Gordon, William S. Hopkins, John R. Huber,



Morris D. Morris; Vernon A. Mund, Douglass C. North, Charles M. Tiebout

Associate Professors

Henry T. Buechel, John B. Gillingham, Kenneth M. McCaffree, Feng-hwa Mah, Walter Y. Oi, Dean A. Worcester, Jr.

Assistant Professors

Yoram Barzel, Barney Dowdle, John E. Earl, John A. Hynes, Martin B. Johnson, Robert P. Thomas; Judith G. Thornton, Henry Y. Wan, Jr. (visiting)

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, which are outlined below.

Undergraduate Programs

Adviser

Henry T. Buechel
326 Savery Hall

ADMISSION

Bachelor of Arts

Requirements in the field of economics are: 200, 201, 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 281; Accounting 210, 220, and 230.

Honors in Economics

Adviser

Henry T. Buechel
326 Savery Hall

Participants in the College of Arts and Sciences Honors Program 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); 300H (junior year, Autumn Quarter); 301H (junior year, Winter Quarter); 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 over-all grade-point average 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

Dean A. Worcester
301D Guthrie Hall

Admission

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 School* section for details of regulations concerning residence and languages.

Programs of Study

The Department of Economics offers courses leading 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. Programs can also be arranged in which the student takes a field in a related subject.

With an economics minor, prospective candidates 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 oral and written examinations covering the Core Program and his selected fields. 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. 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
107 Parrington Hall

Professors

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. Hilien, Jr., Helen A. Kaufman (emeritus), Jane S. Lawson (emeritus), Robert O. Payne, Angelo M. Pellegrini, Arnold Stein, T. Brents Stirling, E. Ayers Taylor (emeritus), Frank Joseph Warnke, Sophus K. Winther (emeritus), Lawrence J. Zillman

Associate Professors

Robert P. Adams, George Bluestone, Malcolm J. Brown, Harry H. Burns, Margaret R. Duckett, Garland O. Ethel, Florence J. Gould, Markham Harris, William F. Irmscher, Frank W. Jones, Jacob Korg, Glenn Leggett, William H. Matchett, Henry A. Person, William L. Phillips, Grant H. Redford, Donald S. Taylor, David R. Wagoner

Assistant Professors

Edward Alexander, Sylvia F. Anderson, Maud L. Beal (emeritus), G. Nelson Bentley, Janna P. Burgess (emeritus), Richard I. Cook, Elizabeth D. Dipple, Fredrick M. Garber, Donna L. Gerstenberger, Muriel L. Guberlet (emeritus), David D. Harvey, Morton Y. Jacobs, Bertha M. Kuhn (emeritus), Eric LaGuardia, Robert A. Magowan, Jr., Florence D. McKinlay (emeritus), Lore

Metzger, Martha J. Nix (emeritus), Edgar F. Racey, Jr., Otto Reinert, Viola K. Rivenburgh, Roger H. Sale, Robert P. Shulman, Eugene H. Smith, Robert B. Stanton, Roger B. Stein, Robert D. Stevick, Berenice D. Thorpe, Margaret C. Walters, Elinor M. Yaggy

Instructors

Robert E. Bagg, Judith C. Bechtold (acting), Lois G. Clemens (acting), William M. Dunlop (acting), Douglas P. Farr, Mary J. Gilbertson, Glenn W. Hatfield, Jr., Donald M. Kartiganer, Roberta B. Langford (acting), Milton A. Mays, Jarold W. Ramsey (acting), Henrietta B. Reifler (acting), Norma Rowen (acting), James E. Siemon

Lecturers

Geraldine S. Mertz, Leota S. Willis

The Department of English offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. It also offers the same in Comparative Literature. Comparative Literature courses in the Department of English 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

Leota Willis, Marian Gustin
132 Parrington Hall

Admission

For undergraduate students, the Department provides two elective curricula leading to the Bachelor of Arts degree, one in composition and advanced writing, the other in language and literature. 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).

PROGRAMS OF STUDY

Curriculum in 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 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

James W. Hall
109 Parrington Hall

Members of the College Honors Program must fulfill the requirements of that program during the freshman and sophomore years in addition to the following departmental honors requirements. With the approval of the department 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 English."

Students in English can qualify for honors work at all levels. Freshmen are eligible for honors sections in Freshman English. Freshmen and sophomore students may apply for the College Honors Program; students in this program are in special sections of the Master-

pieces courses (265, 266, 267). Students entering the departmental honors program from the College Honors 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 should have averages of 3.00 over-all and 3.30 in English, although the departmental committee may at times admit candidates with lower averages. All honors students do guided individual work in connection with certain of the courses they take, and may also take some of their work in seminars in special topics (499H). The major requirements are the same as for regular students except that the honors student must take one course for honors credit each quarter. A thesis is done in connection with one of the special seminars.

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

A. C. Hamilton
111 Parrington 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.

Admission

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 credits may be transferred from an accredited institution.

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 in Far Eastern and Russian studies are also available in that department. In the social sciences, graduate programs (with Far Eastern and Russian emphasis) are sponsored by the Institute in cooperation with the Departments of Anthropology, Economics, Geography, History, Political Science, and others. 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 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 China 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 especially qualified students.

In order to help students and advisers identify the different courses dealing with the various countries and areas, their numbers are listed below. Courses listed here but taught in departments other than Far Eastern and Slavic Languages and Literature may be used for credit toward a major in Far Eastern and Slavic.

CHINA: Far Eastern 240, 290, 402, 435J, 443, 465J, 466J, 467J, 468J; Art 383; Music (consult Far Eastern and Slavic adviser); Philosophy 428, 429; Political Science 344. See Chinese Language and Literature.

FAR EAST: Far Eastern 110, 310; Political Science 414, 429, 432; Music (consult School of Music or Far Eastern and Slavic adviser).

INDIA: Far Eastern 312J, 382J, 383J, 384J, 482J, 483J, 484J; Art 382.

INNER ASIA: Far Eastern 314J, 340, 341, 342, 430, 450. See Mongolian, Tibetan, and Turkic Languages and Literature.

JAPAN: Far Eastern 335J, 345J, 347J, 452J, 453J; Art 384; Music (consult Far Eastern and Slavic adviser). See Japanese Language and Literature.

KOREA: Far Eastern 242, 292; Art 384. See Korean Language and Literature.

SOUTHEAST ASIA: Far Eastern 303J, 312J (in part), 316, 332J (in part), 434J; Anthropology 317, Linguistics 478, 578. See Thai and Vietnamese Languages.

USSR (RUSSIA): Far Eastern 243, 329, 333J, 378, 401, 421J, 422J, 423J, 424J, 427J-428J, 429, 448J; Economics 495, 595; Political Science 420, 441. See also Polish, Russian, Serbo-Croatian, and Slavic Languages and Literature.

FAR EASTERN AND SLAVIC LANGUAGES AND LITERATURE

Chairman

George E. Taylor
406 Thomson Hall

Professors

Kung-chuan Hsiao, W. A. Douglas Jackson, Fang-kuei Li, John M. Maki, Franz H. Michael, Nicholas N. Poppe, Erwin Reifler, Vincent Y. Shih, Marc M. Szeftel, George E. Taylor, Donald W. Treadgold, Hellmut Wilhelm, Frank G. Williston, Karl A. Wittfogel

**Associate Professors**

Robert H. Abernathy, Robert J. C. Butow, Noah D. Gershevsky, Leon M. Hurvitz, George Ivask, Richard N. McKinnon, Ivar Spector, Henry S. Tatsumi, Laurence C. Thompson, Jr., Turrell V. Wylie, Isabella Y. Yen

Assistant Professors

Imre Boba, George V. Grekoff, Yan-shuan Lao, Feng-hwa Mah, Tamako Niwa, Harold E. Swayze

Lecturers

Noburu Hiraga, Nawang L. Nornang, Elias T. Novikow, Vadim O. Pahn, Jan J. Solecki, Doo Soo Suh

Instructors

Willis A. Konick, Mayako Matsuda

Language Informants

Paul V. Gribanovsky, Vladimir Gross, Alexey Ivanchukov, Phi-Hung Nguyen, Kuo-yi Pao, Amnuay Tapingkae, Natalie Tracy

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. This is done in fulfillment of the task of a liberal education to provide a foundation from which to face squarely and intelligently not only one's own life but the world.

This aim is furthered in the Department by an introduction into, and an appreciation 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 the history and the structure of these languages *per se*, the Department, in close cooperation 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 which 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**Advisory Office**

403 Thomson Hall

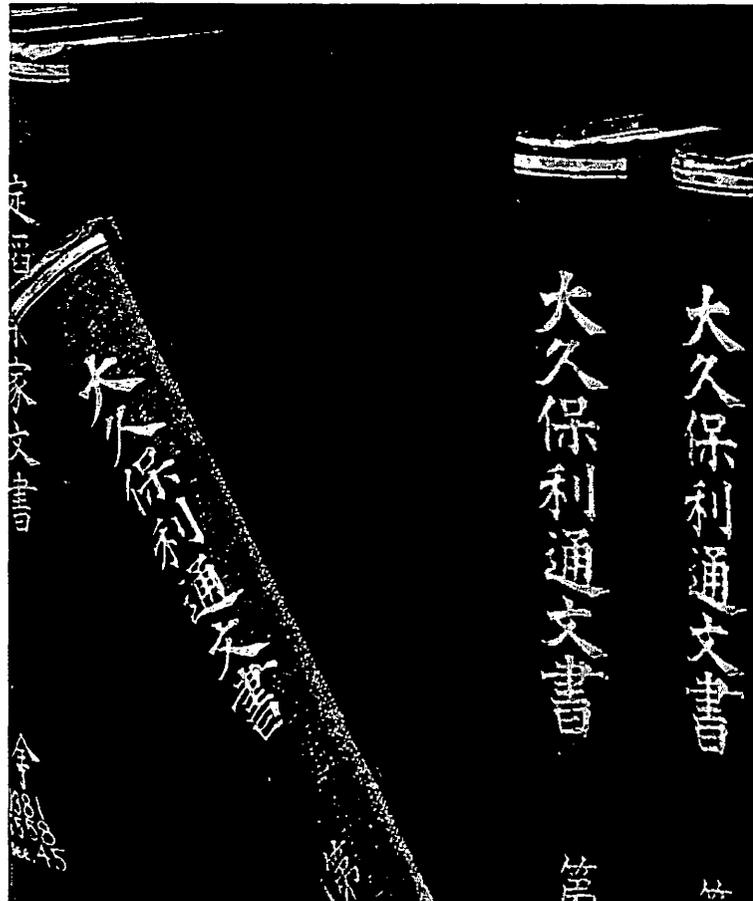
Programs of Study

Two degree programs are offered to undergraduate students: a regional studies curriculum which combines training in a discipline with specialization in a particular area and language; and a language and literature curriculum in one of the Far Eastern or Slavic languages and cultures.

Major and minor academic fields in education and a major academic field for elementary education majors are offered in Russian language and literature. A major and a minor academic field is also offered in Far Eastern studies. See the *College of Education* section.

Graduation Requirements

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.

In the regional studies curriculum, the requirements are: Far Eastern 110 or 310; at least 40 credits in one of the disciplines of the social sciences or humanities (excluding languages), including both basic courses in the discipline and courses in which it is applied to Asia or Russia; at least 15 credits in other disciplines on Asia and Russia (excluding languages); and 30 credits or the equivalent in one Far Eastern or Slavic language.

Students preparing to teach Russian language in the public schools should present 64 credits in the language and the appropriate courses in the College of Education.

Honors in Far Eastern and Slavic Languages and Literature

Adviser

E. Harold Swayze
220 Thomson Hall

Departmental majors who are also members of the College of Arts and Sciences Honors Program must fulfill the requirements of the honors program during the freshman and sophomore years in addition to the following departmental honors requirements. 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, 421J, 422J, 423J, 424J, 443, 452J, 453J, 456J, 465J, 466J, 467J, 468J, 493J; Political Science 414, 420, 429, 432, and 441; Chinese 455, 456 and 457; Economics 495; Philosophy 428; and Russian 426 and 427.)

Departmental honors majors in the regional studies curriculum are required to take Far Eastern 496H*, 497H or 498H. Each is open to nonmajor honors students. Honors majors in the language and literature curriculum may take all or part of this sequence, but they must take a total of at least 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

George E. Taylor
406 Thomson Hall

Admission

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate School* section.

* Subject to approval.



Graduate students who are required to take intensive Chinese or Russian (10-credit courses) must obtain the written approval of the executive officer of the Department and the approval of the Graduate School should their program call for more than 15 credits.

Master of Arts

The department offers courses leading to the Master of Arts degree in the fields of language and literature and in regional studies.

The Master of Arts degree in the field of 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) and a thesis.

The Master of Arts degree in regional studies is offered with the support of the Far Eastern and Russian Institute and the various cooperating departments. Students working toward this degree continue their training in one discipline but also take supporting courses in other disciplines dealing with the area of concentration (either the Far East or Russia). Such course work is available in anthropology, art, economics, geography, history, linguistics, literature, music, philosophy, and political science. For regional studies, a working knowledge of the appropriate language is required. General requirements are a minimum of 45 credits (including at least 12 in seminar work) and a thesis.

In exceptional cases, a Master of Arts degree in Far Eastern regional studies without a working knowledge of a Far Eastern language may be arranged. 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 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
108 Smith Hall

For the program offered under General Studies, see *Interdepartmental Programs* in this section.



GEOGRAPHY

Chairman

John C. Sherman
406 Smith Hall

Professors

George D. Hudson, W. A. Douglas Jackson, Howard H. Martin (emeritus), Marion E. Marts, John C. Sherman, Charles M. Tiebout, Edward L. Ullman

Associate Professors

Frances M. Earle, Richard L. Morrill, Morgan D. Thomas, Joseph Velikonja

Assistant Professor

Hiroaki G. Kakiuchi

Lecturer

Willis R. Heath

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

GENETICS

Chairman and Graduate Program Adviser

Herschel L. Roman
338 Johnson Hall

Professors

August H. Doermann, Howard C. Douglas, Stanley M. Gartler, Arno G. Motulsky, Hershel L. Roman

Associate Professors

Benjamin D. Hall, Brian J. McCarthy, Laurence M. Sandler, David R. Stadler

Assistant Professors

Jonathan A. Gallant, Donald C. Hawthorne, Eugene W. Nester, Reinhard F. Stettler

The Department of Genetics offers a graduate program 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.



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

H. George Kakiuchi
404B Smith Hall

The Department has no fixed program for all students electing to major in geography. The program each student follows, including 50 credits in geography, is developed jointly by him 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.

Programs of Study

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; and three courses on the 400 level; (2) emphasis on a field within geography; and (3) a minimum of three courses in two fields related to geography, mainly the social sciences, earth sciences, or mathematics.

Graduate Programs

Graduate Program Adviser

John C. Sherman
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.

Joint-degree programs of study leading to the doctorate in the Russian, East European, and East Asia fields can be developed 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 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 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 Education* section.



GEOLOGY

Chairman

Howard A. Coombs
42 Johnson Hall

Professors

Julian D. Barksdale, Howard A. Coombs, Richard Fuller, George E. Goodspeed (emeritus), Virgil S. Mallory, Peter H. Misch, Harry E. Wheeler

Associate Professors

Kenneth O. Bennington, Bates McKee

Assistant Professors

Gerald K. Czamanske, Stephen C. Porter, Joseph A. Vance

Geology is the science of the earth—the study of mountains, plains, the varied processes that alter the face of the earth, oceans, ocean basins, ground water, rocks, minerals, fossils, and the conditions under which life existed in the past. Geologists as a group are engaged in the absorbing task of trying to wrest from the earth all its secrets and treasures. The industrial growth of the United States depends heavily on geology.

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

Eileen Kjerulf
42 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, 141, 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) as well as a foreign language (French, German, or Russian) in his undergraduate curriculum.

Graduate Programs

Graduate Program Adviser

Howard A. Coombs
42 Johnson Hall

Admission

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate Education* 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

Examinations for both the master's and doctor's degrees will include subjects from the whole field of geology. All students must present an approved field course such as 401 or other field experience which is approved by the Department.

Prospective candidates for advanced degrees should take the following courses: 443, 480, 481, and a second course in paleontology, or the equivalents of these courses.

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.

Prospective candidates for the Doctor of Philosophy degree must present any two of the following languages: Russian, French, German. All prospective Ph.D. candidates must have either an M.S. or M.A. degree.



GERMANIC LANGUAGES AND LITERATURE

Chairman

William H. Rey
340 Denny Hall

Professors

Raymond Immerwahr, Carroll E. Reed, William H. Rey

Associate Professors

Gerhard Baumbaertel, George C. Buck, Antonin Hruby, Herman C. H. Meyer, Annemarie M. Sauerlander, Richard F. Wilkie, Jr.

Assistant Professors

Felice Ankele (emeritus), Gunter Hertling, Elenora M. Wesner (emeritus)

Instructors

Hellmut Ammerlahn, Alan P. Cottrell, Eugene Egert, Helmut Pfanner, Horst Rabura, Otto R. Siebenmann

Lecturer

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 50 credits are required for the major and 39 credits for the minor. First-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; 2 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.

Honors in Germanics

Adviser

Herman C. Meyer
340 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, 302, 303, 310, 311, 401, 402, 403, in addition to the seniors honors colloquium series (490H, 491H, 492H).

Members of the College Honors Program must fulfill the requirements of that program during the freshman and sophomore years, in addition to the following departmental honors requirements. 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 Program

Graduate Program Adviser

William H. Rey
320 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.

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. If his entire program lies within the field of Germanics, he must elect 24 credits in modern literature and 12 credits in philology and medieval literature or vice versa.

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 (438), Goethe (434, 435), Romanticism (515), Nineteenth-Century Drama (416), Nineteenth-Century Prose (417), and Twentieth-Century Literature (518). They are complemented by courses in Middle High German and Middle High German Literature in the original (556, 557), Bibli-



ography (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 M.A. 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.

A minor in Germanics for the M.A. degree must consist of a minimum of 12 credits in acceptable courses beyond an undergraduate minor in the field. In no instance, however, may a minor in Germanics for the master's degree be less than a major for the bachelor's degree at the University of Washington.

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 81 credits in course work after admission to the Graduate School (45 credits beyond the M.A.) before taking his General Examinations. If he minors in another department, he may elect a minimum of 30 credits in Germanics. If his entire program lies within the field of Germanics, he must elect 30 credits in modern literature (since 1500) and 15 credits in philology and the older literature or vice versa. Furthermore, he is expected to earn at least 9 credits in supervised research (600). 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 15 credits is required. In no instance, however, may a minor in Germanics for the doctor's degree be less than the course requirements stated for the M.A. major.



HISTORY

Chairman

Robert E. Burke
308 Smith Hall

Professors

Vernon Carstensen, Giovanni Costigan, Edith Dobie (emeritus), William S. Holt, Solomon Katz, Ernst Levy (emeritus), Thomas J. Pressly, Max Savelle, Marc Szeftel, S. Harrison Thomson (visiting), Donald W. Treadgold

Associate Professors

Dauril Alden, Robert E. Burke, Robert J. C. Butow, Donald E. Emerson, Gordon Griffiths, Howard Kamin-sky, John L. H. Keep, Scott H. Lytle, Peter F. Sugar

Assistant Professors

Jon M. Bridgman, Sidney L. Cohen, Arther L. Ferrill, Thomas L. Hankins, Fred J. Levy, Elmo R. Richardson

(visiting), John W. Spellman, Peter J. Vorzimmer, John A. Williams

Instructor

Carol G. Thomas (acting)

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.

Once thought of as a chronicle of events and later as a connected story of military and political events, history, in its present-day context, is also concerned with the economic, social, and political evolution of a given society and the ideas expressed in its religion, science, arts, and literature. History is the questions we ask of the past to clarify the problems of the present. It begins where physiology and archaeology stop. Anthropology is concerned with "prehistoric" human societies; history usually begins with those societies which have left a record which the historian can read.

The student of history can expect to gain a growing capacity to see himself in relation to his society, and his own society in the perspective of all human society.

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

Adviser

C. D. Hart
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.

Graduation Requirements

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 390-391 and 490-491). 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

Scott Lytle
106 Smith Hall

Members of the College Program must fulfill the requirements of that program during the freshman and sophomore years in addition to the departmental honors requirements listed. 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 History."

For freshmen and sophomores, honors sections are available in History 101, 102, 201, and 202, and in Social Science 101, 102, and 103.

Students interested in the departmental honors program must have a cumulative grade-point average of at least 3.00 and must obtain the approval of the Department. In their junior year they should enroll in 390H-391H and in their senior year in 490H-491H, in which course they should complete a senior essay. If their work in these courses and their essays are adjudged to be of honors quality, the Department will recommend them for a bachelor's degree "With Distinction in History."

In addition to submitting a regular application for admission to the Graduate School, each applicant is expected to file with the Department of History cer-



tain 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.

Graduate Programs

Graduate Program Adviser

Dauril Alden
308 Smith Hall

Admission

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate Education* 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 will be required to give 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 March 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.

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 Personnel 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 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, participate in the work of 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 and they are expected to complete a minor in another department.

Students majoring in Far Eastern 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.

Students majoring in ancient history are expected to satisfy the same requirements as other students, except that only one year of seminar work in the Department of History may be required. They will take two fields of ancient history, and one of the remaining fields will be arranged in cooperation with the Department of Classics. Additional work in ancient history may be prescribed in lieu of a minor. Before advanced scholarly work in ancient history can be seriously undertaken, a working knowledge of Latin and Greek is essential.

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, Jennie I. Rowntree (emeritus), Margaret E. Terrell

Associate Professors

Doris J. Brockway, Martha E. Dresslar (emeritus),
Laura E. McAdams

Assistant Professors

Florence T. Hall, Dorothy I. Henderson, Richard H. Klemer (visiting), Elaine R. Monsen (acting), Mabel M. Nielsen, Marguerite P. Schroeder

Instructors

Jeannette Crum, Grace G. Granberg, Margaret B. Murdoch, Alice W. Sanstrom, Mabel K. Shigaya, Dorothy J. Smith, Sharon C. Wagner

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 gaining practical experience in management and group living.

Undergraduate Programs

Adviser

Margaret Murdoch
307B 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; Microbiology 301; Zoology 208. Students who wish to prepare for a hospital internship must take Biochemistry 361 and 363. 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 170 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, 111, 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, 111, 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, 309, 332, 370S, 371S or 371X; Speech 101. *Other*: Art 109; Chemistry 101, 102; Economics 200; Microbiology 301; Psychology 100, 306, 320; Speech 100; Zoology 118 or 208. 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 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 Curriculum 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 out 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.

(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 lower-division 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 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.

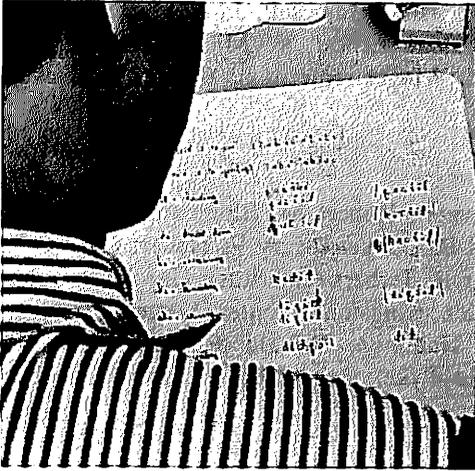
The *Master of Arts* degree is attained by work in textiles and clothing; the *Master of Science* degree, by work in foods and nutrition. Study in either area may be combined with home economics education or family economics. A minimum of 12 credits in a field related to home economics is required.

Master of Arts in Home Economics; Master of Science in Home Economics

There is no foreign language requirement for these degrees. Students may take all their work in home economics or may take up to 15 credits in related fields, such as art, economics, education, public health, or the biological, physical, or social sciences. 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. These 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
229C Denny Hall

Professors

Charles A. Ferguson (visiting), Melville Jacobs, Fan-Kuei Li, Nicholas N. Poppe, Carroll Reed (Acting Chairman 1964-65), Sol Saporta (on leave 1964-65), Oswald J. L. Szemerényi (visiting)

Associate Professors

Robert H. Abernathy, Laurence C. Thompson

Assistant Professors

Heles Contreras (visiting), Antonina Filonov, George V. Grekoff, Fred Lukoff, William F. Wyatt, Jr.

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 at the 400 level 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, speech, English, or another language and literature, and provides the essential basis for graduate work in general linguistics and related specialties. The same courses 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, 454J, 455J.

Graduate Programs

Graduate Program Adviser

Carroll E. Reed
338 Denny Hall

Admission

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.

Master of Arts

Requirements for the Master of Arts degree are as follows: (1) A reading knowledge of German or French, 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 examination 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.

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 structural knowledge of Latin and Greek to be demonstrated as early as possible, which requirement may be fulfilled either by examination or by enrolling for Latin 300 and Greek 300 offered by the Department of Classics; Linguistics 504, 505, 506, 514, 515, 516, 530, and 599; 9 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
245 Physics Hall

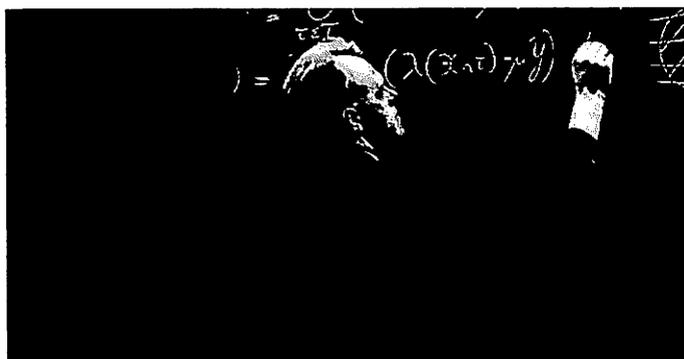
Professors

Carl B. Allendoerfer, Maynard G. Arsove, John P. Ballantine, Ross A. Beaumont, Z. William Birnbaum, Francis H. Brownell III, Douglas G. Chapman, Clyde M. Cramlet, Roy Dubisch, James M. G. Fell, Theodor Ganea, Ronald K. Getoor, Irving L. Glicksberg, Edwin

Hewitt, John R. Isbell, James P. Jans, Victor L. Klee, Lee H. McFarlan, Ernest A. Michael, Richard S. Pierce, Roy M. Winger (emeritus), Herbert S. Zuckerman

Associate Professors

Sherwin P. Avann, Robert M. Blumenthal, Harry H. Corson, David B. Dekker, Mary E. Haller, Charles R. Hobby, Arthur R. Jerbert (emeritus), Harold H. Johnson, J. Maurice Kingston, Gunter Lomer, Anne C. Morel, Isaac Namioka, Ronald Nunke, Robert R. Phelps, Ronald Pyke, Roger W. Richardson, Robert F. Tate



Assistant Professors

David G. Cantor, Ralph E. DeMarr, Homer G. Ellis, Ramesh A. Gangolli, Morton M. Hackman, Thomas W. Hungerford, Tervo Ikebe, Michael McAndrew, George Monk, David S. Newman, Kathleen O'Keefe, Robert W. Ritchie, William Ritter, Sol Schwartzman, Jack Segal, Alan Troy, John W. Woll, Jr., William B. Woolf, N. Donald Ylvisaker

Instructor

Norman Hosay

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 bachelor'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.

Special Facilities

The Laboratory of Statistical Research, directed by Z. W. 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 Research Computer Laboratory, directed by D. B. Dekker, is equipped with the 650, 7094, and 1401 high-speed computers. It provides computing services to all portions of the University and is also available to students who are studying programming or numerical analysis.

Degrees

The Department offers programs leading to the degrees of Master of Arts, Master of Arts in Teaching Mathematics, Master of Science, Master of Science in Mathematical Statistics, and Doctor of Philosophy.

Undergraduate Programs

Advisers

J. Maurice Kingston
245 Physics Hall

Marjorie M. Lortz
245 Physics Hall

Lee H. McFarlan
249 Physics Hall

Admission

Students planning to take courses in mathematics, either as a mathematics major, or as part of some other curriculum, 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 described below.

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 or 155, 156 College Algebra.

These courses carry elective credit in the College of Arts and Sciences, but may not be used to satisfy the degree requirements of certain departments and colleges. Specific information on this matter may be obtained by consulting the appropriate department or college material in this issue of the University's Catalog.

In order to enter 104, 105, or 155, students must have the high school prerequisites listed under the detailed course descriptions below 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. 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 45 credits in mathematics beyond college algebra is required. Courses must include 124, 125, 126, 224, and 27 credits in approved electives.

TEACHER PREPARATION OPTION

A minimum of 45 credits in mathematics beyond college algebra is required. Courses must include 124, 125, 126, 391, 392, 411, 412, 413, 444, 445, and 9 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: 114, 124, 125, 126, general physics

Sophomore year: 224, 301, 324, 325

Junior year: 322, 401, 402, 403, 404

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, 324, 391, 392, 401, 404, 481, 483, 484, and 485. 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, 221, 224, 322, 374, 401, 404, 464, 465, and 466, and 6 credits in approved electives.

HONORS IN MATHEMATICS

Adviser

W. B. Woolf

309 Engineering Annex

Members of the College Honors Program 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, 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: Mathematics 401, 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 courses, Mathematics 134H, 135H, 136H, 234H, 235H, and 236H.

Graduate Programs

Graduate Program Adviser

James P. Jans

305 Engineering Annex

Admission

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 of Arts degree. Students presenting only the minimum amount of undergraduate mathematics cannot expect to earn a master's degree in less than two years.

Since one foreign language is required for all the above master's degrees, except the Master of Arts in Teaching Mathematics, and two languages are required for the doctor's degree, students seeking admission are advised to elect languages as undergraduates. 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 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 in Teaching Mathematics

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 30 approved credits in courses numbered 400 or above, with at least 5 credits in courses numbered 500 or above, is prescribed. These credits must all be in mathematics, except that Education 475A (Improvement of Teaching: Secondary Mathematics), may be included. The thesis for this degree should be an exposition of a mathematical subject closely related to the content of secondary school mathematics. There is no language requirement for this degree.

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 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 mathematics courses numbered 500 or above. The thesis 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, in-

dustrial uses, and disease-producing mechanisms. The related fields concerned with parasites, viruses, and immunity are included in the work of this Department.

In addition to courses for medical students, the Department of Microbiology offers programs in microbiology leading to a bachelor's degree in the College of Arts and Sciences. The purpose of the undergraduate degree is to prepare the individual to assume the responsibilities of a microbiologist upon graduation and to provide him with the background which will permit him to study for an advanced degree if his capabilities warrant it. 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 Education* section. The fields of specialization for advanced degrees are general and medical bacteriology, immunology, parasitology, medical mycology, virology, and physiology of bacteria. Course requirements vary according to the field chosen.

For students in the College of Arts and Sciences, the Department of Microbiology in the School of Medicine offers a four-year curriculum leading to a bachelor's degree. An honors program leading to a bachelor's degree with honors or distinction in Microbiology is available for qualified undergraduates. The degrees of Master of Science and Doctor of Philosophy are also offered in the field of microbiology. See *Graduate Education* section.

Undergraduate Programs

Adviser

Esther Duchow
G301 Health Sciences Building

Graduation Requirements

The requirements are: 36 credits in microbiology courses, including 400; 10 credits in botany or zoology or Biology 101J-102J; Physics 101, 102, 103; Chemistry 140, 150, 151, 160, 170, 221, 231, 232, 241 (or, instead of the last three courses, 335, 336, 345, 346); and Mathematics 124, Biology 451, Botany 461, and Zoology 423 may be counted toward the 36 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; Biology 451; Botany 461; and Biochemistry 481, 482, 483.

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 and 423.
Medical: Microbiology 322, 443, 444; Biological Structure 301, 330; Pathology 231; Zoology 458. For a complete listing and description of medical courses, see *Description of Courses* section.

Honors In Microbiology

Adviser

Neal B. Groman
H325, 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 Honors Program during the freshman and sophomore years (see *Honors* section), but 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 Honors in Microbiology" must comply with the requirements for a bachelor of science degree in microbiology (see above). 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



Admission

Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Education* section. Prospective candidates for advanced degrees are selected primarily upon the basis of scholarship and motivation. 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, Demar B. Irvine, Berthe P. Jacobson, George F. McKay, Kathleen Munro (emeritus), Theodore F. Normann, John W. Verrall, August H. Werner (emeritus), Emanuel R. Zetlin

Associate Professors

James M. Beale, Jr., Irene N. Bostwick, Henry L. Clarke, Walter A. Eichinger, Else J. Geissmar, Edison D. Harris, Eva Maria Heinitz, Randolph Hokanson, Gerald Kechley, George C. Kirchner (emeritus), Ré Koster, John T. Moore, Ralph R. Rosinbum, Vilem M. Sokol, Miriam Terry, Walter C. Welke, Edith Woodcock

Assistant Professors

Warren Babb, William D. Cole, Richard R. Ferrin, Robert A. Garfias (acting), Charles W. Heffernan

Instructors

Thomas W. Bridges, Rodney B. Eichenberger, Paul D. Tufts

Lecturer

Hans Moldenhauer

The School of Music offers curricula for music majors leading to bachelor, master, and doctoral degrees as described below. The School also serves the University-at-large by providing lecture courses of interest to nonmajors and by opening its performing ensembles to any qualified singer or instrumentalist. Students planning to teach in the public schools may earn bachelor degrees in the College of Arts and Sciences by including in their programs courses in the College of Education that are required for the teaching certificate. For students enrolled in the College of Education, the School also offers a combined major and minor with secondary school emphasis, a minor with secondary school emphasis, and a major with elementary school emphasis; see the *College of Education* section.

Undergraduate Programs

Adviser

Paul D. Tufts
105 Music Building

To qualify as a music major the student must demonstrate proficiency in vocal or instrumental performance, as well as a sufficient knowledge of notation and theory to enter first-year theory at the college level. 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.

Bachelor of Arts in Music

This degree is offered with a major in Music Teaching, and is intended for students who wish to avail themselves of a four-year program as a preparation for the teaching of music in secondary schools. (For more thorough professional training in a five-year program,

see below under the description for the concurrent Bachelor of Arts and Bachelor of Music degrees.) A grade-point average of 2.50 in music courses is required for graduation.

Required are 97 credits in music. Courses must include music teaching: 10 credits from 344, 346J, 474, 476, 499; 36 credits in vocal or instrumental instruction and performance techniques; Theory 101, 102, 103, 114, 115, 116, 201, 202, 203, and 6 credits from 321, 322, 353; Music History: 207, 208, 209, 307, 308, 347; Conducting: 384 or 385; 12 credits in ensembles. For graduation, the student must have completed Education 371X or 371S, directed teaching in the field of music. For the requirements in education courses for the State of Washington Provisional Certificate see the *College of Education* section.

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 core of the curriculum is intended to develop an understanding of music through the study of its theory and history, and the student has the further option of additional concentration in either the theory-history aspects or the performance aspects of music.

Required are 70 credits in music. Courses must include Theory 101, 102, 103, 114, 115, 116, 201, 202, 203, 321, 322, 323, 481; Music History 207, 208, 209, 307, 308, 309; and 27 credits in one of the following options: Music Theory-History Option—12 additional credits in Theory or History; 9 credits in upper-division vocal or instrumental instruction; 6 credits in ensembles. Vocal or Instrumental Option—18 credits in vocal or instrumental instruction, of which 9 credits must be upper division; 9 credits in ensembles. A grade-point average of 2.50 in music courses is required for graduation.

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" must maintain a grade-point average of 3.20 in music courses.

Candidates for the concurrent degrees must complete the Music Theory-History option* for the Bachelor of Arts, and one of the majors described below for the Bachelor of Music.

Specific requirements for each Bachelor of Music major are as follows:

COMPOSITION MAJOR: A minimum total of 125 credits in music is required. Courses must include 24 credits in Composition from 191, 291, 391, 491; 5 credits in Conducting; 24 credits† in vocal or instrumental instruction; 18 credits in ensembles. The theory-history sequence for the B.A. should include 353, 408, 409, 422.

MUSIC HISTORY MAJOR: A minimum total of 125 credits in music is required. Courses must include 353, 452, and 3 credits from 314, 315, 316; 15 additional credits in Music History; 5 credits in Conducting; 24 credits* in vocal or instrumental instruction; 18 credits in ensembles. The theory-history sequence for the B.A. should include 407, 408, 409, 422. 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.

MUSIC TEACHING MAJOR: A minimum of 126 credits in music is required. Courses must include 16 credits in Music Teaching from 344, 346J, 474, 476, 499;

*Students proficient in performance may be permitted to substitute courses in theory or music history for not more than 6 of these credits.

†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 additional courses to complete the total.



42 credits in vocal or instrumental instruction and performance techniques distributed among a major performance medium (24 credits), a secondary performance medium (12 credits), and performance electives (6 credits); Conducting, 384 or 385; 12 credits in ensembles. The theory-history sequence for the Bachelor of Arts degree should include 353 (or 354), 421, 422. For the requirements outside of music necessary for the teaching certificate see the *College of Education* section.

PIANO MAJOR: A minimum total of 133 credits in music is required. Courses must include 46 credits from 150, 250, 350, 450, 451; Accompanying, 334, 335, 336; Repertoire, 337, 338, 339; Pedagogy, 434, 435, 436; 18 credits in ensembles. The theory-history sequence for the Bachelor of Arts degree should include 331, 332, 333, 422.

VIOLIN OR VIOLONCELLO MAJOR: A minimum total of 133 credits in music is required. Courses must include 46 credits from 150, 250, 350, 450, 451; 6 credits in Piano, 130A or 210A; Conducting, 384; Pedagogy, 434, 435; 21 credits in Ensembles. The theory-history sequence for the Bachelor of Arts degree should include 303, 367, 452. Violinists should complete one year of viola.

VOICE MAJOR: A minimum total of 132 credits in music is required. Courses must include 46 credits from 150, 250, 350, 450, 451; 6 credits in Piano, 130A or 210A; Rhythmic Movement and Music Theater Technique, 111, 112, 113, 211; Accompanying, 334; Repertoire, 337, 338, 339; Choral Conducting, 385; Pedagogy, 434; 12 credits in ensembles. 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.

ORGAN MAJOR: A minimum total of 134 credits in music is required. Courses must include 46 credits from 150, 250, 350, 450, 451; 6 credits in Voice; 331, 332, 333; Accompanying, 334, 335; Repertoire, 337, 338, 339; Choral Conducting, 385; 12 credits in ensembles. The theory-history sequence for the Bachelor of Arts degree should include 303, 422.

ORCHESTRAL INSTRUMENT MAJOR: A minimum total of 129 credits in music is required. Courses must include 46 credits from 150, 250, 350, 450, 451; 6 credits in Piano, 130A or 210A; Conducting, 384; 21 credits in ensembles. The theory-history sequence for the Bachelor of Arts degree should include 367.

Graduate Programs

Graduate Program Adviser

Demar Irvine

108 Music Building

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate Education* section. Summaries of the undergraduate preparation required for each of the various majors are listed in the information leaflets, "Graduate Studies," prepared by the School of Music. All students working toward advanced degrees are expected to be proficient in general musicianship, including piano, and show a satisfactory knowledge of music theory and music literature.

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

Majors are offered in composition, music teaching, 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

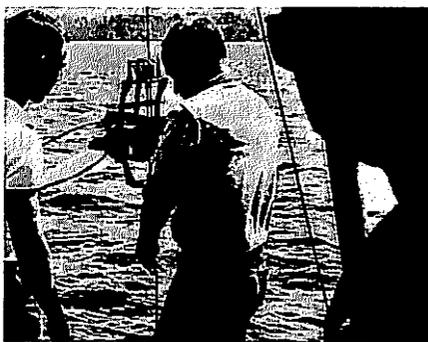
This degree is intended as a recognition of high professional attainment in some major branch of performance, or in original composition, or in the field of music teaching. The main objective of the doctoral

studies for this degree should be the broadening and deepening of professional preparation for teaching at the college level. In addition to an expert knowledge of the specialty, prospective candidates must show superior competence in the various supporting musical disciplines and some awareness of fields other than music.

Of the minimum of 80 credits of course work required, half must represent music courses numbered 500 or above, and from 15 to 25 credits should be completed in courses numbered 300 or above in departments other than music. In lieu of a single longer dissertation, students will submit three theses. One of the theses must be a research paper; the other two may be additional research papers, or musical compositions, or essays of a critical or methodological nature. A reading knowledge of two foreign languages is required.

Doctor of Philosophy

This degree is offered with a major 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. A minimum of 80 credits is required, of which 36 credits must be in music courses numbered 500 or above, and 20 to 30 credits will normally represent supporting courses in other departments. In addition, the student must present an acceptable dissertation representing original and independent investigation.



OCEANOGRAPHY

Chairman

Richard H. Fleming
202 Oceanography Building

Professors

Richard H. Fleming, Clifford A. Barnes, Maurice Rattray, Jr., Francis A. Richards

Associate Professors

Karl Banse, Joe S. Creager

Assistant Professors

Lawrence K. Coachman, T. Saunders English, M. Grant Gross, Jr.

Research Appointments

Dora P. Henry (Associate Professor), George C. Anderson, Betty J. Enbysk, Dean A. McManus, Y. Ram-mohanroy Nayudu (Assistant Professors); William A. Dawson, Hsin-Yi Ling, John T. Whetten (Instructors); Walter C. Sands (Lecturer)

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

Adviser

T. Saunders English
321 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 Sci-



ences and complete: Chemistry 140, 150, 151, 160, 170, 221; Geology 205 or 310; Mathematics 124, 125, 126; Oceanography 203, 403; 405 or 450; 401, 402 or 404J, 410, 412; 421-422, 423; 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. The requirements for the options are:

Biological Oceanography Option: Biology 451, 451L; Botany 112, 446; Mathematics 281, 382; Oceanography 401, 402, 443, 460, 499; Zoology 112, 433, 434, 456.

Chemical Oceanography Option: Chemistry 335, 336, 337, 345, 346, 455, 456, 457, 458 (347 recommended), and 3 additional credits in chemistry courses numbered above 402; Mathematics 281, 382; Oceanography 424, 443, 460, 499; 404J, 410, 412, and either 411 or 452 and 453; 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, 443, 452, 453, 460, 499.

Physical Oceanography Option: Mathematics 224, 225, 238, 322, 324, 391, 392, 438; Geophysics 403J and Physics 221, 222, 325, 326, 327, 371, 372; or Mathematics 325, Atmospheric Sciences 340, 431, 432, 441, 442, and Physics 221, 222; and Oceanography 404J, 410, 411, 412, 443, 460, 499.

Honors in Oceanography

Adviser

T. Saunders English
321 Oceanography Building

Members of the College of Arts and Sciences Honors Program must fulfill the requirements of that program during the first eight quarters of study in addition to the following departmental honors requirements. 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 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, 6 credits); 280H (Introduction to Oceanography, 5 credits); 380H* (Upper-Division Tutorial, 6 credits); 480H* (Undergraduate Research, 6 credits); 488H (Field Experience, 2-6 credits); 489H (Undergraduate Thesis, 1-6 credits, max. 6).

Honors credits 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 comprehensive examination may be required of each honors student as part of the thesis requirement. A senior thesis will be required for each honors student.

Graduate Program

Graduate Program Adviser

J. S. Creager
211 Oceanography Barge

Admission

Students who have completed an undergraduate major in oceanography or one of the supporting sciences can be accepted for graduate studies in the Department of Oceanography. Students not majoring in Oceanography should acquire a background in the basic sciences equivalent to the requirements for the Bachelor of

* The student will elect one or both.

Science in Oceanography. Students with weak undergraduate preparation must expect to spend more time earning a graduate degree. Additional information can be obtained from the Department.

The student specializes in biological, chemical, geological, or physical oceanography; interdisciplinary studies are possible. He is expected to have as background the material covered in Oceanography 401, 402 or 404J, 410, 412; 403, 405 or 450; 421-422, 423, 460, and 520. All requirements of the Graduate School must be satisfied.

Master of Science

The student and his adviser prepare a program of study. This program and a thesis proposal are approved by the Supervisory Committee. The student must obtain a certificate of proficiency in one foreign language and translate one scientific paper. A qualifying written examination must be passed and a thesis prepared. The student presents his thesis at a departmental seminar for approval by the Supervisory Committee.

Doctor of Philosophy

The student and his Supervisory Committee prepare a program of study and research. A reading knowledge of two scientific languages and a translation of one scientific paper in each are 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, Arthur Smullyan

Associate Professors

Paul Dietrichson, David Keyt, Robert J. Richman

Assistant Professors

John F. Boler, James Mish'alani, Laurent Stern

Instructor

John R. Moulton

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 Boler
234 Savery Hall

The requirements are: 50 credits in philosophy, including 110 or 215, 120, 320, 322, and at least one from 321, 325, or 326. Humanities 103 in the General Education program, which is identical with Philosophy 100, may be counted toward a major.

Honors in Philosophy

Adviser

Arthur F. Smullyan
264 Savery Hall

Members of the College of Arts and Sciences Honors Program must fulfill the requirements of that program during the freshman and sophomore years in addition to the following departmental honors requirements. 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. Special honors sections of Philosophy 100, 120, and 215 are regularly offered.



Graduate Programs

Graduate Program Adviser

R. Richman
264 Savery Hall

ADMISSION

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 should be taken as early as possible and no later than the first quarter of the second year of graduate study.

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 Examinations in four parts covering the fields of logic, history of philosophy, metaphysics and epistemology, and ethics. 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 M. Wilson
105 Hutchinson Hall

Chairman for Men

R. K. Cutler
210 Edmundson Pavilion

WOMEN

Professor

Marion R. Broer (on leave)

Associate Professors

M. Kathro Kidwell, Leone H. Rulifson, Ruth M. Wilson

Assistant Professors

Elizabeth J. Culver, Carolyn Darrow (acting), Katharine S. Fox, Mary J. Gaines (on leave), Dorthalee B. Horne, Dorothy G. MacLean, Bonnie J. Purdy

Lecturer

Lucille Trucano

Instructors

Norma J. Carr, Iris Garland

Instructors

John J. Pariseau, Robert J. Schwarzkopf, Peter Steilberg

The School of Physical and Health Education functions in three main areas: the physical education activity program which provides courses required of undergraduate University students; the program in intramural sports and recreation, which provides organized competition, sports clubs, and recreational facilities which all students may use on a voluntary basis; and the prescribed professional education programs, which provide four-year curricula in physical education, recreational leadership, and 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.

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

Adviser (Men)

R. K. Cutler

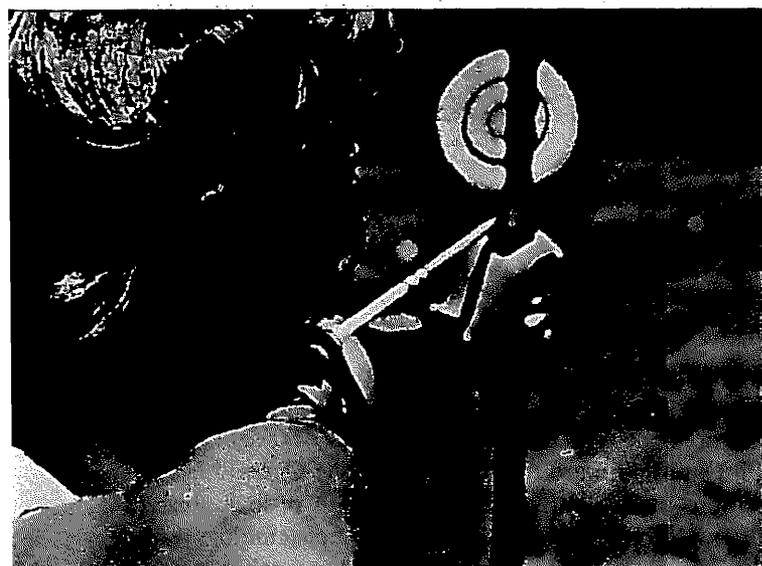
210 Edmundson Pavilion

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 101J-102J or Zoology 111-112; Zoology 118 and 118L or 208; Health Education 291, 429, 465; Physical



MEN

Associate Professors

Russell K. Cutler, Eric L. Hughes, Norman F. Kunde, Caswell A. Mills, Clifford L. Peek, George S. Reeves, Leonard W. Stevens, John A. Torney, Jr.

Lecturers

Wilbur M. Duckworth, Robert W. Hendershott, Stanley J. Hiserman, Richard N. Huey, Kenneth Lehman, James Owens, Robert A. Peterson, Thomas O. Tipps, Donald E. White



Education 164, 165, 166, 190, 264, 265, 266, 293, 309, 322, 340, 345, 363, 370, 371, 450, 493; and Recreation Education 294, 324.

CURRICULUM IN RECREATIONAL LEADERSHIP

This curriculum is designed to prepare qualified personnel for employment in tax-supported, industrial, military services, hospital, institutional, commercial, or voluntary agencies in conducting or administering recreation programs and services. The program of study with electives as offered provides opportunity to meet the basic requirements for these indicated specialized areas.

The specific requirements for the Recreational Leadership major are: Recreation Education 254, 294, 324, 344, 354, 374, 434, 454; Health Education 291, 292; Physical Education 164, 165, 166, 265, 266, 295 or 364, 309, 340; Business Administration 210, 301, 365; Education 455 or 209; Political Science 202; Communications 303, 200; Art 100, 290 or 291 or 292; Drama 101 or 102 or 103, 331 or 338; Librarianship 452; Music 107.

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 and 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 101J-102J 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, 358, 361, 363, 364, 370, 371, 372 or 373, 447, 450, 493; and Recreation Education 294, 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 level, 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.

A health education curriculum leading to a Bachelor of Arts degree without a teaching certificate is offered through the Department of Preventive Medicine.

The requirements are: Biology 101J-102J; 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.

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 283, 272, 273, 280, 281, 284, 293, 375, 376, 377; Health Education 291, 292; Chemistry 100 or high school chemistry; Biological Structure 301; Physics 170 and 170L; Zoology 118 and 118L; 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 Physical Education 272, 280, 282, 283, 284, 375, 436; Health Education 292; Recreation Education 294, 324, 344, 454; Biological Structure 301; Forestry 356; Librarianship 452; Speech 332; Art 100 or Educa-

tion 376; and Art 290 or 291 or 292; Drama 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 Physical Education 271, 272, 273, 280, 281, 282, 283, 284, 293, 375, 376, 377, 304 or 305-306, 322, 345, 436, 450, 480, N466; Recreation Education 344; Health Education 291, 292, 453; Biological Structure 301; Physics 170 and 170L; Zoology 118 and 118L.

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 101J-102J; 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)

Russell K. Cutler
201 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.

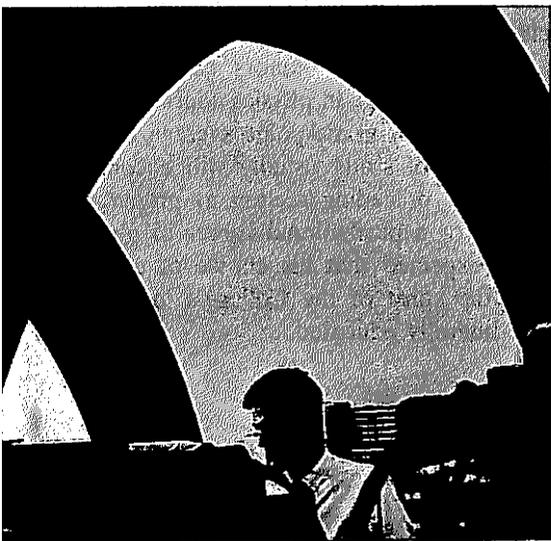
For the master's degree with a major in physical education, at least 22 credits, including the thesis, must be in courses numbered 500 and above. There is no foreign language requirement for the degree Master of Science in Physical Education. In the Department for Men, a total of 41 credits, including Physical Education 600, is 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. At least 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 Physical and Health Education Department.

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.



The requirements for a minor in physical education for the master's degree are at least 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

John S. Blair, David Bodansky, Henry L. Brakel (emeritus), Kenneth C. Clark, Jay G. Dash, Hans G. Dehmelt, George W. Farwell, Ronald Geballe, Isaac Halpern, Joseph E. Henderson, Ernest M. Henley, Boris A. Jacobsohn, Jere J. Lord, George E. Masek, Seth H. Neddermeyer, Fred H. Schmidt, Edwin A. Uehling, Clinton L. Utterback (emeritus), Lawrence Wilets, Robert W. Williams

Associate Professors

Marshall Baker, James B. Gerhart, Paul M. Higgs, Ray W. Kenworthy, Llewellyn A. Sanderman, John F. Streib, Jr.

Assistant Professors

Victor Cook, Howard F. Davis, William D. McCormick, Mark N. McDermott, Ivan Muzinich, 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 3½ 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

Superior students may be selected to participate in the departmental honors curriculum and to be candidates to receive the bachelor's degree "With Distinction in Physics." Members of the College of Arts and Sciences Honors Program majoring in physics must also be selected to participate in the departmental honors curriculum to become candidates for an honors degree.

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 for developing into an original and productive scientist. Undergraduates majoring in physics may be recommended for the degree of Bachelor of Science "With Distinction in Physics" if they 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

J. S. Blair
333 Physics Hall

Admission

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. German, French, and Russian are suitable for this purpose. (4) The student must pass a Final Examination which usually is oral.

Students obtaining 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 basic program: Physics 505, 506 (Advanced Mechanics), 513, 514, 515 (Electricity and Magnetism), 517, 518, 519 (Quantum Mechanics), 524, 525 (Thermodynamics and Statistical Mechanics), and 528 (Current Problems of Physics). 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, but not required, to complete work in one or more fields other than physics. This

outside work may be presented as either a minor or as a supporting subject. The Department recognizes either approach, details being arranged by the student and his Supervisory Committee. Approximately 12 credits of work in a field of interest are considered to constitute a supporting subject. Particular attention is called to the following offerings of the Department of Mathematics: Mathematics 527 (Elements of Real Variables for Scientists), 528, 529 (Hilbert Space Operators and Applications), as well as 534, 535, 536 (Complex Variable), 538, 539 (Nonlinear Ordinary Differential Equations), and 569JJH (Partial Differential Equations).

Reading proficiency in two foreign languages must be demonstrated by examination. Russian, French, and German are suitable for this purpose.

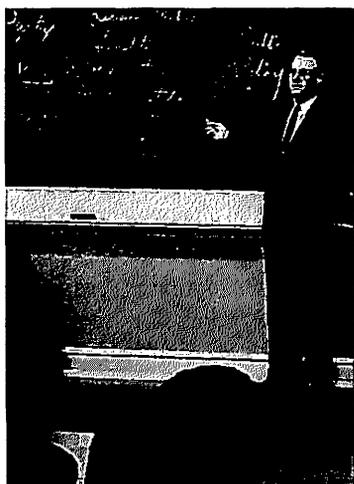
In addition to the preliminary examination, prospective candidates for the degree of Doctor of Philosophy must pass, successively, a written qualifying examination, a General Examination for admission to candidacy, and a Final Examination. The qualifying examination is designed to assess the depth of 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, Dell G. Hitchner,
Linden A. Mander, John S. Reshetar, Jr., George A.
Shipman, Donald H. Webster

Associate Professors

Charles W. Cassinelli, David J. Danelski, Alex Gottfried,
William H. Harbold, Morton Kroll

Assistant Professors

John H. Kessel, Walter L. Riley, Peter H. Rohn, Robert Warren

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, 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. For students who are definitely preparing to enter the government service, more detailed course recommendations are set forth in two specialized curricula: International Relations and Public Administration. 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 Education 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

Arthur Wild, Donald Seney
204 Smith Hall

Graduation Requirements

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 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 include Political Science 201 and 202, and must also be distributed among the following three broad fields to the extent of at least ten credits in each: political theory and public law; government, politics, and public administration; comparative government and international relations. The Department maintains a current list of courses which will satisfy these requirements.

Curriculum in International Relations

Recommended courses are: Political Science 202 and 203; 411 or 418; 445, 460, and 470; at least four courses from 321, 322, 328, 336, 420, and 427; at least three courses from 323, 324, 429, 430, and 432; 425, 426; Economics 200; Geography 100; and Sociology 110.

A reading and translating knowledge of at least one modern foreign language is strongly recommended. To develop the necessary language proficiency, not less

than 30 university credits in one language, or the equivalent in high school and university work combined, will be needed.

Curriculum in Public Administration

Recommended courses are: Political Science 201, 202, 362, 412, 427, 450, 460, 470, 471, 472, and if possible 370 or 451, 375 or 376; Accounting 210; Economics 200, 201, 301, 350, and 451; Business Statistics 201 or Mathematics 281; Psychology 100; Sociology 310 and 466; and History 241. The program should be supplemented by at least four other upper-division courses in the social sciences selected in consultation with an adviser.

Honors in Political Science

Adviser

William H. Harbold
208 Smith Hall

Members of the College of Arts and Sciences Honors Program must fulfill the requirements of that program during the freshman and sophomore years, in addition to the following departmental honors requirements. 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 Political Science 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 ten hours 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, Political Science 398H, although with the approval of their adviser, 5 credits in Political Science 499H may be substituted for 5 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, written examination, which will be scheduled according to need at the end of each term.

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

Hugh A. Bone
206 Smith Hall

Admission

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate Education* section. Prospective candidates for these degrees must have completed an undergraduate major or the equivalent in political science.

PROGRAMS OF STUDY

Master of Arts

A total of 36 credits in individually approved programs is required. The student must also submit an essay of distinction and pass a comprehensive oral examination on the content of a major and two minor fields.

If the student is permitted to adopt Far Eastern or Russian political science as a field of concentration, he must have a reading knowledge of the appropriate foreign language, and both of his supporting fields must be in general political science.

Master of Public Administration

A curriculum leading to this degree is offered by the Graduate School of Public Affairs; see the *Graduate Education* section.

Doctor of Philosophy

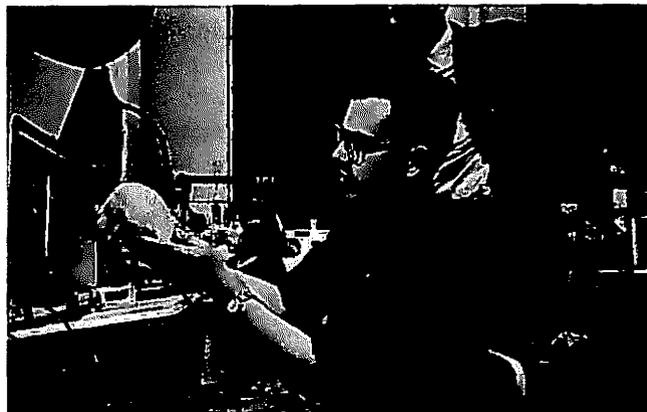
Doctoral students must acquire mastery of a field of concentration in which the dissertation is prepared and of additional supporting fields. The following fields may be used for both purposes: political theory, international law and relations, comparative government, public law, public administration, American government and politics, and state and local government. Combinations of some of these fields may be required.

Students may be permitted to substitute special regional fields for any of the above general fields under the conditions set forth below. But if this is done,

comparative government cannot be offered as well. Students are also encouraged to minor, or offer supporting courses, in other social sciences such as history, economics, sociology, psychology, or geography.

A minimum of 108 credits is required, including 27 allowed for the dissertation. Not less than two-thirds of the minimum credits required for the degree must consist of those earned in courses numbered 500 or above. The student must present a field of concentration and four supporting fields.

If the student is permitted to adopt Far Eastern or Russian political science as a field of concentration, he may also present a related field of regional studies as one of his supporting fields. (See the *Graduate Education* section.)



PSYCHOLOGY

Acting Chairman

George P. Horton
M40 Denny Hall

Professors

Sidney W. Bijou, Allen L. Edwards, Erwin A. Esper (emeritus), Paul E. Fields, Eugene H. Galanter, A. Paul Horst, Roger B. Loucks, Moncrieff H. Smith, Jr., Charles Riddell Strother, William R. Wilson (emeritus), Lloyd S. Woodburne

Associate Professors

Donald M. Baer, Sidney S. Culbert, Louise B. Heathers, George P. Horton, Benjamin B. McKeever, Irwin G. Sarason, Ezra Stotland

Assistant Professors

Jay S. Birnbrauer, Eleanor Evans, Mitchell Glickstein,



Thomas G. Hermans (emeritus), Robert B. Lockard, Clifford E. Lunneborg, Jr., H. Herbert Wells III

Lecturers

K. Eileen Allen, Robert E. Guild, Florence R. Harris, Thomas F. Hodgson, Margaret S. Johnston, Theodore D. Tjossem, Nathaniel N. Wagner

Psychology is that branch of science which seeks to understand the behavior of organisms, both human and infra-human, normal and abnormal. Psychology accepts the individual organism rather than the collective or group as the unit of analysis. It attempts to discover how organisms perceive the world, how they develop and change over the course of their life histories, how they choose among alternative courses of action, how they relate to their fellows and to social institutions.

A major in psychology frequently appeals to students concerned with problems of social and individual betterment. The prospective major, however, is advised that the emphasis of the Department is upon the scientific inquiry into the human condition 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 which their solution requires.

Though the undergraduate offerings of the Department are not intended to fit the student for any particular occupational role, they are of special value to students planning careers in business and industry, in the medical and legal professions, in teaching, in nursing, and in social work. Students interested in psychology as a career must be prepared for from three to four years of graduate training.

The Department of Psychology offers courses leading to the degrees of Bachelor of Science, Master of Science, and Doctor of Philosophy. The Departments of Physiology and Psychology offer a joint program in physiological 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.) Students in the College of Education

who elect psychology as a major field must fulfill the formal requirements stated below.

In addition to its research and teaching laboratories, the Department includes, in separate quarters, the Developmental Psychology Laboratory with its research and pre-school laboratories.

Undergraduate Programs

Adviser

M40 Denny Hall

Admission

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 enter the Department as an undergraduate major.

Graduation Requirements

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, 130, 134, or 157) 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 Psychology 190H (Introduction to the Scientific Analysis of Behavior), and of Psychology 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 Psychology 190H (or equivalent), 191H (or equivalent), and 301 with a minimum grade of B in each.

Candidates for the Bachelor of Science "With 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 (Psychology 350H and 450H) and Honors Thesis (Psychology 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 adviser, 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

George P. Horton
M40 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.

Admission

The requirements for admission to the Department of 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 Education* 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 and engineering, 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.

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, Princeton, New Jersey 94704, or 1947 Center Street, Berkeley, California. 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 Admissions Office 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 proseminar (500-501-502); (2) the experimental design and quantitative techniques sequence (514-515-516); and (3) the experimental laboratory (520-521-522). Part of the purpose of this first-year program is avowedly evaluative, but more importantly, 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.

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 apply for 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 four 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 is associated with the Department of Physiology and Biophysics in a joint doctoral program in physiological psychology. Students interested in this special degree can obtain details from the coordinator of the program, Dr. Mitchell Glickstein, Department of Psychology, University of Washington.

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, 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.

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

A. Emerson Creore (acting)
217 Denny Hall

Professors

Jean-Charles Chessex (emeritus), Carlos Gracia-Prada

(emeritus), Howard L. Nostrand, Sol Saporta, William C. E. Wilson

Associate Professors

Oscar Büdel, A. Emerson Creore, Jean F. David, Lionel J. Friedman, Abraham C. Keller, Marcelino Peñuelas, Sol Saporta, Lurline V. Simpson, Anfbal Vargas-Barón, Clotilde M. Wilson

Assistant Professors

Robert C. Dale, Herschel J. Frey, Victor E. Hanzeli, John F. Saunders, Emile Snyder, Joseph Sommers

The Romance languages make up one of the two largest language families in Western civilization. (The other large family, Germanic languages, includes English.) The four Romance languages which have the richest literatures, and are spoken by the largest numbers of persons, are French, Spanish, Italian, and Portuguese. In each of these four languages and their literature, the University of Washington offers an undergraduate major program and the opportunity to specialize before or after graduation in any of the interests that develop from the basic study of a modern language and literature. Among these further interests are the perfecting of the language skills—understanding the spoken word, speaking, reading, and writing; the internal study of literary works of art; the history of literature—both the external situation of individual works and the evolution of literary types; the analysis of the structure of the language, its historical development, and its relation to other languages; the investigation of the language-learning process, and the consequent design of teaching methods, materials, equipment, and curricula; the describing of the cultural and social context essential for an understanding of a language and its literature.

The study of a foreign language and literature has value, above all, for one's general education—the experience of penetrating into a foreign way of life and thought can be a "Copernican step" to freedom from the ethnocentric feeling that one's native way of seeing and judging is *the* natural way. A second language and culture also opens the way to careers in international political, legal, business, and professional relations, and in teaching, where language specialists are in critically short supply for all age levels beginning with the elementary grades.

The Department of Romance Languages and Literature offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. For undergraduate students, the Department offers an elec-

tive curriculum with a major in French, Italian, Spanish, Portuguese, or Romance linguistics.

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). Curriculum in Latin-American studies is provided by General Studies.

The Department offers courses in English, 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.

Entering students' high school work in language will be evaluated by means of a placement test (see *Undergraduate Education* section).

Any of the prerequisites for courses in this Department may be waived at the instructor'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

217 Denny Hall

Graduation Requirements

The *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, as outlined in syllabi obtainable from the Department. 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 or 309; 6 credits in advanced conversation (327, 330, 430); 409; 12 elective 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 or 309; 6 credits in advanced conversation (327, 330, 430); 409; 12 elective credits in literature courses numbered above 400. (See also Latin-American Studies under *General Studies*.)

Italian Major

A minimum of 38 credits of course work (or equivalent) in Italian beyond the level of 103, plus Romance 401. Required are: 212, 213, and 214; 421, 422, and 423. Beyond these courses, an individualized program may include supervised study and exercises in the Language Laboratory.

Portuguese Major

The Portuguese major consists of an individualized program of courses selected from those listed in the College List, and may include supervised study and exercises in the Language Laboratory.

Romance Linguistics Major

There is a prerequisite of 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, 10); 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 on the College List.

In all curricula, credits 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.

Honors in French or Spanish

Adviser (French)

A. E. Creore
239 Denny Hall

Adviser (Spanish)

John Saunders
217 Denny Hall

Members of the College of Arts and Sciences Honors Program must fulfill the requirements of that program during the freshman and sophomore years, in addition to the following departmental honors requirements. 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 "With Distinction in Spanish."

Candidates for departmental honors must have an over-all grade-point average of 3.00 with 3.50 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 are as follows: French or Spanish 327H (6 credits), 304H, 305H, 306H, 491H, 492H, 493H; plus nonhonors courses French or Spanish 301, 302, 303, 409, and Romance 401; plus electives in upper-division literature courses offered by the Department (6 credits). For the academic year 1964-65, substitutions will be made for courses 491H, 492H, 493H.

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.

By special arrangement, honors credit is available to honors students in French or Spanish 390.

An honors thesis (3 credits) is required.

Graduate Programs

Graduate Program Adviser

A. Emerson Creore
217 Denny 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 in some combination of French, Italian, Portuguese, and/or Spanish language and literature and Romance linguistics.

Students are responsible for knowing and fulfilling the general requirements of the Graduate School.

Master of Arts

The Master of Arts degree may have any of three investigative emphases: (1) language and linguistics, (2) literature, and (3) teaching and learning foreign languages and their literature in socio-cultural context. All three areas of specialization presuppose competence in the written and spoken language, and knowledge and critical appreciation of the literature and the culture it expresses. The student will be expected to demonstrate knowledge of literary works and periods such as those included in appropriate syllabi obtainable from the Department. Details of the student's program will be determined by each student in consultation with his advisory committee.

A prospective candidate will be admitted to a degree program upon satisfactory completion of an undergraduate major or its equivalent; indication (by one or more critical papers) of ability to conduct investigations on the level of undergraduate seminars and to express the results in clear, correct, and well-organized reports; and demonstration of oral and written proficiency in a Romance language. A transfer student may submit a preliminary recording of his pronunciation before registering at the University of Washington, and an applicant for a teaching assistantship must do so. Supplementary or remedial assignments may be recommended where serious deficiencies exist.

The master's thesis may consist of a problem in original research, or an exposition or status study of an accepted topic. A nonthesis program, primarily for language teachers, stresses linguistic proficiency and acquaintance with area and culture.

Doctor of Philosophy

Doctoral programs are offered in the following four fields of specialization: Romance literature; Romance linguistics; language and language learning; French or Spanish or Italian or Portuguese language and literature.

The Master of Arts degree is a prerequisite for the Ph.D. General Examination, unless an exception is granted by the Graduate Studies Committee of the Department.

General requirements for all the Ph.D. programs 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 a mutually acceptable adviser. (2) Prior to acceptance, the student is expected to demonstrate near-native proficiency in the major Romance language. (3) Early in his course the student should pass a reading examination in two foreign languages other than the major, one of which must be a non-Romance language. (4) As early as possible the student and his adviser will submit a course plan to the Graduate Studies Committee for approval. (5) Prior to the General Examination, a student who has not written a master's thesis will be required to write, after consultation with his adviser, a critical paper designed to develop and demonstrate capacity for research and criticism. (6) A dissertation approved in subject and content by the student's adviser and an advisory committee must be submitted in completed form to the chairman of the Graduate Studies Committee six weeks before the date of 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 (represented by Romance 401, 402; 505, 506, 507; 581; and a course of study in the history of one Romance language), the student's course work will normally include at least 30 credits in each of two Romance literatures, as selected by the student and his adviser. Whatever the combination of these two literatures may be, 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 Graduate Studies 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.

Courses outside the Department of Romance Languages may be accepted in some programs as approved by the student's Supervisory Committee.

ROMANCE LINGUISTICS

Approximately half of the student's course work will be in Romance linguistics and the histories and structures of individual Romance languages. The other half



will be divided equally between courses in general linguistics and in one Romance literature as chosen by the student. In literature, the student should have knowledge of literary works such as those listed in the M.A. syllabus for 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, 507, 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 the advisory committee) in a Romance literature. Romance 475DJ and 475EJ are also recommended.

FRENCH OR SPANISH OR ITALIAN OR PORTUGUESE 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 or a literary genre or in any humanistic field relevant to the research specialization as represented by the choice of a doctoral dissertation subject.

SCANDINAVIAN LANGUAGES AND LITERATURE

Chairman

Sverre Arestad
215 Denny 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 study of Scandinavian should be regarded primarily as a contribution to a liberal education. Some students will want to use one of the languages to fulfill the two-year college language requirement; others may want to enter teaching or government; and still others may find any of the languages useful in research.

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.

In all Scandinavian languages, courses 101-102 and 103 should, if possible, be taken with 104-105 and 106 to make 5-credit courses.



Undergraduate Programs

Advisers

Sverre Arestad
215A Denny Hall

Walter Johnson
215C Denny Hall

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, 104-105, 106, 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, 104-105, 106, 220, 221, 222, 300, 301, 302, 409, 450, and 490. Other courses may be substituted with the approval of the adviser.

Honors in Scandinavian Languages and Literature

Adviser (Norwegian)

Sverre Arestad
215A Denny Hall

Adviser (Swedish)

Walter Johnson
215C Denny 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 to graduate "With College Honors" in either Norwegian or Swedish.

Graduate Programs

Graduate Program Advisers

Sverre Arestad
215 Denny Hall

Walter Johnson
215C Denny Hall

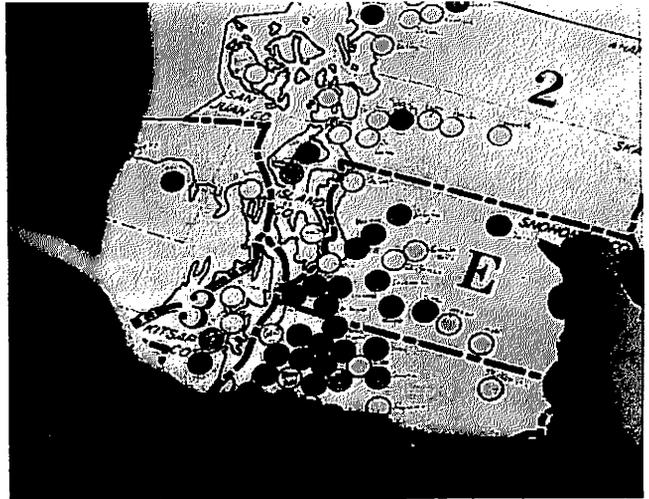
Master of Arts

Students who intend to work toward the master's degree must meet the requirements of the Graduate School. To meet the language requirement, French or German is recommended. Students must obtain 20 credits in courses numbered 500 and above.

SOCIOLOGY

Chairman

Robert E. L. Faris
202A Guthrie Hall



Professors

Stuart C. Dodd, Robert E. L. Faris, Norman S. Hayner, Otto N. Larsen, George A. Lundberg (emeritus), S. Frank Miyamoto, Calvin F. Schmid, Clarence C. Shrag

Associate Professors

E. A. T. Barth, William R. Catton, Jr., Richard Emerson, Robert K. Leik

Assistant Professors

William J. Chambliss, Joseph C. Cohen, Herbert L. Costner, Donald Noel, Thomas Ryther, L. W. Wager, Walter B. Watson, James A. Williams

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

204A Guthrie Hall

Admission

In this curriculum, at least 50 credits in sociology are required. Courses must include: 110 or 310; 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 must fulfill the requirements of that program during the freshman and sophomore years in addition to the following departmental honors requirements. 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. In each of these there is greater emphasis on research problems and techniques than in regular sections. Non-majors 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 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. Students must take a written examination in two fields of sociology. A minor in another department or a program of supporting courses must also be taken. A master'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 in Sociology 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 the Graduate Program Adviser for the Department. 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 Department 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 Education* section.



SPEECH

Acting Chairman

Barnet Baskerville
209 Parrington Hall

Professors

Barnet Baskerville, James A. Carrell, Horace G. Rahskopf, Frederick W. Orr (emeritus), William R. Tiffany

Associate Professors

Winfred W. Bird, Laura I. Crowell, Albert L. Franzke, Clair N. Hanley, Dominic A. LaRusso, Oliver W. Nelson, Thomas R. Nilsen, John M. Palmer, Orville L. Pence, James Shapley

Assistant Professors

Delmond Bennett, Mark S. Klyn (acting), LuVern Kunze, Chester C. Long, Robert Post, Kenneth K. Sereno (acting), Walter W. Stevens, David B. Strother, Marcel E. Wingate

Instructors

George O. Enell, Gary Hawkins, Gary Peterson

Lecturers

Margaret Baker, Michael Hogan, Maureen Morse

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, 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
205 Parrington Hall

ADMISSION

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., 370, 411, 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 and hearing therapy are required to complete the following courses: 310, 370, 371, 373, 475, 480, 481, 482, 485, 487, and 374-384 (9 credits), plus any three of the following: 100, 101, 140, 220, 230, 332, 359, 400.



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)
209 Parrington Hall

James A. Carrell (Speech and Hearing Therapy)
1320 Northeast Campus Parkway

Admission

Students who intend to work toward an advanced degree in speech must meet the requirements of the Graduate School as outlined in the *Graduate Education* section and present a background of undergraduate study acceptable to the department, as outlined in its *Graduate Education Guide*.

Master of Arts

Prospective candidates must complete 36 credits of approved course work of which 12 credits should be in a minor or supporting courses from closely related areas. Thesis research may be in any subdivision of the field.

Doctor of Philosophy

Two major areas of concentration are available: (1) public address and rhetoric including argumentation and discussion, and (2) speech correction and hearing 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

Aubrey Gorbman
225 Johnson Hall

Professors

W. Thomas Edmondson, Ernst Florey, 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, Alan J. Kohn, Gordon H. Orians, Dixy Lee Ray, Frank Richardson

Assistant Professors

Richard A. Cloney, W. Mary Griffiths (acting), Alex J. Haggis, Kenneth L. Osterud, Robert T. Paine

Cooperating Faculty

(Health Sciences faculty members who teach courses leading to bachelor's degrees in Microbiology and Preventive Medicine): E. Russell Alexander, Blair M. Bennett, Peter A. Breysse

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 (both descriptive and "experimental"); physiology at the minute cellular level and at the level of organ systems. The Department has an especially strong group of invertebrate zoologists 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.

Zoology 114, 118, 118L, and 204 are given to meet the needs of other students and will not be counted toward departmental majors.

Undergraduate Programs

Advisory Office

227 Johnson Hall

GRADUATION REQUIREMENTS

Bachelor of Arts

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, and Botany 112, 5 credits each (or Biology 101J-102J, 10 credits with a grade of A or B and permission); Zoology 400 or 458 (or 208), 5 or 6 credits (note that each requires college chemistry as prerequisite); Genetics 351 or 451, 3 credits. The remaining credits will be selected from the four groups of courses tabulated below to include at least two courses from each

of two groups and one from each of the remaining groups. Genetics 351, 451, Zoology 208, 400, 458 may be used to meet the general requirements above and apply toward the satisfaction of the group requirement. Credit for laboratory courses offered separately from the lecture and designated by an "L" can be counted toward the credit requirement for the major. Additional requirement: Mathematics 105 or equivalent.

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 and Botany 112, 5 credits each (or Biology 101J-102J, 10 credits with a grade of A or B and permission); Zoology 400 or 458, 5 or 6 credits; Genetics 451, 3 credits. The remaining credits will be selected from the four groups of courses which follow, to include at least two courses from each of two groups and one from each of the remaining groups:

Group A: Zoology 201, 208, 400, 409, 438, 456, 457, 458.

Group B: Zoology 330, 362, 462, 464, 465, Biology 454, 472, 473.

Group C: Zoology 403, 423, 432, 433, 434, 435, 444, 453-454, Biology 401.

Group D: Biochemistry 481, 482, 483, Genetics 351, 451, 452, Botany 472, Microbiology 400, Oceanography 403, Zoology 381, 402.

Genetics 451, Zoology 400, 458 may be used to meet the general requirements above and will apply toward the satisfaction of the group requirement.

Credit for the laboratory courses offered separately from the lecture and designated by an "L" can be counted toward the credit requirement for the major. Additional requirements are: Mathematics 105; one year of physics, 15 credits; and chemistry through organic or physical, approximately 30 credits. Mathematics through calculus is highly recommended. French, German, or Russian is recommended to meet the language requirement of the College. An introduction to a second foreign language also is highly recommended.

The Department requires notification of intention to take a degree in zoology not later than the end of the junior year, and approval by a departmental adviser of a program for the major.



Honors in Zoology

Adviser

Alex J. Haggis
244 Johnson Hall

Members of the College of Arts and Sciences Honors Program must fulfill the requirements of that program during the freshman and sophomore years in addition to the following departmental honors requirements:

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 401H, 401LH, 472H, 472LH, 473H, 473LH. (All of the foregoing courses have dual listings.) Zoology 490H (Undergraduate Seminar), is required in the senior year. 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

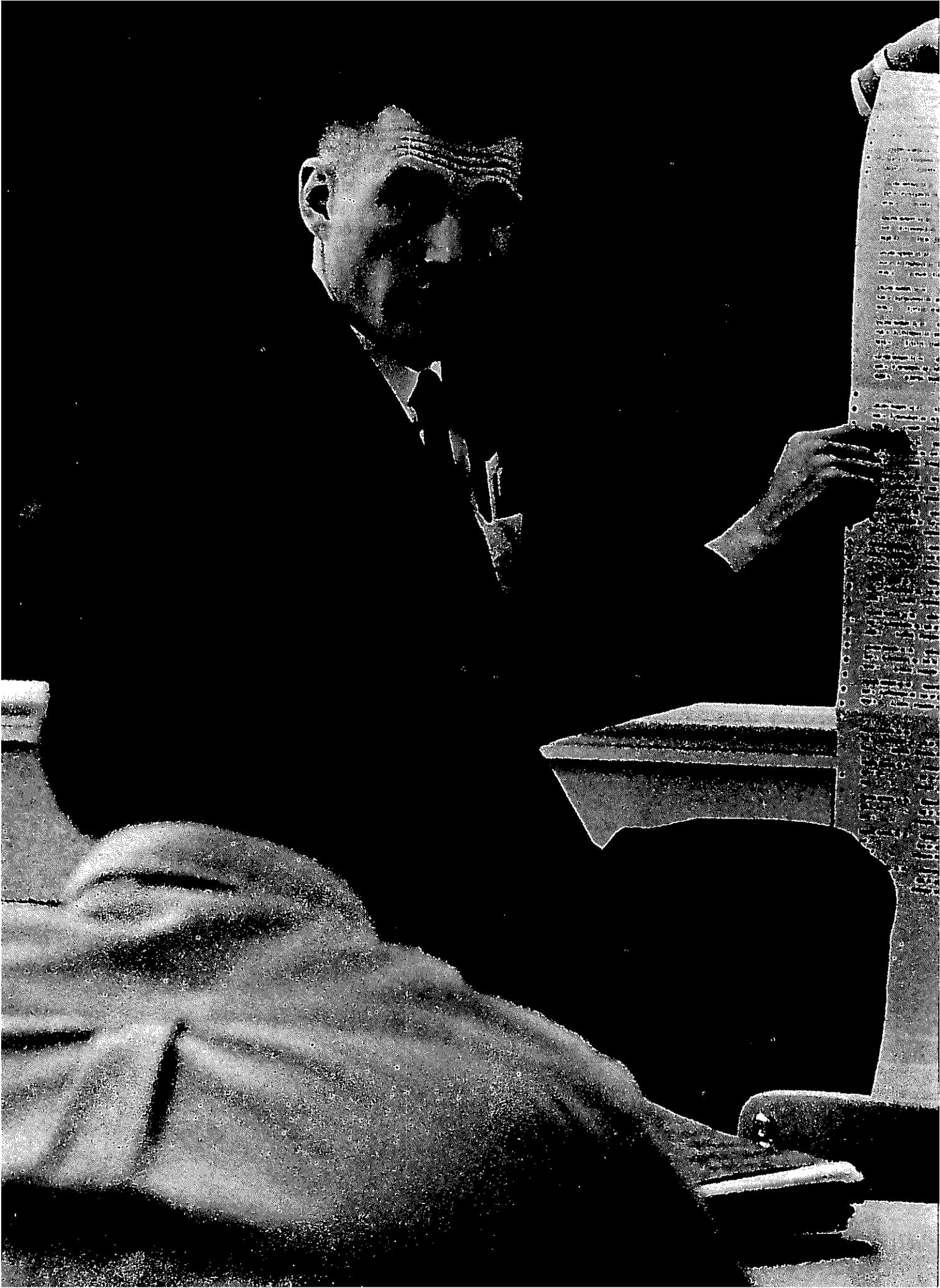
Graduate Program Adviser

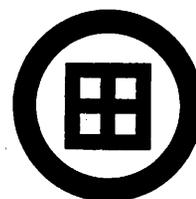
Alan J. Kohn
113 Johnson Hall

Students who intend to work toward the advanced degree of Master of Science or Doctor of Philosophy must meet the requirements of the Graduate School.

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 be accepted for research supervision by a member of the staff. A choice of supervisor need not be made immediately, but will 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 his supervisor and a faculty committee. Students are encouraged to complete a written general examination in five basic fields: comparative anatomy, embryology, general physiology, genetics, and invertebrate zoology during the first year of residence.





BUSINESS ADMINISTRATION

Dean

Kermit O. Hanson
115 Mackenzie Hall

Associate Dean

Sumner Marcus
117 Mackenzie Hall

DEPARTMENT OF ACCOUNTING, FINANCE, AND STATISTICS

Professors

Kenneth B. Berg, William E. Cox (emeritus), Kermit O. Hanson, Charles N. Henning, Arthur N. Lorig, Julius A. Roller, Lauren M. Walker

Associate Professors

Stephen H. Archer, George J. Brabb, John S-Y. Chiu, Charles A. D'Ambrosio, Don T. DeCoster, Myles S. Delano, Dudley W. Johnson, Vincent M. Jolivet, Thomas F. Keller (visiting), Fred J. Mueller, Gerhard G. Mueller, William Pigott III, William F. Sharpe

Assistant Professors

John J. Brosky, Bruce H. Olson, William R. Welke, Loyd C. Heath (acting)

Instructor

John P. Fertakis (acting)

Lecturers

Gerald L. Cleveland, L. Brent Eager, Frank H. Hamack, Fletcher O. Johnson, Robert M. Simpson

DEPARTMENT OF GENERAL BUSINESS

Professors

Philip J. Bourque, S. Darden Brown, Edward J.

Chambers, Joseph Demmery (emeritus), Leonard D. Goldberg, Sumner Marcus, Dwight E. Robinson, Bayard O. Wheeler

Associate Professors

Gordon W. Bertram (visiting), William R. Greiner, Jack Lessinger, R. Joseph Monsen, Robert H. Scott, Warren R. Seyfried, Scott D. Walton, James A. Wickman

Assistant Professor

Walter E. Stewart (acting)

Lecturers

Allen L. Carr (part-time), Marvin B. Durning, John L. Hay, Donald W. Ireland

DEPARTMENT OF MARKETING, TRANSPORTATION, AND INTERNATIONAL BUSINESS

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, Robert A. Nelson, 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, Robert A. Lenberg (acting)

Lecturer

D. James Manning

**DEPARTMENT OF POLICY, PERSONNEL RELATIONS,
AND PRODUCTION**

Professors

Theodore J. Barnowe, Edward G. Brown, Wendell L. French, Austin Grimshaw, Dale A. Henning, Fremont E. Kast, Preston P. LeBreton, Jim Rosenzweig, Albert N. Schrieber, Robert A. Sutermeister

Associate Professors

Margaret P. Fenn, Richard A. Johnson, Henry P. Knowles, Harry R. Knudson, Jr., Robert C. Meier, William T. Newell, Borje O. Saxberg

Assistant Professors

Henry C. Fisher (acting), Robert T. Woodworth

Instructor

Rodney E. Schneck

The major mission of the College 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 College 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. Approximately half of the undergraduate program, however, is in the communication arts and the quantitative, physical, and social sciences.

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 College 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 College of Business Administration was established in 1917. Since 1921, the College 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 1,500 students, and a graduate enrollment of 250.

The College offers courses leading to the degrees of Bachelor of Arts in Business Administration, Master of Business Administration, Master of Arts, and Doctor of Business Administration. The College also cooperates with other colleges and departments in a program leading to the degree of Master of Urban Planning.

College Facilities and Services

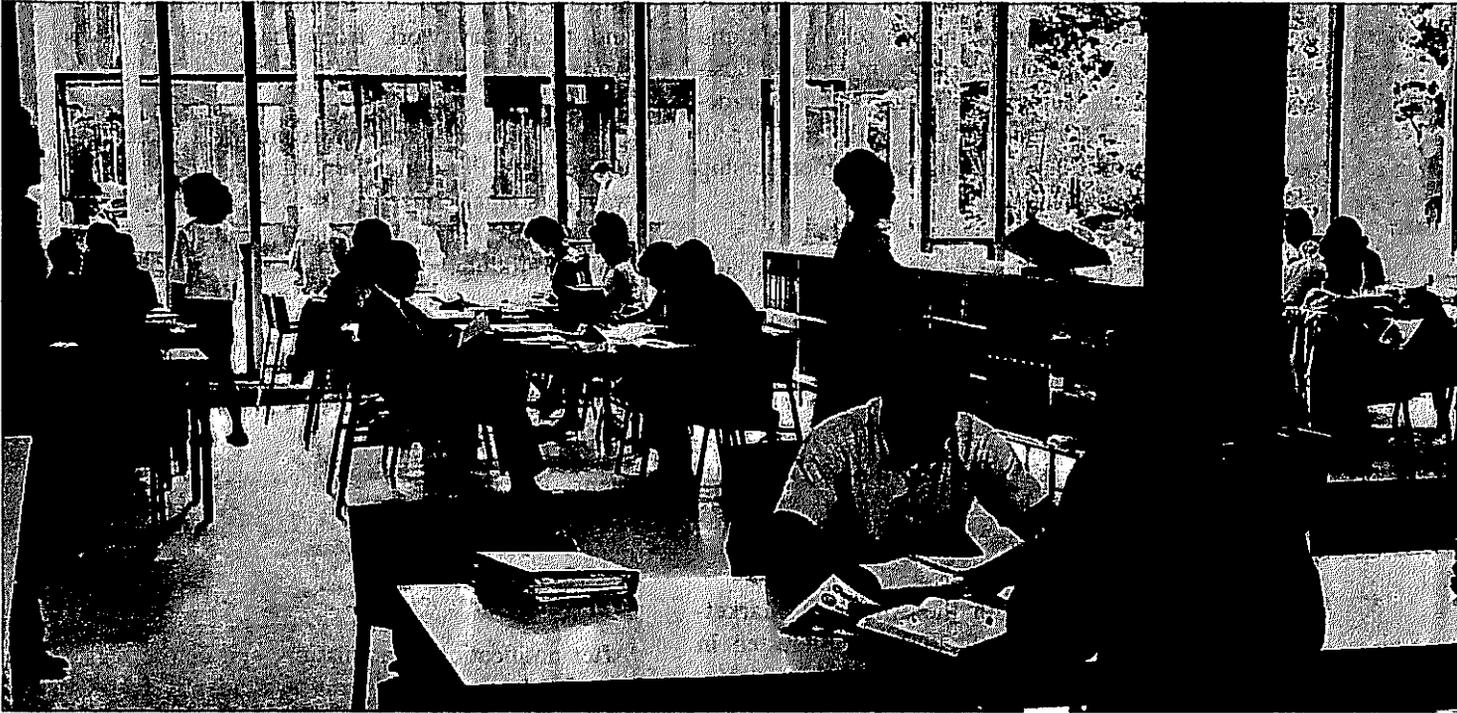
Two new buildings, Balmer Hall and Mackenzie Hall, serve as the centers for most College activities.

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 College's administrative and faculty center. It contains the Dean's Office, the Office of Undergraduate Affairs and Student Advising, the Business Administration Graduate Office, 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 College 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 College 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 College 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 *Insurance Society* is an organization of students with a professional interest in insurance. Members must have had at least one insurance course.

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 College 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

Henry P. Knowles
137 Mackenzie Hall

Admission

After notification of admission, and before registration, entering freshmen and transfer students should visit or write to the College for assistance in planning their course programs. The College of Business Administration maintains an advisory office in 137 Mackenzie Hall. Curriculum advisers are available at all times to help students plan their programs of study, both for college core requirements and for the major sequence.

High School Electives

Students who expect to enter the College of Business Administration should plan their high school electives carefully. Since the degree program of the College requires college algebra and beginning calculus, it is advisable for students to include additional mathematics courses in their high school electives.

Mathematics Placement Tests

A student in the College of Business Administration is required to take a special series of Mathematics courses beginning with Mathematics 155. The same procedure is followed to determine placement eligibility for Mathematics 105, but a higher score is required. The College recommends enrollment in Mathematics 101, if background is needed.

Graduation Requirements

Bachelor's Degrees

Students working toward bachelor's degrees in business administration must meet certain general requirements



of the University and the College, 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. Of these credits 60 must be in upper-division courses, those numbered 300 or above.

Students in other colleges of the University who wish simultaneously to receive a degree from the College of Business Administration must receive approval from the Dean of the College of Business Administration at least three quarters before completing the requirements for the degree from this College.

Minimum requirements of the College of Business Administration are: 72 credits earned in courses in Business Administration; 72 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 Supply Corps.

Any student transferring into the College 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 College. Of these 45 credits, at least 35 must be earned in a minimum of three quarters in residence.

Curriculum

The lower- and upper-division requirements leading to the degree of Bachelor of Arts in Business Administration are outlined below.

First Year

ENGL 101, 102, 103	COMPOSITION (3,3,3)	9
MATH 155, 156	COLLEGE ALGEBRA (3,3)	6
MATH 157	ELEMENTS OF CALCULUS (3)	3
PE M, PE W	ACTIVITIES (1,1,1)	3

Non-Business Administration Courses to be Taken in First and Second Years

PHIL 100	INTRODUCTION TO PHILOSOPHY <i>or</i>	5
PHIL 120	INTRODUCTION TO LOGIC	5
POL S 201	MODERN GOVERNMENT <i>or</i>	5
POL S 202	AMERICAN GOVERNMENT AND POLITICS	5
PSYCH <i>or</i> SOC <i>or</i> ANTH	(10 CREDITS IN ONE SUBJECT)	10
SCI		5
HIST		5
HUM		9-10

Second-Year Business Administration Core

ACCTG 210, 220	FUNDAMENTALS OF ACCOUNTING (3,3)	6
ACCTG 230	BASIC ACCOUNTING ANALYSIS	3
B LAW 201	LEGAL FACTORS IN THE BUSINESS ENVIRONMENT	3
B LAW 202	BUSINESS AGREEMENTS	3
B STAT 201	STATISTICAL ANALYSIS	3

ECON 200	INTRODUCTION TO ECONOMICS	5
ECON 202, 203	ECONOMICS PRINCIPALS AND PRICE DETERMINATION (3,3)	6

Upper-Division Business Administration Core

B CMU 301	WRITTEN BUSINESS COMMUNICATIONS	3
B STAT 301	PROBABILITY AND INFERENCE IN BUSINESS DECISION MAKING	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 400	MARKETING AND PHYSICAL DISTRIBUTION MANAGEMENT (DOMESTIC AND FOREIGN)	3
PERS 301	INDUSTRIAL RELATIONS	3
POL A 470	BUSINESS POLICY	4
PROD 301	PRINCIPLES OF PRODUCTION	3

Plus one additional course from:

ACCTG 475	ADMINISTRATIVE CONTROLS (3)	3
G BUS 441	MANAGERIAL ECONOMICS (3)	3
POL A 440	ORGANIZATION THEORY (3)	3

Major

For courses see major requirements under Departmental Programs section.

Electives

Electives must bring total credits to 180, and non-Business Administration credits to a minimum of 72. Physical Education Activity courses are in addition to the 180 total credit requirement and the 72 non-Business Administration credits.

Honors Program

Director

Henry P. Knowles
137 Mackenzie Hall

The Honors Program of the College 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 College Honors Committee. Further information about the program can be obtained from the Director.

Conjoint B.A. Honors Seminar

Director of Honors Program

Henry P. Knowles
137 Mackenzie Hall

The Honors Program of the College of Business Administration provides an opportunity for a small number of highly qualified undergraduate students in business administration to explore, through colloquia, reading, independent study, and consultations with faculty members, areas of academic interest that would not be possible in prescribed departmental degree programs and the usual elective offerings.

GRADUATE PROGRAMS

Graduate Program Adviser

Richard A. Johnson
109 Mackenzie Hall

Admission

Students seeking advanced degrees in business administration must first file an application for admission to the Graduate School. The Admissions Office evaluates the application and then forwards it to the College of Business Administration for review. Admission must be approved by both the College 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, 20 Nassau Street, Princeton, New Jersey, or 4640 Hollywood Boulevard, Los Angeles 27, California. Arrangements should be made for this examination well in advance of the quarter in which the student desires to enter.

Programs of Study

The College 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.

Admission: Master's Programs

Properly qualified students who are graduates of the University of Washington or of other colleges or universities of recognized rank may be admitted. 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 requirement may be admitted (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 would 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 subjects may expect to 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	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	Production 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
Gen. Bus. 571-572	Research in Business	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 first part of the examination will be on Cores I and II and the second part will be on the area of concentration.

Those entering students who have not previously satisfied Core I requirements should plan to commence their programs during Autumn Quarter.

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 36 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 College of Business Administration or elsewhere; a minimum of 9 credits is required in the minor field. If the minor is elected outside the College, 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

*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.

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 College 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.

Admission: Doctoral Program

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 College of Business Administration. Students must select business and its environment, or economics, as one of their four areas of study. In addition, the student must show evidence of competency in business research 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.



Accounting

Chairman

Julius Roller
155 Mackenzie Hall

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 311, 321, 331, 411, 421, and 6 elective credits in 400-level accounting courses (except 444J and 499). Although 6 elective credits in Accounting are required for the Accounting major, students interested in a public accounting career should take additional accounting and business law courses.* Such additional courses might cause the student to accumulate more than the minimum 180 credits required for graduation.

Business Communications

Chairman

Charles J. Miller
156 Mackenzie Hall

Good writing is a valuable asset to a business career. The business communications courses assist the student to write effectively, to solve business problems by letter, and to create effective business reports.

Business and Its Environment

Acting Chairman

S. Darden Brown
154 Mackenzie Hall

The Business and Its Environment curriculum is intended primarily for graduate students and may constitute one of the four area requirements for the degree

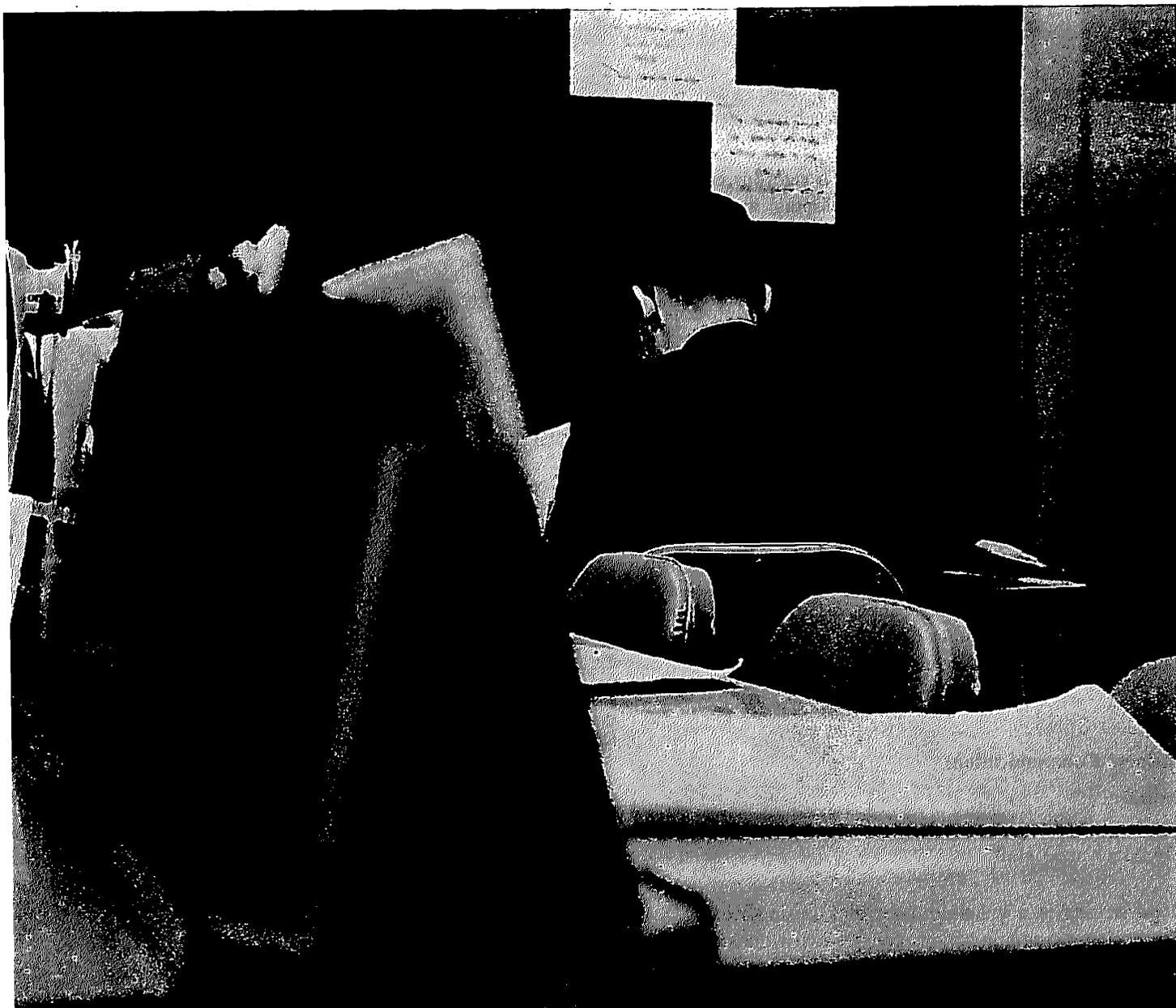
* According to the Public Accounting Act of 1949 (State of Washington) a college graduate with 45 quarter credits earned in accounting and 15 in business law, economics, and finance will have the experience requirement for obtaining the certificate of "certified public accountant" reduced from two years to one year.



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. To this end, it offers course work and supervised research in the external relationships, rather than the internal management of business.

Business Education

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.) However, a business teacher trainee may prefer to enroll in the College of Business Administration. If so, he must (1) meet all requirements for graduation in the College of Business Administration, including a major such as accounting or general business; (2) take the courses required for certification by the College of Education; and (3) take the basic 100-series courses. Such students, therefore, should plan on one or two quarters of work beyond the basic 180 quarter credits.



Business Law

Acting Chairman

S. Darden Brown
154 Mackenzie Hall

The Business Law curriculum provides an opportunity for students from all colleges to develop an understanding of the processes of law and justice in English-speaking societies, and to appreciate the significance of legal factors in the business environment.

Business Statistics and Operations Research

Chairman

Julius Roller
155 Mackenzie Hall

The Business Statistics and Operations Research curriculum provides education in analysis of business problems. Among subjects of study are classical statistical inference, modern statistical decision theory, and the mathematical methods of operations research. The



requirements for a major are: Business Statistics 401, 444J, 450; Accounting 311 (Cost Accounting); plus two courses elected from Business Statistics 330, 340, 451, 460.

Finance

Chairman

Julius Roller
155 Mackenzie Hall

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 College 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 331 (Income Determination Accounting); plus 6 credits from Finance 327, 361, 423, 428, 453, 461.

General Business

Acting Chairman

S. Darden Brown
154 Mackenzie Hall

The General Business major is designed for students who desire broad preparation in more than one area of study rather than intensive specialization in one area. The student should consult with a faculty adviser to plan his program of studies.

In selecting courses for the General Business major the student should select courses from at least three fields in 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.

Human Relations in Business and Industry

Chairman

Preston P. Le Breton
152 Mackenzie Hall

The purpose of this curriculum is to help students develop knowledge, skills, and attitudes about human

behavior that will help them to become responsible members of the business world. Courses offered are useful to students in other colleges and schools of the University.

International Business

Chairman

Charles J. Miller
156 Mackenzie Hall

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, 327, and 470. Courses in foreign languages are strongly recommended.

Law, Preprofessional Program

Adviser

S. Darden Brown
211 Mackenzie Hall

Students at the University who plan to enter the School of Law may qualify for entrance by obtaining a bachelor's degree before entrance; or by taking a special three-year course of prelegal training which leads to a bachelor's degree in the College of Business Administration at the successful completion of the first year in the School of Law.

The three-year Business Law program must include 136 credits with a 2.50 grade-point average, and the required quarters in physical education activity, if a degree is to be conferred at the end of a year in the School of Law. The three-year Business Law curriculum is open to students from other institutions who enter the University with advanced standing, provided they earn at least 45 approved credits in the University before entering the School of Law. This privilege is not extended to normal school graduates attempting to graduate in two years nor to transfer students who enter the University with the rank of senior.

Students must satisfy all the specific requirements for a Bachelor of Arts in Business Administration degree, with the exception of Business Law 201 (Legal Fac-

tors in the Business Environment) and 202 (Business Agreements), and must have accumulated a total of 136 credits before entering the School of Law.

In addition, the applicant must take the Law School Admission Test which is given in November, February, April, and August. If possible, applicants should take the February test. The August test is too late for admission for that year.

Marketing

Chairman

Charles J. Miller
156 Mackenzie Hall

Marketing is the major integrative force in business today; it precedes and conditions all other functions in most business. 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, and Transportation 372.

Personnel and Industrial Relations

Chairman

Preston P. Le Breton
152 Mackenzie Hall

This curriculum provides training in the policies and procedures used in developing and maintaining an efficient work force. 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) and 418 (Work Simplification).

Policy and Administration

Chairman

Preston P. Le Breton
152 Mackenzie Hall

Courses are provided that integrate and supplement the

work in other departments of the College. The courses are designed to add to the understanding of the fundamental principles of business from the viewpoint of management, particularly of those executives whose decisions shape important policies of business under private ownership. The administrative viewpoint and the general unit of business administration are emphasized, and the habit of thinking about business problems in an over-all context is encouraged.

Production

Chairman

Preston P. Le Breton
152 Mackenzie Hall

This curriculum is concerned with the production function in all business enterprises and includes the administration of materials, machines, manpower, methods, and standards. Training is provided in industrial organization and management, production planning and control, purchasing and materials management, manufacturing methods, and operations analysis. The requirements for the major are: Production 341, 342, 343, 460; Accounting 311; and Mechanical Engineering 203. Suitable substitutes for Mechanical Engineering 203 may be arranged with faculty permission for those students who have had corresponding experience or who desire training in other technical specialties.

Real Estate

Acting Chairman

S. Darden Brown
154 Mackenzie Hall

The area of real estate and urban land economics encompasses the nature, allocation, use, and management of real estate 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 College of Business Administration are Geography 477 (Urban Geography) and Urban Planning 400 (Introduction to Urban Planning).

Risk and Insurance

Acting Chairman

S. Darden Brown
154 Mackenzie Hall

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 College, particularly finance and management.

The student will find job opportunities open to him in underwriting, claims adjusting, insurance company representation, 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.

The functional process of rational risk-bearing is investigated by adopting the viewpoint of the economic unit—individual, family, business firm, insurance company, society—which faces risks of loss. The course of study in Risk and Insurance begins with a foundation of general principles and insurance theory; these are used to analyze and evaluate typical exposures to loss. Advanced courses explore solutions to loss-exposure problems utilizing insurance and noninsurance techniques.

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, 432 or 438, and 480.

Transportation

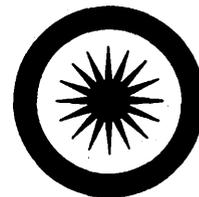
Chairman

Charles J. Miller

156 Mackenzie Hall

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.





EDUCATION

Dean

Gordon C. Lee
210 Miller Hall

Associate Dean

John E. Corbally
210 Miller

Professors

Athol R. Baily, Homer Boroughs, Jr., John E. Corbally, Edgar M. Draper, Henry R. Fea, Maurice F. Freehill, Frederic T. Giles, Alice H. Hayden, Jacob T. Hunt, Gordon C. Lee, Francis F. Powers, George D. Strayer, Jr.

Associate Professors

Lawrence M. Brammer, J. Robert Briggs, Clifford D. Foster, John Jarolimek, John H. Jessup, Jack E. Kittell, Cecilia MacDonald (on leave 1964-65), Rufus C. Salyer, Sylvia Vopni

Assistant Professors

Dale L. Bolton, Charles O. Burgess, Ellis D. Evans, David L. Madsen, Roger G. Olstad, Sam L. Sebesta, Sterling S. Stott, Robert E. Tostberg

Emeritus

Harriett V. Batie, Thomas R. Cole, August Dvorak, Edwin B. Stevens

Lecturers

Arlene F. Brandes, Barbara B. Hauck, Thomas D. F. Langen

BUREAU OF SCHOOL SERVICE AND RESEARCH

Director (Acting)

John E. Corbally
M200 Miller

Associate Director

Donald W. Emery

Director, In-Service

Edgar M. Draper

Director, Advanced Placement

Eugene H. Smith

Special Consultant

Joe A. Chandler

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. He is not only a transmitter of information but a catalyst for his students as well, suggesting ways to use knowledge for the improvement of society.

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 Services and Research, the College provides a wide variety of professional services to the schools and communities of the state of Washington. Upon request, University faculty members from within and without the College of Education are available for in-service training and to act in advisory capacities.

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 through-

out the state. In cooperation with the State Department of Public Instruction and school districts throughout 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 in which students teach for one quarter, 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 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 SWEA (*Student Washington Education Association*) by joining the College chapter. Members are provisional active members of the Washington Education Association. Campus meetings are held on a regular schedule; in addition there are four regional meetings a year and a state convention in the spring.

Membership in the *Education Club* is open to all students interested in education. Club meetings provide opportunities for students to become better acquainted with each other and with their instructors, and to hear guest speakers discuss topics of interest in the educational field.

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

Hesper St. John, Supervisor
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.

New requirements for the Bachelor of Arts Degree awarded by the College of Education have been instituted to take effect Autumn Quarter, 1964. Students who enter the College of Education during that quarter and thereafter will be governed by the new 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 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 Intermediate Mathematics 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 the one 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 200, 404, 405, 413; Radio-TV 270, 271, and 373
Comparative Literature: all undergraduate courses
Drama 101, 102, 103, 146, 151, 152, 230, 247, 248, 253, 325, 331, 338, 395J, 404, 416, 421, 422, 423, 455, 461, 471, 472, 473, 474, 475, 476, 492
English: all undergraduate courses except 101, 102, 103, 150, 151, 303
Far Eastern and Russian Institute 382J, 384J
Far Eastern and Slavic Languages and Literature: all undergraduate courses
Germanic Languages and Literature: all undergraduate courses
History 316, 317, 382J, 414, 420, 429, 442, 443
Home Economics 240 or 347, 322, 329, 429, 432, 433
Humanities 101, 102, 103, 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, 414, 415, 424, 425, 434, 435, 436, 476
Philosophy: all undergraduate courses except 110, 120, 230, 231, 410, 460, 463, 465, 470
Physical Education 283, 351, 352, 355
Romance Languages and Literature: all undergraduate courses
Scandinavian Languages and Literature: all undergraduate courses
Speech 100, 110, 111, 140, 220, 320, 340, 345, 349, 400, 420, 421, 440

Social Sciences

Anthropology: all undergraduate courses except 201, 380, 431, 433, 455J, 480, 481, 482
Architecture and Urban Planning: Urban Planning 482, 485
Business Administration: Business Law 201; Human Relations 365 or 460; General Business 101, 444;

Policy and Administration 440; International Business 310

Communications: Advertising 226; Communications 201, 303, 312, 402, 406, 411, 414, 415, 470, 480; Journalism 320

Economics: all undergraduate courses

Education 209, 288

Far Eastern and Russian Institute: all undergraduate courses except 382J, 384J

General Studies 455-456

Geography: all undergraduate courses

History: all undergraduate courses except 316, 317, 382J, 384J, 414, 420, 429, 442, 443

Home Economics 350, 354, 356, 454, 457

Linguistics 451J, 452J, 462J, 463J

Philosophy 110, 120, 230, 231, 410, 460, 463, 465

Physical and Health Education: Recreation Education 294; Health Education 250

Political Science: all undergraduate courses

Psychology: all undergraduate courses except 301, 316, 421, 422, 423, 498

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, 436

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

Geology: all undergraduate courses

Home Economics 307, 407, 408, 415

Mathematics: all undergraduate courses except 101, 103, 104, 114, 497J

Microbiology: 201, 301, 400

Oceanography: all undergraduate courses except 110, 111, 112

Physical Education 293, 322, 480

Physics: all undergraduate courses

Psychology 316, 421, 422, 423

Speech 310, 411, 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.

GRADUATE PROGRAMS

Graduate Program Adviser

Gordon C. Lee
210 Miller Hall

Graduate Information Office

Claire F. Jones
210 Miller Hall

The advanced degree programs in Education are designed to further the knowledge of students in various specialized professional areas and to offer opportunities for advanced study and research appropriate to the goal of the individual. Qualifications for acceptance include a solid undergraduate training and successful relevant professional experience.

Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Education* section as well as the general departmental requirements listed below. The Department of Education 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 for admission to the program leading to the master's degrees; two years of successful teaching or administrative experience are required for admission to a program leading to a doctoral degree. Admission to a doctoral program in the College of Education is governed by selection procedures which lasts until 12 to 24 credits beyond the master's degree have been earned at the University and certain standardized examinations and departmental qualifying examinations have been completed.

Master of Arts

The requirements are: 24 credits in education, including Education 591 and 10 credits in each of two fields in education; and 12 credits of approved course work in a department other than education. The fields in education in which work may be taken for the M.A. degree are: curriculum, educational administration and supervision, educational methods, educational psychology, educational sociology, elementary education, guidance and counseling, higher education, history and philosophy of education, and remedial and special education. Students must pass a written final examination and present an acceptable thesis on an approved topic.

Students in the master's degree program who are enrolled in other departments and are taking a minor in education, must present a minimum of 12 approved credits in education courses.

Master of Education

The requirements are: 27 credits in education, including Education 591 and a minimum of 5 credits in each of four fields in education; and 15 credits in two departments other than education, including 5 credits in courses numbered above 500. The fields in education from which work may be taken for the M.Ed. degree are: audio-visual education, business education, curriculum, educational administration, educational methods, educational psychology, educational sociology, educational supervision, elementary education, guidance and counseling, higher education, history and philosophy of education, industrial education, remedial and special education, secondary education, and tests and measurements. Students must pass a written Final Examination over the selected four fields in education and present an acceptable thesis on an approved topic.

Doctor of Education

The requirements are: 60 credits in education, including Education 490 or 491, 587 and 588 or 589, 591, a minimum of 12 credits in one field in education, a minimum of 9 credits in each of three other fields in education, and electives to make up the total; and 45 credits in departments other than education, including 9 to 15 credits each in arts and letters, science and mathematics, foreign language, and social sciences. The fields in education from which prospective Ed.D. candidates may elect work are: curriculum, educational administration and supervision, educational methods, educational psychology, educational sociology, elementary education, guidance and counseling, higher education, history and philosophy of education, and remedial and special education. It is expected that students who

plan to enter upon doctoral work will have maintained a grade-point average of 3.50 or better in their work for the master's degree.

Doctor of Philosophy

The requirements are: 70 credits in education, including Education 490, 587, and 588 or 589, 591, and approximately 15 credits in each of three fields in education; and either 35 credits in one department other than education, or 20 credits in each of two departments other than education. The fields in education in which prospective Ph.D. candidates may specialize are: curriculum, educational administration and supervision, educational methods, educational psychology, elementary education, guidance and counseling, higher education, history and philosophy of education, and remedial and special education. It is expected that students who plan to enter upon doctoral work will have maintained a grade-point average of 3.50 or better in their work for the master's degree.

Doctoral students who are taking a minor in education must present a minimum of 35 approved credits in education courses.

Detailed descriptions of the requirements and procedures of the several advanced degrees are obtainable through the Office of Graduate Information of the College of Education, 210 Miller Hall.

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 certifications 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 of approved course work beyond the bachelor's degree 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.

Specific details concerning the earning of each of the certificates at the University of Washington is presented in the discussion following this general introduction.

Information about out-of-state transfers, emergency, and special types of certificates can be obtained from the State Department of Public Instruction, Olympia, Washington.

The certificate pattern listed provides 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 with special abilities or backgrounds may, by demonstration of equivalent competence as indicated by previous course work, by a record of past professional experience, or by the successful completion of advanced credit examinations 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 in the office of the Director of Student Teaching, 200 Miller Hall.

The Provisional Certificate

(Elementary Emphasis, Grades K-6)

This certificate will be awarded on 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 education sequence (elementary), (5) student teaching.



**The Professional Education Sequence
(Elementary Emphasis)**

COURSES	CREDITS
EDUC 288 INTRODUCTION TO TEACHING	1
SPCH 101 SPEECH FOR TEACHERS	3
EDUC 302 INTRODUCTION TO CHILD STUDY AND DEVELOPMENT; PREREQUISITE 288, CUMULATIVE GRADE-POINT AVERAGE 2.50	3
EDUC 308 INTRODUCTION TO 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 DIRECTED TEACHING; PREREQUISITE 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 480 OR 488 HISTORY AND PHILOSOPHY OF EDUCATION; PREREQUISITE EDUCATION 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).	
TOTAL CREDITS	31

The Professional Elementary Education Minor

Requirements are 29-33 credits for Provisional Certification plus 12-15 credits for Standard Certification, fifth year.

COURSES	CREDITS
EDUC 374E READING IN THE ELEMENTARY SCHOOL; PREREQ- UISITE 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; PREREQ- UISITE 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 101J-102J (10 CREDITS); BOTANY 111, 112; CHEMISTRY 100, 101; GEOLOGY 101; OCEANOGR- APHY 101; PHYSICS 110 AND 111; ZOOLOGY 111, 118	
EDUC 379 MATHEMATICS IN THE ELEMENTARY SCHOOL; PREREQUISITE 302 AND MATHEMATICS 170	3
MATH 170 THEORY OF ARITHMETIC	3
*EDUC 376 ART IN THE ELEMENTARY SCHOOL (3 CREDITS); PREREQUISITES 302 AND ART 105 (3) OR 109 (3) OR 129 (2)	2 OR 3
*EDUC 377 MUSIC IN THE ELEMENTARY SCHOOL; PREREQUISITES 302 AND MUSIC 104	3
MUSIC 104 MUSIC FUNDAMENTALS	2
*EDUC 378 PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL; PREREQUISITE 302	3
*EDUC 338 HEALTH IN THE ELEMENTARY SCHOOL; PREREQ- UISITE 302	2
29-33	

* 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 Certification Program).

**The Provisional Certificate
(Secondary Emphasis, Grades 7-12)**

The Provisional Certificate, secondary emphasis, will be awarded upon completion of: (1) a bachelor's degree,¹ (2) an authorized major (2.00 minimum grade-point average), (3) the professional education sequence (secondary), and (4) student teaching.

**The Professional Education Sequence
(Secondary Emphasis)**

COURSES	CREDITS
EDUC 288 INTRODUCTION TO TEACHING	1
SPCH 101 SPEECH FOR TEACHERS	3
EDUC 305 INTRODUCTION TO PROBLEMS OF ADOLESCENCE; PREREQUISITES 288, CUMULATIVE GRADE-POINT AVERAGE 2.50	3
EDUC 308 INTRODUCTION TO 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 INTRODUCTION TO SECONDARY SCHOOL TEACHING; PREREQUISITE 309	2
(EDUC) SPECIAL METHODS ²	2-3
EDUC 371X OR 371S DIRECTED TEACHING; ³ PREREQUISITES SPEECH 101; EDUC 370S IF REQUIRED; 120 CREDITS (MINIMUM); 2.00 GRADE-POINT AVERAGE IN PRO- FESSIONAL EDUCATION; 2.50 CUMULATIVE GRADE- POINT AVERAGE; PERMISSION	15
EDUC 410 OR 412 OR 480 OR 488 HISTORY AND PHILOSOPHY OF EDUCATION; PREREQUISITES EDUC 371X OR 371S. COMPLETION OF ONE OF THE ABOVE COURSES WILL SATISFY THE REQUIREMENT. STUDENTS MAY, WITH THE APPROVAL OF THE ADVISORY OFFICE OF THE COLLEGE OF EDUCATION, DELAY FULFILLMENT OF THIS REQUIREMENT UNTIL THE FIFTH YEAR	3
TOTAL CREDITS	33-36

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 elementary and/or secondary level(s); (3) completion of 45

¹ A minor is required within the degree program of the College of Education. Students from other schools and colleges who seek certification are not bound by this requirement but are urged to recognize that the demands of modern teaching presume breadth of subject-matter competence.

² Special methods courses are not required unless stipulated by the major or minor department. Special methods courses may be substituted for Education 370S with the approval of the Dean.

³ Students enrolling in 371X or 371S who plan to teach in the social studies field must have completed course work in geography, economics, world history, United States history, and Washington State history prior to student teaching.

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 of 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 at the University of Washington after one year of successful teaching experience. At least 12 of these credits must be taken in residence.
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.

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 graduate students after one year of successful teaching and prior to completion of requirements, preferably before the applicant has begun study for the credential. All applications are to be made to the State Superintendent of Public Instruction. The candidate may secure an application form for the Provisional Principal's Credential from the county superintendent, the State Department of Public Instruction, or the College of Education at the University of Washington. The completed application form, together with the \$1.00 registration fee, is to be forwarded to the county superintendent who, in turn, forwards it to the State Department of Public Instruction.

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. The 24 credits should be earned in courses that 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. Two years of this experience must be as a full-time classroom teacher. Two of the three years of successful teaching experience must be in an organized elementary school for those seeking the provisional elementary principal's credential; and in an organized junior, senior, or four-year high school for applicants for the provisional secondary principal's credential. One year of the three years of successful teaching experience required for the provisional general principal's credential must be in an organized junior, senior, or four-year high school.

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. An official program plan must be arranged in consultation with the College of Education Advisory Office in 207 Miller Hall. The candidate will receive one copy of this approved program after it is evaluated officially by the College of Education committee on administrators' credentials. It is the responsibility of the candidate to notify the Advisory Office when he has completed the requirements.

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. Applications are to be made to the State Superintendent of Public Instruction. The candidate may obtain an application form for the Standard Principal's Credential from the county superintendent, the Superintendent of Public Instruction, or the University of Washington College of Education, Seattle 98105. The completed application form, together with the \$1.00 registration fee, is to be forwarded to the County Superintendent of Public Instruction.

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. Candidates for the Standard General Principal's Credential, with experience as principals at one level only, are required 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 three years of experience as a principal on the appropriate level or levels are requirements for a Standard Principal'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 the College of Education Advisory Office in 207 Miller Hall. The candidate will receive one copy of this approved program after it is evaluated officially by the College of Education committee on administrators' credentials. It is the responsibility of the candidate to notify the Advisory Office when he has completed the requirements.

H. 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. Applications are to be made to the State Superintendent of Public Instruction. The applicant may obtain an application form for the Provisional Superintendent's Credential from the county superintendent, the State Superintendent of Public Instruction, or the University of Wash-

ington College of Education. The completed application form, together with the \$1.00 registration fee, is to be forwarded to the county superintendent who, in turn, sends it to the State Superintendent of Public Instruction.

B. After completion of the Standard Principal's Credential, 12 credits in residence at the University of Washington must be earned for a Provisional Superintendent'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 the College of Education Advisory Office in 207 Miller Hall. The candidate will receive one copy of this approved program after it is evaluated officially by the College of Education committee on administrators' credentials. It is the responsibility of the candidate to notify the Advisory Office when he has completed the requirements.

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. The candidate should apply to the

Office of the State Superintendent of Public Instruction. He may obtain an application form for the Standard Superintendent's Credential from his county superintendent, the Superintendent of Public Instruction, or the College of Education at the University of Washington. He then forwards the completed application form with the \$1.00 registration fee to his county superintendent who, in turn, sends it to the Superintendent of Public Instruction.

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 an adviser in 207 Miller Hall. The candidates will receive one copy of this approved program after it is evaluated officially by the College of Education committee on administrator's credentials. It is the responsibility of the candidate to notify his adviser in 207 Miller Hall when he has completed the requirements.

E. The Standard Superintendent's Credential is valid as long as the holder's teaching certificate is valid.

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

(50 approved credits required)

COURSES	CREDITS
201 PHYSICAL ANTHROPOLOGY: MAN IN NATURE	5
202 CULTURAL ANTHROPOLOGY: COMPARISON AND ANALYSIS	5
203 ARCHAEOLOGY: THE DAWN OF TRADITION	5
210 NORTH AMERICAN INDIANS (3) OR	
211 OCEANIA (3) OR	



213	AFRICA (3) OR	
215	NATIVE PEOPLES OF SOUTH AMERICA (3) OR	
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
272	PREHISTORIC CULTURES OF NORTH AMERICA (3) OR	
274	PREHISTORIC CULTURES OF SOUTH AMERICA (3)	3
355	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 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 23		
50		

Anthropology Major: Secondary School Emphasis
 (50 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 ARCHAEOLOGY: THE DAWN OF TRADITION	5
APPROVED ANTHROPOLOGY ELECTIVES CHOSEN AFTER CONSULTATION REGARDING THE STUDENT'S SPECIAL FIELD OF INTEREST 20	
35	

Art
Teaching Major: Secondary School Emphasis
 (80 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 THE HISTORY OF WESTERN ART (3,3,3)	9
APPROVED ART HISTORY ELECTIVES	3
HUM 102 THE ARTS	5
ART SUBJECT AREAS	
1. 201 CERAMIC ART (3); 253, 254, 255 DESIGN AND MATERIALS (3,3,3); 272 SCULPTURE (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, OR 362 LIFE (3,3,3); 463, 464, OR 465 COMPOSITION (3,3,3) TO TOTAL 12-15	
3. 205 LETTERING (3); 261 ELEMENTARY INTERIOR DESIGN (2); 350, 351, OR 352 PRINTMAKING (3,3,3); 367 GRAPHIC DESIGN (3) TO TOTAL 8-12	
4. 300 DESIGN IN LEATHER (3); 302 BOOKBINDING (3); 303, 304, 305 ART EDUCATION CRAFTS (2,2,2) TO TOTAL 6-12	
319 (2), 320 (3)	5
80	

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 THE 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 DESIGN IN LEATHER (3); 302 BOOKBINDING (3); 303, 304, 305 ART EDUCATION: CRAFTS (3,3,3) TO TOTAL 6	
APPROVED ART ELECTIVES (ANY COURSES WHERE PREREQUISITES ARE SATISFIED)	6
EDUC 376 ART IN THE ELEMENTARY SCHOOL	3
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 THE 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 (2) 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
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 101J-102J GENERAL BIOLOGY (5-5) AND BOT 112 THE PLANT KINGDOM (5), 113 ELEMENTARY PLANT CLASSIFICATION (5) OR ZOO 111, 112 GENERAL ZOOLOGY (5,5) AND BOT 111 ELEMENTARY BOTANY (5), 112 THE PLANT KINGDOM (5), 113 ELEMENTARY PLANT CLASSIFICATION (5) AND ZOO 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
53-55	

Biology Major: Secondary School Emphasis

(38-40 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 101J-102J GENERAL BIOLOGY (5-5) AND BOT 112 THE PLANT KINGDOM (5), 113 ELEMENTARY PLANT CLASSIFICATION (5) OR ZOO 111, 112 GENERAL ZOOLOGY (5,5) AND BOT 112 THE PLANT KINGDOM (5), 113 ELEMENTARY PLANT CLASSIFICATION (5) OR ZOO 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	15
	38-40

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)
ZOO 201 CELL BIOLOGY (4)
ZOO 208 ELEMENTARY HUMAN PHYSIOLOGY (5) OR 458 VERTEBRATE PHYSIOLOGY (6)
ZOO 330 NATURAL HISTORY OF MARINE INVERTEBRATES (5)
ZOO 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

* May be deferred until fifth year.

SEC STUDIES X111 INTERMEDIATE TYPEWRITING	2
SEC STUDIES X112 ADVANCED TYPEWRITING	2
SEC STUDIES X115 OFFICE MACHINES	3
SEC STUDIES X320 SECRETARIAL PRACTICE	5
**SEC STUDIES X310 ADVANCED SHORTHAND (5); PREREQUISITES, TWO YEARS HIGH SCHOOL SHORTHAND AND/OR DEMONSTRATED SHORTHAND COMPETENCE; AND TRANSCRIPTION (5) OR DEPARTMENTAL PROFICIENCY EXAMINATION 0-10	0-10
**SEC STUDIES 311	
EDUC 324 TEACHERS' COURSE IN BUSINESS EDUCATION: BOOKKEEPING AND GENERAL BUSINESS	2
EDUC 325 TEACHERS' COURSE IN BUSINESS EDUCATION: TYPEWRITING, SHORTHAND, TRANSCRIPTION, AND BUSINESS COMMUNICATIONS	2
	59

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	5
BUS LAW 201 LEGAL FACTORS IN THE BUSINESS ENVIRONMENT	3
ACCTG 210, 220 FUNDAMENTALS OF ACCOUNTING (3,3)	6
SEC STUDIES X111 INTERMEDIATE TYPEWRITING	2
SEC STUDIES X112 ADVANCED TYPEWRITING	2
SEC STUDIES X320 SECRETARIAL PRACTICE	5
EDUC 324 TEACHERS' COURSE IN BUSINESS EDUCATION: BOOKKEEPING AND GENERAL BUSINESS	2
	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 X111 INTERMEDIATE TYPEWRITING	2
SEC STUDIES X112 ADVANCED TYPEWRITING	2
SEC STUDIES X115 OFFICE MACHINES	3
EDUC 324 TEACHERS' COURSE IN BUSINESS EDUCATION: BOOKKEEPING AND GENERAL BUSINESS	2
	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 (3,3,2,3)	11
CHEM 170 QUALITATIVE ANALYSIS	3
CHEM 221 QUANTITATIVE ANALYSIS	5
CHEM 231, 232, 241, 242 ORGANIC CHEMISTRY (3,3,2,2)	10

** Required only if student plans to teach shorthand.



CHEM 350, 351	ELEMENTARY PHYSICAL CHEMISTRY (3,3)	6
PHYS 101, 102, 103, 107, 108, 109	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 (3,3,2,2)	10
CHEM 350, 351	ELEMENTARY PHYSICAL CHEMISTRY (3,3)	6
PHYS 101, 102, 103, 107, 108, 109	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

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 (3,3,2)	8
PHYS 110, 111, 112	GENERAL PHYSICS (3,3,4) OR APPROVED EQUIVALENT	10
		<hr/> 37

Drama

***Combined Teaching Major and Minor: Secondary School Emphasis**

(75 approved credits required)

COURSES		CREDITS
101	INTRODUCTION TO THE THEATER	2
146	THEATER VOICE AND SPEECH	3
151, 152	ACTING (3,3)	6
210, 211, 212	THEATER TECHNICAL PRACTICE (4,4,4)	12
230	INTRODUCTION TO CHILDREN'S DRAMA	2
247	THEATER VOICE AND SPEECH	2
253	ACTING	3
298	THEATER PRODUCTION	1
316	THEATRICAL MAKE-UP	2
461, 461L	THEORY AND FUNDAMENTALS OF DIRECTING AND LABORATORY	3

*Satisfaction of the Combined Teaching Major and Minor also satisfies the minor area degree requirements for Education.

498	THEATER PRODUCTION	1
	EMPHASIS AREAS (SELECT ONE):	8-9
1.	ACTING-DIRECTING: 248 THEATER VOICE AND SPEECH (2); 451, 452 ADVANCED ACTING (3,3)	
2.	CHILDREN'S DRAMA: 338 CREATIVE DRAMATICS (3); 431 FUNDAMENTALS OF PUPPETRY (2); 435 CHILDREN'S THEATER DIRECTING (2); 438 CREATIVE DRAMATICS (2)	
3.	DESIGN-TECHNICAL: 414 SCENE DESIGN (2); 415 STAGE COSTUME DESIGN (2); 418 SCENE PAINTING (2); 419 STAGE LIGHTING (2)	

Drama Major Total

45-46

DRAMA 471, 472, 473	HISTORY OF WORLD THEATER AND DRAMA (5,5,5)	15
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APPROVED DRAMA COURSE IN 470's (5) OR APPROVED DRAMA COURSE IN 480's (5) OR APPROVED DRAMA COGNATE (5) (SEE FOLLOWING LIST)	5
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324 SHAKESPEARE (5)	5
325 OR 326 SHAKESPEARE (5,5)	5

Dramatic Literature Minor Total

30

Combined Major and Minor Total

75-76

RECOMMENDED DRAMA COGNATE COURSES

CLASS 427	GREEK AND ROMAN DRAMA IN ENGLISH (3)	
COMP LIT 301	WORLD CLASSICS OF GERMANY, RUSSIA, AND SCANDINAVIA	
ENGL 259	INTRODUCTION TO MODERN DRAMA (2)	
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 THEATER	2
146	THEATER VOICE AND SPEECH	3
151, 152, 153	ACTING (3,3,3)	9
230	INTRODUCTION TO CHILDREN'S DRAMA	2
247	THEATER VOICE AND SPEECH	2
316	THEATRICAL MAKE-UP	2
325	PLAY PRODUCTION	5
331	PUPPETRY	3
338	CREATIVE DRAMATICS	3
435	CHILDREN'S THEATER DIRECTING	2
438, 438L	CREATIVE DRAMATICS AND LABORATORY (2,1)	3
461	THEORY AND FUNDAMENTALS OF DIRECTING	2
461L	DIRECTING LABORATORY	1
498	THEATER PRODUCTION	1
APPROVED DRAMA COURSE IN 470's (5) OR APPROVED DRAMA COURSE IN 480's (5) OR APPROVED DRAMA COGNATE (5) (SEE ABOVE LIST OF RECOMMENDED DRAMA COGNATE COURSES)	5	

45

Teaching Minor: Secondary School Emphasis
(26 approved credits required)

COURSES	CREDITS
101 INTRODUCTION TO THE THEATER	2
146 THEATER VOICE AND SPEECH	3
151, 152 ACTING (3,3)	6
230 INTRODUCTION TO CHILDREN'S DRAMA	2
298 THEATER PRODUCTION	1
316 THEATRICAL MAKE-UP	2
325, 326 PLAY PRODUCTION (5,5)	10
	26

Economics

Teaching Major: Secondary School Emphasis
(64 approved credits required)

COURSES	CREDITS
ECON 200 INTRODUCTION TO ECONOMICS	5
ECON 201 PRINCIPLES OF ECONOMICS	5
ECON 300 INTERMEDIATE PRICE THEORY	5
ECON 301 NATIONAL INCOME ANALYSIS	5
ECON 320 MONEY AND BANKING (5) OR	
ECON 340 LABOR ECONOMICS (5) OR	
ECON 350 PUBLIC FINANCE AND TAXATION I (5) OR	
ECON 370 ECONOMIC PRINCIPLES OF FOREIGN TRADE (5) OR	
ECON 390 COMPARATIVE ECONOMIC SYSTEMS (5)	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	
ECON 320 MONEY AND BANKING (5) OR	
FIN 320 MONEY, FINANCIAL INSTITUTIONS, AND INCOME (4) AND	
FIN 350 BUSINESS FINANCE (4)	9-12
B STAT 201 STATISTICAL ANALYSIS (3) AND	
B STAT 301 PROBABILITY AND INFERENCE IN BUSINESS DECISION	
MAKING (3) OR	
MATH 281 ELEMENTS OF STATISTICAL METHOD (5) OR	
PSYCH 301 STATISTICAL METHODS (5) OR	
SOC 223 SOCIAL STATISTICS (5)	5-6
APPROVED ELECTIVES IN ECONOMICS, OTHER SOCIAL SCIENCES, OR	
BUSINESS ADMINISTRATION	25
	64

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
	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, 345 VICTORIAN POETS (BROWNING, TENNYSON, ARNOLD, HOPKINS, ROSSETTI) (5) OR	
347 NINETEENTH-CENTURY PROSE (5)	5
361 AMERICAN LITERATURE: BEGINNINGS TO 1840 (5) OR	
362 AMERICAN LITERATURE: 1840 TO 1860 (5) OR	
363 AMERICAN LITERATURE: 1860 TO 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 TEACHERS COURSE IN ENGLISH	3
	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, 345 VICTORIAN POETS (BROWNING, TENNYSON, ARNOLD, HOPKINS, ROSSETTI) (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
	45



**Teaching Minor: Secondary School Emphasis
(41 approved credits required)**

COURSES	CREDITS
271 EXPOSITORY WRITING	3
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
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 TEACHERS COURSE IN ENGLISH	3
	—
	41

**Far Eastern and Russian
(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 453J MODERN JAPANESE HISTORY	5
FAR E 243 RUSSIAN CIVILIZATION (5) OR	
FAR E 423J MODERN RUSSIAN HISTORY (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 SOUTHEAST ASIA	5
CHIN 320 CHINESE LITERATURE IN ENGLISH (5) OR	
JAP 420 JAPANESE LITERATURE 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 333J THE SOVIET UNION	5
GEOG 312J SOUTH ASIA (5) OR	
GEOG 313J EAST ASIA (5)	5
POL S 344 CHINESE GOVERNMENT (5) OR	
POL S 414 ORIENTAL POLITICAL THOUGHT	5
POL S 429 INTERNATIONAL RELATIONS IN THE FAR EAST (5) OR	
POL S 432 AMERICAN FOREIGN POLICY IN THE FAR EAST (5)	5
POL S 420 FOREIGN RELATIONS OF THE SOVIET UNION (5) OR	
POL S 441 POLITICAL INSTITUTIONS OF THE SOVIET UNION (5)	5
	—
	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	
GEOG 412J SOUTH ASIA (5) OR	
POL S 344 CHINESE GOVERNMENT (5) OR	
POL S 345J JAPANESE GOVERNMENT (5) OR	
POL S 414 ORIENTAL POLITICAL THOUGHT (5)	10
FAR E 423J RUSSIAN CIVILIZATION (5) OR	
FAR E 423J MODERN RUSSIAN HISTORY (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 SOUTHEAST ASIA (5) OR	
FAR E 453J MODERN JAPANESE HISTORY (5)	5
POL S 429 INTERNATIONAL RELATIONS IN THE FAR EAST (5) OR	
POL S 432 AMERICA FOREIGN POLICY IN THE FAR EAST (5) OR	
POL S 420 FOREIGN RELATIONS OF THE SOVIET UNION (5) OR	
POL S 441 POLITICAL INSTITUTIONS OF THE SOVIET UNION (5)	5
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	30

French (Romance Languages)

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	0-15
201, 202 INTERMEDIATE (5,5) OR APPROVED EQUIVALENT	0-10
222 INTRODUCTION TO FRENCH LITERATURE (5) OR APPROVED EQUIVALENT	0-5
301, 302 ADVANCED SYNTAX AND COMPOSITION (3,3)	6
303 FRENCH STYLISTICS	3
304 SURVEY OF FRENCH LITERATURE: 1100-1680 (3)	
305 SURVEY OF FRENCH LITERATURE: 1680-1800 (3)	
306 SURVEY OF FRENCH LITERATURE: 1800-1960 (3)	9
308 SEVENTEENTH-CENTURY FRENCH LITERATURE (3) OR	
309 TWENTIETH-CENTURY FRENCH LITERATURE (3)	3
327 ADVANCED CONVERSATION (2, MAX. 8) OR	
330 CONVERSATIONAL FRENCH (2½-4, MAX. 8) OR	
430 CONVERSATIONAL FRENCH (1-3, MAX. 6)	TO TOTAL 6
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 329 TEACHERS' COURSE IN FRENCH	3
	—
	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
325 HISTORICAL GEOGRAPHY OF AMERICA	3
APPROVED GEOGRAPHY UPPER-DIVISION ELECTIVE COURSES	27
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	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
302 THE PACIFIC NORTHWEST	3
258 MAPS AND MAP READING	2
325 HISTORICAL GEOGRAPHY OF AMERICA	3
APPROVED GEOGRAPHY UPPER-DIVISION ELECTIVE COURSES	22
	<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
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	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 (3,3,2,3)	11
PHYS 101, 102, 103, 107, 108, 109 (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 GENERAL GEOLOGY FOR NONSCIENCE MAJORS (5)	5
GEOL 103 GENERAL GEOLOGY FOR NONSCIENCE MAJORS	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
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	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 (3,3,2,3)	11
BIOL 101J-102J GENERAL BIOLOGY (5-5) OR	
ZOOL 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 GENERAL GEOLOGY FOR NONSCIENCE MAJORS (5)	5
GEOL 103 GENERAL GEOLOGY FOR NONSCIENCE MAJORS	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 OR	
101 GENERAL GEOLOGY FOR NONSCIENCE MAJORS	5
102 GENERAL GEOLOGY FOR NONSCIENCE MAJORS OR	
220 MINERALOGY	5
103 GENERAL GEOLOGY FOR NONSCIENCE MAJORS	5
411J GEOMORPHOLOGY	4
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	19



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
(60 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 (2,2,2)	6
310, 311 INTRODUCTION TO THE CLASSICAL PERIOD (3,3)	6
312 INTRODUCTION TO THE GERMAN NOVELLE	3
401, 402, 403 GRAMMAR AND COMPOSITION (2,2,2)	6
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 TEACHERS' COURSE IN GERMAN	3
	60

Germanic Languages and Literature Major: Elementary School Emphasis
(36 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 (2,2,2)	6
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 TEACHERS' COURSE IN GERMAN	3
	36

Teaching Minor: Secondary School Emphasis
(42 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 (2,2,2)	6
310, 311 INTRODUCTION TO THE CLASSICAL PERIOD (3,3)	6
312 INTRODUCTION TO THE GERMAN NOVELLE	3
401, 402, 403 GRAMMAR AND COMPOSITION (2,2,2)	6
405 LINGUISTIC ANALYSIS OF GERMAN	3
EDUC 330 TEACHERS' COURSE IN GERMAN	3
	42

Health Education

(School of Physical and Health Education)

Teaching Major: Secondary School Emphasis

(68-73 approved credits required, and 39 credits in general education 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 INTRODUCTION TO MENTAL HYGIENE (2) OR	
PSYC 450 PRINCIPLES OF PERSONALITY DEVELOPMENT	2
EDUC 408 MENTAL HYGIENE FOR TEACHERS AND ADMINISTRATORS	3
P MED 323 INTRODUCTION TO PUBLIC HEALTH PRINCIPLES AND PRACTICES	3
P MED 420 PRINCIPLES OF EPIDEMIOLOGY	2
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 AND ELEMENTARY PHYSIOLOGY LABORATORY (6) OR	
ZOOL 208 ELEMENTARY HUMAN PHYSIOLOGY (5)	5-6
APPROVED ELECTIVES IN HEALTH EDUCATION OR RELATED FIELDS	6-9
	68-73

GENERAL EDUCATION COURSES	CREDITS
BIOL 101J-102J GENERAL BIOLOGY (5-5)	10
ENGL 101, 102, 103 COMPOSITION (3,3,3)	9
H EC 300 NUTRITION	2
P ED ACTIVITIES	TO TOTAL 3
PSYCH 100 GENERAL PSYCHOLOGY	5
SOC 110 SURVEY OF SOCIOLOGY	5
SP 100 BASIC SPEECH IMPROVEMENT	5
	39

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
	25-30

RECOMMENDED ELECTIVES

PSYCH 320	DIRECTED OBSERVATION OF EARLY CHILDHOOD DEVELOPMENT (3)
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)
BIOL 351	HUMAN GENETICS (3)
MICRO 301	GENERAL MICROBIOLOGY (5)
P MED 420	PRINCIPLES OF EPIDEMIOLOGY (2)
P MED 422	INTRODUCTION TO ENVIRONMENTAL HEALTH (3)
P MED 424	PUBLIC HEALTH PROGRAMS (2)
P MED 492	PROBLEMS IN INTERNATIONAL HEALTH (2)
PSYC 267	INTRODUCTION TO MENTAL HYGIENE (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

(50 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
	<hr/> 50

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 33 credits in prerequisite courses)

*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 fulfills Home Economics course requirements for a Vocational Certificate.

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 TEACHERS COURSE IN HOME ECONOMICS	5
PSYCH 320 DIRECTED OBSERVATION OF CHILD DEVELOPMENT	3
	<hr/> 62

ART 109	DESIGN (PREREQUISITE FOR HOME ECON. 234 AND 347)	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
MICRO 301	GENERAL MICROBIOLOGY	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
		<hr/> 33

Home Economics Major: Elementary School Emphasis

(45 approved credits and 23 credits in prerequisite courses)

COURSES	CREDITS
†110 FOOD AND NUTRITION (5) OR	
216 FOOD PREPARATION AND MEAL MANAGEMENT (3)	3 OR 5
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 OR 20
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**Two credits count as Education, and three credits count as Home Economics.

†Students cannot receive credit for both Home Econ. 110 and 300, or 300 and 307.



PREREQUISITES

ART 109	DESIGN (PREREQUISITE FOR HOME ECON. 347)	3
CHEM 101	GENERAL CHEMISTRY (PREREQUISITE FOR HOME ECON. 316)	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
		23

Teaching Minor: Secondary School Emphasis

(32 approved credits in Home Economics and 23 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 (PREREQUISITE FOR HOME ECON. 347)	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
		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	TEACHERS' COURSE IN 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 WOODWORKING	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	TEACHERS' COURSE IN 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

(42-48 approved credits required. All journalism courses must be approved by the curriculum adviser of the School of Communications.)

COURSES	CREDITS	
JOUR 200	NEWS WRITING	3
JOUR 301	COPY EDITING	3
JOUR 318	REPORTING CONTEMPORARY AFFAIRS	3
JOUR 375J	TEACHERS' COURSE IN 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
		18-24

ELECTIVE COURSES

CMU 312	COMMUNICATIONS THEORY (3)	
CMU 320	LEGAL ASPECTS OF COMMUNICATIONS (3)	
CMU 402	GOVERNMENT AND MASS COMMUNICATIONS (3)	
CMU 406	SOCIAL CONTROL OF THE MASS MEDIA (3)	
CMU 414	HISTORY OF MASS COMMUNICATIONS (3)	
CMU 408, 409, 410	COMMUNICATIONS RESEARCH (3,3,3)	
CMU 415	COMPARATIVE COMMUNICATIONS SYSTEMS (3)	
CMU 480	PROPAGANDA (3)	
JOUR 413	EDITORIAL WRITING, POLICIES, AND RESEARCH (3)	
ADV 340	ADVERTISING PROCEDURES (5)	
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 OF	6-9
		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
(24 approved credits required)

COURSES	CREDITS
JOUR 200 NEWS WRITING	3
JOUR 301 COPY EDITING	3
JOUR 318 REPORTING CONTEMPORARY AFFAIRS	3
JOUR 375J TEACHERS' COURSE IN 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
	24

Latin (Classics)

Teaching Major: Secondary School Emphasis
(36 approved credits required: 27 credits in upper-division Latin courses; and 9 additional credits in approved Greek or upper-division Latin courses, or from the courses listed below.)

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 DRAMA 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 S 101	HISTORY OF CIVILIZATION: THE GREAT TRADITION (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 ROMAN REPUBLIC (3)
HIST 404	THE 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, including a minimum of 1 credit in Latin 309 Advanced Grammar and Composition.)

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
450 LIBRARY MATERIALS FOR TEACHERS	3
451 CHILDREN'S LITERATURE	3
453 LITERATURE FOR YOUNG PEOPLE	3
454 LIBRARY IN THE SCHOOL	3
	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 135, 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
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	9
	45



Educ. 336 Teachers' Course in Secondary 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. Requirements are the same as for the Teaching Major: Secondary School Emphasis, except that the 9 credits of mathematics electives are not required.)

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

Educ. 337 Teachers' Course in 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, 307, 308, 347 MUSIC HISTORY (2,2,2,2,2)	12
321, 322, OR 353 UPPER-DIVISION THEORY (3,2,3)	6
344 ELEMENTARY SCHOOL MUSIC	3
346J TEACHERS' COURSE IN SECONDARY SCHOOL MUSIC	3
384 OR 385 CONDUCTING	3
474 THE MUSIC CURRICULUM OR MUSIC 299: UNDERGRADUATE RESEARCH	2
476 THE GENERAL MUSIC CLASS	2
MAJOR INSTRUMENT OR VOICE TO TOTAL OF 24	
MINOR INSTRUMENT OR VOICE	12
MUSIC ENSEMBLE (MINIMUM OF ONE YEAR CHORAL ENSEMBLE REQUIRED)	12
	—
COMBINED MUSIC MAJOR TOTAL	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, 347 MUSIC HISTORY	8
344 ELEMENTARY SCHOOL MUSIC	3
APPLIED MUSIC (INCLUDE NOT LESS THAN 3 CREDITS IN VOICE, NOR LESS THAN 3 CREDITS IN PIANO) TO TOTAL OF 18	
MUSIC ENSEMBLE	6
	—
	50

Physical Education for Men

Teaching Major: Secondary School Emphasis

(65 approved credits required in Health Education, Physical 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 SKILLS AND MATERIALS IN TRACK AND FIELD AND WEIGHT TRAINING	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	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 COACHING OF BASKETBALL (2) OR COACHING OF TRACK AND FIELD (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
	—
	65

RELATED COURSES

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 101J-102J 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
	—
	35

Teaching Major: Elementary School Emphasis
(50 approved credits in Health Education, Physical Education, and Recreation Education)

COURSES	CREDITS
H ED 429 METHODS IN TEACHING: FIRST AID AND SAFETY	3
164 SKILLS IN MATERIALS AND AQUATICS	2
165 SKILLS AND MATERIALS IN GYMNASTICS	2
166 SKILLS AND MATERIALS IN TEAM SPORTS	2
190 INTRODUCTION TO PHYSICAL AND HEALTH EDUCATION	2
264 SKILLS AND MATERIALS IN TRACK AND FIELD AND WEIGHT TRAINING	2
265 SKILLS AND MATERIALS IN LOW-ORGANIZED GAMES	2
266 SKILLS AND MATERIALS IN INDIVIDUAL SPORTS	2
293 PHYSIOLOGY OF MUSCULAR EXERCISE	3
309 THE SCHOOL DANCE PROGRAM	2
322 KINESIOLOGY	3
340 ADMINISTRATION OF INTRAMURAL SPORTS	3
345 PRINCIPALS OF PHYSICAL EDUCATION	3
358 METHODS OF TEACHING GYMNASTICS	2
361 METHODS OF TEACHING WRESTLING (2) OR	
364 METHODS OF TEACHING AQUATICS (2)	2
363 METHODS OF TEACHING SPORTS	2
370 COACHING OF FOOTBALL	2
371 COACHING OF BASKETBALL	2
450 THE SCHOOL PHYSICAL EDUCATION PROGRAM	3
493 PROBLEMS IN ATHLETICS	3
R ED 324 RECREATION PROGRAMS	3
	50

Teaching Minor: Secondary School Emphasis
(27 approved credits required)

COURSES	CREDITS
164 SKILLS AND MATERIALS IN AQUATICS	2
165 SKILLS AND MATERIALS IN GYMNASTICS	2
166 SKILLS AND MATERIALS IN TEAM SPORTS	2
264 SKILLS AND MATERIALS IN TRACK AND FIELD AND WEIGHT TRAINING	2
265 SKILLS AND MATERIALS IN LOW-ORGANIZED GAMES	2
266 SKILLS AND MATERIALS IN INDIVIDUAL SPORTS	2
345 PRINCIPLES OF PHYSICAL EDUCATION	3
358 METHODS OF TEACHING GYMNASTICS (2) OR	
361 METHODS OF TEACHING WRESTLING (2) OR	
363 METHODS OF TEACHING SPORTS (2) OR	
364 METHODS OF TEACHING AQUATICS (2)	2
370 COACHING OF FOOTBALL (2) OR	
371 COACHING OF BASKETBALL (2) OR	
372 COACHING OF TRACK AND FIELD (2) OR	
373 COACHING OF BASEBALL (2)	2
450 THE SCHOOL PHYSICAL EDUCATION PROGRAM	3
ZOOL 118 SURVEY OF PHYSIOLOGY	5
	27

Physical Education for Women

Teaching Major: Secondary School Emphasis
(60-66 approved credits required in Health Education, Physical Education, and Recreation Education; 30 credits required in specific related courses.)

COURSES	CREDITS
H ED 292 FIRST AID AND SAFETY (3) OR	
H ED 429 METHODS OF TEACHING FIRST AID AND SAFETY (3)	3
271 PHYSICAL EDUCATION BACKGROUNDS (FUNDAMENTALS OF WOMEN'S FIELD SPORTS)	2

272 PHYSICAL EDUCATION BACKGROUNDS (FUNDAMENTALS OF MOVEMENT)	2
273 PHYSICAL EDUCATION BACKGROUNDS (INDIVIDUAL SPORTS—WOMEN)	2
280 INTRODUCTION TO PHYSICAL AND HEALTH EDUCATION	2
281 PHYSICAL EDUCATION BACKGROUNDS (WOMEN'S GYMNASTICS)	2
282 PHYSICAL EDUCATION BACKGROUNDS (FUNDAMENTALS OF RHYTHM)	2
283 PHYSICAL EDUCATION BACKGROUNDS (CONTEMPORARY DANCE)	2
284 PHYSICAL EDUCATION BACKGROUNDS (AQUATICS)	1
293 PHYSIOLOGY OF MUSCULAR EXERCISE	3
304 OFFICIATING (2) OR	
305-306 OFFICIATING (1-1)	2
322 KINESIOLOGY	3
*344 ORGANIZATION AND ADMINISTRATION OF CAMP PROGRAMS	3
*345 PRINCIPLES OF PHYSICAL EDUCATION	3
375 METHODS IN PHYSICAL EDUCATION I	7
376 METHODS IN PHYSICAL EDUCATION II	7
377 METHODS IN PHYSICAL EDUCATION III	6
*436 ADAPTED ACTIVITIES	3
450 THE SCHOOL PHYSICAL EDUCATION PROGRAM	2
N466 COACHING (3 QUARTERS)	0
480 PRINCIPLES OF MOVEMENT	3
H ED 291 PERSONAL AND GENERAL HYGIENE (3) AND HEALTH EDUC. 453, METHODS AND MATERIALS IN HEALTH TEACHING (3) REQUIRED IF HEALTH EDUCATION MINOR IS NOT COMPLETED	6

60-66

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 170 INTRODUCTION TO HEALTH SCIENCES PHYSICS (5) AND INTRODUCTION TO HEALTH SCIENCES PHYSICS LABORATORY (1)	6
SOC 110 SURVEY OF SOCIOLOGY	5
ZOOL 118 SURVEY OF PHYSIOLOGY (5) AND ELEMENTARY PHYSIOLOGY LABORATORY (1)	6
	30

Physical Education for Women Major: Elementary School Emphasis
(55 approved credits required)

COURSES	CREDITS
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

*May be deferred until fifth year.



PE 271	PHYSICAL EDUCATION BACKGROUNDS (FUNDAMENTALS OF WOMEN'S FIELD SPORTS)	2
PE 272	PHYSICAL EDUCATION BACKGROUNDS (FUNDAMENTALS OF MOVEMENT)	2
PE 281	PHYSICAL EDUCATION BACKGROUNDS (WOMEN'S GYMNASTICS)	2
PE 282	PHYSICAL EDUCATION BACKGROUNDS (FUNDAMENTALS OF RHYTHM)	2
PE 280	INTRODUCTION TO PHYSICAL AND HEALTH EDUCATION	2
PE 304	OFFICIATING (2) OR	
PE 305-306	OFFICIATING (1-1)	2
PE 375	METHODS OF PHYSICAL EDUCATION I	7
PE 480	PRINCIPLES OF MOVEMENT	3
APPROVED ELECTIVES		12
		<hr/> 55

SUGGESTED ELECTIVES

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	PHYSICAL EDUCATION BACKGROUNDS (INDIVIDUAL SPORTS—WOMEN) (2)	
PE 283	PHYSICAL EDUCATION BACKGROUNDS (CONTEMPORARY DANCE) (2)	
PE 284	PHYSICAL EDUCATION BACKGROUNDS (AQUATICS) (1)	
PE 293	PHYSIOLOGY OF MUSCULAR EXERCISE (3)	
PE 304 OR 305-306	OFFICIATING (2, 1-1)	
PE 311	RHYTHMIC ACTIVITIES FOR SMALL CHILDREN (2)	
PE 312	PHYSICAL FITNESS ACTIVITIES FOR CHILDREN (2½)	
PE 322	KINESIOLOGY (3)	
PE 351	THEATER DANCE (2)	
PE 352	HISTORY OF DANCE (3)	
PE 355	MODERN DANCE WORKSHOP (2-6)	
PE 376	METHODS IN PHYSICAL EDUCATION II (7) OR	
PE 295	FUNCTIONAL SWIMMING AND WATER SAFETY (2)	
PE 377	METHODS IN PHYSICAL EDUCATION III (6) OR	
PE 309	THE SCHOOL DANCE PROGRAM (2)	
PE 450	THE SCHOOL PHYSICAL EDUCATION PROGRAM (2)	
PE 459-460	DANCE PRODUCTION (2-2)	
PE 498	SPECIAL STUDIES IN PHYSICAL EDUCATION (2-6)	
PHYS 170	INTRODUCTION TO HEALTH SCIENCES PHYSICS (5) AND	
PHYS 170L	INTRODUCTION TO HEALTH SCIENCES PHYSICS LABORATORY (1)	
R ED 344	ORGANIZATION AND ADMINISTRATION OF CAMP PROGRAMS (3)	

Teaching Minor: Secondary School Emphasis
(25 approved credits required)

COURSES	CREDITS
H ED 292	FIRST AID AND SAFETY 3
PE 271	PHYSICAL EDUCATION BACKGROUNDS (FUNDAMENTALS OF WOMEN'S FIELD SPORTS) (2); PHYS. EDUC. 272 PHYSICAL EDUCATION BACKGROUNDS (FUNDAMENTALS OF MOVEMENT) (2); PHYS. EDUC. 273 PHYSICAL EDUCATION BACKGROUNDS (INDIVIDUAL SPORTS—WOMEN) (2); PHYS. EDUC. 282 PHYSICAL EDUCATION BACKGROUNDS (FUNDAMENTALS OF RHYTHM) (2); OR APPROVED EQUIVALENT 8
PE 309	THE SCHOOL DANCE PROGRAM (2) OR
PE 377	METHODS IN PHYSICAL EDUCATION III (6) 2 OR 6
PE 375	METHODS IN PHYSICAL EDUCATION I 7
APPROVED ELECTIVES TO TOTAL OF 25 CREDITS	1-5
	<hr/> 25

SUGGESTED ELECTIVES

EDUC 340	TEACHERS' COURSE IN HEALTH AND PHYSICAL EDUCATION FOR WOMEN (2)
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 322	KINESIOLOGY (3)
PE 351	THEATER DANCE (2)
PE 352	HISTORY OF DANCE (3)
PE 355	MODERN DANCE WORKSHOP (2-6)
PE 376	METHODS IN PHYSICAL EDUCATION II (7)
PE 450	THE SCHOOL PHYSICAL EDUCATION PROGRAM (2)
PE 459-460	DANCE PRODUCTION (2-2)
PE 480	PRINCIPLES OF MOVEMENT (3)
PE 281	PHYSICAL EDUCATION BACKGROUNDS (FUNDAMENTALS OF RHYTHM) (2) OR
PE 283	PHYSICAL EDUCATION BACKGROUNDS (CONTEMPORARY DANCE) (2) OR
PE 284	PHYSICAL EDUCATION BACKGROUNDS (AQUATICS) (1)

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
	<hr/> 51

Physics Major: Elementary School Emphasis

Requirements are the same as the Teaching Major: Secondary School Emphasis.

Physics Minor: Secondary School Emphasis
(22 approved credits required)

COURSES	CREDITS
PHYS 121, 122, 123 GENERAL PHYSICS (4,4,4)	12
PHYS 131, 132, 133 GENERAL PHYSICS LABORATORY (1,1,1)	3
PHYS 225 ELECTRIC CIRCUITS	4
PHYS 320 INTRODUCTION TO MODERN PHYSICS	3
	<hr/> 22

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 (MIN. 10)	
(2) GOVERNMENT, POLITICS, AND PUBLIC ADMINISTRATION (MIN. 10)	
(3) COMPARATIVE GOVERNMENT AND INTERNATIONAL RELATIONS (MIN. 10)	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 LOCAL GOVERNMENT AND ADMINISTRATION (5)

50

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

The Department of Political Science maintains a current list of approved courses for the three broad fields.

APPROVED UPPER-DIVISION POLITICAL SCIENCE ELECTIVES	5
	30

Psychology

Teaching Major: Secondary School Emphasis
(50 approved credits required; 40 credits in psychology and 10 credits in natural sciences. 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 ap-

propriate 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 above. 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 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 "BREADTH" REQUIREMENTS)	
	10
	50

Proposed elective or equivalent credits 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 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)

Russian Major: Secondary School Emphasis

(51-56 approved credits beyond the elementary level [Russian 110, AB, 210, or 100 Russian A, 105, Russian B, 200 Russian C, 205 Russian D], 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	15
RUSS 361, 362, 363 RUSSIAN READINGS A,B,C,	9
RUSS 451, 452 ADVANCED RUSSIAN GRAMMAR AND COMPOSITION	10
EDUC 341 TEACHERS' COURSE IN RUSSIAN	2
COURSES CHOSEN FROM ELECTIVES FOR BACKGROUND IN RUSSIAN STUDIES (SEE LIST BELOW)	5-10
	51-56

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 441 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 455 HISTORY OF RUSSIAN STANDARD SPOKEN LANGUAGE	10
SLAV 450 INTRODUCTION TO SLAVIC PHILOLOGY	3

Russian Major: Elementary Education Emphasis

(Requirements are the same as the Russian Minor: Secondary School Emphasis.)

Russian Minor: Secondary School Emphasis

(40-45 credits required beyond the elementary level [Russian 110, 210, or 100-105, 200, 205], including the following:)

COURSES	CREDITS
RUSS 310 ACCELERATED RUSSIAN EF OR RUSS 300, 305 RUSSIAN E (5), RUSSIAN F (5)	10
RUSS 311, 312, 313 INTERMEDIATE RUSSIAN A,B,C	15
RUSS 361 OR 362 OR 363 RUSSIAN READINGS A,B,C	3
RUSS 451 OR 452 STRUCTURE OF RUSSIAN	5
EDUC 341 TEACHERS' COURSE IN RUSSIAN	2
COURSES CHOSEN FROM ELECTIVES FROM BACKGROUND IN RUSSIAN STUDIES (SEE MAJOR ELECTIVE LIST)	5-10
	40-45

Sociology

Teaching Major: Secondary School Emphasis

(50 approved credits in sociology 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	5
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
	50

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
	27

Spanish (Romance Languages)

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	0-15
201, 202, 203 INTERMEDIATE (5,5,5) OR APPROVED EQUIVALENT	0-15
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)	3
327 ADVANCED CONVERSATION (2, MAX. 8) OR	
330 CONVERSATIONAL SPANISH (2½-4 MAX. 8) OR	
430 CONVERSATIONAL SPANISH (1-3, MAX. 6) TO TOTAL 6	
409 ADVANCED PHONETICS	3
ROM 401 INTRODUCTION TO ROMANCE LINGUISTICS	3
APPROVED ELECTIVES IN ROMANCE LANGUAGES AND LITERATURE	
COURSES NUMBERED ABOVE 400	9
EDUC 343 TEACHERS' COURSE IN SPANISH	3
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	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
(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 Education

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
100 VOICE IMPROVEMENT	2
140 ORAL INTERPRETATION	5
220 INTRODUCTION TO PUBLIC SPEAKING	5
230 ESSENTIALS OF ARGUMENT	5

235 PARLIAMENTARY PROCEDURE	3
310 VOICE SCIENCE	5
332 PRINCIPLES OF GROUP DISCUSSION	5
335 METHODS OF DEBATE	3
370 SPEECH CORRECTION	5
EDUC 342 TEACHERS' COURSE IN 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 Education 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 Education Major: Elementary School Emphasis
(40 approved credits required)

COURSES	CREDITS
100 BASIC SPEECH IMPROVEMENT	5
110 VOICE IMPROVEMENT	2
111 ARTICULATION IMPROVEMENT	2
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
	—
	40

Speech Education Minor: Secondary School Emphasis
(30 approved credits required)

COURSES	CREDITS
100 BASIC SPEECH IMPROVEMENT	5
110 VOICE IMPROVEMENT (2) OR	
111 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 (2 OR 3) OR	
EDUC 342 TEACHERS' COURSE IN SPEECH	3
370 SPEECH CORRECTION	5
	—
	30

Speech and Hearing Therapy Major: Elementary School Emphasis
(61-65 credits, including the following:)

COURSES	CREDITS
310 VOICE SCIENCE	5
370 SPEECH CORRECTION	5



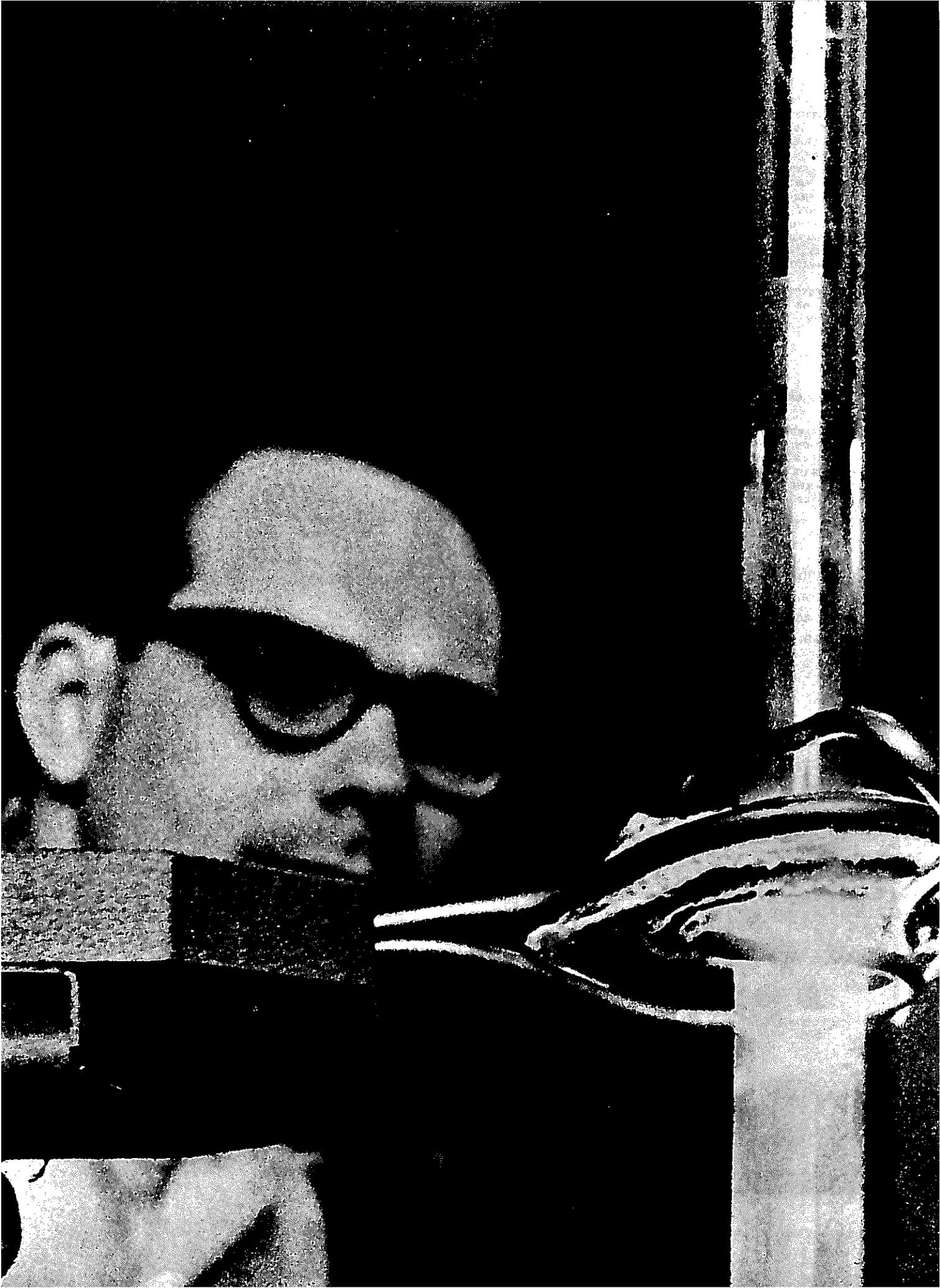
371	SPEECH CORRECTION	5
373	DIAGNOSTIC METHODS IN SPEECH CORRECTION	5
411	ANATOMY OF THE VOCAL ORGANS AND EAR	5
475	STUTTERING	3
476	LANGUAGE DEVELOPMENT OF THE CHILD	3
478	INTERVIEW TECHNIQUES FOR SPEECH AND HEARING REHABILITATION	3
480	INTRODUCTION TO AUDIOLOGY	5
481	PRINCIPLES AND METHODS OF AURAL REHABILITATION	5
485	MEDICAL BACKGROUND FOR AUDIOLOGY	2
487	AUDIOMETRY	3
374	CLINICAL PRACTICE IN SPEECH CORRECTION AND 484 CLINICAL PRACTICE IN AURAL REHABILITATION (MINIMUM OF 3 CREDITS IN EITHER)	7
487	AUDIOMETRY	3

(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)

During the fifth year students should elect a sufficient number of courses in Speech Pathology and Audiology to meet the academic requirements for certification by the American Speech and Hearing Association.







ENGINEERING

Dean

Harold E. Wessman
206 Guggenheim Hall

Associate Deans

W. Ryland Hill
206 Guggenheim Hall

Dean E. McFeron
314B Guggenheim Hall

Executive Committee

Harold E. Wessman, Chairman, W. Ryland Hill, Dean E. McFeron, R. J. H. Bollard, Ralph W. Moulton, Charles H. Norris, A. V. Eastman, V. B. Hammer, S. W. Chapman, C. J. Kippenhan, D. A. Pifer, A. L. Babb; faculty representatives for 1963-64, D. E. Alexander, D. L. Johnson, J. W. Souther

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 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, 2,300 undergraduates and 700 graduate students were enrolled in engineering curricula.

tory 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, two nuclear reactor laboratories, 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 is scheduled for early completion. Future plans include modern and expanded quarters for the Engineering Library and a substantial increase in laboratory space for Aeronautics and Astronautics.

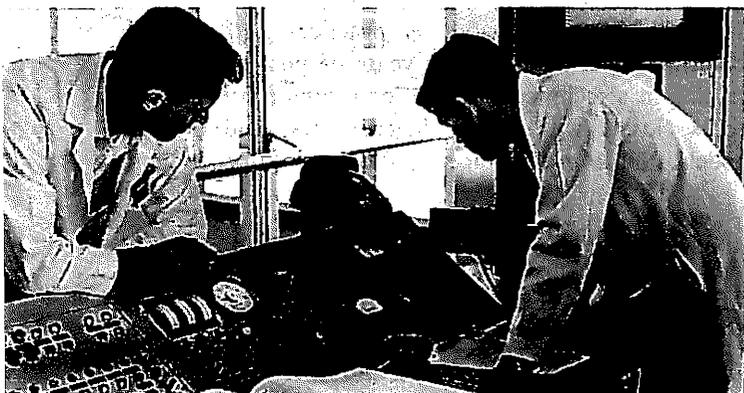
The University of Washington assumed the administration of the school formerly known as the General Electric School of Nuclear Engineering at Richland, Washington, on July 1, 1958. This facility is now operated as the Center for Graduate Study at Hanford. This transfer of administration was made to enhance 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

Dean E. McFeron
314B Guggenheim Hall

The *Office of Engineering Research*, formerly called the Engineering Experiment Station, performs a three-fold function:



College Facilities and Services

The teaching and research activities of the College of Engineering occupy ten major campus buildings and portions of others. All except the Hydraulics Labora-



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 or doctoral degree.

The Office of Engineering Research is headed by a director who also serves as Associate Dean of the College. The functioning of the Office is guided by an Engineering Research Board consisting of the Dean of the College of Engineering as chairman, the 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 at the University of Washington*, 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, and the *Washington Engineer* also have representatives on the Council, which supervises various student activities.

The *Washington Engineer*, which is written and managed entirely by engineering students, is published six times a year. It has achieved a national reputation as an outstanding engineering college magazine.

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.

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. 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. Students who pass the algebra qualifying test but fail to qualify in trigonometry must take Mathematics 104 (Plane Trigonometry) in addition to the regular engineering mathematics sequence.

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 counsels 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 engineering 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

206 Guggenheim Hall

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 and engineering graphics, plus 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 graphics and 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.

GRADUATE PROGRAMS

(Graduate Program Advisers are listed under the 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 De-

partments 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.

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 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 ceramic, chemical, civil, electrical, mechanical, and nuclear engineering, 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 degree awarded by the College of Engineering.

Interdepartmental Programs

Interdepartmental programs are available in Engineering Mechanics and Nuclear Engineering. Degrees of Master of Science in Engineering and Doctor of Philosophy are available for work in each of these fields.

Engineering Mechanics

An interdepartmental program in Engineering Mechanics is offered through the cooperation of the Departments of Aeronautics and Astronautics, Civil Engineering, Mechanical Engineering, and the Division of Metallurgical Engineering. Work in this field can lead to the Master of Science in Engineering and the Doctor of Philosophy degree:

Nuclear Engineering

A graduate program in Nuclear Engineering leads to the degree of Master of Science in Engineering, Major: Nuclear Engineering, and the Doctor of Philosophy

degree. The program is a cooperative undertaking of the Nuclear Engineering Group, with members from the Departments of Chemical, Civil, Electrical, and Mechanical Engineering, and the Division of Metallurgical Engineering.

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.



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 (emeritus), W. Burnett Bonow, Walter L. Dunn, Albert L. Hoag, Dorland H. Konichek, Thomas W. Macartney, Donald C. McNeese, Rowland E. Messer, Robert W. Seabloom

Assistant Professors

William S. Chalk, James D. Collins, Keith C. Crandell, Geoffrey K. Douthwaite, Philip A. Jacobsen, Roy A. McCready, George A. Nelson, Mahlon O. Ness, Charles C. Redeker, Wells Thompson

Instructors

John F. Phillips, Martin Wolff

Lecturer

Richard W. Seed

CURRICULUM IN GENERAL ENGINEERING

First Year

FIRST QUARTER		CREDITS
GE 100	ORIENTATION	1
GE 101 or 104	GRAPHICS	3
GE 111	PROBLEMS	3
CHEM. 140	GENERAL	3
MATH. 105	COLLEGE ALGEBRA	5
		15
PE ACTIVITY		**

SECOND QUARTER		CREDITS
GE 102 or 105	GRAPHICS	2 or 3
GE 112	STATICS	3
CHEM. 150	GENERAL	3
CHEM. 151	GEN. CHEM. LAB.	2
MATH. 124	CALC. WITH ANALYTIC GEOMETRY	5
		15-16
PE ACTIVITY		**

**See College of Arts and Sciences section for Physical Education Activity requirement.



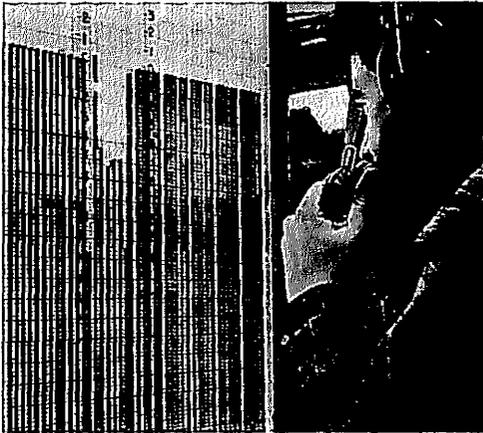
THIRD QUARTER		CREDITS
GE 103	APPLIED DESCRIPTIVE GEOM. or HONORS ELECTIVE*	3
GE 115	DIGITAL COMPUTING	2
CHEM. 160	GENERAL	3
MATH. 125	CALC. WITH ANALYTIC GEOMETRY	5
PHYS. 121	GENERAL	4
		17
PE ACTIVITY		**

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 tests in algebra and trigonometry will adjust their program of studies to allow for refresher courses.

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, Harold C. Martin, Robert E. Street

*List an elective or a sophomore subject.

**See *College of Arts and Sciences* section for Physical Education Activity requirement.

Associate Professors

Ian M. Fyfe, Robert G. Joppa, Timothy F. O'Brien

Assistant Professors

Harlow G. Ahlstrom, Jirair K. Kevorkian, R. Reid Parmerter, William H. Rae, Jr.

Visiting Faculty

M. E. Fourney, Joseph A. Stern

The department 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 of 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

Adviser

R. J. H. Bollard
207 Guggenheim Hall

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
MTLE 250	MT'LS. SCIENCE	4
HSS 270	REPORT WRITING	2
PHYSICS 123	GENERAL	4
		<hr/> 16

THIRD QUARTER		CREDITS
AE 200	INTRODUCTION	2
CE 292	MECH. OF MT'LS. I	3
ME 320	THERMODYNAMICS I	5
HSS 331	ORIG. WEST. CULT. INST.	3
MATH. 238	DIFF. EQUATIONS	3
		<hr/> 16

Third Year

FIRST QUARTER		CREDITS
AE 300	AERODYNAMICS	3
AE 320-	JUNIOR LAB	0
CE 293	MECH. OF MT'LS. II	3
EE 303	ELEMENTS OF EE	5
HSS 332	DEV. WEST. CULT. INST.	3
		<hr/> 14

SECOND QUARTER		CREDITS
AE 301	AERODYNAMICS	3
AE -321-	JUNIOR LAB	0
AE 330	STRUCT. ANAL.	3
EE 400	VACUUM TUBES AND ELECTRONICS	5
HSS 333	CONTEMP. POL. AND SOCIAL PROBLEMS	3
		<hr/> 14

THIRD QUARTER		CREDITS
AE 302	AERODYNAMICS	3
AE -322	JUNIOR LAB	-3
AE 331	STRUCT. ANAL.	3
ME 340	ENGR. MT'LS	3
PHYSICS 320	MODERN	3
HSS 491	LIT. HERITAGE WEST. WORLD I	3
		<hr/> 18

Fourth Year

FIRST QUARTER		CREDITS
AE N390-	SEMINAR	0
HSS 492	LIT. HERITAGE WEST. WORLD II	3
TECHNICAL ELECTIVES		12
		<hr/> 15

SECOND QUARTER		CREDITS
AE N-391-	SEMINAR	0
H. REL. 365	HUM. BEHAVIOR IN ORGANIZATIONS	3
TECHNICAL ELECTIVES		12
		<hr/> 15

THIRD QUARTER CREDITS

AE -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 these 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 University 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. 322, 324, 325, 427, 428, 429 AE 470
THEORETICAL	
AERODYNAMICS	AE 400, 401, 402
STRUCTURES	AE 332, 430, 431, 432, 441, 442
DYNAMICS	AE 440, 480, 481, 450, 451
DESIGN	AE 410, 411, 412
PROPULSION	AE 460, 461, 462
LABORATORY	AE 420, 421, 422, 425
AUTOMATIC CONTROL	EE 235, 479, 493

Graduate Programs

Graduate Program Adviser
R. J. H. Bollard
207 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 Education* section.

Master of Science in Aeronautics and Astronautics

A total of 39 credits is required: either the nonthesis option consisting of 39 credits of course work or the thesis option consisting of 30 credits of course work and 9 thesis credits. The student must follow an approved program of study including continuing study of applied mathematics and the engineering sciences (solid mechanics, gas dynamics, thermo- and electrodynamics of continua, dynamics) as well as electives related to the fields of aeronautics and astronautics.

Master of Aeronautics and Astronautics

A total of 60 credits of course work and a more extensive thesis, equivalent to 18 credits of course work, are required for this more advanced degree. Other requirements are similar to those for the degree of Master of Science in Aeronautics and Astronautics.



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.

Before the student is allowed to take the General Examination for admission to candidacy, he must take comprehensive written and oral examinations to test his understanding and comprehension of the broad field of aeronautics and astronautics. After admission to candidacy and while carrying out the investigation for his dissertation, it is ordinarily required that the student be in full-time residence for at least one academic year of three consecutive quarters.

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
37 Bagley 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, 37 Bagley Hall.

CHEMICAL ENGINEERING

Chairman

Ralph W. Moulton
37 Bagley Hall

Professors

Albert L. Babb, Morton M. David, Lennart N. Johanson, Joseph L. McCarthy, Ralph W. Moulton

Associate Professor

Charles A. Sleicher, Jr., William J. Heideger

Assistant Professors

John C. Berg, Kermit L. Garlid, Norman F. Sather

Lecturer

Kyosti V. Sarkanen

CURRICULUM IN CHEMICAL ENGINEERING

Second Year

FIRST QUARTER		CREDITS
CH. E. 271	INTRODUCTION	1
CHEM. 335	ORGANIC	3
CHEM. 345	ORG. CHEM. LAB.	2
MATH. 126	CALC. WITH ANALYTIC GEOMETRY	5
PHYSICS 122	GENERAL	4
		<hr/>
		15
SECOND QUARTER		CREDITS
CH. E. 272	INTRODUCTION	1
HSS 265	TECH. OF COMMUN.	3
CHEM. 336	ORGANIC	3
ECON. 211	GENERAL	3
MATH. 224	INTERMEDIATE ANALYSIS	3
PHYSICS 123	GENERAL	4
		<hr/>
		17

THIRD QUARTER		CREDITS
CH. E 273	INTRODUCTION	1
EE 303	ELEMENTS OF EE	5
HSS 270	REPORT WRITING	2
CHEM. 170	QUAL. ANAL.	3
CHEM. 337	ORGANIC	3
MATH. 238	DIFF. EQUAT.	3
		<hr/>
		17

Third Year

FIRST QUARTER		CREDITS
CH. E 384	INDUST. STOICH	4
HSS 331	ORIG. WEST. CULT. INST	3
CHEM. 455	PHYSICAL	4
PHYSICS 320	MODERN	3
ELECTIVES		3
		<hr/>
		17

SECOND QUARTER		CREDITS
CH. E 385	THERMODYNAMICS	4
HSS 332	DEV. WEST. CULT. INST.	3
CHEM. 221	QUANT. ANAL.	5
CHEM. 456	PHYSICAL	3
		<hr/>
		15

THIRD QUARTER		CREDITS
CH. E N381	FIELD TRIP	0
CH. E 470	TRANSPORT PROC. PRIN.	4
HSS 333	CONTEMP. POL. AND SOCIAL PROBLEMS	3
CHEM. 457	PHYSICAL	3
CHEM. 458	PHYSICAL CHEM. LAB.	4
ELECTIVES		3
		<hr/>
		17

Fourth Year

FIRST QUARTER		CREDITS
CH. E 471	UNIT OPER.	3
CH. E 474	UNIT OPER. LAB.	2
CH. E 481	PROCESS DESIGN PRIN. I	3
CH. E 499	SPECIAL PROJECTS	2
HSS 491	LIT. HERITAGE WEST. WORLD I	3
H. REL. 365	HUM. BEHAV. IN ORGANIZATIONS	3
		<hr/>
		16

SECOND QUARTER		CREDITS
CH. E 472	UNIT. OPER.	3
CH. E 475	UNIT OPER. LAB.	2
CH. E 482	PROCESS DESIGN PRIN. II	3
CH. E 499	SPECIAL PROJECTS	2
HSS 492	LIT. HERITAGE WEST. WORLD II	3
ELECTIVES		3
		<hr/>
		16

THIRD QUARTER		CREDITS
CH. E 476	UNIT OPER. LAB.	2
CH. E 483	PROCESS DESIGN	5
HSS 493	LIT. HERITAGE WEST. WORLD III	3
ELECTIVES		3
		<hr/>
		13

Graduate Programs

Graduate Program Adviser

Ralph W. Moulton
37 Bagley 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 the Graduate School and meet the requirements as outlined in the *Graduate Education* section. 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 30 credits of course work and a 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

Charles H. Norris
201 More Hall

Professors

Thomas H. Campbell, Jack R. Clanton, Martin I. Ekse, F. Burt Farquharson (emeritus), Charles W. Harris (emeritus), Robert G. Hennes, Edgar M. Horwood, Alfred L. Miller, Harold K. Moritz, 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

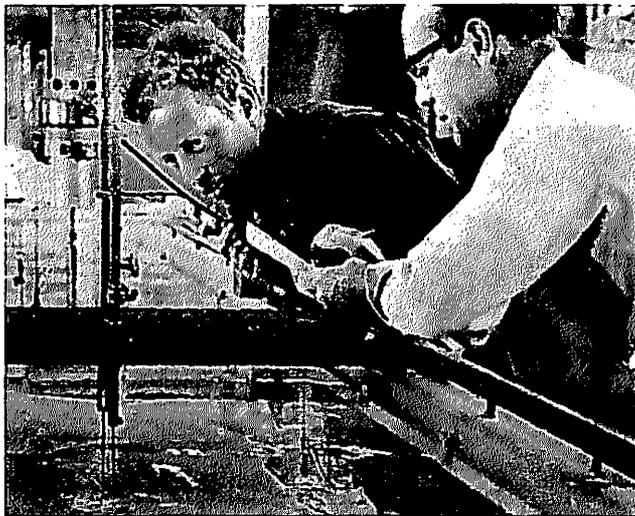
Richard H. Bogan, Dale A. Carlson, Harry H. Chenoweth, Hiram M. Chittenden, J. E. Colcord, Jr., Billy J. Hartz, Joseph C. Kent, Richard H. Meese, William M. Miller, Holger P. Mittet, Ronald E. Nece, Eugene P. Richey, Roy B. Sawhill, Howard S. Strausser, Jr., Bayard S. Wilson

Assistant Professors

Russell F. Christman, Ray T. Oglesby

Instructor

Mehmet A. Sherif



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 and designs highway and road systems, air terminals, port and river developments, water supply and waste disposal systems. He works with professionals from such disciplines as architecture, urban planning, business and industrial management, economics, and various social sciences.

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 CE 201 (Civil Engineering Projects I), and extends throughout the remainder of the four-year program.

The departmental honors adviser is Bayard S. Wilson, 305 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 four 3-credit civil engineering elective courses. Electives in the field of hydraulics are courses 441, 445, 447, 448; in engineering mechanics, 494; in materials, 467; in structures, 481, 482, 485; in sanitary, 455, 456; in transportation, 410, 415, 417, 419, and 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
		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
		17

THIRD QUARTER		CREDITS
CE 216	GEOMETRONICS	4
CE 291	DYNAMICS	3
HSS 270	REPORT WRITING	2
MTL. E 250	MT'LS. SCIENCE	4
MATH. 391	ELEM. PROBABILITY	3
		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
		17

SECOND QUARTER		CREDITS
CE 320	TRANSPORTATION ENGR. I	3
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
		16

THIRD QUARTER		CREDITS
CE 345	FLUID MECHANICS II	3
CE 350	SANITARY ENGR. I	3
CE 382	STRUCT. ANALYSIS II	3
ECON. 211	GENERAL	3
HSS 333	CONTEMP. POL. AND SOC. PROBLEMS	3
		15

Fourth Year

FIRST QUARTER		CREDITS
CE 446	HYDR. ENGR.	3
CE 451	SANITARY ENGR. II	5
CE 466	SOIL MECHANICS	3
CE 483	STRUCT. DESIGN I	3
HSS 491	LIT. HERITAGE WEST. WORLD I	3
		17

SECOND QUARTER		CREDITS
CE 421	TRANSPORTATION ENGR. II	3
CE 484	STRUCT. DESIGN II	3
CE ELECTIVE	. . . . .	3
CE ELECTIVE	. . . . .	3
HSS 492	LIT. HERITAGE WEST. WORLD II	3
		15

THIRD QUARTER		CREDITS
CE ELECTIVE	. . . . .	3
CE ELECTIVE	. . . . .	3
HSS 493	LIT. HERITAGE WEST. WORLD III	3
B. LAW 307	BUSINESS LAW	3
H. REL. 365	HUM. BEHAVIOR IN ORGANIZATIONS	3
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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 Engineer-

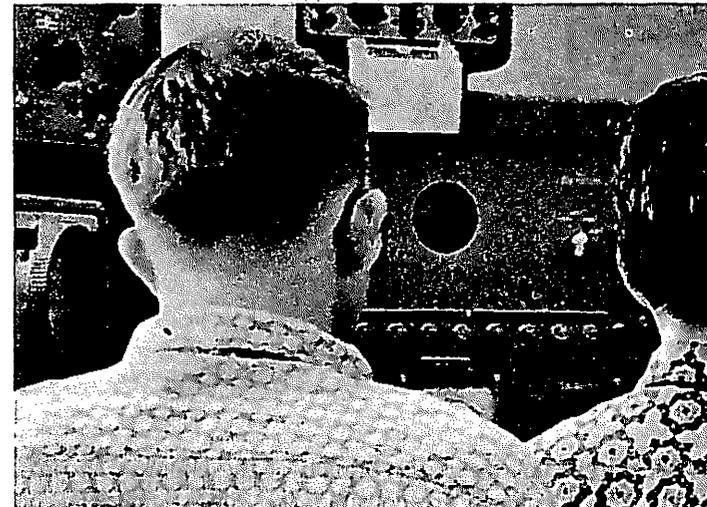
ing, Master of Science in Civil Engineering, and Doctor of Philosophy.

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, Lyall B. Cochran, Austin V. Eastman, Arthur E. Harrison, W. Ryland Hill, Jr., G. Lisle Hoard (emeritus), 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

John L. Bjorkstam, Robert N. Clark, Hellmut Golde, Edward C. Guilford, Gordon H. Hanson, Chih-Chi Hsu, Akira Ishimaru, Dean W. Lytle, Endrik Noges, Irene C. Peden, Floyd D. Robbins, Katsunori Shimada, Lynn A. K. Watt

Assistant Professors

Robert W. Albrecht, Frank J. Alexandro, Jr., Alistair D. C. Holden, Robert E. Lindsay, Robert B. Pinter, Rubens A. Sigelmann

Lecturer

William E. Creedon

Electrical engineering is characterized by the study of the performance of electrons and other charged particles in useful service to mankind. Since electrons constitute one of the basic particles of matter, electrical engineering is very closely related to the fields of physics and mathematics. Many opportunities to relate abstract theory to practical application are found in the control of mechanical and other operations, as in complex airplane controls, control of sawmills and paper mills, remote control of electric generating stations. Other examples include the transmission of control and communications signals over vast distances, both over the surface of the earth and out into interstellar space. Systems capable of communicating with and controlling satellites as far away as other planets in our solar system, and of sending back pictures by television or facsimile processes are now available. The transmission of power by electric means has made possible the location of load facilities at points far removed from the original sources of energy such as hydroelectric power plants and nuclear power plants. Electric computers now solve problems in seconds which would otherwise require hours or even days. An example of the importance of time is in the computation of in-flight changes in the path of supersonic missiles or satellites for which information must be provided in a fraction of a second to be of any value.

The undergraduate curriculum includes chemistry, physics, mathematics, thermodynamics, mechanics, and four basic areas of electrical engineering: circuits, fields and propagation, electronics, and electromechanical energy conversion. Some specialization is possible through a judicious choice of electives in the senior year but at least one year of graduate work is required to permit any depth of specialization.

Undergraduate Programs

Adviser

William E. Creedon
213 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.

High scholarship students who plan to study for an advanced degree may, with the advice of a faculty counselor and approval of the Department chairman, make a limited number of substitutions for normally required courses in the junior and senior years.

Students planning to take a degree in industrial engineering should elect Accounting 210 (Fundamentals of Accounting).

The honors adviser is Walter E. Rogers, 304 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
		<hr/>
		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
		<hr/>
		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. EQUAT.	3
		<hr/>
		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
		<hr/>
		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

Graduate Programs

Graduate Program Adviser

Walter E. Rogers
304 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 Education* 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.

*Students planning to do graduate work are urged to include, as electives, Electrical Engineering 441 and one or more of the following: Electrical Engineering 449, 451, 469, 479, 485.

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. The courses must include 510 and 520-521-522. Other 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, 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 Education* section), this Department selects prospective candidates for the doctor's degree from outstanding students at the master's level by means of a series of written 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,
James W. Souther

Assistant Professors

Wesley L. Hunner, Jack T. Leahy, John R. Rustad,
Louis P. Trimble, Myron L. White

Instructors

Raymond W. Mise, Robert B. Johnstone

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 required in all engineering curricula.

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: Business Law 307 (Business Law), Human Relations in Business and Industry 365 (Human Behavior in Organizations), and Economics 211 (General Economics).

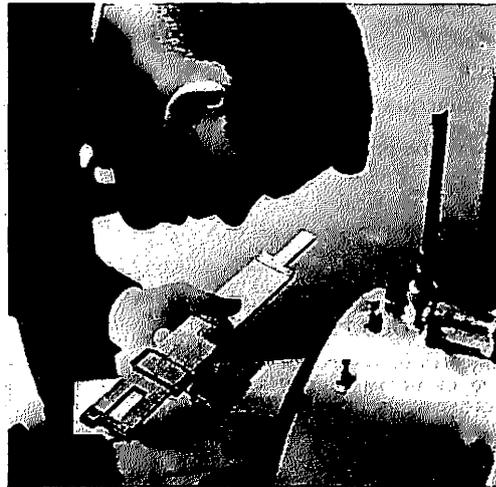
The Department participates in the honors program of the College of Engineering, providing once each year an honors section in every course except HSS 302. The honors adviser is Stuart W. Chapman, 316 Guggenheim Hall.

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. Since the College does not have a department of industrial engineering, students registering for this fifth year of study must have their schedule of courses approved by the department through which they received their first bachelor's degree. Curriculum counseling is available in the Department of Mechanical Engineering.



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.

Undergraduate Programs**Advisers**

Berl W. Owens
206 Mechanical Engineering Building

Albert B. Drui
210 Mechanical Engineering Building

CURRICULUM IN INDUSTRIAL ENGINEERING

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.

FIRST QUARTER	CREDITS
ME 415 STAT. QUAL. CONTROL	3
ME 417 METH. ANAL.	3
ACCTG. 220 FUNDAMENTALS	3
TECHNICAL ELECTIVES	6
	15

SECOND QUARTER	CREDITS
ME 410 ENGR. ADMIN.	3
ME 411 ENGR. ECON.	3
ACCTG. 230 BASIC ACCTG. ANAL.	3
TECHNICAL ELECTIVES	6
	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
	15

Recommended Electives

PRODUCTION TECHNOLOGY AREA

EE 477 PRINCIPLES OF COMPUTER APPLICATION	4
EE 479 FUND. OF AUTOMATIC CONTROL	4
EE 433 TRANSISTOR CIRCUIT ENGR.	3
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	3
ME 420 ENGINEERING RELIABILITY	3
ME 441 AUTOMATIC CONTROL	3
BUS STAT 444J APPLICATIONS OF DIGITAL COMPUTERS	3
PERS. 301 INDUSTRIAL RELATIONS	3
PERS. 345 PERSONNEL METHODS AND THEORY I	3
PROD. 343 PRODUCTION AND INVENT. CONTROL	3
PROD. 460 MANUFACTURING ADMINISTRATION	5
POL. AND AD. 440 ORGANIZATION THEORY	3

OPERATIONS RESEARCH AREA

BUS. STAT. 401 ADVANCED BUS. STATISTICS	4
BUS. STAT. 444J APPLICATIONS OF DIGITAL COMPUTERS	3
BUS. STAT. 450 ANALYTICAL TECH. IN BUS. I	3
BUS. STAT. 451 ANALYTICAL TECH. IN BUS. II	3
BUS. STAT. 460 MULTIVARIATE ANAL. FOR BUS.	3
FIN. 350 BUSINESS FIN.	4
POL. & AD. 480 BUSINESS SIMULATION	5
MKT. 301 MKT. TRANSP. AND INTERNAT'L BUS.	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, 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

Charles P. Costello, Jr., Richard W. Crain, Sr., Creighton A. Depew, Kurt R. Galle, Michael Guidon III, Richard E. Holt, William C. Kieling, Albert S. Kobayashi, William B. Nordquist, Berl W. Owens, Robert E. Sherrer, Raymond Taggart

Assistant Professors

Jay W. Anderson, Oscar M. Browne, Jr., Albert B. Drui, Ashley F. Emery, Paul W. Ford

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 included 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 students 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	MECH. SYST'S.	3
HSS 265	TECH. OF COMMUN.	3
MATH. 126	CALC. WITH ANALYTIC GEOMETRY	5
PHYS. 122	GENERAL	4
		16

SECOND QUARTER		CREDITS
ME 202	WELDING	1
ME 215	STAT. METHODS IN ENGR.	3
ME 222	ME LAB.	1
CE 291	DYNAMICS	3
HSS 270	REPORT WRITING	2
MATH. 224	INTERM. ANAL.	3
PHYS. 123	GENERAL	4
		17

THIRD QUARTER		CREDITS
ME 203	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	PROD. TOOLING	1
ME 320	THERMODYNAMICS I	5
ME 340	MATERIALS	3
CE 293	MECH. OF MT'LS.	3
HSS 332	DEV. WEST. CULT. INST.	3
MATH 238	DIFF. EQUAT.	3
		18

SECOND QUARTER		CREDITS
ME 306	PROD. TECHNIQUES	1
ME 321	THERMODYNAMICS II	5
ME 361	MACH. DESIGN	3
ME 367	DYNAMICS	3
ECON. 211	GENERAL	3
HSS 333	CONTEMP. POL. AND SOC. PROBLEMS	3
		18

THIRD QUARTER		CREDITS
ME 307	PROD. PLANNING	1
ME 330	EXPER. THERMODYNAMICS	4
ME 362	MACH. DESIGN	3
EE 303	ELEMENTS OF EE	5
HSS 491	LIT. HERITAGE WEST. WORLD I	3
		16

Fourth Year

FIRST QUARTER		CREDITS
ME 430	HEAT TRANSFER	3
CE 342	FLUID MECHANICS I	4
EE 305	ELECT. MACH. OF	3
EE 400	VACUUM TUBES AND ELECTRON.	5
HSS 492	LIT. HERITAGE WEST. WORLD II	3
		15

SECOND QUARTER		CREDITS
ME 434	ADV. ME LAB.	3
ME 468	MACH. 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 Education* 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, air conditioning, refrigeration, nuclear power, instrumentation and automation, 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, Milnor Roberts (emeritus)

Associate Professors

Barry D. Lichter, Thomas S. Shevlin

Assistant Professors

Thomas F. Archbold, Robert J. Campbell, Jr., William F. Flanagan, 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, including 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

Drury A. Pifer
211 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
MTL. E 250	MT'LS. SCIENCE	4
CER. E 201	INTRODUCTION	1
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. EQUAT.	3
		—
		15

Third Year

FIRST QUARTER		CREDITS
CER.E 306	EXCURSION	1
CER.E 312	STRUCTURE AND RHEOLOGY	5
CH.E 384	STOICHIOMETRY	4
MTL.E 351	MINERAL PROCESSING I	4
CHEM. 455	PHYSICAL	4
		—
		18

SECOND QUARTER		CREDITS
CER.E 314	EQUILIBRIA	3
CH.E 385	THERMODYNAMICS	4
EE 303	ELEMENTS OF EE	5
HSS 331	ORIG. WEST. CULT. INST.	3
ECON. 211	GENERAL	3
		—
		18

THIRD QUARTER		CREDITS
CER.E 315	VITREOUS STATE	4
CH.E 470	TRANSPORT. PROC. PRIN.	4
HSS 332	DEV. WEST. CULT. INST.	3
CE 292	MECH. MTL.S. I	3
PHYSICS 320	MODERN	3
		—
		17

Fourth Year

FIRST QUARTER		CREDITS
CER.E N307	EXCURSION	0
CER.E 401	DRYING AND FIRING	4
CER.E 441	SEMINAR	1
CER.E 470	REFRACTORIES	3
CER.E 499	SPECIAL PROJECTS	1
HSS 491	LIT. HERITAGE WEST. WCRLD I	3
MTL.E 412	X-RAY DIFFRACTION	3
TECHNICAL ELECTIVE	. . . . .	3
		—
		18

SECOND QUARTER		CREDITS
CER.E 402-	PLANT DESIGN	2-
CER.E 421	CER. BODIES LAB.	3
CER.E 441	SEMINAR	1
CER.E 499	SPECIAL PROJECTS	2
HSS 333	CONTEMP. PROBLEMS	3
HSS 492	LIT. HERITAGE WEST. WORLD II	3
TECHNICAL ELECTIVE	. . . . .	3
		—
		17

THIRD QUARTER		CREDITS
CER.E -403	PLANT DESIGN	-2
CER.E 441	SEMINAR	1
CER.E 499	SPECIAL PROJECTS	2
HSS 493	LIT. HERITAGE WEST. WORLD III	3
H.REL. 365	HUM. BEHAVIOR IN ORGANIZATIONS	3
ELECTIVES	. . . . .	5
		—
		16

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 Education* section.

Master of Science in Ceramic Engineering

A total of 45 credits of which 36 credits are in course work and a suitable thesis for 9 credits is required for this degree. A comprehensive oral examination completes the requirements.

Students may select courses and research in accordance with their special interests and objectives. Graduate work is largely concerned with advanced materials science as applied to ceramics; however, courses may be selected which also 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.

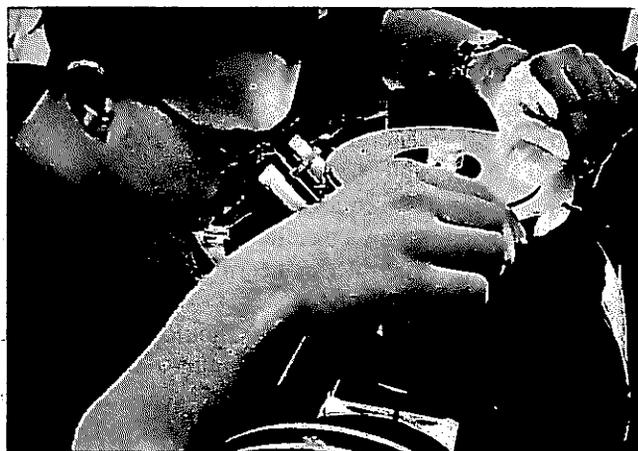
Doctor of Philosophy

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 materials science 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.



Undergraduate Programs

Adviser

Drury A. Pifer
211 Roberts Hall

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 processing. Electives in labor relations and economics are recommended for students interested in plant operation and administration. Accounting 210 (Fundamentals of Accounting) is recommended for those intending to study Industrial Engineering.



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
		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
		16

THIRD QUARTER		CREDITS
MET.E 204	CHEM. MET. 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. EQUAT.	3
		16

Third Year

FIRST QUARTER		CREDITS
MET.E 322	MET. THERMO. I.	3
MET.E 361	STRUCT. OF SOLIDS I	4
CE 292	MECH. OF MT'LS.	3
MTL.E 351	MINERAL PROCESSING I.	4
HSS 331	ORIG. WEST. CULT. INST.	3
		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
		16

THIRD QUARTER		CREDITS
MET.E 306	EXCURSION	1
MET.E 321	CHEM. MET. II	2
MET.E 363	REACT. IN SOLIDS	4
CHEM.E 470	TRANSPORT PROCESSES PRIN.	4
HSS 333	CONTEMP. POL. AND SOC. PROBLEMS	3
ECON. 211	GENERAL	3
		17

Fourth Year

FIRST QUARTER		CREDITS
MET.E 468	SEMINAR	1
MTL.E 412	X-RAY DIFFRACTION	3
CHEM. 455	PHYSICAL	4
HSS 491	LIT. HERITAGE WEST. WORLD I	3
TECHNICAL ELECTIVES		6
		17

SECOND QUARTER		CREDITS
MET.E 421	MET. THERMO. II	4
MET.E 468	SEMINAR	1
HSS 492	LIT. HERITAGE WEST. WORLD II	3
TECHNICAL ELECTIVES		9
		17

THIRD QUARTER		CREDITS
MET.E 306	EXCURSION	1
MET.E 468	SEMINAR	1
HSS 493	LIT. HERITAGE WEST. WORLD III	3
TECHNICAL ELECTIVES		6
ELECTIVES		6
		17

In the senior year students majoring in physical metallurgy must elect Metallurgical Engineering 460, 461, 464, 466; chemical metallurgy majors must elect Mining Engineering 464 (Mineral Processing: Hydrometallurgy).

MINERAL PROCESSING ENGINEERING OPTION

Students electing this option will, in the third year, substitute Materials Engineering 352 (Mineral Processing II) and Mining Engineering 464 (Mineral Processing: Hydrometallurgy) for Metallurgy 324 and 363.

Fourth Year

FIRST QUARTER		CREDITS
MIN.E 463	FLOTATION	3
MTL.E 412	X-RAY DIFFRACTION	3
HSS 491	LIT. HERITAGE WEST. WORLD I	3
GEOL. 423	OPTICAL MINERALOGY	5
ELECTIVES		3
		17

SECOND QUARTER		CREDITS
MIN.E 465	MICROSCOPY	2
MIN.E 499	SPECIAL PROJECTS	2
MTL.E 481	MINERAL INDUST. ECON.	3
HSS 492	LIT. HERITAGE WEST. WORLD II	3
H. REL. 365	HUM. BEHAVIOR IN ORGANIZATIONS	3
ELECTIVES		3
		16

THIRD QUARTER		CREDITS
MIN.E 306	EXCURSION	1
MIN.E 466	MINERAL PROCESSING: PRACTICES	2
MIN.E 467	MINERAL PROCESS PLANT DESIGN	2
MIN.E 499	SPECIAL PROJECTS	2
ME 415	STAT. QUAL. CONTROL	3
HSS 493	LIT. HERITAGE WEST. WORLD III	3
ELECTIVES		3
		16

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 School* section.

Master of Science in Metallurgical Engineering

A total of 45 credits of which 36 credits are in course work and a suitable thesis for 9 credits are required

for this degree; and a comprehensive oral examination completes the requirements. 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.

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 prospective candidate will present a written dissertation based on his research program which makes an original and independent contribution to knowledge. Proficiency in basic research 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 geo-

logic environment, methods for their exploitation and recovery, and of the technical and economic factors controlling the industry. In the curriculum, the basic and engineer-sciences common to all engineering are complemented by the addition of geologic science.

Mining Engineering is concerned with the sampling of mineral deposits and the economic evaluation of sample data, the application of industrial engineering to mine operations, the application of rock mechanics to support and design of underground openings and to the breaking of rock, the design of systems for breaking, loading, and transporting large tonnages, and the control of environment in underground mines.



Undergraduate Programs

Adviser

Drury A. Pifer
211 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 is designed to prepare for mine operation and production. A work-study program, conducted in cooperation with the major mines in the Northwest, provides essential industrial 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, with the work-study program also available in this option.

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
		<hr/>
		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
		<hr/>
		16

THIRD QUARTER		CREDITS
MIN.E 330	MINE SURVEYING	2
CE 291	DYNAMICS	3
MTL.E 250	MT'LS. SCIENCE	4
MATH. 238	DIFF. EQUAT.	3
PHYSICS 123	GENERAL	4
		<hr/>
		16

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
		<hr/>
		16

SECOND QUARTER		CREDITS
MIN.E 325	VALUATION	2
CE 292	MECH. OF MT'LS. I.	3
ME 415	STAT. QUAL. CONTROL	3
EE 400	VACUUM TUBES AND ELECTRONICS	5
HSS 332	DEV. WEST. CULT. INST.	3
		<hr/>
		16

THIRD QUARTER		CREDITS
MIN.E 306	EXCURSION	1
MIN.E 331	MAPPING	1
MTL.E 352	MINERAL PROCESS. II	2
CE 293	MECH. OF MAT'LS. II	3
CE 342	FLUID MECHANICS. I.	4
HSS 333	CONTEMP. POL. AND SOCIAL PROBLEMS	3
ECON. 211	GENERAL	3
		<hr/>
		17

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
ACCTG. 210	FUNDAMENTALS	3
		<hr/>
		15

SECOND QUARTER

MTL.E 481	MINERAL INDUST. ECON.	3
HSS 492	LIT. HERITAGE WEST. WORLD II	3
GEOL. 340	STRUCTURAL	5
H. REL. 365	HUM. BEHAVIOR IN ORGANIZATIONS	3
ELECTIVE		3
		<hr/>
		17

THIRD QUARTER

THIRD QUARTER		CREDITS
MIN.E 306	EXCURSION	1
MIN.E 426	EXPLORATION	3
MIN.E 432	MINE PLANT DESIGN	5
HSS 493	LIT. HERITAGE WEST. WORLD III	3
ME 417	METHODS ANAL.	3
ELECTIVES		3
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		18

GEOLOGICAL 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
		<hr/>
		16

SECOND QUARTER

SECOND QUARTER		CREDITS
MIN.E 325	VALUATION	2
ME 415	STAT. QUAL. CONTROL	3
GEOL. 340	STRUCTURAL	5
CE 292	MECH. OF MAT'LS. I.	3
HSS 332	DEV. WEST. CULTURAL INST.	3
		<hr/>
		16

THIRD QUARTER

THIRD QUARTER		CREDITS
MIN.E 306	EXCURSION	1
MIN.E 331	MAPPING	1
MTL.E 352	MINERAL PROCESS. II	2
CE 342	FLUID MECHS. I	4
HSS 333	CONTEMP. POL. AND SOCIAL PROBLEMS	3
GEOL. 326	SEDIMENT. PETROL.	5
		<hr/>
		16

Fourth Year

FIRST QUARTER		CREDITS
MIN.E 425	ROCK MECHANICS	2
HSS 491	LIT. HERITAGE WEST. WORLD I	3
GEOL. 423	OPTICAL MINERALOGY	5
ECON. 211	GENERAL	3
ELECTIVES		5
		<hr/>
		18

SECOND QUARTER

SECOND QUARTER		CREDITS
MIN.E 427	GEOPHYSICS	2
MTL.E 481	MINERAL INDUST. ECON.	3
HSS 492	LIT. HERITAGE WEST. WORLD II	3
GEOL. 424	PETROG. AND PETROL. OF IGNEOUS ROCKS	5
CE 466	SOIL MECHANICS	3
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		16

THIRD QUARTER

THIRD QUARTER		CREDITS
MIN.E 306	EXCURSION	1
MIN.E 426	EXPLORATION	3
HSS 493	LIT. HERITAGE WEST. WORLD III	3
GEOL. 425	PETROG. AND PETROL. OF METAMORPHIC ROCKS	5
GEOL. 487	ORE DEPOSITS	5
		<hr/>
		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
EE 400	VACUUM TUBES AND ELECTRONICS	5
ME 415	STAT. QUAL. CONTROL	3
HSS 332	DEV. WEST. CULT. INST.	3
CHEM. 350	PHYSICAL	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
ECON. 211	GENERAL	3
		16

Fourth Year

FIRST QUARTER		CREDITS
MIN.E 463	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 MICROS.	2
MIN.E 499	SPECIAL PROJECTS	2
HSS 492	LIT. HERITAGE WEST. WORLD II	3
MTL.E 481	MINERAL INDUST. ECON.	3
ELECTIVES		6
		16

THIRD QUARTER		CREDITS
MIN.E 306	EXCURSION	1
MIN.E 464	HYDROMETALLURGY	4
MIN.E 466	MINERAL PROCESSING: PRACTICES	2
MIN.E 499	SPECIAL PROJECTS	2
HSS 493	LIT. HERITAGE WEST. WORLD III	3
ELECTIVES		5
		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 Education* 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. 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. Students may undertake research in the United States Bureau of Mines Seattle Coal Research Laboratory in cooperation with the staff of the Bureau. 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.

INTERDEPARTMENTAL PROGRAMS

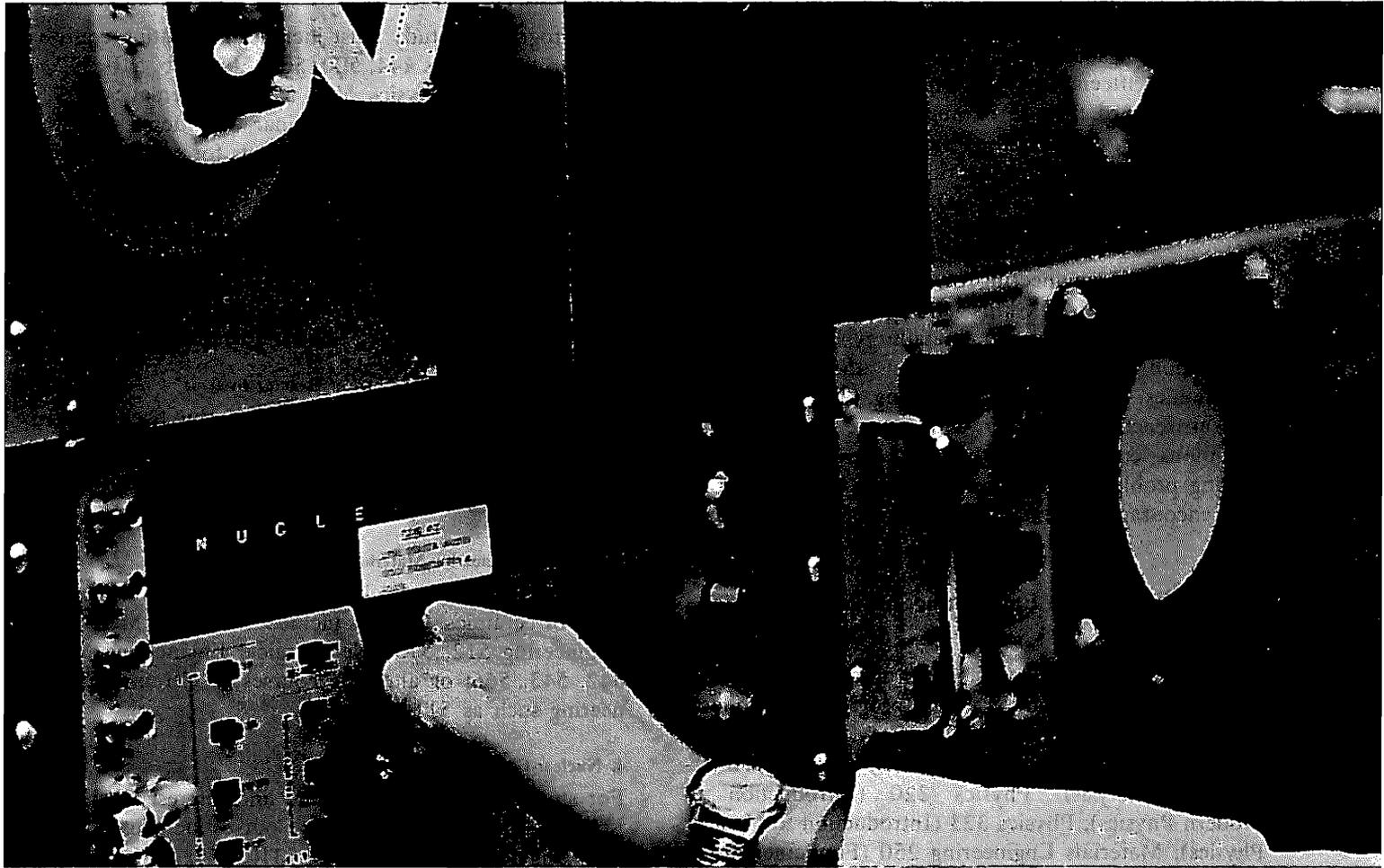
ENGINEERING MECHANICS

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 the Departments of Aeronautics and Astronautics, Civil Engineering, or 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, 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 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 the student is enrolled.



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 program will ordinarily include continuing study in mathematics and the engineering sciences (solid mechanics, fluid mechanics, thermodynamics, dynamics), and must satisfy the basic unit and thesis requirements of the department in which the student is enrolled.

NUCLEAR ENGINEERING

Chairman, Nuclear Engineering Group, and
Graduate Program Adviser

Albert L. Babb
Nuclear Reactor Building

Professors

Albert L. Babb, Morris E. Childs, Joseph C. Firey,
Dean E. McFeron, Ralph W. Moulton, Douglas H.
Polonis, Paul J. Waibler

Associate Professors

Richard H. Bogan, Charles P. Costello, Jr., Creighton
A. Depew

Assistant Professors

Robert W. Albrecht, Kermit L. Garlid

Senior Nuclear Engineer

William E. Wilson, Jr.

The nuclear engineering program is a cooperative undertaking of the faculty in chemical, civil, electrical, mechanical, and metallurgical engineering.

Nuclear engineering is directly concerned with the release, control, and utilization of all types 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.

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); Nuclear Engineering 484 (Introduction to Nuclear Engineering). 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.

Minor electives in a student's program may be chosen from such fields of study as: control systems and servo-mechanisms; electronics; chemical separation processes; numerical analysis; heat transfer; materials engineering; sanitary engineering.

Doctor of Philosophy

The program of study must include preparation equivalent to the courses 444, 500, 501, 505, 506, 510, 512, 550, 560, 561; Physics 509, 510; 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 511, 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, 531, 532, 534, 546; 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. Radioisotope Usage and Environmental Control

For students with a background and interest in sanitary engineering. Courses include: 559; Civil Engineering 550, 551, 552, 560, 561; 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, 581, 582, 583, 584; 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

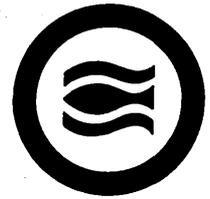


the student's understanding of the basic scientific and engineering concepts upon which his doctoral work will be based. The subject material includes undergraduate fundamentals in mathematics, physics, and the engineering sciences as well as the material in the first year of graduate work in nuclear 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.





FISHERIES

Dean

Richard Van Cleve
204 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, William F. Thompson (emeritus), Arthur D. Welander

Associate Professors

Donald E. Bevan, Robert L. Burgner, Alexander M. Dollar, Max Katz (acting), Ole A. Mathisen, Gerald J. Paulik

Assistant Professor

John D. McPhail

Lecturer

F. Heward Bell

Research Appointments

David Bannerjee, Jong R. Chung, Rita R. Colwell, James Ellis, Phyllis Frick, Dov Grajcer, Joseph Greenough, Richard Grinols, Enrique Guardia, John Harris, Gary Houghtby, Abbie Huber, Ruth Hung, Mounir Ishac, Barbara Kemp, Stephen Martin, Jack Matches, Bruce Miller, Livia Molnar, James Orsi, Raymond Simon, Bohdan Slabyj, Frieda Taub, Robert Y. Ting, William Wiebe

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 in the field have been of minor importance, but the population growth combined with rapid depletion of fisheries stocks has focused attention on a worldwide problem. The Fisheries Division of the College of Fisheries is concerned, through both its faculty and students, with the investigation of possible solutions: new stocks of fish and how to catch them; how to use well known stocks 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.

Since the College was organized, the great halibut and salmon stocks have gone through periods of rapid development followed by disastrous decline. Through careful management of stocks there has been some successful conservation.

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 Division of Food Science 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 extensive research program in food science is largely concerned with marine and freshwater products of the Pacific Northwest, it concentrates on general principles applicable in a wide range of circumstances, and attracts large numbers of out-of-state and foreign students, particularly at the graduate level.

Both scholarly and realistic, the Food Science program of the College not only achieves the objectives of University study, but also serves the needs of the local food industry and the requirements of the wider industrial and government enterprises outside the state of Washington.

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.

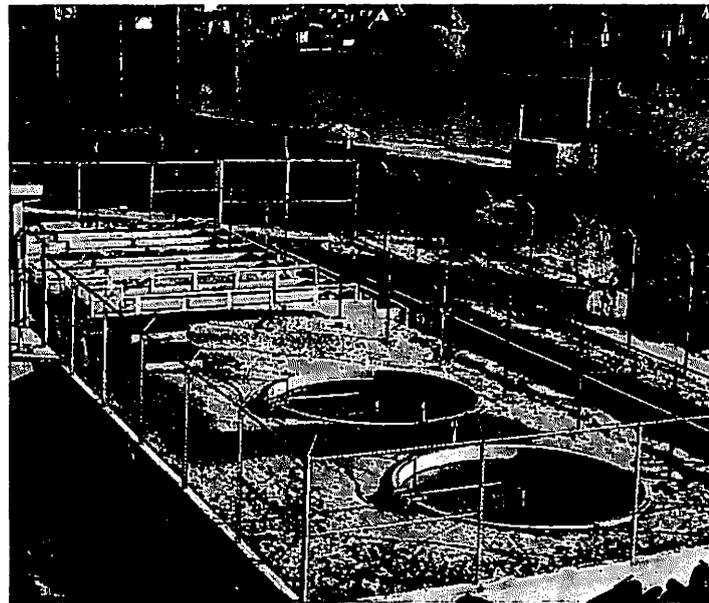
The College programs are designed to provide both the scientific training and the professional competency necessary for graduates to satisfy the various needs of their chosen fields. A Bachelor of Science in Fisheries is granted to students successfully completing a prescribed curriculum. Four options are offered: marine fisheries

biology, freshwater fisheries biology, invertebrate fisheries, and fisheries 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.

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 sixteen thousand bound volumes and twenty-six thousand pamphlets, the library currently receives more than seven hundred serial publications. All the major abstract journals in the biological sciences are also available, as are indexes to government re-



search reports. Further material needed for research work is obtained from other library collections on the campus or by interlibrary 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 fresh-water 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 fresh-water 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 used for studying the physiology and behavior of fish incorporate a large flume through which fresh water can pass at different velocities, a rotating annular tank provided with machinery for accurately controlling its speed, and a separate room containing troughs and tanks in which water temperature may be controlled at a wide range of levels. A special room is being equipped in which both light and temperature can be controlled in a number of separate units.

Equipment for the study of the effects of pollutants upon fish is enclosed in a room in which the temperature can be maintained at any level between 50° and 75° F. This laboratory is supplied with treated and untreated water from 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 the three computers and the auxiliary punched-card 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 most other types of fishing carried on in the North Pacific, as well as for handling a wide variety of experimental gear.

The headquarters of one of the Pacific Coast's largest fishing fleets is located within two miles of the campus. Puget Sound, in addition to its 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.

Food science facilities include separate, well-equipped laboratories for food microbiology, food biochemistry, and food analysis. The food-processing 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.

There are some facilities for technological studies at sea on the M.S. "Commando." These include freezing and other refrigeration equipment and a small laboratory unit.

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 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 Fisheries Research Institute

Staff

Nevin Aspinwall, C. D. Becker, Donald E. Bevan, Robert L. Burgner, Kenneth K. Chew, Michael L. Dahlberg, Michael B. Dell, John R. Donaldson, John Dupuy, Charles W. Fowler, Lawrence E. Gales, Allan C. Hartt, Benny Hsu, Stanley Katkansky, Max Katz, Orra E. Kerns, Jr., Stephen B. Mathews, Ole A. Mathisen, Denny M. Miller, David W. Narver, Richard Neal, Martin O. Nelson, Gilbert B. Pauley, Donald E. Rogers, William F. Royce, Craig L. Ruddell, Eng-Chow Tan, 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 graduate students are working toward their degrees on major fisheries 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 red salmon; (2) migrations of salmon on the high seas; (3) effects of logging on salmon streams; (4) ecology of nursery areas in pink and chum salmon streams; and (5) guiding migrant salmon. 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 this Commission.

Research on problems other than salmon has been expanding rapidly. Current projects include several studies on oysters, ecology of paralytic shellfish toxicity, and studies of blood parasites of fish.

The Institute maintains headquarters on the University campus and semipermanent field stations at six locations in Alaska. The campus headquarters is 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 fisheries problems in collaboration with other colleges and departments of the University, especially with Engineering, Economics, and Law.

The motor vessel "Malka," 38 feet long, is used for inshore oceanographic and biologic 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 red salmon in North America. They are equipped for studies of the 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 the 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 Graduate School, and approval of the College of Fisheries. Students entering

the graduate program in either Fisheries 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.

Employment

The College of Fisheries assists its students to obtain summer employment and also helps them to secure permanent employment when they graduate. Some Research Assistantships furnishing part-time employment for students are available 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 fisheries biology and fisheries or food technology.

Graduate students in the College of Fisheries are in a very favorable position to pursue an active research program leading to advanced degrees. Members of the instructional staff of the College are engaged in research programs that keep them abreast of the rapidly developing special fields of fisheries and food research. The fine physical facilities of the College provide many special laboratories where research may be conducted on thesis problems.

In addition to the opportunities for graduate work at the College of Fisheries, the federal government, International Fisheries Commissions, and State Fisheries Departments have research staffs working in laboratories on or near the campus. Many of the senior research members of the cooperating fisheries research 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

Admission

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 15 credits of a foreign language or by passing an appropriate placement examination.

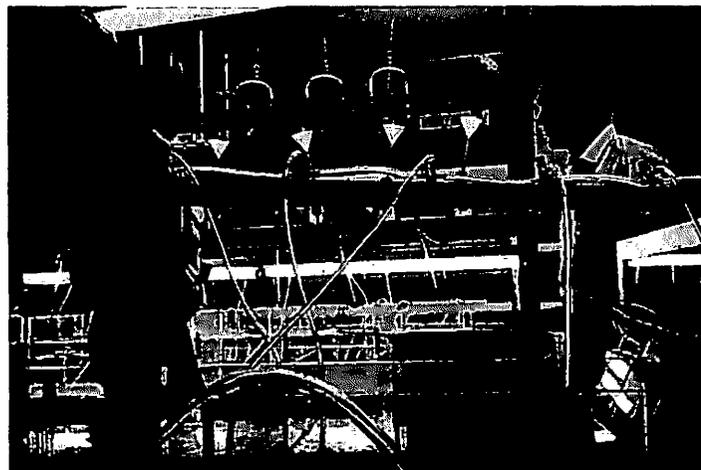
Graduation Requirements

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 curriculum 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. No student whose standing is in any way provisional can have an application for degree accepted.

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 (English 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. Foreign language credits earned in University courses will be counted toward graduation but they may not be used as part of the 30 credits required in the specifically recommended courses for the Bachelor of Science in Fisheries degree.

Students who transfer from other institutions are normally required to earn at least 10 credits in their major subject in this College.



FISHERIES

Adviser

A. C. DeLacy
248 Fisheries Center

BACHELOR OF SCIENCE IN FISHERIES

A student may major in marine fisheries biology, freshwater fisheries biology, invertebrate fisheries, or fisheries administration. He must take the courses required for all options, complete the required courses for his selected option, and earn a minimum of 30 credits from the list of recommended courses. At least 20 of the credits from the group of recommended courses must be in subjects other than fisheries.

Required courses for all Fisheries options

Chemistry 100 (Chemical Science) 140, 150, 151, 160 (General), 170 (Qualitative Analysis), 221 (Quantitative Analysis); English 101, 102, 103 (Composition); Fisheries 101, 301, 303, 495 (6 credits); Mathematics 104 (Plane Trigonometry), 105 (College Algebra); 281 (Elements of Statistical Method) or 391 (Elementary Probability); humanities or social sciences to equal 10 quarter credits; Zoology 111, 112 (General)

**Option A: Marine Fisheries Biology****REQUIRED COURSES**

Fisheries 402, 405 or 406, 425, 426, 427; Mathematics 124 (Calculus with Analytic Geometry); Oceanography 203 (Introduction to Oceanography) or 401 (General Oceanography); Zoology 453-454 (Comparative Anatomy of Chordates) or 456 (Vertebrate Embryology)

Option B: Freshwater Fisheries Biology**REQUIRED COURSES**

Biology 473 (Limnology); Fisheries 302, 402, 451, 452, 453, 460 or 461; Zoology 453-454 (Comparative Anatomy of Chordates) or 456 (Vertebrate Embryology)

Option C: Invertebrate Fisheries**REQUIRED COURSES**

Biology 472 (Principles of Ecology); Fisheries 302, 405, 406, 427, 454, 480; Mathematics 124 (Calculus with Analytic Geometry); Oceanography 203 (Introduction to Oceanography) or 401 (General Oceanography), 403 (Biological Oceanography); Zoology 330 (Natural History of Marine Invertebrates), 433, 434 (Invertebrate Zoology)

Option D: Fisheries Administration**REQUIRED COURSES**

Communications 303 (Public Relations); Economics 211 (General Economics), 300 (Intermediate Price Theory), 435 (Natural Resource Utilization and Public Policy); English 271, 272 (Expository Writing); Fisheries 402, 453, 480, 405 or 406, 425 or 427; Forestry 350 (Wildlife Management); Political Science 470 (Introduction to Public Administration); Speech 220, 320 (Public Speaking)

Substitutions for "required courses for all Fisheries options" may be made under this program with permission of the graduation committee of the College of Fisheries. A sequence of Chemistry 101, 102, 221 will usually be taken.

Recommended Courses for All Fisheries Options

Biochemistry 361 (Biochemistry) and 363 (Biochemistry Laboratory), or 481 (Biochemistry) and 484 (Biochemistry Laboratory); Biology 472 (Principles of Ecology), 473 (Limnology); Botany 112 (The Plant Kingdom); Chemistry 231, 232 (Organic Chemistry), 241, 242 (Organic Chemistry Laboratory); Economics 435 (Natural Resource Utilization and Public Policy); Genetics 451 (Genetics); fisheries courses, other than required, to equal a maximum of 10 credits; foreign language to equal 10 credits; Forestry 350 (Wildlife

Management); Geology 101 (General Geology for Non-science Majors) or 205 (Physical Geology); Mathematics 114 (Elementary Computer Programming), 124, 125, 126 (Calculus with Analytic Geometry), 374 (Principles of Digital Computers and Coding), 382, 383 (Statistical Inference in Applied Research), 486 (Experimental Design); Oceanography 203 (Introduction to Oceanography) or 401 (General Oceanography), 403 (Biological Oceanography); Philosophy 120 (Introduction to Logic), 460 (Introduction to the Philosophy of Science); Physics 101, 102, 103 (General Physics), 107, 108, 109 (General Physics Laboratory); Political Science 471 (Administrative Management), 472 (Introduction to Administrative Law), 473 (Comparative Administrative Systems); Zoology 330 (Natural History of Marine Invertebrates), 331 (Natural History of Fresh-water Invertebrates), 381 (Microtechnique), 400 (General Physiology), 433, 434 (Invertebrate Zoology), 458 (Vertebrate Physiology)

BACHELOR OF SCIENCE WITH A MAJOR IN FISHERIES

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. 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.

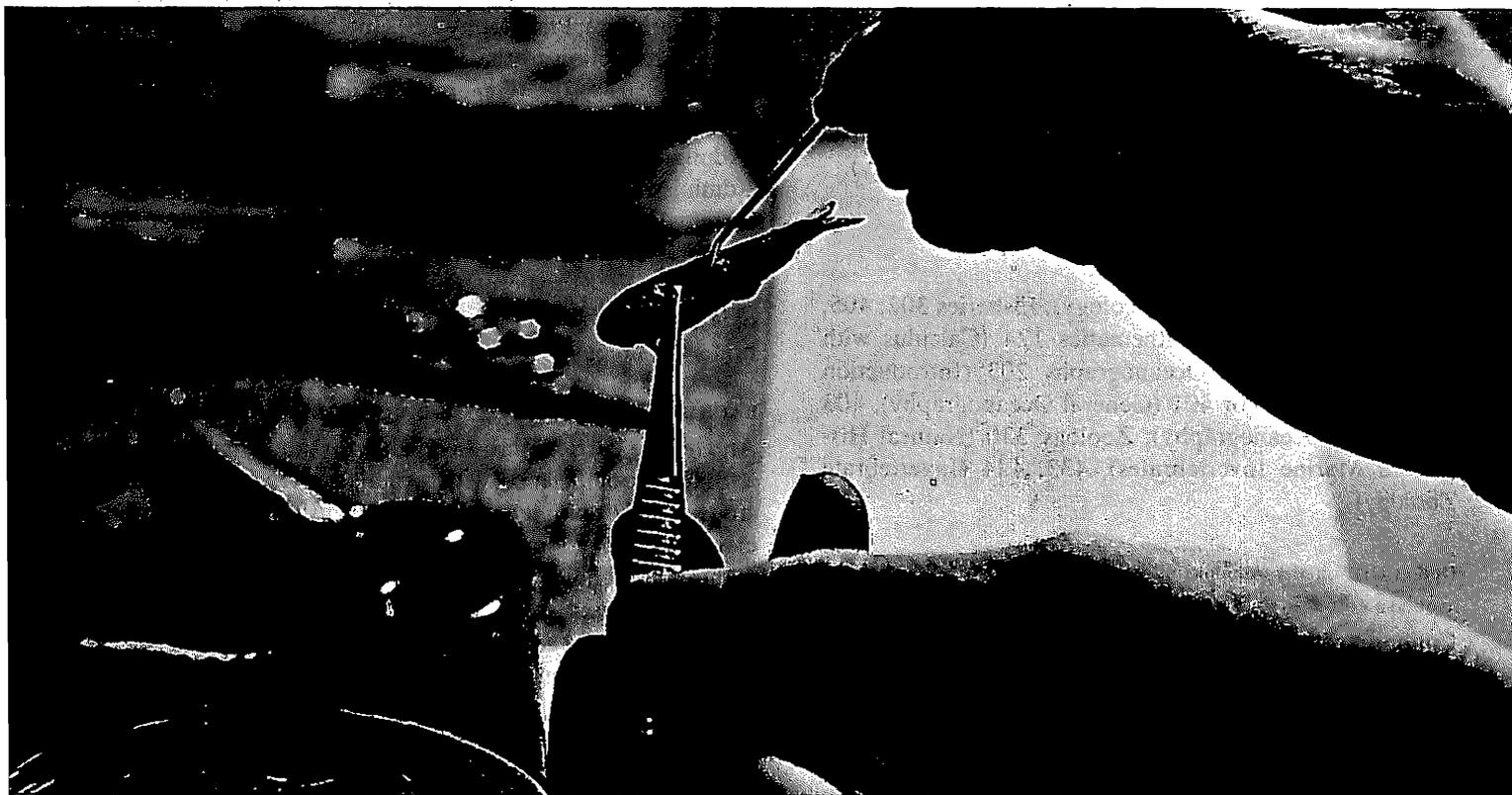
In preparation for graduate work in the field of fish behavior, students should follow the program of courses below. A Bachelor of Science with a major in Fisheries will be granted to a student successfully completing this program together with electives sufficient to meet University graduation requirements. Since the purpose of this program is to prepare students for graduate study in fish behavior, a 3.00 grade-point average is required in the junior and senior years. A student who does not meet this grade-point requirement cannot be awarded a Bachelor of Science degree under this program.

Recommended courses

Biology 472 (Principles of Ecology) and 472 L (Ecology Laboratory); Chemistry 101 (General Chemistry), 102 (General and Organic Chemistry); English 101, 102, 103 (Composition); Fisheries 101, 301, 425, 451, 460, 495 (6 credits), and 5 elective credits in fisheries;

foreign language to equal 15 credits (two years of one language should have been taken in high school; the first college language should be taken in the senior year); Genetics 451 (Genetics) and 451L (Genetics Laboratory); Mathematics 105 (College Algebra); Philosophy 120 (Introduction to Logic), 460 (Introduction to the

Philosophy of Science); Psychology 100 (General Psychology), 301 (Statistical Methods), 316 (Animal Behavior), 426 (Animal Laboratory); Zoology 111, 112 (General), 409 (Ethology), 409L (Ethology Laboratory); 456 (Vertebrate Embryology) or 458 (Vertebrate Physiology).



FOOD SCIENCE

Adviser

John Liston

221 Fisheries Center

Bachelor of Science with a Major in Food 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 361 (Biochemistry), and 363 (Biochemistry Laboratory) or 481*, 482*, (Biochemistry) and 484* (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); English 101, 102, 103 (Composition); Fisheries 480, 495; Food Science 481,

*Students intending to proceed to graduate study are advised to take these courses.



482, 483, 484, 485, 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 101*, 102*, 103* (General Physics) and 107*, 108*, 109* (General Physics Laboratory), Preventive Medicine 440 (Water and Waste Sanitation), 441 (Milk and Food Sanitation)

Recommended courses

Accounting 210 (Fundamentals of Accounting); Botany 111 (Elementary Botany), 112 (The Plant Kingdom), 461 (Yeasts and Molds); Chemistry 350 (Elementary Physical Chemistry), 426 (Instrumental Analysis); Fisheries 101, 301, 302, 303, 406; Food Science 320 (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 Production); Zoology 111, 112 (General Zoology)

Graduate Programs

Graduate Program Adviser

Richard Van Cleve
204 Fisheries Center

For further information, see the *Graduate Education* section of this Catalog.

Graduate students majoring 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 Fisheries or its 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

Professors

James S. Bethel, C. Frank Brockman, Harvey D. Erickson, Stanley P. Gessel, Bror L. Grondal (emeritus), Gordon D. Marckworth, J. Kenneth Pearce, James C. H. Robertson, Walter H. Schaeffer, Henry Schmitz (president emeritus), David R. M. Scott, George Stenzel

Associate Professors

Benjamin S. Bryant, Lawrence Leney, K. V. Sarkanen, David P. Thomas

Assistant Professors

Barney Dowdle, Herman J. Heikkenen, Reinhard F. Stettler, Kenneth J. Turnbull

The important timber resource of the Northwest requires men especially trained to harvest the forest crop efficiently and wisely, and men skilled in techniques of converting the raw material to maximal economic use.

Because the University of Washington is in the center of the Northwest timber industry, forestry students encounter first hand the forest-management and forest-industry problems with which they will be concerned as foresters. Government forests and private timber holdings serve as laboratories, and field work in forest

management and logging engineering is an integrated part of the four-year curriculum. Practicing foresters contribute to the laboratory instruction. Sawmills, plywood plants, pulp and paper mills, wood-industry research laboratories, and other wood-processing plants, all in close proximity to the College of Forestry, provide field laboratories for student projects in the forest products curriculum.

The University's College of Forestry was established in 1907, when professional forestry education in the United States was in its infancy. Accredited by the Society of American Foresters, the College offers courses leading to the degrees of Bachelor of Science in Forestry, Master of Forestry, Master of Science in Forestry, and Doctor of Philosophy. Curricula leading to these degrees are also accredited by the Society of American Foresters.

College Facilities and Services

Since 1925 the College has been centered in the main forestry building, 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. The building contains administrative offices, faculty offices, undergraduate classrooms and laboratories, as well as those facilities listed below.

The *Library*, a branch of the University's Henry Suzallo Library, contains 15,000 bound volumes and

30,000 pamphlets, reports, and monographs. It also has an excellent collection of approximately twelve hundred forestry periodicals and many indexes to current forestry literature. Under the nationwide Farmington Plan sponsored by the Special Library Association, it 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.

Two *Forest Soils Laboratories*, in Anderson Hall, serve a dual purpose as research and teaching aids in the College. In addition to enabling graduate students to study all types of forest soil problems and thoroughly explore properties of forest soils, undergraduate students can become familiar with important forest soil characteristics and with methods for analyzing forest soils. Supplementing the Forest Soils Laboratories is a field laboratory at Pack Demonstration Forest, where less elaborate studies of forest soils and other problems are conducted. These three laboratories have been important factors in expanding research on the growth of forest trees. Greenhouse space is also available through cooperation with the Botany Department.

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 leaves, twigs, and flowers of the hardwood trees, and shrubs and twigs of the coniferous species. Fruit specimens and a complete cone collection of American conifers are maintained apart from the mounted collection. The Herbarium also provides authentic specimens for use in identifying woody plant material in many branches of forestry work. Another herbarium, complete in range plants, is maintained by the Botany Department and is available to forestry students.

The *Wood Collection* contains nearly thirty-five hundred specimens from all parts of the world, providing authentic material for research and for identification of wood samples. The collection is valuable in the study of properties, characteristics, and uses of various woods, and provides material for studies of wood structure, both gross and microscopic.

Housed in its own building on the campus, the *Forest Products Laboratory* is equipped to conduct advanced studies of wood and wood products. Sections of the Laboratory are devoted to timber physics, woodworking, wood gluing, wood preservation, kiln drying, photomicrography, advanced wood technology, fiber board,

and particle board. Testing machines, presses, machine tools, chemical apparatus, kilns, and mensuration devices permit almost unlimited experiments with wood. A dry kiln for research and instruction in wood seasoning is situated adjacent to the Forest Products Laboratory. It is equipped with modern instrumentation for remotely controlling the variables involved in the drying of lumber over a wide range of conditions. The 18-foot by 26-foot drying chamber is sufficiently large to reproduce conditions found in industrial-seasoning practice, yet not so large as to be unwieldy for conducting basic wood-drying research. Undergraduate students in forest products operate the kiln as part of their senior-year program.

The *University Arboretum* is a 200-acre park planted with trees and shrubs from all over the world. The diversified topography of the Arboretum, which produces varied soil and moisture conditions, and 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. The Arboretum is a ten-minute walk from the campus.

A new facility completed in 1964, the *Hugo Winkler Forest Sciences Laboratory*, contains the offices of the Institute of Forest Products, faculty offices, an undergraduate laboratory for instruction in wood technology, forest entomology, forest pathology, and twelve research laboratories.

The *Lee Memorial Forest* is a tract of young timber 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 farm forestry area, the Lee Memorial Forest is used for teaching and research in forest management, silviculture, ecology, and forest soils. A number of permanent study plots have been established, a study map made, and intensive growth measurements taken. During the winter of 1952 a first thinning was made in Douglas fir stands 35 and 55 years old. The accessibility, stocking age, and site of the Lee Memorial Forest make it exceptionally valuable for studies and demonstrations of farm forestry practices applicable in Western Washington.

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 Mt. Rainier National Park highway at La Grande, Washington, 65 miles from the University. The Pack Forest is an excellent field and research laboratory as well as a public demonstration project. Since 1928, when several permanent sample plots were established, research projects in various phases of silviculture, mensuration, and forest soils have been set up. Cooperative studies are being conducted with the Pacific Northwest Forest and Range Experiment Station.

Complete facilities for classwork and living accommodations are available to students and instructors working at the Pack Forest.

The *Winnifred Denney Moore Memorial Forest* is 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 Cascade 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 for experimental plantings and land management studies in the high altitudes of Eastern Washington.

The *White River Forest* is a recent acquisition. On December 21, 1961, the Division of Surplus Property Utilization of the Department of Health, Education, and Welfare granted the University some 650 acres of cut-over land southeast of Enumclaw, lying at an elevation of 1,200 feet in scattered blocks along both sides of the Mud Mountain Reservoir. The White River Forest will be used for research studies which will include: (1) management of second-growth stands, especially hardwoods; (2) relationship between forests and game; (3) studies of forest recreation; and (4) studies of forest soils and drainage problems in glaciated areas.

The *Institute of Forest Products*, which is housed in Hugo Winkenwerder Forest Sciences Laboratory, has three general objectives: (1) to provide students with increased opportunities for advanced study and research particularly in fields relating to products of the forest; (2) to provide for additional new and important research results especially in fields relating to forest products, and (3) to provide for increased University research cooperation with industry and government in fields relating to forest products. Predoctoral and postdoctoral research assistantships are available.

The *Forest Club*, founded in 1908, is an organization of students in the College of Forestry. Through the club, students and faculty members cooperate to keep in touch with current developments in forestry and lumbering and the leaders in these fields, and to interest the public in the College and in the forestry problems of the state. Club meetings feature prominent speakers and educational films. The club sponsors an all-day field event, called Garb Day, an annual dance, and an annual banquet, which is attended by representatives from nearly every field of forestry. The Club is affiliated with the Association of Western Forestry Clubs, a student-sponsored organization fostering interforest school cooperation among the eight institutions in the western United States. A major project of this organization is the sponsorship of an annual Conservation Week to promote conservation through education. Each year, Forest Club members work with the King County Forest Committee in conducting tree-farm tours for school children in the county. Serving as guides, students transmit their classroom and field-acquired knowledge to the younger generation so that America's junior citizens may appreciate the philosophy of conservation and wise use of the forest resource.

Organized at the University of Washington in 1908, *Xi Sigma Pi* is the oldest and largest national forestry honorary fraternity in the United States. It has chapters in nearly all the leading forestry schools in the country. At the University of Washington, *Alpha Chapter* encourages a high standard of scholarship in forestry education, the advancement of the profession, and fraternal relations among workers in forest activities. *Xi Sigma Pi* requires a grade-point average of at least 3.00 for six quarters in residence at the College of Forestry. The growth of *Xi Sigma Pi* is reflected in a membership list of more than fifteen hundred, a list that includes names familiar to foresters throughout the country.

Graduates of the College of Forestry are members of the *Washington Foresters' Alumni Association*. Yearly dues are \$2.00. Members receive the *Washington Forester*, which is published annually, and the *Alumni Directory*. An annual alumni reunion is held each spring either at Pack Forest or at the College of Forestry in conjunction with the annual Forest Club banquet.

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 United States Forest Service, Bureau of Land Management, and National Park Service, the State Department of Natural Resources, and a number of companies in the forest and lumber industries. 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

Adviser

Walter H. Schaeffer
206 Anderson Hall

Admission

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 thorough preparation in mathematics and the natural sciences will have the best chance of completing their forestry

program and receiving their Bachelor of Science 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

For undergraduate students working toward the bachelor's degree, specialization is offered in forest management, logging engineering, and forest products. Students must meet certain general requirements of the University and the College as well as the particular curriculum requirements which are described in the announcements below. General requirements for the bachelor degree include physical education, scholarship and minimum credits, and senior-year residence.

Curricula

All students in the College of Forestry are required to take a common program for the first four quarters. This program is as follows:

First Year		
AUTUMN QUARTER		CREDITS
FOR 101	DEVELOPMENT	1
BOT 111	ELEM. BOTANY	5
CHEM 101	GENERAL	5
MATH 105	COLLEGE ALGEBRA	5
		<hr/>
		16

WINTER QUARTER		CREDITS
FOR 102	DEVELOPMENT	1
BOT 112	ELEM. BOTANY	5
CHEM 102	GENERAL AND ORGANIC	5
ENGL 101	COMPOSITION	3
		<hr/>
		14

SPRING QUARTER		CREDITS
FOR 103	DEVELOPMENT	1
MATH 124	CALCULUS	5
PHYS 101-107	GENERAL	5
ENGL 102	COMPOSITION	3
		<hr/>
		14

Second Year		
AUTUMN QUARTER		CREDITS
FOR 204	DENDROLOGY	5
PHYS 102-108	GENERAL	5
POL S 202	AMERICAN GOVERNMENT	5
		<hr/>
		15



Forestry students registering for the second quarter of their sophomore year select the field of forestry in which they will specialize. The curricula for the three fields of specialization,* Forest Management, Logging Engineering, and Forest Products are as follows:

Curriculum in Forest Management

Second Year

WINTER QUARTER		CREDITS
ACCTG 210	GENERAL	3
ECON 200	INTRO. TO ECONOMICS	5
ENGL 103†	COMPOSITION	3
ZOOL 112	GENERAL	5
		16

SPRING QUARTER		CREDITS
FOR 160	ELEM. FOREST MENSURATION	5
G E 121	PLANE SURVEYING	3
GEOL 205	PHYSICAL GEOLOGY	5
ELECTIVES		3
		16

Forestry students in the Forest Management and Logging Engineering curricula are required to spend one month at Pack Forest immediately prior to the Autumn Quarter of their third year. The program at Pack Forest consists of field studies in Forest Ecology, Forest Surveying, and Forest Mensuration. A total of 6 credits are given for this work.

Third Year

AUTUMN QUARTER		CREDITS
FOR 310	GEN. FOREST SOILS	4
FOR 403	TIMBER PHYSICS	3
FOR 260	MENSURATION	5
APPROVED ELECTIVES		3
		15

WINTER QUARTER		CREDITS
FOR 321	SILVICS	3
FOR 372	SEASONING & PRESERVATION	2
FOR 465	FOREST PHOTO INTERPRETATION	3
ZOOL 204	FORESTRY ZOOLOGY	5
APPROVED ELECTIVES		2
		15

*At the time of printing, the three upper-division curricula in the College of Forestry were undergoing revision. The courses included here will be changed in the 1966 *General Catalog*. Please contact the College of Forestry for the new upper-division curricula.

†Not required if a B average is obtained in English 101 and 102.

SPRING QUARTER		CREDITS
FOR. 322	SILVICULTURAL METHODS	3
FOR. 430	ADV. FIRE CONTROL	3
BOT. 361	FOREST PATHOLOGY	5
APPROVED ELECTIVES		4
		15

Fourth Year

AUTUMN QUARTER		CREDITS
FOR. 408	FOREST ECONOMICS	5
FOR. 423	APPLICATION OF SILVICULTURAL METHODS	3
FOR. 435	FOREST ENTOMOLOGY	4
APPROVED ELECTIVES		3
		15

WINTER QUARTER		CREDITS
FOR. 409	FOREST POLICY AND ADMINISTRATION	3
FOR. 460	FOREST MANAGEMENT	5
APPROVED ELECTIVES		7
		15

SPRING QUARTER		CREDITS
FOR. 466	FIELD STUDIES	5
FOR. 467	FIELD STUDIES	5
FOR. 468	FIELD STUDIES	4
FOR. 469	FIELD STUDIES	2
		16

Curriculum in Logging Engineering

See Forest Management curriculum information at left, regarding the Pack Forest requirement for Logging Engineering majors.

Second Year

WINTER QUARTER		CREDITS
ECON 200	INTRO. TO ECONOMICS	5
G E 101	ENGR. GRAPHICS	3
MATH 125	CALCULUS	5
ELECTIVES		3
		16

SPRING QUARTER		CREDITS
FOR 160	ELEM. FOREST MENSURATION	5
G E 121	PLANE SURVEYING	3
GEOL 205	PHYSICAL GEOLOGY	5
SPCH 327	EXTEMPORE SPEAKING	3
		16

Third Year

AUTUMN QUARTER		CREDITS
FOR. 310	GEN. FOREST SOILS	4
FOR. 404	TIMBER PHYSICS	5
CE 210	ROUTE DESIGN	5
APPROVED ELECTIVE		1
		15

WINTER QUARTER		CREDITS
FOR. 321	SILVICS	3
FOR. 372	SEASONING & PRESERVATION	2
FOR. 440	CONSTRUCTION	4
CE 415	PHOTOGRAMMETRY OR	
FOR. 465	FOREST PHOTO INTERPRETATION	3
APPROVED ELECTIVES		3
		15

SPRING QUARTER		CREDITS
FOR. 322	SILVICULTURAL METHODS	3
FOR. 430	ADV. FIRE CONTROL	3
FOR. 435	FOREST ENTOMOLOGY	4
BOT. 361	FOREST PATHOLOGY	5
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		15

Fourth Year

AUTUMN QUARTER		CREDITS
FOR. 401	SAFETY PRACTICES	2
FOR. 408	FOREST ECONOMICS	5
FOR. 441	FOREST ENGR.	5
APPROVED ELECTIVES	. . . . .	3
		<hr/>
		15

WINTER QUARTER		CREDITS
FOR. 442	LOGGING ENGR.	5
FOR. 460	FOREST MANAGEMENT	5
APPROVED ELECTIVES	. . . . .	4
		<hr/>
		14

SPRING QUARTER		CREDITS
FOR. 446	FIELD STUDIES	3
FOR. 447	FIELD STUDIES	5
FOR. 448	FIELD STUDIES	5
FOR. 449	FIELD STUDIES	3
		<hr/>
		16

SPRING QUARTER		CREDITS
FOR. 370	WOOD PRESERVATION	3
FOR. 371	WOOD PRESERVATION LAB.	2
FOR. 471	TIMBER DESIGN	3
BOT. 361	FOREST PATHOLOGY	5
APPROVED ELECTIVES	. . . . .	2
		<hr/>
		15

Fourth Year

AUTUMN QUARTER		CREDITS
FOR. 470	FOREST PRODUCTS INDUSTRIES	5
FOR. 481	MILLING	5
APPROVED ELECTIVES	. . . . .	5
		<hr/>
		15

WINTER QUARTER		CREDITS
FOR. 472	PLYWOOD, LAMINATION, AND GLUES	5
FOR. 483	KILN DRYING	3
APPROVED ELECTIVES	. . . . .	7
		<hr/>
		15

SPRING QUARTER		CREDITS
FOR. 476	WOOD PULP	6
FOR. 482	MANUFACTURING PROBLEMS	5
FOR. 484	FIELD STUDIES	2
FOR. 485	FOREST PRODUCTS SEMINAR	2
		<hr/>
		15

Curriculum in Forest Products

Second Year

WINTER QUARTER		CREDITS
CHEM 150-151	GENERAL	5
PHYS 103-109	GENERAL	5
MATH 125	CALCULUS	5
		<hr/>
		15

SPRING QUARTER		CREDITS
ECON 200	INTRO. TO ECONOMICS	5
ENGL 103‡	COMPOSITION	3
G B 101	ENGR. GRAPHICS	3
FOR 160	ELEM. FOREST MENSURATION	5
		<hr/>
		16

Third Year

AUTUMN QUARTER		CREDITS
FOR. 320	SILVICULTURE	3
FOR. 404	TIMBER PHYSICS	5
FOR. 461	FOREST MANAGEMENT	3
APPROVED ELECTIVES	. . . . .	6
		<hr/>
		17

WINTER QUARTER		CREDITS
FOR. 307	WOOD STRUCTURE	3
FOR. 407	FOREST ECONOMICS	2
B LAW 307	BUSINESS LAW	3
APPROVED ELECTIVES	. . . . .	5
		<hr/>
		13

‡Not required if a B average is obtained in English 101 and 102.



GRADUATE PROGRAMS

Graduate Program Adviser

James S. Bethel
206 Anderson Hall

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. The Master of Forestry, Master of Science in Forestry, and Doctor of Philosophy degrees are conferred by the Graduate School through the College of Forestry.

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 School* section.

In addition to requesting admission forms from the Graduate School, admissions forms also should be obtained from the Dean, College of Forestry. These provide supplementary information required by the Graduate Committee of the College of Forestry.

Master of Forestry

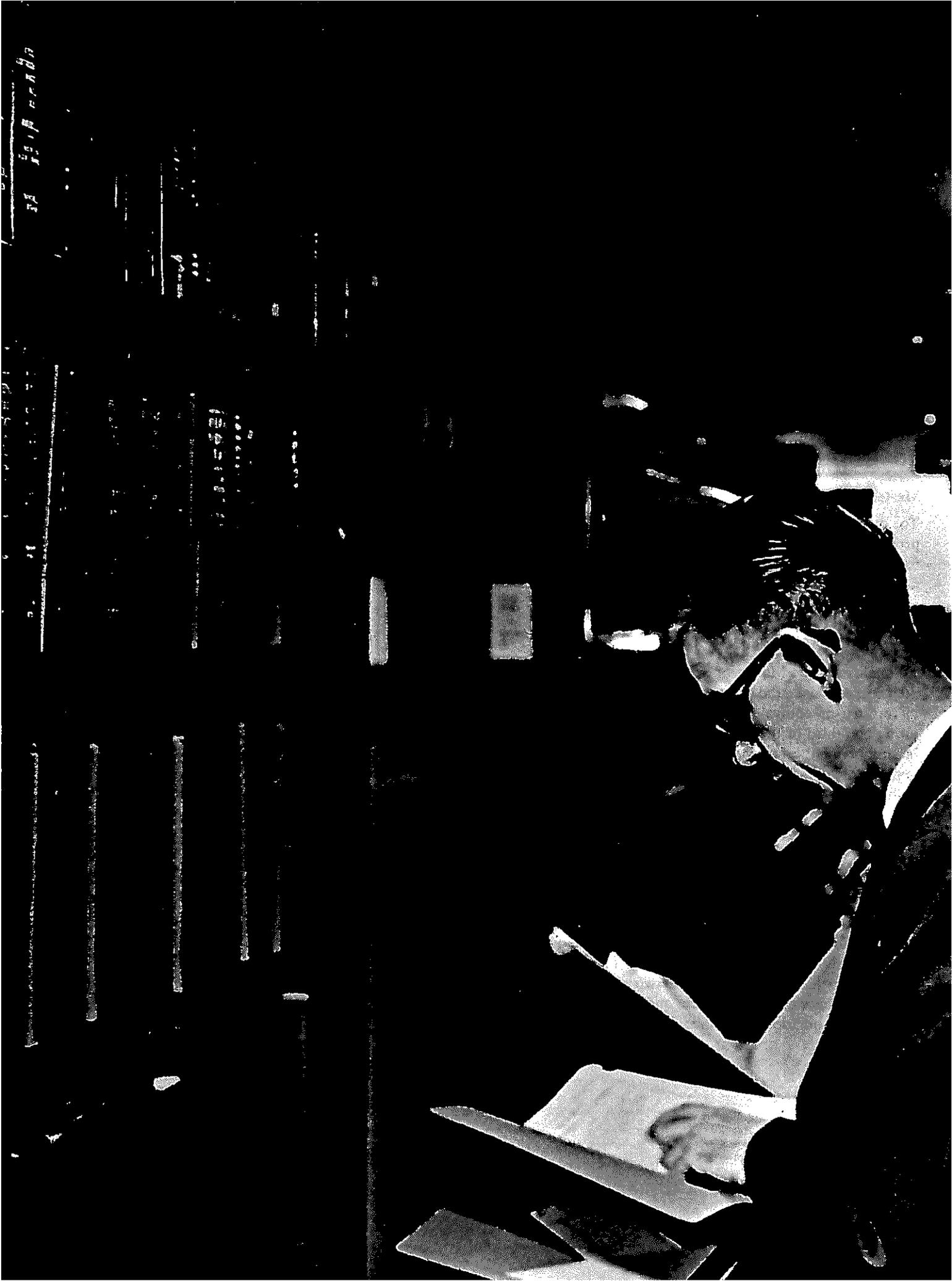
To qualify for the Master of Forestry degree, the prospective candidate must have a bachelor's degree in forestry. Supporting course work is taken mainly in the field of forestry. Only 400- and 500-numbered courses are acceptable. A foreign language is not required.

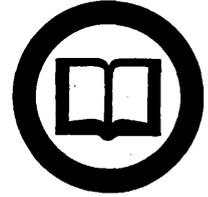
Master of Science in Forestry

To qualify for the Master of Science in Forestry degree, the prospective candidate must have a bachelor's degree in forestry or equivalent. A minor in science, constituting one-third of the required course work is required in support of the forestry major. Only 400- and 500-numbered courses are acceptable. Students admitted with a forestry-equivalent bachelor's degree ordinarily require a minimum of two years to complete the degree. A foreign language is not required.

Doctor of Philosophy

General requirements are listed in the *Graduate Education* section. Additionally, prospective doctoral candidates in forestry are required to pass the language examinations for this degree within the first academic year beyond the master degree or two academic years beyond the baccalaureate degree; and must precede the General Examination for admission to candidacy.





LAW

Dean

Lehan K. Tunks
207 Condon Hall

Associate Professor

David H. Vernon

Professors

Richard Cosway, Harry M. Cross, Robert L. Fletcher, Marian G. Gallagher, Alfred Harsch, Dan F. Henderson, Ralph W. Johnson, Ernst Levy (emeritus), Robert Meisenholder, Arval Morris, Rudolph H. Nottelmann (emeritus), Cornelius J. Peck, John W. Richards, Luvern V. Rieke, Warren L. Shattuck, George N. Stevens, Robert L. Taylor, Philip A. Trautman, Lehan K. Tunks, David H. Vernon

Associate Professor

Richard O. Kummert (visiting)

Assistant Professors

Bernard E. Harvith, Roland L. Hjorth, Marjorie D. Rombauer

Law is the clear line man draws between anarchy and order. It is both catalyst and instrument, empowered by the people to be their arbiter and regulator. Necessarily flexible in a changing community, the law evolves within the framework of ethics, history, economics, social science, and philosophy. Man's concepts of right and wrong and of justice, fundamental to the existence of society, are realized through his legal system.

The faculty of the School of Law at the University of Washington trains young men and women for the practice of law anywhere in the United States in accordance with the highest traditions of professional responsibility. Whether the student is interested in becoming an advocate, counselor, judge, or law teacher, or is preparing for a career in government, politics, or business, the curriculum and methods of instruction are designed to develop his highest potential.

Since the problems of the individual are at the same time a part of the larger problems of an enormously complex and competitive society, the School of Law provides the widest possible perspective. It is essential that the student study the society in which he lives, and that he both see and understand the law, not as a self-contained system designed primarily for the settlement of disputes between individuals, but as a decisive, if not the dominant, factor of social control.

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 developing and using, rather than merely echoing, the teachings of the past.

The basic materials of appellate courts are the actual decisions of appellate courts, supplemented by selected readings from other sources which illuminate the nature of judicial, administrative, and legislative processes. The student is encouraged in every possible way to rely on his own initiative and to develop his

powers of perception and communication. During the first year, the curriculum is devoted to the study of basic courses and is required of all students. Later, the student, in the light of his own developed interests, may explore those subjects which will best suit his needs.

Established at the University in 1899, the School of Law is housed in Condon Hall, which is 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, Malaya, 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 Library

The Law School Library contains more than 158,000 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*.

Courts, Administrative Agencies, and Other Law-Making Bodies

Since the School of Law is conveniently located near federal and state courts sitting in Seattle, students may witness the trial of cases. The United States District Court is in session and tries cases almost continuously. The United States Court of Appeals for the Ninth Circuit holds sessions in the city each year. The Superior Court of King County, the justice courts, the municipal court, and the juvenile court are in session throughout the school year. The Supreme Court of the State of Washington, at Olympia, is also easily accessible and provides opportunities for students to hear the argument of cases on appeal. Other decision-making and official law-making bodies which also function in the community are open to student observation.

Prelegal Education

The School of Law does not prescribe a definite prelegal curriculum for its applicants. The wide range of lawyers' tasks and the difference in offerings from school to school preclude such an approach. However, there are certain goals which every prelegal student 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 what courses in their college or university will best accomplish these ends. The School of Law faculty will be glad to assist in program planning.

Since briefs, pleadings, legal memoranda, and other papers which law students are required to prepare and submit must be typewritten, all students are urged to obtain a minimal skill in typing while undergraduates. Examinations may be typed by those desiring to do so.

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 bar; 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—comprise 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 and Procedure. 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. The three 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 ten per cent of the graduating class.

The *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

Special stipends are available to assist (for three years) LL.B. degree candidates who are qualified by reason of language competency 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 whose prior academic performance and economic need justify it may apply for scholarship assistance on forms available from the School of Law. It may be convenient to request these forms at the time of obtaining an application for admission. Beginning students desiring such scholarship assistance must submit their applications for such help by March 1 of the year in which they intend to enter.

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, 333 Student Union Building, University of Washington, 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.

Student Employment

There are available a limited number of part-time positions for student attendants in the Law School Library.

Part- and full-time work off campus may be obtained at the Student Employment Office, Lewis Hall Annex. 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. Placement in jobs on the campus is handled by the University Personnel Department located in the Parkway Personnel Office, 4014 University Way N.E., and the ASUW Personnel Office located in the Student Union Building.

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. Of course, the securing of employment remains the ultimate responsibility of the individual. However, the experience of the recent past indicates that virtually all graduates can be suitably placed.

ADMISSION

When Students May Enter

Beginning students may enter the School of Law only in the Autumn Quarter, and are required to be present at the opening day of the term, as stated in their letter of acceptance, usually a few days earlier than that set for upper-class students.

Requirements for Admission to the First-Year Class

Applicants for admission to the School of Law must either be graduates of approved colleges or universities, or have completed three-fourths of the work required for a bachelor's degree from an approved college or university.

The School of Law recommends completion of the regular four-year college program before undertaking the

study of law. In practice, any admission on the basis of having completed only three-fourths of a baccalaureate degree program is reserved for students demonstrating such superior abilities as to justify acceleration of their programs of formal academic and professional education. This corresponds with the advice given in most undergraduate collegiate institutions.

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. The test is given annually in February, April, July, 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.

Procedure

The applicant must:

- (1) Request a formal application blank from the Director of Admissions, University of Washington, School of Law, Seattle, Washington 98105. The application should be filed with the Director of Admissions early in the final year of prelegal study and under no circumstances later than July 15 of the year for which admission is sought.
- (2) Request 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.
- (3) Request the Educational Testing Service, preferably on his test application, to send his test score to the School of Law.
- (4) Submit one permanent passport-size facial photograph (approximately 2" x 2") on or before the date of 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 competency in that tongue. 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 are recommended to be directly in touch with TOEFL, preferably advising the Admissions Office of the School of Law of their activity by remitting carbons.

Admission with Advanced Standing

A transfer student may apply for admission if he has successfully completed work at an approved school, if he is in good standing at the time of his withdrawal, and if he meets the admission requirements for beginning students. At the discretion of the Dean, credit may be granted for courses in which grades are above the graduation average at the school from which he is transferring.

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 of Law.

The LL.B. Degree

The degree of Bachelor of Laws (LL.B.) is conferred upon all regular students who have completed satisfactorily the prescribed course of study in residence, consisting of a minimum of 132 quarter credits in professional law subjects, including required courses, with a scholarship average of at least 68, extending over at least nine quarters.

Grading

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.

Detailed regulations concerning the conduct of the honor system under the aegis of the Student Bar Association, scholastic standing, and other germane conduct are maintained and, from time to time, are distributed in current form to students in school by the originating offices.

Time Demands of Law School Study

Regardless of the particular studies undertaken, it is reasonably well established that law school demands that an optimum effort be devoted by each student to

his academic enterprises. Therefore, beginning students should not plan to dilute their efforts by other activity. Some available income-producing opportunities of a nature related to law study have academic value with a minimum of diluting effect. However, law students are required periodically to report the amount of time per week spent by them in income-producing activities, which should seldom exceed ten hours per week for upper-class students.

Occasionally, an especially well-qualified, mature student is admitted who is permitted to extend his studies longer than the normal nine quarters. Sometimes such students may hold other positions of a demanding character. Individual arrangements made in these cases balance the requisites of a sufficient immersion in legal studies to warrant appreciation of the relationships among the various categories of the law, with a slower rate of progress toward the degree than the nine-quarter (three academic years) plan, and the continuance of activities outside the School of Law. 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 of 1965 will be able to graduate in December, 1967, and thus be educationally eligible for an examination to be admitted to practice as early as January, 1968. To accelerate, a student must have the approval of the Dean's Office. The School policy is to permit only those students whose grades at the end of the first year indicate that they have at least an average, as compared with a minimum, proficiency for the study of the law to undertake the accelerated program.

Summer School

The School of Law offers a limited number of courses 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.



Several of the courses offered deal with subjects in which local law is of unusual significance. These courses will be of particular interest to students from other schools who plan to practice in this state. 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.

CURRICULUM

The first and second years of law study have been composed of a program of required courses. Except for Law 569, Office Management and Professional Responsibility, the third-year program has been entirely elective.

The following program has been in effect through 1963-64. At the date of sending this catalog to press, revisions are in prospect. Details concerning them are within the general frame of reference described.

Further continuing curriculum revision within the general frame of reference annually can be expected. The precise adjustments within this frame will be available from the School of Law.

First Year

400	CONTRACTS (4-3-3)	Rieke, Shattuck
415	PROCESSES (2-2)	Tunks
420	CRIMINAL LAW AND PROCEDURE (2-3)	Cosway, Morris
430	PROPERTY I (3-3-4)	Barndt, Johnson
440	TORTS (3-3-4)	Lewis, Richards
450	AGENCY (3)	Taylor, Johnson
460	ORIENTATION (0)	Gallagher, Rombauer
461, 462	LEGAL RESEARCH AND WRITING (2,1)	Gallagher, Rombauer

Second Year

500	ADMINISTRATIVE LAW (4)	Lewis, Trautman
505	BUSINESS ASSOCIATIONS (2-4)	Madison, Meisenholder
510	CIVIL PROCEDURE II (2-3)	Meisenholder, Stevens
515	COMMERCIAL TRANSACTIONS (4-3)	Cosway, Taylor
520	CONSTITUTIONAL LAW (3-4)	Morris, Fletcher
525	EQUITABLE REMEDIES (4)	Barndt, Stevens
530	INCOME TAXATION (3-2)	Rauscher, Harsch
535	PROPERTY II (4-4)	Cross, Fletcher

Third Year

328	CONVEYANCING (4)	Cross
550	ADMIRALTY (3)	Richards
551	COMMUNITY PROPERTY (3)	Cross
552	COMPARATIVE LAW (3)	Henderson
553	CONFLICT OF LAWS (4)	Trautman
554	CORPORATION FINANCE AND RELATED TAX PROBLEMS (2-2)	Taylor
555	CREDITORS' RIGHTS (3)	Cosway
556	CRIMINAL PROCEDURE SEMINAR (3)	Stevens
558	DEATH AND GIFT TAXATION (3)	Harsch
559	DOMESTIC RELATIONS (3)	Rieke
560	ESTATE PLANNING (2-2)	Harsch
561	EVIDENCE (4-2)	Richards
562	FEDERAL JURISDICTION (3)	Meisenholder
563	GOVERNMENT REGULATION OF BUSINESS (2-2)	Rieke
564	INSURANCE (3)	Taylor
565	INTERNATIONAL TRANSACTIONS (3)	Henderson
566	JURISPRUDENCE (3)	Morris
567	LABOR LAW (3)	Lewis
568	LABOR RELATIONS (3)	Lewis
569	OFFICE MANAGEMENT AND PROFESSIONAL RESPONSIBILITY (0)	Stevens
570	LEGISLATION (3)	Harsch
571	LOCAL GOVERNMENT LAW (3)	Trautman
572	PROBLEMS IN METROPOLITAN PLANNING (2)	Trautman
573	MORTGAGES (4)	Shattuck
574	NATURAL RESOURCES (3)	Johnson
575	PROBATE PRACTICE (2)	Fletcher
576	SOCIAL LEGISLATION (2)	Cosway
577	STATE AND LOCAL TAXES (3)	Harsch
578	SUPREME COURT TODAY (3)	Morris
579	SURETYSHIP (2)	Shattuck
580	TRIAL AND APPELLATE PRACTICE (3,2)	Trautman
581	TRUST ADMINISTRATION (2)	Cross
585	PROBLEMS IN EVIDENCE (4)	Meisenholder
600	RESEARCH PROBLEMS IN LAW (1-5)	Staff
610	LAW REVIEW (1-4, MAX. 4)	Trautman

Summer

525	EQUITABLE REMEDIES (3)	Stevens
551	COMMUNITY PROPERTY (3)	Cross
553	CONFLICT OF LAWS (3)	Trautman
555	CREDITORS' RIGHTS (3)	Cosway
558	DEATH AND GIFT TAXATION (3)	Fletcher
559	DOMESTIC RELATIONS (3)	Rieke
567	LABOR LAW (3)	Murphy
571	LOCAL GOVERNMENT LAW (3)	Barndt
573	MORTGAGES (3)	Shattuck
586	PUBLIC INTERNATIONAL LAW (3)	Taubenfeld



Director

Irving Lieberman
133 Library

Associate Director

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

Marion E. Peterson, Mabel A. Turner, Sara H. Wheeler

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.

It is the concern of the School of Librarianship to train those who make the library a working tool of the educational and cultural process.

One of thirty-six 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 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. The School of Librarianship is a member of the Association of American Library Schools.

Admission

The approval of both the Graduate School and the School of Librarianship is necessary for admission to



LIBRARIANSHIP

the graduate program, which may be entered in either Summer or Autumn Quarter. The preferred starting period for the student who intends to pursue the entire program for four consecutive quarters is Autumn Quarter. The deadline for submission of application and complete credentials for Autumn Quarter is July 15, and for Summer Quarter, May 15. The deadline for submission of the application and complete credentials for foreign students for Autumn Quarter is the previous February 1. It is recommended that applicants for admission write to the School of Librarianship for its *Announcement*, which describes in detail the programs offered, the requirements for admission, and the degrees. Inquiries should be addressed to Dr. Irving Lieberman, 133 Library, University of Washington.

Prerequisite Program

Beginning with the Autumn Quarter, 1965, four prerequisite courses will be required of all students before entrance to the graduate program. These courses will be offered during the academic year 1964-65, summer of 1965, and regularly thereafter. The courses are designed to form a basic foundation for graduate courses to follow and also to serve as terminal library courses for students not seeking the graduate library degree.

Summer Program

The full program for the Master of Librarianship degree is available to Summer Quarter students. Basic required courses are offered every summer, and continuations of these courses are given in alternate summers. Additional course offerings vary from year to year, but are planned to enable students to complete requirements for the degree by attendance during summers only.

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 training in nursing since 1917. The School of Nursing has offered an *integrated* academic and hospital course 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 autonomous 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 facilities of the entire School of Dentistry.

The second unit of the University Hospital, completed in 1959, is a 320-bed unit. It includes inpatient and outpatient facilities, laboratories, X-ray facilities, an emergency department, a physical medicine and rehabilitation unit, premature nursery, etc. The unit is contiguous with the first unit of the Hospital, completed in 1954, which houses the teaching 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. A new center for cancer research, a regional primate center, and a biochemistry-genetics building, now under construction, will also be extensions of the present building complex. Completion of these closely integrated units will give the University one of the finest health sciences centers in the United States.

Facilities and Services

The Health Sciences Library serves the Schools of Medicine, Dentistry, and Nursing. Used by many re-



HEALTH SCIENCES

searchers in other sections of the University, the Library has nearly 100,000 carefully 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 microcard 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, and Nursing are conducted not only in the University Hospital, but also in hospitals affiliated with the Division of Health Sciences. Faculty members with full-time status, including chairmen of clinical departments, are appointed in teaching and service capacities at these hospitals. 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.

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

Assistant Dean

Berton E. Anderson
B320 Health Sciences Building

Professors

Berton E. Anderson, Oscar E. Beder, David B. Law,
Alton W. Moore, Saul Schluger, Leo M. Sreebny,
Gerald D. Stibbs

Associate Professors

Charles L. Bolender, Charles I. Degering, Jan Diepen-
heim, Martha H. Fales, John D. Gehrig, Jean E.
Hodson, F. Lloyd Jacobson, Patricia J. Keller, Thomp-
son M. Lewis, Benjamin C. Moffett, Jr., Kenneth N.
Morrison, Alfred L. Ogilvie, Charles Schroeter, Irving
B. Stern, John Vigg, Myron E. Warnick, Walter A.
Wykhuis

Assistant Professors

Gordon J. Christensen, George A. Drennan, James R.
Easley, Eugene Natkin, Richard A. Riedel, Russell
Ross, John L. Sauer, Arnold Tamarin

Instructors

Virginia K. Anderson, Donald N. Bechlem, Ralph H.
Buseman, James D. Haberman, James R. Hooley,
Linda M. Kocher, O. Monte Merrill, Mary Margaret
Ryan, Joan S. Voris, Donald A. Welk, Ralph A.
Yuodelis

In the School of Dentistry the student learns funda-
mental principles significant to the entire body of dental
knowledge, and is expected to acquire habits of reason-
ing 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 profes-
sional training, and the program of instruction is de-
signed 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 student to learn the
fundamentals of the basic health sciences, to master
certain clinical skills, and to acquire a thorough under-
standing of professional and ethical principles. The
four-year educational 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 in-
cludes 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 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 pre-dental work at other institutions may compare these courses with those given in their schools by checking the course descriptions given in this Catalog.

COURSES	CREDITS
ENGLISH 101, 102, 103 (COMPOSITION)	9
CHEMISTRY 140, 150 AND 151, 160 AND 170 (GENERAL AND QUALITATIVE ANALYSIS)	14
CHEMISTRY 231, 232, 241, 242 (ORGANIC)	10
PHYSICS 101, 102, 103 AND 107, 108, 109 (GENERAL AND LAB.)	15
ZOOLOGY 111, 112 (GENERAL)	10
ZOOLOGY 456 (VERTEBRATE EMBRYOLOGY)	5
OR 453-454 (COMPARATIVE ANATOMY OF CHORDATES)	10

The Committee on Admissions recommends that pre-dental 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. The final date on which applications for entrance in Autumn Quarter may be submitted is March 1. Prior to that date, each applicant must submit the following:

1. Formal application for admission on the form furnished by the University of Washington 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. (This does not apply to University of Washington students.)
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 pre dental 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. 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 pre dental 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

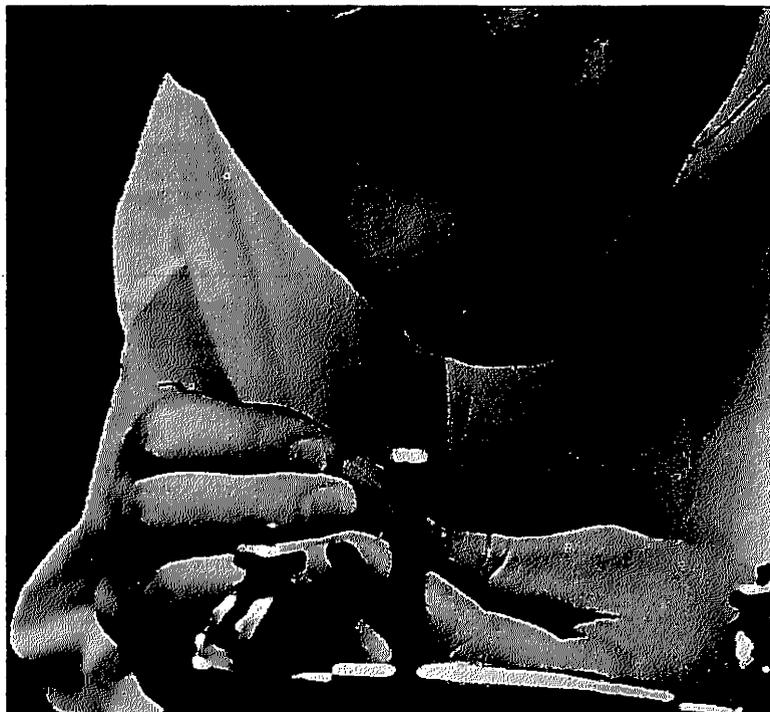
All students accepted by the School of Dentistry will be expected to indicate their willingness to participate in the School's Honor Code.

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 pre dental requirements, induction into military service, or failure to pass the physical examination required of all students at the time of registration.

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.



FIRST YEAR SCHEDULE

Autumn Quarter

HOURS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:30-MW 8:00-TTHF	BIOL STR 328 (GROSS ANATOMY)	DENTAL MATERIALS 131	BIOL STR 328 (GROSS ANATOMY)	DENTAL MATERIALS 131	OPERATIVE DENTISTRY 132 (ORAL ANATOMY)
9:30-12:20-MWF 9-12-TTH	GROSS ANATOMY LABORATORY	DENTAL MATERIALS LABORATORY	GROSS ANATOMY LABORATORY	DENTAL MATERIALS LABORATORY	ORAL ANATOMY LABORATORY
1:30-2:20	OPERATIVE DENTISTRY 132 (ORAL ANATOMY)	BIOL STR 330 (MICROSCOPIC ANATOMY)	FREE	BIOL STR 328 (GROSS ANATOMY)	BIOL STR 330 (MICROSCOPIC ANATOMY)
2:30-5	ORAL ANATOMY LABORATORY	MICROSCOPIC ANATOMY LABORATORY		GROSS ANATOMY LABORATORY	MICROSCOPIC ANATOMY LABORATORY

Winter Quarter

8-8:50	DENTAL SCIENCE AND LITERATURE 100 (ORIENTATION)	FREE	FREE	FREE	OPERATIVE DENTISTRY 133 (ORAL ANATOMY)
9-TTHF 9:30-M	PHYSIOLOGY AND BIOPHYSICS 370 (HUMAN PHYSIOLOGY)	ORAL PATHOLOGY 131 (ORAL HISTOLOGY AND EMBRYOLOGY)		ORAL PATHOLOGY 131	ORAL ANATOMY LABORATORY
9-12-P 10-12-TTH 11:30-12:30-M	PHYSIOLOGY LABORATORY	ORAL HISTOLOGY AND EMBRYOLOGY LAB		ORAL HISTOLOGY AND EMBRYOLOGY LAB	
1:30-2:20	BIOL STR 331 (NEUROANATOMY)	BIOL STR 329 (GROSS ANATOMY)	PHYSIOLOGY AND BIOPHYSICS 370	PHYSIOLOGY AND BIOPHYSICS 370	BIOL STR 329
2:30-5	NEUROANATOMY LABORATORY	GROSS ANATOMY LABORATORY	PHYSIOLOGY LABORATORY	PHYSIOLOGY LABORATORY	GROSS ANATOMY LABORATORY

Spring Quarter

8:30	BIOCHEMISTRY 361 (BIOCHEMISTRY)	BIOCHEMISTRY 362 (BIOCHEMISTRY) (CONF.)	BIOCHEMISTRY 361 (BIOCHEMISTRY)	BIOCHEMISTRY 362 (BIOCHEMISTRY) (CONF.)	BIOCHEMISTRY 361 (BIOCHEMISTRY)
9:30	PROSTHODONTICS 131 (COMPLETE DENTURE TECHNIC)	BIOCHEMISTRY LABORATORY	FREE	BIOCHEMISTRY LABORATORY	OPERATIVE DENTISTRY 134
10:30-12	PROSTHODONTICS LABORATORY		OPERATIVE DENTISTRY 134 ORAL ANATOMY LAB.		ORAL ANATOMY LABORATORY
1:30-2:20	OPERATIVE DENTISTRY 131	PROSTHODONTICS 131	OPERATIVE DENTISTRY 131	PROSTHODONTICS 131	PROSTHODONTICS LABORATORY
2:30-5	OPERATIVE DENTISTRY LABORATORY	PROSTHODONTICS LABORATORY	OPERATIVE DENTISTRY LABORATORY	PROSTHODONTICS LABORATORY	PROSTHODONTICS LABORATORY

THIRD YEAR SCHEDULE

Autumn Quarter

HOURS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8-8:50	PROSTHODONTICS 300	OPERATIVE DENTISTRY 300	O.D.T.P.* 300	ORAL SURGERY 300	FREE
9-9:50	PERIODONTICS 300	PERIODONTICS 300	ENDODONTICS 304	FIXED PARTIAL DENTURES 300	PERIODONTICS 300
10-12:30	CLINIC	CLINIC	CLINIC	CLINIC	CLINIC
1:30-2:30		ORAL PATHOLOGY 331		ORAL PATHOLOGY 331	
2:30-5-TTH		ORAL PATHOLOGY LABORATORY		ORAL PATHOLOGY LABORATORY	
2-4:30-MWF	CLINIC		CLINIC		CLINIC

Winter Quarter

8-8:50	PROSTHODONTICS 301	PROSTHODONTICS 303	FREE	FIXED PARTIAL DENTURES 301	ORAL SURGERY 303 (GENERAL ANESTHESIA)
9-9:50	O.D.T.P.* 301	OPERATIVE DENTISTRY 301	PERIODONTICS 301	ORAL SURGERY 301	PERIODONTICS 301
10-12:30	CLINIC	CLINIC	CLINIC	CLINIC	CLINIC
2:00-4:30	CLINIC	CLINIC	CLINIC	CLINIC	CLINIC

Spring Quarter

8-8:50	PROSTHODONTICS 302	DENT. SCI. AND LIT. 302 (TECH. COMPOSITION)	OPERATIVE DENTISTRY 302	DENT. SCI. AND LIT. N300 (DENTAL MEDICINE)	DENT. SCI. AND LIT. 302
9-9:50	ORTHODONTICS 300	PROSTHODONTICS 304	FIXED PARTIAL DENTURES 302	ORAL SURGERY 302	DENT. SCI. AND LIT. N301
10-12:30	CLINIC	CLINIC	CLINIC	CLINIC	CLINIC
2-4:30	CLINIC	CLINIC		CLINIC	CLINIC
2-3-w			ORAL SURGERY 331		
3-5-w			ORAL SURGERY LABORATORY		

*Oral Diagnosis and Treatment Planning



SECOND YEAR SCHEDULE

Autumn Quarter

HOURS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:00-TUEF		OPERATIVE DENTISTRY 231		OPERATIVE DENTISTRY 231	PEDODONTICS 200
8:30-MW	MICROBIOLOGY 235		MICROBIOLOGY 235		
9:30-10:20-F		OPERATIVE DENTISTRY LABORATORY		OPERATIVE DENTISTRY LABORATORY	MICROBIOLOGY 235 LABORATORY
10:30-12:20	MICROBIOLOGY LABORATORY		MICROBIOLOGY LABORATORY		MICROBIOLOGY LABORATORY
1:30-2:20	FIXED PARTIAL DENTURES 231	PROSTHODONTICS 231	FREE	PROSTHODONTICS 231	FIXED PARTIAL DENTURES 231
2:30-5	FIXED PARTIAL DENTURES LABORATORY	PROSTHODONTICS LABORATORY		PROSTHODONTICS LABORATORY	FIXED PARTIAL DENTURES LABORATORY

Winter Quarter

8-8:50	PROSTHODONTICS 232	OPERATIVE DENTISTRY 232	PROSTHODONTICS 232	OPERATIVE DENTISTRY 232	DENT. SCI. AND LIT. 200 (DENTAL HISTORY)
9-9:50	PROSTHODONTICS LABORATORY	OPERATIVE DENTISTRY LABORATORY	PROSTHODONTICS LABORATORY	OPERATIVE DENTISTRY LABORATORY	ORAL DIAGNOSIS AND TREATMENT PLANNING 216
10-10:50					PERIODONTICS 200
11-11:50					PEDODONTICS 201
1-2:20-MF	FIXED PARTIAL DENTURES 232	PATHOLOGY 231 (GENERAL PATHOLOGY)	FREE	PATHOLOGY 231	FIXED PARTIAL DENTURES 232
1:30-2:20					
2:30-5	FIXED PARTIAL DENTURES LABORATORY	PATHOLOGY LABORATORY		PATHOLOGY LABORATORY	FIXED PARTIAL DENTURES LABORATORY

Spring Quarter

8-8:50	PHARMACOLOGY 234 (GEN. PHARMACY)	OPERATIVE DENTISTRY 233	PEDODONTICS 216	OPERATIVE DENTISTRY 233	ENDODONTICS 232
9-M	ORAL SURGERY 200				
10-M	ENDODONTICS 201	OPERATIVE DENTISTRY LABORATORY	PEDODONTICS LABORATORY	OPERATIVE DENTISTRY LABORATORY	ENDODONTICS LABORATORY
11-12-M	O.D.T.P.* 217, O.S. 200, PERIODONTICS 231				
9-12-TWTHF					
1-2	FIXED PARTIAL DENTURES 233	O.D.T.P.* 217, O.S.† 200, PERIODONTICS 231	PHARMACOLOGY LAB. 234	PHARMACOLOGY 234	FIXED PARTIAL DENTURES 233
2-5	FIXED PARTIAL DENTURES LABORATORY			O.D.T.P.* 217, O.S.† 200, PERIODONTICS 231	FIXED PARTIAL DENTURES LABORATORY

*Oral Diagnosis and Treatment Planning

†Oral Surgery

FOURTH YEAR SCHEDULE

Autumn Quarter

HOURS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8-8:50	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
9-9:50	PERIODONTICS 401	FIXED PARTIAL DENTURES 400	OPERATIVE DENTISTRY 400		PROSTHODONTICS 400
10-12:30					
2-4:30	CLINIC	CLINIC	CLINIC	CLINIC	CLINIC

Winter Quarter

8-8:50	ORAL SURGERY 401	ORTHODONTICS 401	O.D.T.P.* 401	ORAL SURGERY 403 (MAXILLOFACIAL SURG.)	DENT. SCI. AND LIT. 432 (DENT. ETHICS AND OFFICE MANAGEMENT)
9-9:50	DENT. SCI. AND LIT. 401 (APPLIED DENT. SCIENCES)	PROSTHODONTICS 402	OPERATIVE DENT. 401	DENT. SCI. AND LIT. 401 (APPLIED DENT. SCIENCE)	FIXED PARTIAL DENTURES 401
10-12:30					
2-4:30	CLINIC	CLINIC	CLINIC	CLINIC	CLINIC

Spring Quarter

8-8:50	PERIODONTICS 401	PROSTHODONTICS 401	ORAL SURGERY 404	CONJOINT (DENT.) 402 (APPLIED THERAPY AND PRESCRIB.)	O.D.T.P.* 402
9-9:50	DENT. SCI. AND LIT. 433 (DENTAL ETHICS AND OFFICE MANAGEMENT)	PROSTHODONTICS 401 ORAL SURGERY 402	OPERATIVE DENT. 402		PEDODONTICS 400
10-12:30					
2-4:30	CLINIC	CLINIC	CLINIC	CLINIC	CLINIC

*Oral Diagnosis and Treatment Planning

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 a choice of dental books.

The American Society of Dentistry for Children. This award is presented by the Department of Pedodontics to the two senior dental students who have shown the most 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 two senior students a one-year subscription to the *Journal of Periodontology*.

The American Academy of Dental Medicine Award. A five-year subscription to the *Journal of Dental Medicine* is presented to the senior student demonstrating unusual excellence in this phase of dentistry.

Department of Prosthodontics Award. A one-year subscription to the *Journal of Prosthetic Dentistry* is presented to the senior student who has demonstrated unusual ability in this phase of clinical dentistry.

Washington State Dental Association Award. This certificate is presented to the senior student who has demonstrated character and leadership, together with the highest scholastic achievement during the four-year dental course.

American Academy of Gold Foil Operators. A plaque is awarded each year to the most deserving graduating students for gold foil excellence.

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 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 prom-

ise 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.

Fellowships

Student Part-Time Research Fellowships

Awards in the amount of \$600 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



TUITION AND FEES FOR STUDENTS OF DENTISTRY AND DENTAL HYGIENE

Autumn Quarter

CLASS	TUITION	INCIDENTAL FEE	STUDENT ACTIVITIES FEE	BUILDING FUND FEE	MICROSCOPE RENTAL*	DENTAL ENGINE RENTAL*	LABORATORY CASE RENTAL†	TOTAL
<i>Freshman</i> —RESIDENT	\$100.00	\$66.50	\$2.50	\$6.00	\$7.00	...	...	\$182.00
NONRESIDENT	165.00	116.50	2.50	6.00	7.00	...	...	297.00
<i>Sophomore</i> —RESIDENT	100.00	66.50	2.50	6.00	...	3.50	...	178.50
NONRESIDENT	165.00	116.50	2.50	6.00	...	3.50	...	293.50
<i>Junior</i> —RESIDENT	100.00	66.50	2.50	6.00	7.00	3.50	2.50	188.00
NONRESIDENT	165.00	116.50	2.50	6.00	7.00	3.50	2.50	303.00
<i>Senior</i> —RESIDENT	100.00	66.50	2.50	6.00	...	3.50	2.50	181.00
NONRESIDENT	165.00	116.50	2.50	6.00	...	3.50	2.50	296.00
<i>Graduate</i> —RESIDENT	100.00	66.50	2.50	6.00	...	3.50	...	178.50
NONRESIDENT	165.00	116.50	2.50	6.00	...	3.50	...	293.50
<i>Dental Hygienist—</i> <i>(Junior)</i> —RESIDENT	100.00	66.50	2.50	6.00	...	...	...	175.00
NONRESIDENT	165.00	116.50	2.50	6.00	...	...	...	290.00
<i>Dental Hygienist—</i> <i>(Senior)</i> —RESIDENT	100.00	66.50	2.50	6.00	...	...	...	175.00
NONRESIDENT	165.00	116.50	2.50	6.00	...	...	...	290.00

Winter Quarter

<i>Freshman</i> —RESIDENT	\$100.00	\$66.50	\$2.50	\$6.00	\$7.00	...	...	\$181.50
NONRESIDENT	165.00	116.50	2.50	6.00	7.00	...	...	297.00
<i>Sophomore</i> —RESIDENT	100.00	66.50	2.50	6.00	7.00	3.50	...	185.50
NONRESIDENT	165.00	116.50	2.50	6.00	7.00	3.50	...	300.50
<i>Junior</i> —RESIDENT	100.00	66.50	2.50	6.00	...	3.50	2.50	181.00
NONRESIDENT	165.00	116.50	2.50	6.00	...	3.50	2.50	296.00
<i>Senior</i> —RESIDENT	100.00	66.50	2.50	6.00	...	3.50	2.50	181.00
NONRESIDENT	165.00	116.50	2.50	6.00	...	3.50	2.50	296.00
<i>Graduate</i> —RESIDENT	100.00	66.50	2.50	6.00	...	3.50	...	178.50
NONRESIDENT	165.00	116.50	2.50	6.00	...	3.50	...	293.50
<i>Dental Hygienist—</i> <i>(Junior)</i> —RESIDENT	100.00	66.50	2.50	6.00	3.50	...	...	178.50
NONRESIDENT	165.00	116.50	2.50	6.00	3.50	...	...	293.50
<i>Dental Hygienist—</i> <i>(Senior)</i> —RESIDENT	100.00	66.50	2.50	6.00	...	...	...	175.00
NONRESIDENT	165.00	116.50	2.50	6.00	...	...	...	290.00

Spring Quarter

<i>Freshman</i> —RESIDENT	\$100.00	\$66.50	\$2.50	\$6.00	...	\$3.50	...	\$181.00
NONRESIDENT	165.00	116.50	2.50	6.00	...	3.50	...	296.00
<i>Sophomore</i> —RESIDENT	100.00	66.50	2.50	6.00	...	3.50	...	181.00
NONRESIDENT	165.00	116.50	2.50	6.00	...	3.50	...	296.00
<i>Junior</i> —RESIDENT	100.00	66.50	2.50	6.00	...	3.50	2.50	181.00
NONRESIDENT	165.00	116.50	2.50	6.00	...	3.50	2.50	296.00
<i>Senior</i> —RESIDENT	100.00	66.50	2.50	6.00	...	3.50	2.50	181.00
NONRESIDENT	165.00	116.50	2.50	6.00	...	3.50	2.50	296.00
<i>Graduate</i> —RESIDENT	100.00	66.50	2.50	6.00	...	3.50	...	178.50
NONRESIDENT	165.00	116.50	2.50	6.00	...	3.50	...	293.50
<i>Dental Hygienist—</i> <i>(Junior)</i> —RESIDENT	100.00	66.50	2.50	6.00	3.50	...	...	181.00
NONRESIDENT	165.00	116.50	2.50	6.00	3.50	...	...	296.00
<i>Dental Hygienist—</i> <i>(Senior)</i> —RESIDENT	100.00	66.50	2.50	6.00	...	...	...	177.50
NONRESIDENT	165.00	116.50	2.50	6.00	...	...	...	292.50

Summer Quarter

<i>Graduate</i> —RESIDENT AND NONRESIDENT	\$100.00	\$37.50	\$2.50	\$3.50	...	\$143.50
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*Subject to change.

†Laboratory case rental not available to new students after Autumn Quarter, 1963.

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 Assistant 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.



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, or 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 through 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's 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 candidate 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: Departments of Biochemistry, Biological Structure (formerly Anatomy), Microbiology, Pathology, Pharmacology, Physiology, and Biophysics.



Dental Science and Literature

Chairman

Berton E. Anderson
B324 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

In this Department, the student learns the construction of fixed partial dentures, gold crowns and inlays, and crowns of baked porcelain.

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 a major for students working toward the degree of Master of Science in Dentistry through the restorative dentistry graduate program.

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 Pathology

Chairman

Leo M. Sreebny
B122 Health Sciences Building

Oral Pathology 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 Pathology offers a graduate program for students working toward the degree of Master of Science in Dentistry with a major in Oral Pathology.

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 a graduate program for students working toward the degree of Master of Science in Dentistry with a major in Oral Surgery.

Orthodontics

Chairman

Alton W. Moore
B337 Health Sciences Building

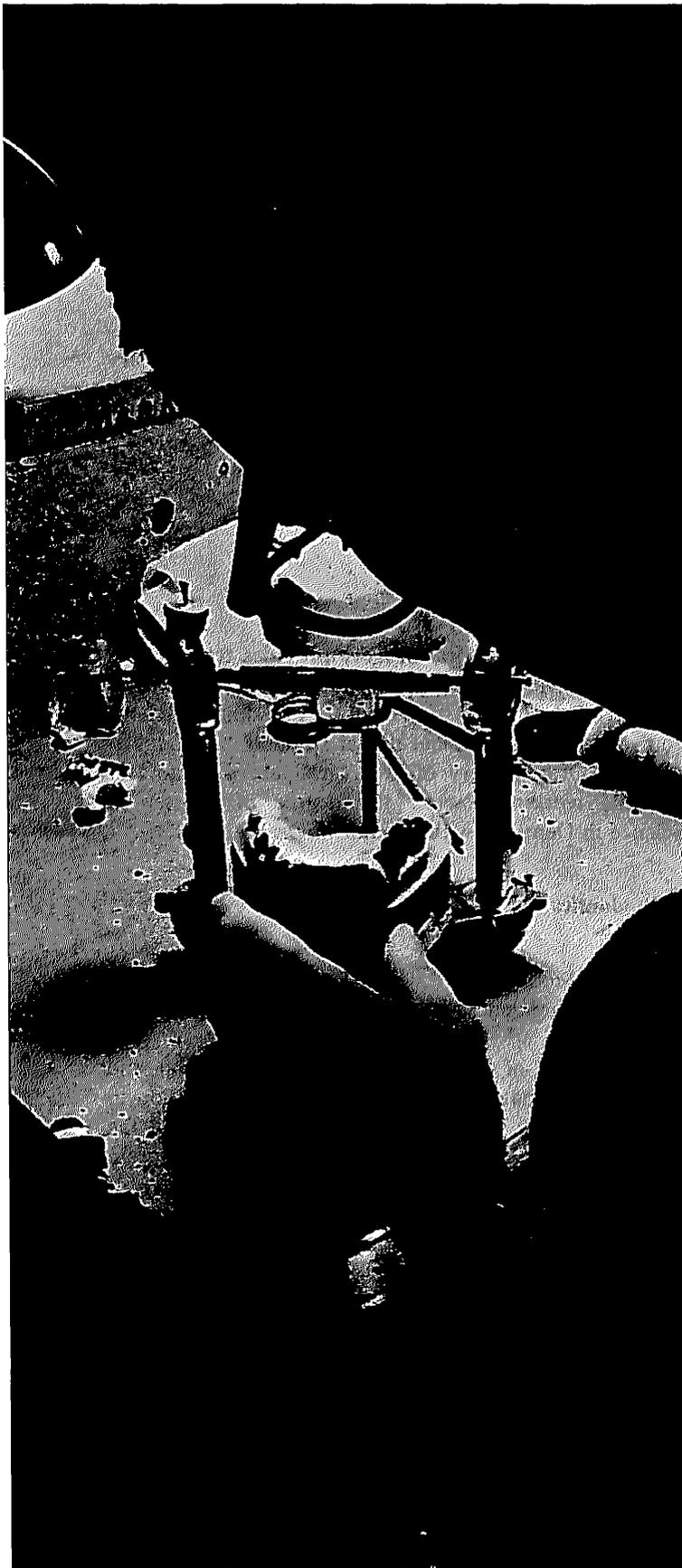
The objective of orthodontics is the prevention and correction of malocclusion of the teeth. In addition to the courses for undergraduate dental students, the Department of Orthodontics offers a graduate program for students working toward the degree of Master of Science in Dentistry with a major in 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 a graduate program for students interested in working toward the degree of Master of Science in Dentistry with a major 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 a graduate program for students working toward the degree of Master of Science in Dentistry with a major 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 a major for students working toward the degree of Master of Science in Dentistry through the restorative dentistry graduate program.

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

Kenneth Mifflin

This laboratory furnishes prosthodontic technician services to undergraduate students of the department and for the department's maxillofacial section. The laboratory furnishes its services to other departments of the school and 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

Two years of pre dental hygiene courses in the College of Arts and Sciences, followed by a two-year program in dental hygiene, lead to a Bachelor of Science degree with a major in Dental Hygiene. The educational program is approved by the Council on Dental Education of the American Dental Association.

Two curricula are offered. Undergraduate students take the basic curriculum, which provides a background in the educational and clinical skills required for the professional practice of dental hygiene. Students who have received certificates in Dental Hygiene from other schools take a curriculum to prepare them for specialized positions in Public Health Dental Hygiene or Dental Hygiene Education.

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 X-ray 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 Pre dental Hygiene

The basic curriculum is open to women of good health between the ages of eighteen and thirty-five. An applicant must meet the requirements of the College of Arts and Sciences as outlined in the *Arts and Sciences* section and complete 90 credits scheduled to include the courses listed below in addition to satisfying the required quarters of physical education activities.

COURSES	CREDITS
ENGL 101, 102, 103 ENGLISH COMP.	9
BIOL 101J, 102J, or ZOOL 111-112	10
CHEM 101 GENERAL AND ORGANIC CHEMISTRY	5
CHEM 102 GENERAL CHEMISTRY	5
PSYCH 100 GENERAL PSYCHOLOGY	5
SOC 110 SURVEY OF SOCIOLOGY	5
SPCH 100 BASIC SPEECH IMPROVEMENT	5
TO MEET DISTRIBUTION OF GROUP REQUIREMENTS OF ARTS AND SCIENCES OF DEPARTMENT OF DENTAL HYGIENE	
AUTHORIZED SUBSTITUTES	46
PHYSICAL EDUCATION ACTIVITY COURSES	3

Students taking their preprofessional training at the University of Washington follow the two-year pre dental hygiene program offered in the College of Arts and Sciences (see the *Arts and Sciences* section). Students in other institutions should check the course descriptions given in 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 the credits obtained during their first year of study. This may be accomplished by writing directly to the Department of Dental Hygiene.

Dental Hygiene Aptitude Test

All dental hygiene applicants are required to take the aptitude test given under the auspices of the American Dental Hygienists' Association. The test is given only twice each year and an applicant must plan to take the test prior to the April 1 application. Information about the test and the dates and places it is given may be

obtained from the Department of Dental Hygiene in the School of Dentistry.

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 pre-dental hygiene education was obtained.

3. A written list of subjects which the applicant is taking or will take to complete the requirements.

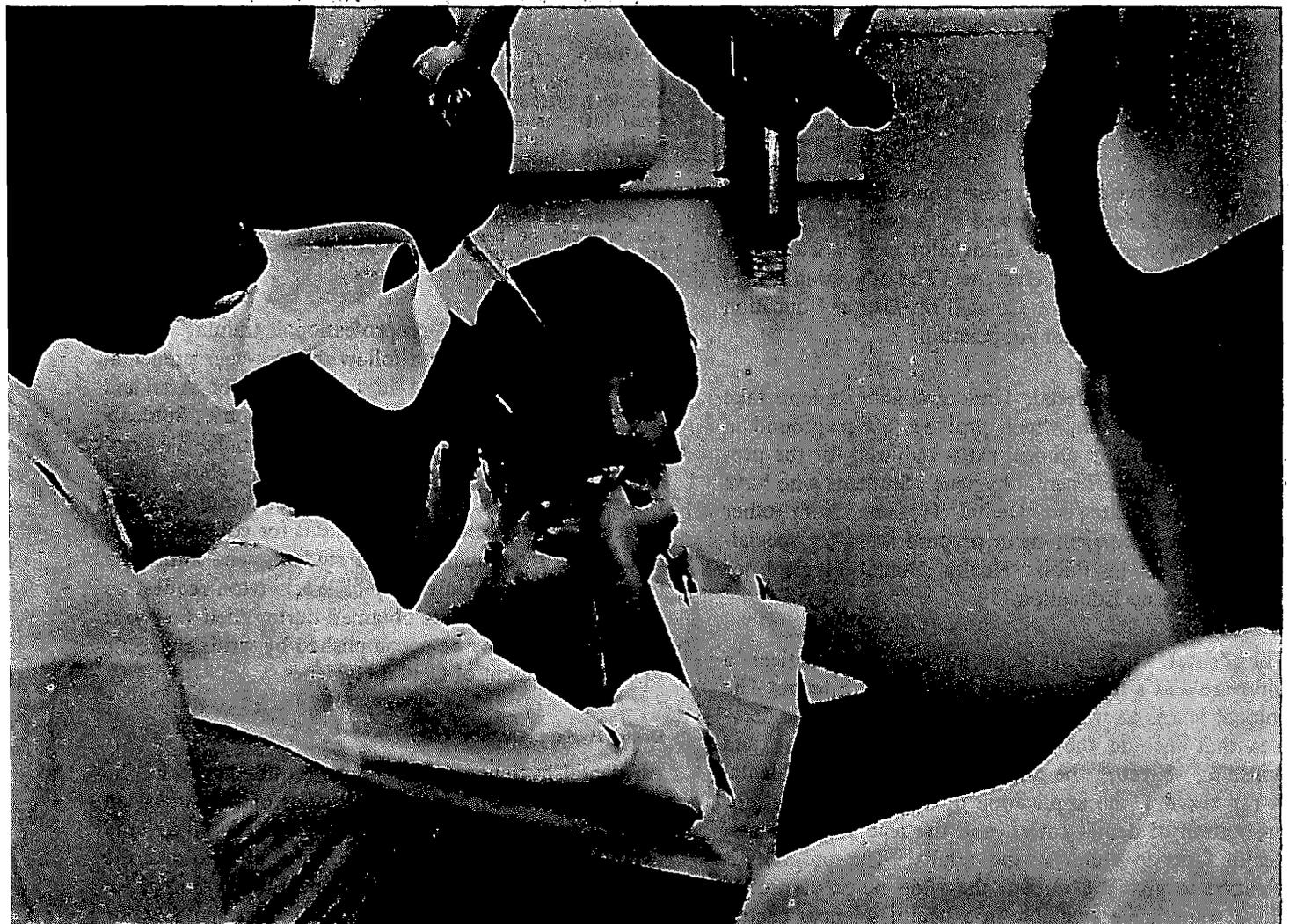
4. At least two letters of recommendation from business or professional persons.

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 test rating, 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 reached a decision.

Tuition And Fees

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 School of Dentistry and of Medicine and the College 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 Biological Structure and Physiology); Education 209 (Introduction to Educational Psychology); Education 405 (Problems of Adolescence); 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 supplement their previous education with the background necessary for positions in administration, teaching, and public health. Students choose a

major in either dental hygiene or public health dental hygiene. The requirement for graduation in this curriculum is a total of 180 academic credits, which must include pre-dental hygiene requirements, courses listed for the basic curriculum, and the course requirements for one of the majors.

Major in Dental Hygiene

Students must fulfill the requirements of the pre-professional 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.

Major in Public Health Dental Hygiene

Students must fulfill the requirements of the pre-professional program and the basic curriculum. Required credits include 36 in dental hygiene plus a minimum of 10 taken with this Department and 36 in public health (to meet health education requirements in the Department of Preventive Medicine, School of Medicine).

The Public Health Traineeship Program of the United States Public Health Service offers awards to dental hygienists for undergraduate public health training.

CONTINUING DENTAL EDUCATION

Director

Berton E. Anderson
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

B322 Health Science Building

Master of Science in Dentistry

The School of Dentistry offers, through the Graduate School, course work leading to a Master of Science in Dentistry degree with a major in Endodontics, Oral Pathology, Oral Surgery, Orthodontics, Pedodontics, Periodontics, or Restorative Dentistry (Fixed Partial Dentures, Operative Dentistry, Prosthodontics).

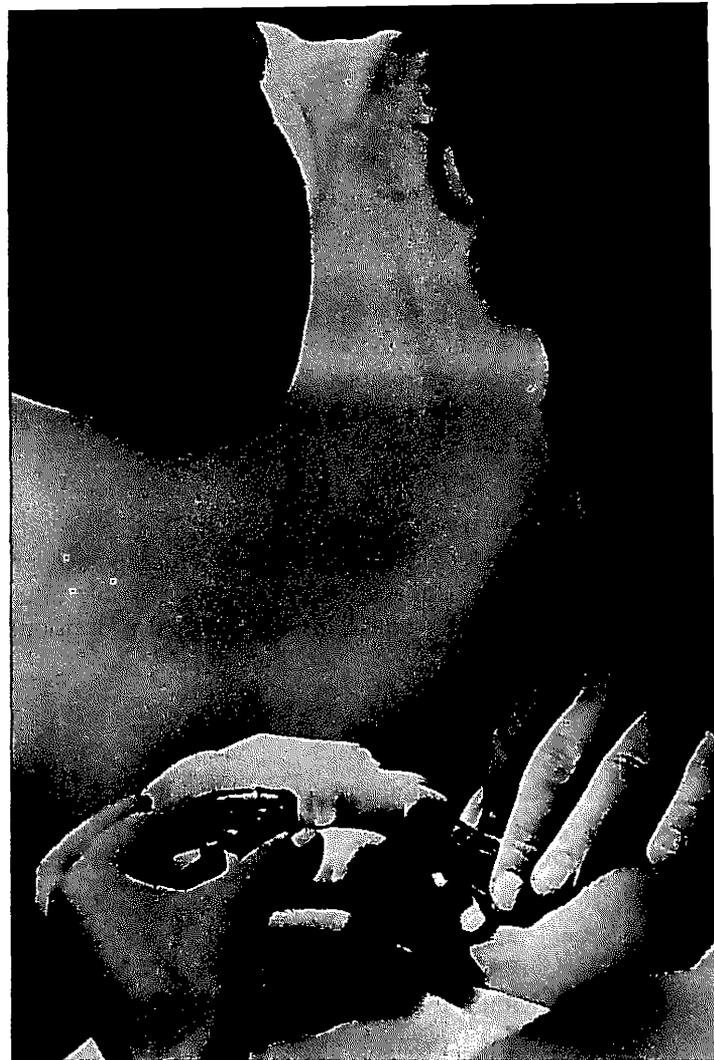
Admission

An applicant is eligible for admission to the Graduate School for work leading to a Master of Science in Dentistry degree 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. The applicant must also meet the admission requirements of the University of Washington Graduate School.

After an applicant has been declared eligible for admission to the Graduate School, his 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 major field commencing Autumn Quarter is as follows: ten in Orthodontics, two in Pedodontics, five in Periodontics, two in Endodontics, 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.

Residence

A minimum of six consecutive quarters (18 months) of residence is required for the Master of Science in Dentistry degree with a major in Orthodontics or Pedodontics; eight quarters (24 months) in Endodontics, or Oral Pathology; three quarters (9 months) of residence for Oral Surgery, plus two-year hospital residency, combined academic and hospital work. Under the program for Restorative Dentistry, the student determines his major (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 the standard master's or doctor's program in the basic science choice of the student. The M.S.D. degree will be offered only in special circumstances.

Programs

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 major department 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.

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 postgraduate 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 and particulars regarding graduate study in the School of Dentistry, address: Director of Graduate Dental Education, University of Washington, School of Dentistry, Seattle, Washington 98105.

Class Schedules

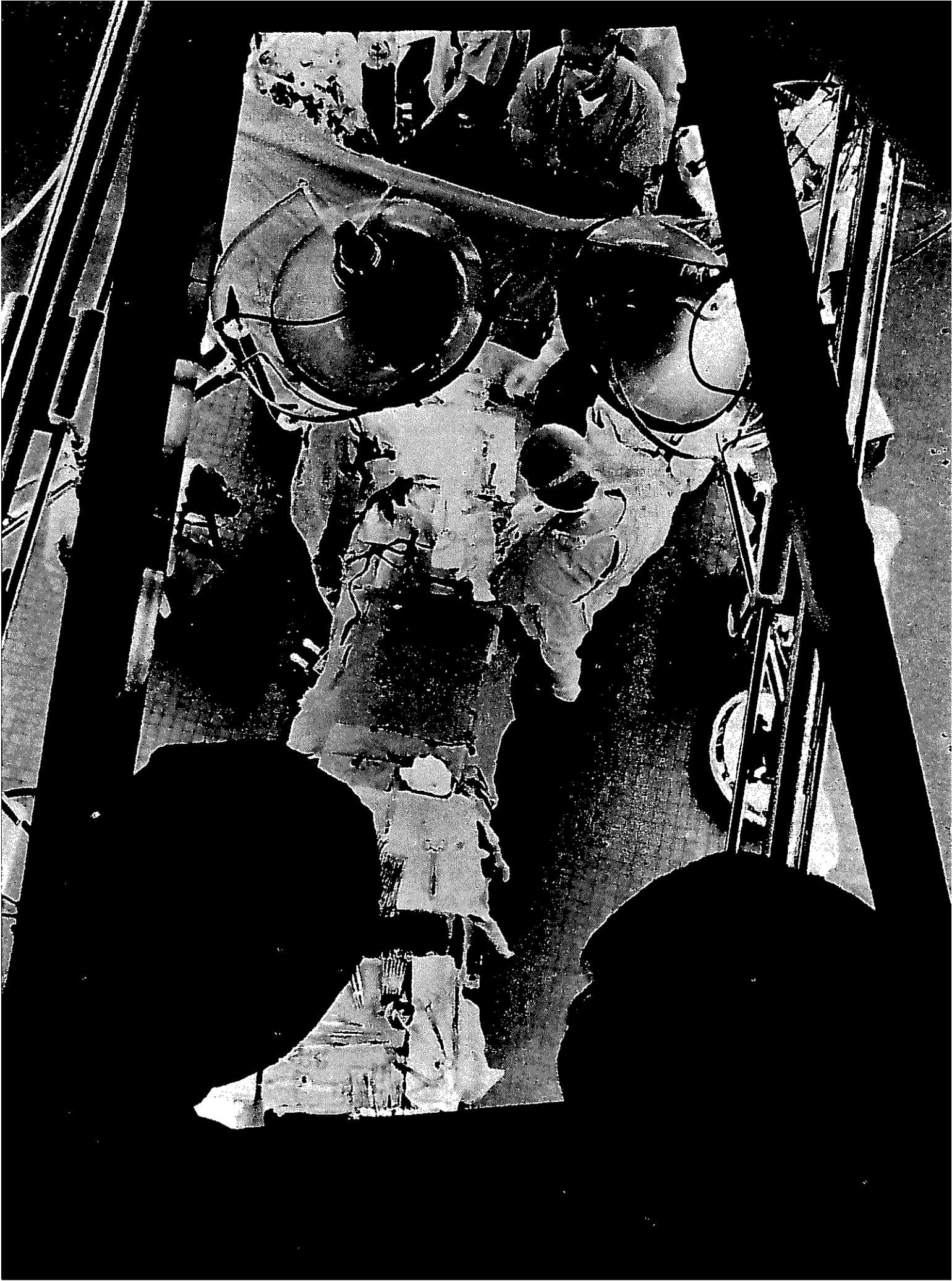
The graduate programs of the School of Dentistry operate on the quarter system of the University. There are three 11-week quarters in the academic school year. In order for the graduate dental programs to be continuous, the Summer Quarter has also been made an 11-week quarter, or equivalent in length to the other quarters in the school year.

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 major in any one of the major 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 the School of Dentistry. It is imperative that applicants observe this deadline in order to ensure prompt attention to credentials and replies to correspondence.

Postgraduate Instruction: Certificates in Dentistry

Requirements for admission to the postgraduate 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 postgraduate student is required 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.





MEDICINE

Dean

John R. Hogness
C304 Health Sciences Building

Assistant Deans

Charles W. Bodemer
William O. Robertson

The healer of the sick has always played an important and essential rôle 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) sound 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 soundly 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 and Rehabilitation. Courses are also offered for practicing physicians.

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 Department of Surgery, a program leading to the degree of Master of Science is 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 major.

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, Obstetrics and Gynecology, Pediatrics, Physical Medicine and Rehabilitation, Psychiatry, Radiology, and Surgery provide clinical study in the fields of medical specialization and in general medical practice.

The School of Medicine is approved by the Council on Medical Education and Hospitals of the American Medical Association and by the Association of American Medical Colleges. 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, 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 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.

	<i>Quarter Credits</i>	<i>Semester Credits</i>
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*. The final date on which applications for entrance in Autumn Quarter may be submitted is *January 1*. An application fee of \$5.00 is required of all applicants who are not residents of the state of Washington. On or before that date, 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. Canadian applicants must include a copy of their University Entrance Certificate.
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 Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.
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, Mrs. Helen Pearce, 121 Miller Hall, for help in planning their programs.

Information concerning admissions 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. 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. 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 two 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. (See the table of charges for medical, medical technology, physical therapy, and occupational therapy students.)



TUITION AND FEES PER QUARTER FOR STUDENTS OF MEDICINE, PHYSICAL THERAPY, OCCUPATIONAL THERAPY, AND MEDICAL TECHNOLOGY

TYPE OF REGISTRATION	TUITION FEE	INCIDENTAL FEE	STUDENT ACTIVITIES FEE	BUILDING FUND FEE	TOTAL FEES AUTUMN, WINTER AND SPRING QUARTERS
MEDICINE					
RESIDENT	\$100.00	\$66.50	\$2.50	\$6.00	\$175.00
NONRESIDENT	165.00	116.50	2.50	6.00	290.00
PHYSICAL THERAPY					
RESIDENT	65.00	37.50	2.50	6.00	111.00
NONRESIDENT	125.00	82.50	2.50	6.00	216.00
OCCUPATIONAL THERAPY AND MEDICAL TECHNOLOGY					
RESIDENT-FULL-TIME	65.00	37.50	2.50	6.00	111.00
NONRESIDENT-FULL-TIME	125.00	82.50	2.50	6.00	216.00
RESIDENT-PART-TIME†	65.00	15.00	*	*	80.00
NONRESIDENT-PART-TIME†	125.00	50.00	*	*	175.00

For information concerning resident, nonresident, and veterans status, see *Appendix*. 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.

*Optional

†Clinical Training

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 ever-increasing demands of medical education in terms of the effort and 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.

The University of Washington School of Medicine has received substantial private and public endowments which provide financial aid to deserving medical students in the nature of awards and prizes, fellowships, research traineeships, scholarships, grants-in-aid, and loans. Information relative to various awards is available in the *Handbook of Scholarships*, Office of the Dean of Students.

Application 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.

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 (\$525) to larger amounts sufficient to cover the entire financial needs of the student through four years of medical school.

A 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 and need.

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.

In 1963, grant expenditures in the School of Medicine for research projects totaled \$7,691,489, including \$2,055,353 in training grants.

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 of \$500 to \$1,100 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 Students 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

THESIS AWARD

An award of \$100 is given for the best thesis written by a graduating senior as determined by the Thesis Committee.

DR. EVERETT O. JONES SCHOLARSHIP PRIZES

Prizes of \$100 are awarded students who have demonstrated outstanding scholarship each year.

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.

FREDERICK 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.

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 an-

nual award of \$250 for outstanding achievement in surgery by a senior student.

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 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. 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 students receive *E* in more than one major subject in one year, they may not make up these deficiencies. 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 1964-65 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. In these studies, the student works closely with people preparing him 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 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 and clinical conferences which are assigned to the departments of the School of Medicine.

Elective Courses

Approximately 25 per cent of the available class hours in each year 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

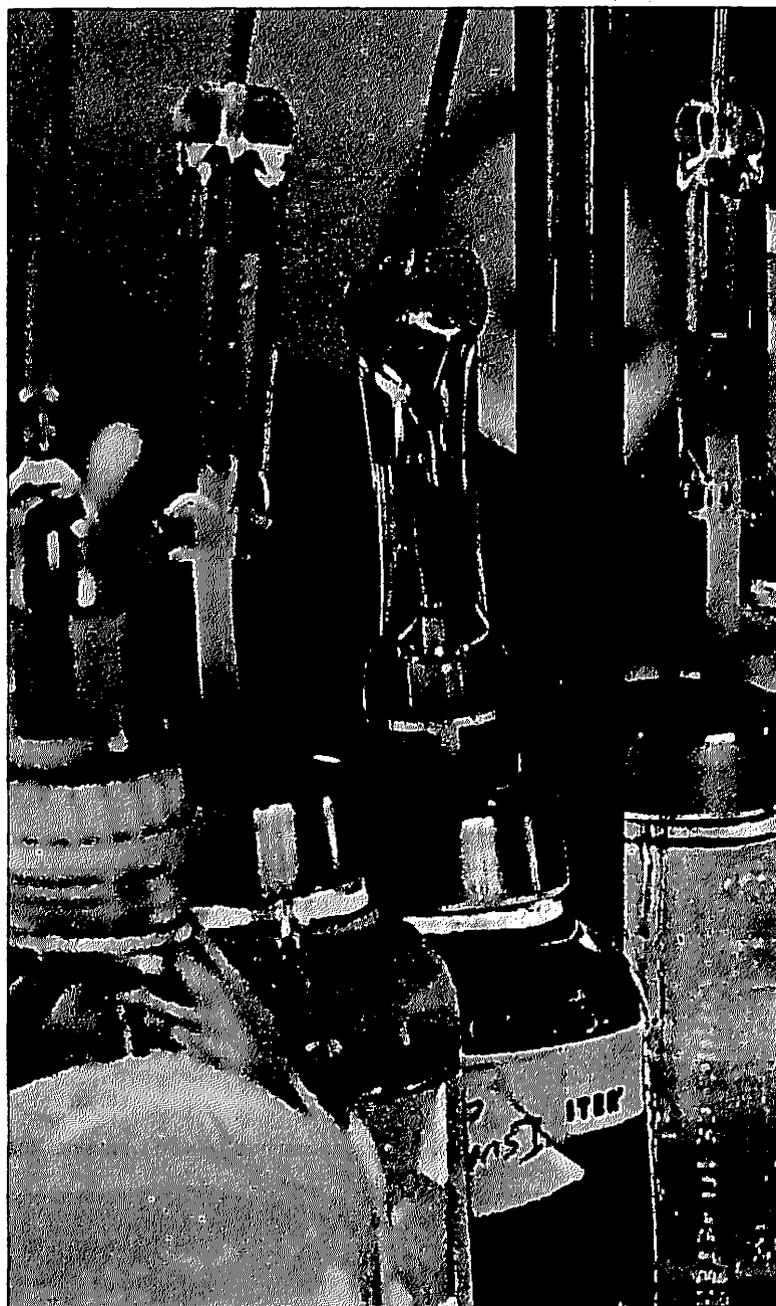
The interested and qualified medical student may earn a Master of Science degree while enrolled in the School of Medicine. To enter the M.D.-M.S. program, the medical student must meet the admissions requirement of the University of Washington Graduate School and be accepted into one of the departments 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 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, Surgery, and Physiology and Biophysics, by adding certain graduate courses without increasing the time in the School of Medicine.

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 ranging from \$900 to \$1,100 for the three-months period, 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 1964-65
Autumn Quarter

HOUR	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
8:30	PSYCH. 400	BIOL. STR. 405- LABORATORY	BIOL. STR. 405-	BIOL. STR. 401-	BIOL. STR. 404	UNASSIGNED
9:30	BIOCH. 401-		BIOL. STR. 405- LABORATORY	BIOL. STR. 401- LABORATORY		
10:30	BIOCH. CONF.					
11:30		BIOCH. 401	BIOCH. 401	BIOCH. 401	BIOCH. 401	
12:30	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
1:30	BIOL. STR. 401-	UNASSIGNED	BIOL. STR. 401-	UNASSIGNED	BIOL. STR. 401-	
2:30	BIOL. STR. 401- LABORATORY		BIOL. STR. 401- LABORATORY		BIOL. STR. 401- LABORATORY	
3:30						
4:30						

Winter Quarter

8:30	BIOCH. -402-	PSYCH. 400	BIOL. STR. -402-	BIOCH. -402-	BIOCH. -402-	BIOL. STR. -402-
9:30	BIOL. STR. -406	PHYSIOL. 401-	BIOL. STR. -402- LABORATORY	PHYSIOL. 401-	BIOL. STR. -406	BIOL. STR. -402- LABORATORY
10:30	BIOL. STR. -406 LABORATORY	PHYSIOL. 401-CONF.		PHYSIOL. 401-CONF.	BIOL. STR. -406 LABORATORY	
11:30		UNASSIGNED		UNASSIGNED		
12:30	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
1:30	BIOCH. -403 CONF.	UNASSIGNED	BIOCH. -403 CONF.	UNASSIGNED	PHYSIOL. 401-	
2:30	BIOCH. -403 LABORATORY		BIOCH. -403 LABORATORY		PHYSIOL. 401- LABORATORY	
3:30						
4:30						

Spring Quarter

8:30	BIOL. STR. -403	CONJ. 409	BIOL. STR. -403	CONJ. 409	CONJ. 409	UNASSIGNED
9:30	BIOL. STR. -403 LABORATORY		BIOL. STR. -403 LABORATORY			
10:30		CONJ. 409 LABORATORY		CONJ. 409 LABORATORY	CONJ. 409 LABORATORY	
11:30					PHYSIOL. -402 CONF.	
12:30	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
1:30	PHYSIOL. -402	UNASSIGNED	PHYSIOL. -402	UNASSIGNED	PHYSIOL. -402	
2:30	PHYSIOL. -402 LABORATORY		PHYSIOL. CONF.		PHYSIOL. -402 LABORATORY	
3:30			UNASSIGNED			
4:30						



SECOND-YEAR SCHEDULE 1964-65

Autumn Quarter

HOUR	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
8:30	PATH. 441-	PHARMACOL. 442-	PATH. 441-	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. 441-		PHARMACOL. 442-	
12:30	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
1:30	PATH. 441-	UNASSIGNED	PHARMACOL. 442- LABORATORY	UNASSIGNED	PATH. 441-	
2:30	PATH. 441- LABORATORY				PATH. 441- LABORATORY	
3:30						
4:30	PATH. CONF.				PATH. 441-	

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
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.					
4:30	PATH. -443 CONF.				MICRO. 443, 444 LABORATORY	

THIRD-YEAR CLERKSHIP SCHEDULE 1964-65

1 WK.	TERM I—8 WEEKS	TERM II—8 WEEKS	TERM III—8 WEEKS	TERM IV—8 WEEKS	1 1 WK.WK.	
SECTIONS	SEPT. 28-NOV. 26	NOV. 30-FEB. 2	FEB. 3-APRIL 1	APRIL 2-MAY 29		
LABORATORY PROCEDURES	SECTION A 1/4 OF CLASS	MEDICINE CLERKSHIP	MEDICINE CLERKSHIP	PSYCHIATRY CLERKSHIP	SURGERY CLERKSHIP	PEDIATRICS CLERKSHIP
	SECTION B 1/4 OF CLASS	MEDICINE CLERKSHIP	PSYCHIATRY CLERKSHIP	SURGERY CLERKSHIP	PEDIATRICS CLERKSHIP	MEDICINE CLERKSHIP
	SECTION C 1/4 OF CLASS	SURGERY CLERKSHIP	PEDIATRICS CLERKSHIP	MEDICINE CLERKSHIP	MEDICINE CLERKSHIP	PSYCHIATRY CLERKSHIP
	SECTION D 1/4 OF CLASS	PEDIATRICS CLERKSHIP	MEDICINE CLERKSHIP	MEDICINE CLERKSHIP	PSYCHIATRY CLERKSHIP	SURGERY CLERKSHIP
					EXAMINATIONS READING PERIOD	

THIRD-YEAR LECTURE SCHEDULE 1964-65

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 1964-65

	TERM I—12 WEEKS	TERM II—12 WEEKS	TERM III—12 WEEKS	JUNE 7-12
SECTIONS	SEPT. 21-DEC. 12	DEC. 14-MARCH 13	MARCH 15-JUNE 5	
SECTION A 1/8 OF CLASS	MEDICINE PSYCHIATRY PREVENTIVE MEDICINE	ELECTIVES	SELECTED SURGICAL SPECIALTIES	OBSTETRICS- GYNECOLOGY
SECTION B 1/8 OF CLASS	ELECTIVES	SELECTED SURGICAL SPECIALTIES	OBSTETRICS- GYNECOLOGY	OBSTETRICS- GYNECOLOGY
SECTION C 1/8 OF CLASS	OBSTETRICS- GYNECOLOGY	OBSTETRICS- GYNECOLOGY	ANESTHESI- OLOGY PHYS. MED. AND REHAB.	MEDICINE PSYCHIATRY PREVENTIVE MEDICINE
				ELECTIVES
				SELECTED SURGICAL SPECIALTIES
				EXAMINATIONS

Medical Practice N483—Hospital Extension Service. Each student is responsible for an assigned number of home care cases throughout the year under the guidance of an instructor.

FOURTH-YEAR LECTURE SCHEDULE 1964-65

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 and 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 Honor is awarded those students in the highest ten per cent of the class who have written a thesis acceptable to the Thesis Committee of the School of Medicine.

Bachelor of Science

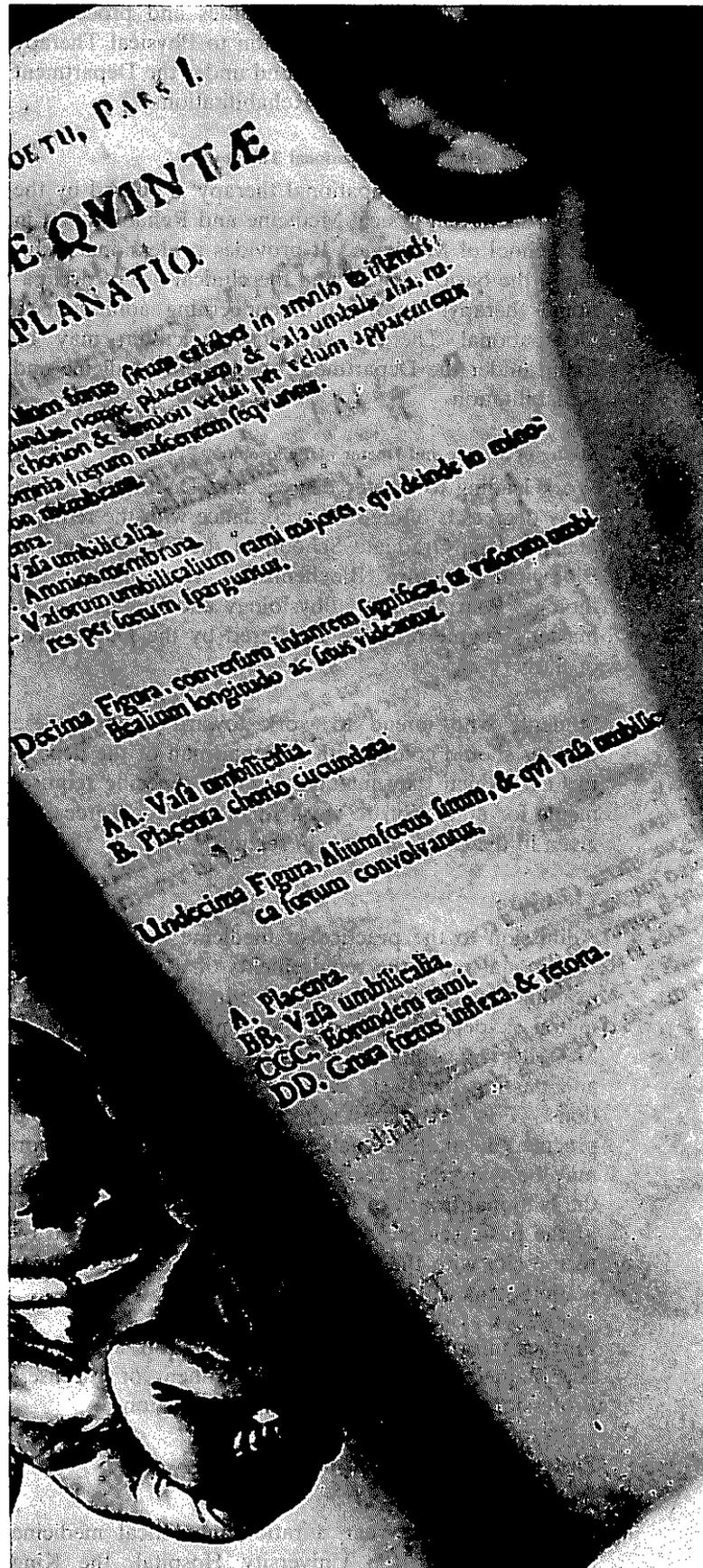
A curriculum leading to a bachelor's degree with a major in microbiology is offered through the College of Arts and Sciences. Microbiology courses are described in this Bulletin, and the curriculum is described in the *College of Arts and Sciences* section.

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 14-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 degrees and Doctor of Philosophy 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 Department of Surgery.

Students who intend to work toward one of these degrees should confer with the chairman of the department in which they intend to major. Specific requirements for admission to work for advanced degrees are given in the *Graduate School* 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. 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

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
C408B Health Sciences Building

Professors

Hans Neurath, Edmond H. Fischer, Donald J. Hanahan,
Edwin G. Krebs

Associate Professors

Earl W. Davie, Milton P. Gordon, Alex Kaplan, Philip
E. Wilcox

Assistant Professors

Guy A. Thompson, Jr., Kenneth A. Walsh

Research Appointments

Patrick Goldsworthy, Marjorie C. Lindberg, Darrel H.
Spackman

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

Earl W. Davie
D413 Health Sciences Building

Admission

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. Candidates must also meet the general entrance 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 past the bachelor's degree 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.

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 course 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 traineeships 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

*Formerly Anatomy.

Associate Professors

Charles W. Bodemer, John H. Luft, George F. Odland, William O. Rieke, Julia G. Skahen

Assistant Professors

Charles E. Blevins, Douglas E. Kelly, Barbara Landau, John W. Sundsten, Daniel G. Szollosi, Richard L. Wood

Instructor

M. Roy Schwarz

Research Appointments

Edward A. Boyden, Ruth E. Rumery, Muttaiya Sundaralingam, David G. Watson

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

E. L. Roosen-Runge
G501 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, 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 Education* 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 Postgraduate 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.

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.

MICROBIOLOGY

Chairman

Charles A. Evans
G305 Health Sciences Building

Professors

Howard C. Douglas, Charles A. Evans, Neal B. Groman, Bernard S. Henry, Erling J. Ordal, John C. Sherris, Russell S. Weiser

Associate Professor

Brian J. McCarthy

Assistant Professors

Eugene W. Nester, C. Evans Roberts, Charles R. Spotts

Instructor

Esther A. Duchow

Research Appointments

Margaret N. Bingham, Velma Chambers, Robert E. Pacha, George Ridgway, Helen R. Whiteley

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 medical students, the Department of Microbiology offers programs in microbiology leading to a bachelor's degree in the College of Arts and Sciences. (See *Arts and Sciences* section.) The undergraduate degree prepares the individual for the responsibilities of a microbiologist upon graduation



and 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 *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 meet the requirements of the Graduate School as outlined in the *Graduate Education* section. The fields of specialization for advanced degrees are general and medical bacteriology, immunology, medical mycology, virology, and microbial physiology and genetics. Course requirements vary according to the field chosen.

PATHOLOGY

Chairman

Earl P. Benditt
D505 Health Sciences Building

Professors

Ellsworth C. Alvord, Jr., Earl P. Benditt, Leo M. Sreebny

Associate Professors

David B. Brown, Cecil Hougie, N. Karle Mottet, Richmond T. Prehn, George M. Martin

Assistant Professors

James L. Bennington (acting), Lamont W. Gaston, David Lagunoff, Russell Ross, Edward A. Smuckler, Benjamin F. Trump

Instructors

S. Bruce Beckwith, A. H. D. Remedios, Rudolf Vracko, Louise Wiegenstein

Research Appointments

Nils Eriksen, Elizabeth K. Smith, Ruth M. Watts

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, the analysis of disease expertly utilizes light and electron microscopy, histo- and cytochemistry, analytic biochemistry, cell and tissue culture, and immunology.

Courses are offered for medical students, dental students, and other students of the health sciences.

Undergraduate Programs

Bachelor of Science in Medical Technology

The required curriculum is described elsewhere in this Catalog.

Specialized undergraduate training is also available in electron microscopy, histochemistry, and cytotechnology. Graduates of such programs may look forward to employment in hospital, clinical, and medical research laboratories as medical technologists.

Graduate Programs

Graduate Program Adviser

Earl F. Benditt
D505 Health Sciences Building

Doctor of Philosophy

A program leading to the Doctor of Philosophy degree in the field of experimental pathology is offered through the Graduate School. Graduates of this program should be qualified for 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 a specialized program in neuropathology.

Residency Training Program

The Department supervises a residency training program in Hospital 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 Pathologic Anatomy and the American Board of Clinical 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.

Curriculum in Medical Technology

Adviser

Edward A. Smuckler
E503 Health Sciences Building

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 two years. Students are referred to the *College of Arts and Sciences* section for course descriptions and credits and for an explanation of the University requirements for English and physical education. The advisory office of the College of Arts and Sciences is in 102 Smith Hall. Beginning with the Autumn 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 Spring Quarter of the third year, students apply for admission to the School of Medicine for the 14-month period of full-time instruction in Medical Technology. During this period they register for Pathology 321, 322-323-424-425, and 426 (Medical Technology). The first eight months of this period consist of full-time classroom and laboratory instruction offered in the School of Medicine. This is followed by approximately six months of full-time instruction and supervised experience in affiliated hospital and public health laboratories.

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.

Bachelor of Science in Medical Technology

A suggested sequence of required courses is as follows:

First Year

FIRST QUARTER		CREDITS
CHEM 140	GENERAL	3
MATH 105	GENERAL	5
OR 155	ALGEBRA	3
		6 OR 8

SECOND QUARTER		CREDITS
CHEM 150	GENERAL	4
CHEM 151	LABORATORY	2
ZOOL 111	GENERAL	5
		11

THIRD QUARTER		CREDITS
CHEM 160	GENERAL	3
CHEM 170	QUAL. ANAL.	3
ZOOL 112	GENERAL	5
		11

Second Year

FIRST QUARTER		CREDITS
CHEM 221	QUANT. ANAL.	5
		5

SECOND QUARTER		CREDITS
CHEM 231	ORGANIC	3
CHEM 241	ORG. CHEM. LAB.	2
		5

THIRD QUARTER		CREDITS
CHEM 232	ORGANIC	3
CHEM 242	ORG. CHEM. LAB.	2
		5

Third Year

FIRST QUARTER		CREDITS
MICRO 441-	MED. BACT.	5-
		5-

SECOND QUARTER		CREDITS
MICRO -442	MED. BACT.	-5
		-5



THIRD QUARTER		CREDITS
MICRO 443	MYCOLOGY	2
MICRO 444	PARASIT.	4
BIOC 361	BIOCHEM.	3
BIOC 363	BIOCHEM. LAB.	2
		11

It is suggested that students might elect such courses as Biological Structure 301, Pathology 310, and Chemistry 335, 336 and 337, or Biochemistry 481, 482, 483, in place of their respective courses in chemistry and biochemistry. Permission is required for courses in biochemistry and microbiology. Electives should be chosen among the humanities to ensure a well-rounded education.

Fourth Year

During the 14-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.

PHARMACOLOGY

Chairman and Graduate Program Adviser

James M. Dille
F421 Health Sciences Building

Professors

James M. Dille, Ted A. Loomis, Donal F. Magee,
Theodore C. West

Associate Professor

Akira Horita

Assistant Professors

John T. Elder, Audrey R. Holliday

Instructor

Bernard P. Salafsky

Research Appointment

Lavern J. Weber

Pharmacology deals with the mechanisms whereby modification of physiological function is produced by drugs, and with the application of these drugs to the relief and treatment of disease.

The Department of Pharmacology provides courses for medical, dental, and pharmacy students and for those doing graduate work in these 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 Education* 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

Theodore C. Ruch
G405 Health Sciences Building

Professors

Harry D. Patton, Theodore C. Ruch, Robert F. Rushmer, Allen M. Scher, J. Walter Woodbury, Allan C. Young

Associate Professors

Kurt R. Galley (acting), Julia G. Skahen, Orville A. Smith, Arnold L. Towe

Assistant Professors

Arthur C. Brown, John T. Conrad, Thomas F. Hornbein, Thelma T. Kennedy, Mitchell Glickstein, Barbara Landau, Charles F. Stevens, Robert L. Van Citters, Curt A. R. Widerhielm

Instructors

Albert McC. Gordon, Theodore H. Kehl, Curt A. R. Widerhielm

Research Appointments

Edward J. Masoro, Alan R. Koch, Edmund H. Brand, Russel W. Morse, H. Fred Stegall

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

Thelma T. Kennedy
C405 Health Sciences Building

Admission

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.

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, a conjoint Ph.D. degree program in these subjects is offered.

The basic graduate courses in physiology and biophysics include 401-402 and Conjoint 409 (Basis of Neurology).

PREVENTIVE MEDICINE

Chairman

J. Thomas Grayston
B506 Health Sciences Building

Professor

J. Thomas Grayston

Associate Professors

Blair M. Bennett, Harry B. Martin, Reimert T. Ravenholt, G. Spencer Reeves

Assistant Professors

E. Russell Alexander, George E. Kenny, Caswell A. Mills, Edward B. Perrin

Instructors

Theodore C. Doege, Irvin Emanuel, John O. Fish, Jack B. Hatlen, Jr., James E. Merritt

Research Appointments

Harley H. Bovee, Howard M. Senkin, Peter A. Breysse, Edwin S. Boatman, Ruth P. Kirk

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 subjects listed above. The Department offers an approved residency program in preventive medicine, provides postdoctoral research training, and offers an M.S. in Epidemiology. An M.D., D.V.M., or Ph.D. in medical science is a prerequisite for admission.

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. In the descriptions of these courses, the name of the department with primary responsibility for each course precedes the names of the other sponsoring departments.

MEDICAL PRACTICE

For a list of courses, see under *Description of Courses*. 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
BB449 University Hospital

Associate Professors

Theodore N. Finley, John M. Hansen

Assistant Professors

Edward W. Crawford, Thomas F. Hornbein

Instructors

Geordis M. Aasheim, Toshio Akamatsu, Gerald E. Allen, Lydia J. Deveny, Felix G. Freund, John H. Stevens, Richard J. Ward, William F. Kennedy, Frederick W. Cheney

Research Appointment

Andrew G. Tolas

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 some experience in anesthesiology.

MEDICINE

Chairman

Robert G. Petersdorf
BB557 University Hospital

Professors

George N. Aagaard, Robert A. Bruce, 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. Donnal Thomas, Wade Volwiler, Robert H. Williams

Associate Professors

Edwin L. Bierman, Gian E. Chatrian, Leonard A. Cobb, John L. Decker, Harold T. Dodge, J. Thomas Dowling, Eloise Giblett, Seymour J. Klebanoff, George F. Odland, C. Alvin Paulsen, Clayton Rich, Paul P. Van Arsdel

Assistant Professors

John R. Blackmon, San Tjian Boen, Ralph E. Cutler, John W. Ensinnck, L. Frederick Fenster, Lamont W. Gaston, Charles J. Goodner, John W. Huff, Thomas E. Morgan, Jr., Wil B. Nelp, Frank Parker, C. Evans Roberts, Phillip Swanson, Marvin Turck, Andrea Turimese, Peter O. Ways, Francis C. Wood, Jr.

Instructors

Richard L. Birchfield, David G. Fryer, Louis A. Healey, Jr., Frederick Hecht, Willard P. Johnson, Harold Sandler

Research Appointments

John A. Glomset, Patrick D. Goldsworthy, Raymond Alexanian, Loring B. Rowell, David Steinmuller, 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 65 postdoctoral research fellows working in various divisions of the Department.

OBSTETRICS AND GYNECOLOGY

Chairman

Charles A. Hunter
BB617 University Hospital

Professors

Charles A. Hunter, Jr., Walter Herrmann

Associate Professor

David C. Figge

Assistant Professors

John T. Conrad, Wayne L. Johnson, Ronald J. Pion

Instructors

Ralph W. Goering, Leon R. Spadoni, Kent Ueland

Research Appointments

Suzanne H. Conrad, Marjorie C. Lindberg, Darrel H. Spackman

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.

PEDIATRICS

Chairman

Ralph J. Wedgwood
BB807 University Hospital

Professors

Robert A. Aldrich (on leave), Robert W. Deisher (on

leave), Vincent C. Kelley, Bruce Mackler, Ralph J. Wedgwood

Associate Professors

Warren G. Guntheroth, Thomas K. Oliver, William O. Robertson, Thomas H. Shepard

Assistant Professors

E. Russell Alexander, David Baum, Abraham B. Bergman, Marilyn L. Cowger, Pierre Ferrier, Sherrel L. Hammar, Robert P. Igo, Charles P. Mahoney, Beverly C. Morgan, David B. Shurtleff, Theodore D. Tjossem

Instructors

Doris Alleyne, Mary M. Campbell, John T. Chapman, Starkey Davis, Neil Duncanson, Frederick Hecht, Robert O. Hickman, George Limbeck, Ellen McNellis, Ann Pytkowicz, Otis E. Ramsey, E. Franklin Stone, John G. Wallace, Christopher P. Williams

Research Appointments

Robert F. Labbe, 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.

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 Professor

Wilbert E. Fordyce

Assistant Professors

Robert Honet, Robert H. Jebsen, Jo Ann McMillan,
Walter C. Stolov, David C. Symington

Instructors

Jan Job Faber, Ronald Hartley, Joseph T. Kunce,
Jennie A. Lucci, Lois A. Rathbun, M. Geraldine Shevlin,
Ronald R. Silverman, Bernard C. Simons, Katherine
L. Tremain, Martha J. Trotter, Frances B. Weatheril

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 paramedical specialties; 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 a curriculum in Occupational Therapy and one in Physical Therapy.

Occupational Therapy

Adviser

Geraldine Shevlin
EE803 University Hospital

Occupational therapy is the treatment, through planned activity, of persons who are physically or mentally ill, 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.

The Department offers 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 and Hospitals of the American Medical Association.

Admission to the Preprofessional Program

Students at the University should register in the College of Arts and Sciences as preoccupational therapy majors. High school students should arrange their current course 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.

Admission to the Professional Program

Students are admitted to the 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).

Students are required to fulfill the same proficiency requirements and distribution requirements as described in the *College of Arts and Sciences* section.

Graduation Requirements

A total of 37 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 requirement:

Art 201 (Ceramic Art); 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).

CURRICULUM IN OCCUPATIONAL THERAPY

Junior Year

FIRST QUARTER		CREDITS
ELECTIVE		5
PSYC 450	PRINCIPLES OF PERSONALITY DEVELOP.	2
ART 201	CERAMICS (OR WEAVING)	3
EDUC 280	FUNDAMENTALS OF WOODWORK	3
SKILLS ELECTIVE		2
		<hr/>
		15

SECOND QUARTER		CREDITS
PSYC 451	PRINCIPLES OF PERSONALITY DEVELOP.	2
PM&R 469	THERAPEUTIC ACTIVITIES II	4
PM&R 380	O.T. THEORY I—FUNDAMENTALS OF O.T.	2
H EC 329	WEAVING (OR CERAMICS)	2
PSYCH 306	DEVELOPMENTAL PSYCHOLOGY	5
		<hr/>
		15

THIRD QUARTER		CREDITS
PSYC 452	CLINICAL PSYCHIATRY	3
B STR 301	HUMAN ANATOMY	4
ZOOL 208	ELEMENTARY PHYSIOLOGY	5
PM&R 481	O.T. THEORY II	3
		<hr/>
		15

Senior Year

FIRST 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

SECOND 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

THIRD QUARTER		CREDITS
PM&R -321	MEDICAL SCIENCE	4
PM&R 342	ADV. KINESIOLOGY	3
PM&R 483	THEORY IV	4
PM&R 484	O.T. THEORY V	2
EDUC 383	WOODWORKING TECHNOL.	3
		<hr/>
		16

Clinical Affiliations

A minimum of nine months total of clinical affiliations are required, to include physical disabilities, psychiatry, pediatrics, general medicine and surgery, and/or tuberculosis. 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.

Physical Therapy

Adviser

Jo Ann McMillan
CC817 University Hospital

The physical therapist is a member of the modern rehabilitation team. Following the prescription of a physician, he or she utilizes a wide variety of treatment methods which help the patient regain lost function or which helps the patient perform despite lost function. The physical therapist must be familiar with the patient's condition as well as have a thorough knowledge of rehabilitation procedure.

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 approved by the American Physical Therapy Association and by the Council on Medical Education and Hospitals of the American Medical Association.

Programs of Study

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.

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 only during the Autumn Quarter. 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. The application procedure is outlined in the *School of Medicine* section. Students are evaluated and admitted on the merits of demonstrated academic abilities and various measured aptitudes.

Students who are enrolled in their fourth year of college study and 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.

The requirements for the Bachelor of Science in Physical Therapy are outlined below.

University Requirements

(1) Physical education activities, 3 credits; (2) upper-division credits, 60 credits earned in 300- and 400-level courses; (3) total credits, 180 credits plus physical education activity.

Curriculum Requirements

(1) The following proficiency requirements should be completed within the first two years: English 101, 102 (103) (English Composition); Mathematics 101 or a score of 475 or above on the Intermediate Mathematics Test or Philosophy 120 (Logic); completion of University language courses on the second-year level or equivalent score on a placement examination. (2) Distribution requirements are as follows: a total of 80 credits must be selected from three groups: the humanities, social sciences, and sciences. At least 15 credits in each of these groups must be from the Special

List. The remainder may be selected from the Special List and the College List (see the *College of Arts and Sciences* section). Not over 30 nor fewer than 20 credits may be from any one group.

Major Requirements

Prerequisites to third year of curriculum are as follows:

COURSE	CREDITS
*BIOL STR 301 (HUMAN)	4
*CHEM 100 AND/OR 101, 102 (GENERAL AND ORGANIC); 1 YEAR OF GENERAL IS ACCEPTABLE	10 OR 15
*MICRO 301 (GENERAL)	5
*PHYS 101, 102 (MECHANICS, SOUND, AND ELECTRICITY)	4,4
*PHYS 103 (IF ELECTED) (HEAT AND LIGHT)	4
*PHYS 107, 108 (LABORATORY)	1,1
*ZOO 118, 118L, OR 208 (PHYSIOLOGY)	5-6
†PSYCH 100 (GENERAL)	5
†PSYCH 306 (CHILD) OR 305 (ABNORMAL) OR 307 (PERSONALITY) OR PSYCHIATRY 267 (DEVELOPMENT OF THE PERSONALITY)	2-5
†SOC 110 (SURVEY)	5
†SPCH 100 (BASIC SPEECH IMPROVEMENT)	5

Students enrolled in other institutions should compare the catalog descriptions of the above courses to assure equivalency of content.

Courses taught in the last two years of curriculum are as follows:

In Major Department

COURSE	CREDITS
PM&R 320-321 MEDICAL SCIENCES	4-4
PM&R 332 PATHOLOGIC PHYSIOLOGY	5
PM&R 342 ADVANCED KINESIOLOGY	3
PM&R 444-445 FUNCTION OF THE LOCOMOTOR SYSTEM	4-4
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 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 (AUTUMN 1966: CHANGE TO 466, 3 CREDITS)	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	5

In Supporting Department

NURS 315 NURSING FOR P.T.	3
PATH 310 GENERAL	2
B STR 331 NEUROANATOMY	2

*Courses must be completed before entrance to third year.

†Courses must be completed before graduation.



CURRICULUM IN PHYSICAL THERAPY

First Year

Sample Program

AUTUMN QUARTER		CREDITS
CHEM 101	GENERAL	5
ENGL 101	COMPOSITION	3
PHYS. EDUC. ACTIVITY		1
APPROVED ELECTIVES		7
		<hr/>
		16

WINTER QUARTER		CREDITS
CHEM 102	GENERAL ORGANIC	5
ENGL 102	COMPOSITION	3
SPCH 100	BASIC SPEECH IMPROVEMENT	5
PHYS. EDUC. ACTIVITY		1
APPROVED ELECTIVES		2
		<hr/>
		16

SPRING QUARTER		CREDITS
ENGL 103	COMPOSITION	3
*MATH 103	INTERMEDIATE ALGEBRA & TRIGONOMETRY	3
SOC 110	SURVEY	5
PHYS. EDUC. ACTIVITY		1
APPROVED ELECTIVES		4
		<hr/>
		16

Second Year

AUTUMN QUARTER		CREDITS
PSYCH 100	GENERAL	5
†PHYS 101	GENERAL	4
†PHYS 107	LABORATORY	1
APPROVED ELECTIVES		5
		<hr/>
		15

WINTER QUARTER		CREDITS
MICRO 301	GENERAL	5
PSYCH 306	CHILD	5
†PHYS 102	GENERAL	4
†PHYS 108	LABORATORY	1
		<hr/>
		15

SPRING QUARTER		CREDITS
B STR 301	GENERAL	4
ZOOL 208	ELEMENTARY HUMAN PHYSIOLOGY	5
APPROVED ELECTIVES		6
		<hr/>
		15

Thrd Year

AUTUMN QUARTER		CREDITS
PM&R 332	PATH. PHYSIOLOGY	5
PM&R 444-	FUNCTION OF THE LOCOMOTOR SYSTEM	4-
PATH 310	GENERAL PATHOLOGY	2
PM&R 415	PROFESSIONAL RELATIONSHIPS	2
APPROVED ELECTIVES		2
		<hr/>
		15

*Prerequisite to Physics 101.

†Physics 101, 102, 107, 108 (4,4,1,1) have been incorporated into prerequisites in place of Physics 170, 170L (5,1).

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
		<hr/>
		15

SPRING QUARTER		CREDITS
PM&R -321	MEDICAL SCIENCE	4-
PM&R 342	ADVANCED KINESIOLOGY	3
PM&R 408	TESTS & MEASUREMENTS	3
PM&R 451	ANATOMY DISSECTION	4
APPROVED ELECTIVES		1
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		15

Fourth Year

AUTUMN QUARTER		CREDITS
PM&R 461	MASSAGE	2
PM&R 466-	BIOPHYSICAL & PHYSIOLOGICAL EFFECTS OF MODALITIES	2-
PM&R 470-	THERAPEUTIC EXERCISE	3-
PM&R 475-	PHYSICAL RESTORATION	3-
PM&R 489	CLINICAL CLERKSHIP	2
NURS 315	NURSING FOR P. T.	3
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		15

WINTER QUARTER		CREDITS
PM&R 414	PSYCHOLOGICAL ASPECTS OF DISABILITY	2
PM&R 463-	MODALITY TREATMENT	4-
PM&R -467	BIOPHYSICAL & PHYSIOLOGICAL EFFECTS OF MODALITIES	-2
PM&R -471-	THERAPEUTIC EXERCISE	-3-
PM&R -476	PHYSICAL RESTORATION	-2
PM&R 490	CLINICAL CLERKSHIP	3
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		16

SPRING QUARTER		CREDITS
PM&R 416	PRINCIPLES OF ADMINISTRATION	2
PM&R -464	MODALITY TREATMENT	4
PM&R -472	THERAPEUTIC EXERCISE	2
PM&R 491	CLINICAL CLERKSHIP	4
APPROVED ELECTIVES		3
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		15

SUMMER QUARTER		CREDITS
PM&R 495	CLINICAL AFFILIATION	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; (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. 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.

	TUITION	INCIDENTAL FEE	OTHER FEES*	TOTAL
RESIDENT	\$ 65.00	\$37.50	\$8.50	\$111.00
NONRESIDENT	\$125.00	\$82.50	\$8.50	\$216.00

THE FOLLOWING ARE THE CHARGES FOR CLINICAL TRAINING:

Summer Quarter (both curricula)

RESIDENT AND NONRESIDENT	—	\$75.00	—	\$75.00
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Autumn, Winter, and Spring Quarters (Occupational Therapy students only)

RESIDENT	\$ 65.00	\$15.00	—	\$ 80.00
NONRESIDENT	\$125.00	\$50.00	—	\$175.00

EXEMPTIONS, SPECIAL FEES, AND REFUND OF FEES (Same as for medical students)

*Other fees consist of Student Activities, \$2.50; ASUW Bond Redemption, \$3.50; HUB Bond Redemption, \$1.00; Building Fund, \$1.50.



PSYCHIATRY

Chairman

Herbert S. Ripley
BB867 University Hospital

Professors

Herbert S. Ripley, Thomas H. Holmes III, Charles R. Strother

Associate Professor

John L. Hampson

Assistant Professors

Cornelis B. Bakker, Merlin H. Johnson, Caroline E. Preston, Theodore D. Tjossem, Nathaniel N. Wagner, Herbert C. Wimberger

Instructors

Carl N. Brownsberger, Mary M. Campbell, John E. Carr, Adolph E. Christ, Laurenze P. Jacobs, Ann R. Pytkowicz, Leslie Y. Rabkin, Otis E. Ramsey, Jr., Otto H. Spoerl, Brenda D. Townes, John G. Wallace

Research Appointments

Minoru Masuda, Lewis L. Langness

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

Professor

Melvin M. Figley

Associate Professor

Robert G. Parker

Assistant Professors

Gerald M. Christensen, Kenneth L. Jackson, Robert S. Leighton, John W. Loop, Wil B. Nelp, Leon A. Phillips, Peter Wootton

Instructors

Kazuko Bill, C. Benjamin Graham, G. Lester Harms, Thomas F. McKay, Theodore R. Purcell, Gilbert S. Stacy

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 (fluoroscopy) or by photographic emulsions (radiography). The majority of important diseases has some radiologic expression. The diagnostic radiologist is, in effect, a general pathologist with special methods.

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 concentrates on the isotopes within specific organs 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 a 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

Henry N. Harkins
BB477 University Hospital

Professors

James R. Cantrell, Eldon L. Foltz, Henry N. Harkins,
K. Alvin Merendino, Lloyd M. Nyhus, Arthur A. Ward,
Jr.

Associate Professors

Julian S. Ansell, John W. Bell, Gian E. Chatrion, D.
Kay Clawson, David H. Dillard, John K. Stevenson,
Lowell E. White

Assistant Professors

Wayne H. Akeson, Edwin Brockenbrough, Robert V.
DeVito, Lawrence H. Gordon, John E. Jesseph, William
A. Kelly, Donald E. Strandness, Jr., Loren C. Winter-
scheid

Instructors

Benjamin Cobb, Louis R. Fry, Hubert M. Radke,
Thomas K. F. Taylor

Research Appointments

Richard G. Black, T. Lloyd Fletcher, June L. DeVito,
Joan S. Lockard, Noel L. Morlock, Moses Nan Kung,
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 the surgical subspecialties; neurosurgery, orthopedics,



and urology. Special studies in general surgery, experimental surgery, ophthalmology, otolaryngology, 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 surgery and the surgical specialties. Those participating in these residency programs may work toward a degree of Master of Science by meeting the requirements of the Graduate School as outlined in the *Graduate Education* section. Performance of a fundamental experimental research problem of high caliber is an additional requirement for this advanced degree.





NURSING

Dean

Mary S. Tschudin
C309 Health Sciences Building

Professors

Katherine J. Hoffman, Kathleen M. Leahy (emeritus),
Elizabeth S. Soule (emeritus), Mary S. Tschudin

Associate Professors

Marjorie B. Batey, A. Evelyn Burke, Richard M. Emerson,
Elizabeth C. Giblin, Florence I. Gray, Edith Heine-
mann, Dolores Little, B. Louis Murray, Gladys Nite,
Virginia Olcott, Harriet H. Smith

Assistant Professors

John R. Atkins (acting), Mary Boozer, Edna M. Brandt,
Pauline Bruno, Marguerite Cobb, Nada J. Estes, Stella
L. Hay, Louise Mansfield, Jeanette G. Nehren, Maxine
L. Patrick, Patricia A. Rose, Alma Sparrow

Instructors

Joan M Baker, Kathryn E. Barnard, Beryl Berg, Flora
Breckenridge, Joan V. Buckles (acting), Leah Cashar,
Janet M. Claypool, Louis A. Colin, Deane Critchley,
Emily I. Doree, Carol J. Gray (acting), Sheila M.
Guichen (acting), Elizabeth M. Hastie, Shirley A.
Jarrott, Mary C. Jones, Margaret G. Klemer, Florence
E. Martin, Aline Midthun, Rosemary Prince (acting),
Barbara K. Redman (acting), Joan F. Risley, Frances
K. Schultz, Delores M. Schumann, Tomine Tjelta,
Esther R. Wallace, Carol A. Weaver

Research Appointments

Mary G. Burton, Doris L. Carnevali, Melba Rade-
macher, Lawrence J. Sharp, Irene N. Splits, Margo D.
Stephens, Betty L. Valentine

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 individual goals of advanced professional competence. 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, although a student, regardless of age and kind or amount of experience, must be basically competent in nursing as well as in any major clinical field elected for further intensive study. Beginning in autumn, 1965, one of the criteria for admission to graduate study will be 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 and 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, courses in specific clinical subjects for affiliating students in other schools of nursing, and courses of general interest to any University student. 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 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 in the College of Arts and Sciences was established in 1934, and in 1945 became an autonomous 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, was opened in May 1959, and has a 300-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 450 in King County Unit I and 220 in Unit II; Swedish Hospital, with a bed capacity of 395; Virginia Mason Hospital, with a bed capacity of 238; and The Doctors' Hospital, with a bed capacity of 187. Hospitals offering health care for selected individuals or specific illnesses include the Children's Orthopedic Hospital and Medical Center with a capacity of 200 beds; Firland Sanatorium, with a capacity of 500; and the state mental hospitals, Northern State Hospital, capacity 1,462; Western State Hospital, capacity 2,986, and Eastern State Hospital, capacity 1,758. The psychiatric unit of the United States Veteran's Administration Hospital in Seattle, capacity 80 beds, provides an additional facility in this area. 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, and the City of Spokane. 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.

Registered Nurse Club

All students enrolled in the Registered Nurse Baccalaureate Program or in the graduate level programs are

eligible for membership in the Registered Nurse Club. This is primarily a social organization.

Admission

Admission with Freshman Standing

In addition to the scholastic criteria that all students are expected to meet, students planning to enter the School of Nursing are advised to select chemistry as their first laboratory science and biology or physics as an elective in preparation for the professional nursing program. A fourth unit in English also will be found helpful. A third year of mathematics is strongly recommended.

Admission with Advanced Standing

Students wishing to transfer from another basic collegiate nursing program and students entering the registered nurse baccalaureate program may apply for admission with advanced standing. Applicants to the registered nurse baccalaureate program must be graduates of an approved junior college or hospital school of nursing.

In addition to the completed application form to the University, an applicant for advanced undergraduate standing or graduate standing in nursing must complete an application to the School of Nursing. The form may be obtained from and must be returned directly to the School of Nursing. An official transcript from each high school, school of nursing, or college attended is required of an applicant for advanced undergraduate standing, and two official transcripts from each college or university and school of nursing (if not part of a university) attended are required of an applicant for graduate standing.

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 \$15.00 for special achievement tests throughout the program. Graduate students who are candidates for an advanced degree should plan for approximately \$150 for costs connected with the preparation of the master's thesis.

Graduate Nurse Examination

Applicants to the registered nurse baccalaureate program must take the National League for Nursing Graduate Nurse Examination before, or as soon as

possible after, entering the School of Nursing. An application form and directions for completing this requirement may be obtained from the School of Nursing or the National League for Nursing. The examination is given in various parts of the country on established dates.

Licensure

Students may be admitted to the registered nurse baccalaureate program or to the master's program in nursing prior to completion of the state board professional examination, but for continuation in either program students must be licensed to practice nursing in a state or country.

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 considerable 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. Basic students may also apply through this Committee to the Washington State League for Nursing for scholarship assistance. The *Elizabeth Sterling Soule Scholar-*

ship is awarded by this organization and 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. 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 qualified students in the baccalaureate programs. 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 senior year 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 senior year. 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 minimum of two years.



Students in the Registered Nurse Baccalaureate Program may apply for the same appointment in the Army Student Nurse Program if they have completed their diploma program within the past 30 months and are able to complete the requirements for their degree within 24 months.

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.

Graduate Traineeships, Assistantships, and Fellowships

The University of Washington participates in the Professional Nurse Traineeship Program as administered by the Division of Nursing Resources of the U.S. Public Health Service. This program offers a limited number of traineeships for qualified applicants who are preparing for educational, supervisory, or public health positions in nursing. The National Institute of Mental Health has made available to the School of Nursing a limited number of traineeships for nurses eligible for advanced study in psychiatric nursing, child psychiatric nursing, and for psychiatric nurses who are seeking doctoral level study in other disciplines.

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 School* 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 Fellowship Branch, Division of Research Grants, National Institutes of

Health, Bethesda, Maryland 20014; *The National League for Nursing Fellowship*: Chairman, National League for Nursing Fellowship Program, 10 Columbus Circle, New York, N.Y. 10019.

Nursing Education Award

The Nursing Education Award is granted annually to the outstanding graduate of each of the programs of the School of Nursing: the Basic, the Registered Nurse Baccalaureate, and the Graduate Program. 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
D323 Health Sciences Building
Virginia Olcott
D329 Health Sciences Building

Bachelor of Science in Nursing

Two undergraduate curricula are offered leading to the degree of Bachelor of Science in Nursing. One, the Basic Nursing Program, is for students with no previous preparation in nursing; the other, the Registered Nurse Baccalaureate Program, is for graduates of hospital or junior college schools of nursing.

Basic Nursing Program

The basic nursing curriculum is planned for four academic years and one summer session at the end of the sophomore year. The distribution of required courses provides a balance of professional and general education. Study in the arts and sciences is distributed over the first three years; professional nursing study is dispersed throughout the four years but in greater concentration during the junior and senior years. There is a close inter-relationship between the general and professional educational aspects of the program. An academic adviser will assist the student to select subjects 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 the quarter, have a current driver's license, and meet state requirements for insurance protection.

A graduate of the basic program is prepared for beginning positions in all fields of professional nursing. Upon completion of the program, she is eligible to take the state licensing examination to become a registered nurse.

The requirements for the basic nursing program are:

<i>Area</i>	<i>Credits</i>
Nursing (102, 227, 228, 260, 298, 299, 301, 367, 368, 369, 370, 371, 372, 373, 374, 407, 409, 412, 413, 414, 415, 416, 421, 422, 429)	90
Related Medical Sciences (Preventive Medicine 323 and 410 and Pharmacy 352)	8
Physical and Biological Sciences (Chemistry 101, 102, Physics 101, Microbiology 301, Conjoint 316-317-318)	32
Humanities (English 101, 102, 103 required and Humanities 101, 102, 103 recommended)	24

Social Sciences (Psychology 100, Sociology 110, Home Economics 119) 14

Electives in Humanities and Social Sciences 12

Plus three physical education activities Total 180

CURRICULUM

First Year

AUTUMN QUARTER	CREDITS
CHEMISTRY 101	5
ENGLISH 101	3
HUMANITIES ELECTIVE	5
PHYS. EDUC. 112	1
ELECTIVE	2
	16

WINTER QUARTER	CREDITS
NURSING 102	2
CHEMISTRY 102	5
ENGLISH 102	3
HUMANITIES ELECTIVE	5
PHYS. EDUC. 114	1
	16

SPRING QUARTER	CREDITS
ENGLISH 103	3
ELECTIVE	2
HUMANITIES ELECTIVE	7
PHYSICS 101	4
PHYS. EDUC. ACTIVITY	1
	17

Sociology 110 may be taken in place of Physics 170 in the freshman year.

Courses in the freshman year may be taken in any accredited junior college, 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 meet the professional requirements of the School as determined by the Admissions Committee of the School of Nursing. Students planning to transfer should contact the adviser to the basic students in the School of Nursing early in the freshman year and not later than March 1 preceding the Autumn Quarter in which they wish to transfer.

Registered Nurse Baccalaureate Program

This baccalaureate curriculum is designed for registered nurses seeking a liberal and generalized professional education as preparation for graduate study or further professional practice. It provides an opportunity to extend the previous preparation of the nurse, through study in the social and natural sciences, the humanities, and nursing. Increased ability to give comprehensive



nursing care and to assist in the prevention and control of disease and in promotion of health in work with individual patients, families, and community health groups is emphasized. Public health nursing is an integral part of the curriculum. Students are given the opportunity to apply these concepts to the care of patients and of family groups in hospital and community agencies. A change in this program will become effective Autumn Quarter, 1965. No students will be admitted to the program pattern described below after Autumn Quarter, 1964.

Students entering the program who are graduates of approved hospital schools of nursing may be allowed a maximum of 65 credits toward the Bachelor of Science in Nursing. These credits are withheld until the student has completed satisfactorily 30 credits (15 of them at this University) and the NLN Graduate Nurse Examination. Graduates from Associate of Arts degree nursing programs will be allowed a maximum of 90 credits toward the Bachelor of Science in Nursing.

The requirements for the Registered Nurse Baccalaureate Program are:

<i>Professional Courses</i>	91 credits
Nursing 361, 365, 366, 412, 415, 416, 417, 418, 419, plus credit from approved school of nursing	
<i>General Education Courses</i>	90 credits
Humanities (15 credits) (including English 101, 102, 103)	
Social Sciences (15 credits) (including Psychology 100 or 190 and Sociology 110 or 310)	
Biological and Physical Sciences	(15 credits)
Social Work and Public Health	(7 credits)
Electives	(38 credits)
<i>Total</i>	<hr/> 181 credits

The candidate for the Bachelor of Science in Nursing is advised to select proportionately those scientific and cultural courses which will extend her background in general education and strengthen her preparation for professional nursing. Of the 181 credits required for graduation, 60 must be in upper-division courses.

Registered nurses are urged to carry professional liability insurance during their clinical practice courses. Since field instruction may be in one or several agencies, either in or outside of Seattle, the student must be prepared to have a car for use, have a current driver's license, and meet state requirements for insurance protection.

GRADUATE PROGRAMS

Graduate Program Adviser
D311 Health Sciences Building

The School of Nursing offers graduate curricula leading to the degrees of Master of Arts or Master of Nursing and a minor on the doctoral level for students matriculated in another discipline. Post-master's programs planned on an individual basis are also available.

Master's Programs

The curricula provide for advanced professional preparation and research in a specialized area of nursing and in teaching, supervision, or administration. Majors are offered in the following areas: maternal-child nursing, medical-surgical nursing, psychiatric nursing, public health nursing, 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 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.

Master of Nursing: This professional degree is offered with emphasis on advanced preparation in an area of specialization in nursing. Courses from at least two fields outside of nursing provide supporting work for the nursing major. A foreign language is not required

for this degree. Requirements for the Master of Nursing degree are:

<i>Area of Study</i>	<i>Credits</i>
Major: advanced nursing courses	18
Related Fields: courses in at least two other disciplines	12
Research: courses in research and thesis	15
	—
	45

Master of Arts: This academic degree is offered with 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 is required to demonstrate a reading knowledge of one foreign language. Requirements for the Master of Arts degree are:

<i>Area of Study</i>	<i>Credits</i>
Major: advanced nursing courses	18
Minor: courses in another discipline	12
Research: courses in research and thesis	15
	—
	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. This may be for the purposes of gaining additional depth in the area of study begun at the master level, for broadening one's area of specialized preparation through study in another area of nursing, or for obtaining additional knowledge and skill in nursing research. Post-master study is offered in the areas of maternal-child nursing, medical-surgical nursing, adult and child psychiatric nursing, administration of schools of nursing, and research in nursing. Individual programs of study may be planned in keeping with the student's interests and long-range professional goals.

The School of Nursing offers a minor on the doctoral level for those students who are matriculated in another discipline such as education or history. 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 may elect to major in one of the following fields: anthropology, microbiology, physiology, or sociology. The minor field is nursing.

Supplementary Public Health Nursing Program

This program of study is designed to provide the registered nurse, holding a bachelor or higher degree, with public health nursing preparation comparable to that provided for basic baccalaureate nursing students.

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 Courses

The School of Nursing provides lower-division, undergraduate courses in psychiatric nursing and tuberculosis nursing for students enrolled in various hospital schools of nursing in the state of Washington. The lower-division courses are directed toward technical competence in the clinical area, and assume less preparation in the social, biological, and physical sciences on the part of the student than is required for the upper-division courses. Public health nursing theory and field experience courses, as developed for the basic-degree students, are offered for 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, Jack E. Orr, Elmer M. Plein, L. Wait Rising, Varro E. Tyler, Jr.

Associate Professors

Lynn R. Brady, Walter C. McCarthy

Research 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 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, chemistry, and chemical engineering. 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 chemistry, pharmacognosy, drug assaying, and research; a branch library; a drug service department; and a stock-room.

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 Chi* was founded in 1908 at the University of Michigan as the *Aristolochite Society*, and in 1922 the name was changed and a charter granted giving permission to expand to other colleges. There are now sixty-three collegiate chapters. *Rho* Chapter, at the University of Washington, was established in 1932. Students who have completed 60 per cent of the credit hours 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 55 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 and Economics 200). 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 one year (2,080 hours) of internship experience 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, which may be taken upon completion of the educational requirement, 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 CHEM SCI.)	3
ENGL 101	COMPOSITION	3
MATH 105	COLLEGE ALGEBRA	5
APPROVED ELECTIVES		5
PHYSICAL EDUCATION ACTIVITY		**
		<hr/>
		16 OR 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		**
		<hr/>
		16

SPRING QUARTER		CREDITS
CHEM 160	GENERAL	3
CHEM 170	QUAL. ANALYSIS	3
ENGL 103	COMPOSITION	3
APPROVED ELECTIVES		7
PHYSICAL EDUCATION ACTIVITY		**
		<hr/>
		16

Second Year

AUTUMN QUARTER		CREDITS
PH CH 237	ORGANIC	3
PHARM 204	ORIENTATION	2 OR 3
BOT 111	ELEMENTARY	5
PHYS 101		
AND 107	GENERAL AND LAB	5
		<hr/>
		15 OR 16

WINTER QUARTER		CREDITS
PH CH 238	ORGANIC	3
PH CH 248	ORGANIC LAB	3
ZOOL 111	GENERAL	5
PHYS 102		
AND 108	GENERAL AND LAB	5
		<hr/>
		16

SPRING QUARTER		CREDITS
PH CH 239	ORGANIC	3
PH CH 249	ORGANIC LAB	3
ZOOL 112	GENERAL	5
MICRO 301	GENERAL	5
		<hr/>
		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
ELECTIVE		2
		<hr/>
		16

WINTER QUARTER		CREDITS
PH CH 326	QUANT. PHARM. ANAL.	5
PH CH 430	INORGANIC MED. PROD.	3
PH COL 301-	GENERAL	4-
PHARM 332	GENERAL AND PHYS. PRINC.	4
		<hr/>
		16

SPRING QUARTER		CREDITS
PH CH 327	QUANT. PHARM. ANAL.	3
PH COL -302	GENERAL	-5
BIOCH 361	BIOCHEMISTRY	3
PHARM 333	GENERAL AND PHYS. PRINC.	4
		<hr/>
		15

Fourth Year

AUTUMN QUARTER		CREDITS
PH CH 440	ORGANIC MED. PROD.	3
PH COG 312	GENERAL	4
ECON 200	INTRODUCTION	5
†APPROVED ELECTIVES		5
		<hr/>
		17

WINTER QUARTER		CREDITS
PH CH 441	ORGANIC MED. PROD.	3
PH COG 313	GENERAL	4
PHARM 318	PHARM. ACCOUNTING	5
†APPROVED ELECTIVES		3
		<hr/>
		15

SPRING QUARTER		CREDITS
PH CH 442	ORGANIC MED. PROD.	3
PH COG 314	GENERAL	4
APPROVED ELECTIVES		8
		<hr/>
		15

Fifth Year

AUTUMN QUARTER		CREDITS
PH COG 315	GENERAL	3
PHARM 407	DISPENSING	4
PHARM 450	PHARM. LAWS	3
APPROVED ELECTIVES		5
		<hr/>
		15

WINTER QUARTER		CREDITS
PHARM 408	DISPENSING	3
PHARM 410	CLIN. DISP. PHARM.	1
PHARM 451	SPEC. PHARM. PRACT.	3
APPROVED ELECTIVES		9
		<hr/>
		16

SPRING QUARTER		CREDITS
PH CH 497	TOXICOLOGY	3
PHARM 409	DISPENSING	3
PHARM 452	PROFESSIONAL MANAGEMENT	3
APPROVED ELECTIVES		6
		<hr/>
		15

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 Education* section. Graduate students must satisfy the requirements for an advanced degree which are in force at the time the degree is to be awarded. For graduate study, the approval of both the College of Pharmacy and the Graduate School is necessary.

*Chem 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.



Basic requirements for admission to graduate study in the pharmaceutical sciences are met by an undergraduate degree in pharmacy. Students with undergraduate majors in the biological or physical sciences may also be admitted, but they will be required to complete courses basic to their chosen field of study during their graduate careers. Applicants must demonstrate above average scholastic ability and promise.

Undergraduates who have decided to pursue graduate work 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 studies in the College of Pharmacy require adequate preparation in the physical and biological sciences, mathematics, and foreign language. Physical chemistry (calculus is a prerequisite), qualitative organic chemistry, biochemistry, and courses in the pharmaceutical sciences are basic. 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 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.

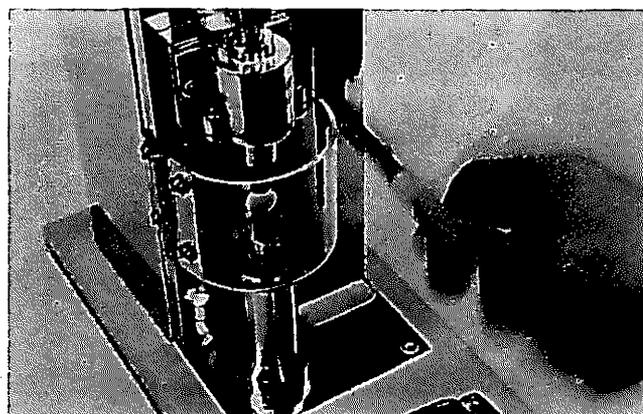
Graduate programs of study vary with the specialization selected. Although the programs are flexible, certain general recommendations may be made. In addition to studies in their chosen major, students with majors in pharmaceutical chemistry and pharmacy are required to follow programs of course work 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 hospital pharmacy majors, courses in the basic medical sciences including biochemistry, microbiology, and pharmacology are necessary in addition to the specialized courses in hospital pharmacy and manufacturing pharmacy.

For pharmacognosy majors, courses in organic chemistry, biochemistry, and plant physiology are basic to most programs. These are generally best supplemented in the biological areas by courses in plant anatomy,

taxonomy, microbiology, and mycology. In the physical area, specialized courses in organic chemistry, analytical chemistry, and physical chemistry are utilized.

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).



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 products, 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

Varro E. Tyler, Jr.
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, sera, vaccines, allergens, 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

Cooperating Faculty

James A. Crutchfield, Jr., Morton Kroll, Kenneth McCaffree, Charles M. Tiebout (Economics); Kenneth C. Cole, Fremont J. Lyden, Robert Warren, Donald H. Webster (Political Science)

The Graduate School of Public Affairs offers graduate professional education for the public service. The School is concerned with education in public affairs that is professional in objective, interdisciplinary in nature, centered in the role of the public administrator, and integrated with the profession as it is practiced.

The Graduate School of Public Affairs administers an interdisciplinary program designed for students preparing themselves for the public service at all levels—local, state, national, and international. The School offers appropriate courses in public administration and public policy and also relies heavily upon courses offered in other divisions of the University to give the students the

greatest possible breadth of scope and discipline. The faculty of the School, therefore, includes participating members drawn from the University at large. In this way, the interests and capacities of the University as a whole in the field of public affairs contribute to the activities of the School.

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 are no specific requirements for undergraduate preparation. 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



PUBLIC AFFAIRS

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 particular areas of public policy such as foreign and defense policy, natural resources 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. A recent addition to 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.

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. Questions concerning the work of the Institute should be directed to Prof. George A. Shipman, Director of the Institute.





SOCIAL WORK

Dean

Charles B. Brink
102 Social Work Hall

Assistant Dean

Jerry L. Kelley

Professors

Arthur C. Abrahamson, Charles B. Brink, David H. Gronewold, Marguerite Hunt, Henry W. Maier, Jack R. Parsons

Associate Professors

Lawrence K. Northwood, Grace D. Reiss, Edmund A. Smith

Assistant Professors

Barbara A. DeNoon, John H. J. Eymberts, Jerry L. Kelley, Robert W. Kessel, Catherine J. Macdonald, Robert W. Macdonald, LeNora B. Mundt, Louise M. Stutsman, Calvin Y. Takagi, Joseph V. Thompson

Lecturer

Evelyn B. Citrin

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, through the Division of General Studies in the University, an undergraduate social welfare major.

Admission

Admission to the graduate professional program of the School of Social Work requires formal admission to the Graduate School, as well as acceptance by the School of Social Work.

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 PROGRAMS

Graduate Program Adviser

Jerry L. Kelley
111 Social Work Hall

Master of Social Work Program

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.

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 Work 502, 503, 504, 505, 506 (Social Welfare Organization), 10 credits. Additional credits may be elected from the 520 seminar series, 580, 587, or from sociology courses listed under *Courses in Affiliated Departments*.

Social Work 551, 552, 553, 556 (Human Growth and Behavior), 10 credits; and Psychiatry 553. Additional credits may be elected from Social Work 557 or from psychiatry and psychology courses listed under *Courses in Affiliated Departments*.

Students must satisfactorily complete a full two-year sequence 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), 18 credits.

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. Consideration is being given to the establishment of a full sequence in the social community organization method.

Social Work 590 (Research Methods), 8 credits; plus either the group research project 593, 594, 595 or an individual thesis, 700. Social Work 586 (Statistics in Social Work), is required for students who have not satisfactorily completed an equivalent course within the past five years.

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.

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 Quarter, 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 Quarter. 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 regular 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 program, as in the Seattle program, is 12 credits.

A week's holiday is scheduled between each quarter, including the Summer and Autumn Quarter. 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 (Seminar), 593-594-595 (Field Practice in Research), and 700 (Thesis). See under *Description of Courses*.



Courses for Non-Social Work Majors

Class enrollment permitting, a number of courses are available to students enrolled in other graduate and professional departments of the University.

Courses for child-care personnel are generally offered during the Summer Quarter only. These courses are specifically planned for child-care staff presently employed in children's institutions. Registration may be on a credit or noncredit basis. Applicants who wish University credit must have had at least two full years of undergraduate college work. Regular attendance and participation in these courses will be recognized with a certificate of attendance. Apply to Dean, School of Social Work, University of Washington.

Refresher courses are offered during Summer Quarter primarily for those students who have interrupted their professional education at the end of one year. Satisfactory completion of the courses is required for admission to continued study if such interruption occurred more than five years previously. Refresher courses may also be elected by students who hold a professional degree but who wish to become more familiar with contemporary concepts and developments in social work. Credits earned in refresher courses are not applicable toward degree requirements. Apply to Dean, School of Social Work, University of Washington.

UNDERGRADUATE PROGRAMS

Adviser

Jerry L. Kelley
111 Social Work Hall

Admission

The School of Social Work participates in a program leading to an undergraduate major in social welfare in collaboration with the Division of General Studies 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 a concentration in the social sciences and social welfare may fulfill their interests by enrollment in the Division of General Studies, College of Arts and Sciences.

The social welfare program of study 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.

Social Work 300, 400, and 401 are also available as service courses to students in other departments of the University.

Educational advising for this curriculum is provided by the staff of the Office of the Division of General Studies, and for the social welfare courses by the director 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.

Financial Aids

For information concerning scholarship awards, fellowships, stipends, and loans, see the *Handbook of Scholarships*, available in the Office of The Dean of 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. Faculty advisers are in a position to help students find part-time 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 position vacancies nationwide and in foreign countries is maintained as received through the initiation of the agencies-seeking staff. Representatives of major agencies visit the campus each year to recruit graduating students. Students are encouraged to interview agency representatives.



Typical Programs of Study

First Year

AUTUMN QUARTER	CREDITS
502 SOCIAL WELFARE ORGANIZATION	2
510 SOCIAL CASE WORK	2
515 FIELD INSTRUCTION	4-8
521 SOCIAL GROUP WORK	2
551 HUMAN GROWTH AND BEHAVIOR	2

WINTER QUARTER	CREDITS
503 SOCIAL WELFARE ORGANIZATION	2
511 SOCIAL CASEWORK (2) OR 522, SOCIAL GROUP WORK (2)	2
515 FIELD INSTRUCTION	4-8
572 SOCIAL COMMUNITY ORGANIZATION	2
552 HUMAN GROWTH AND BEHAVIOR	2

SPRING QUARTER	CREDITS
504 SOCIAL WELFARE ORGANIZATION	2
512 SOCIAL CASEWORK (2) OR 523, SOCIAL GROUP WORK (2)	2
515 FIELD INSTRUCTION	4-8
590 SOCIAL WORK RESEARCH	2
553 HUMAN GROWTH AND BEHAVIOR	2

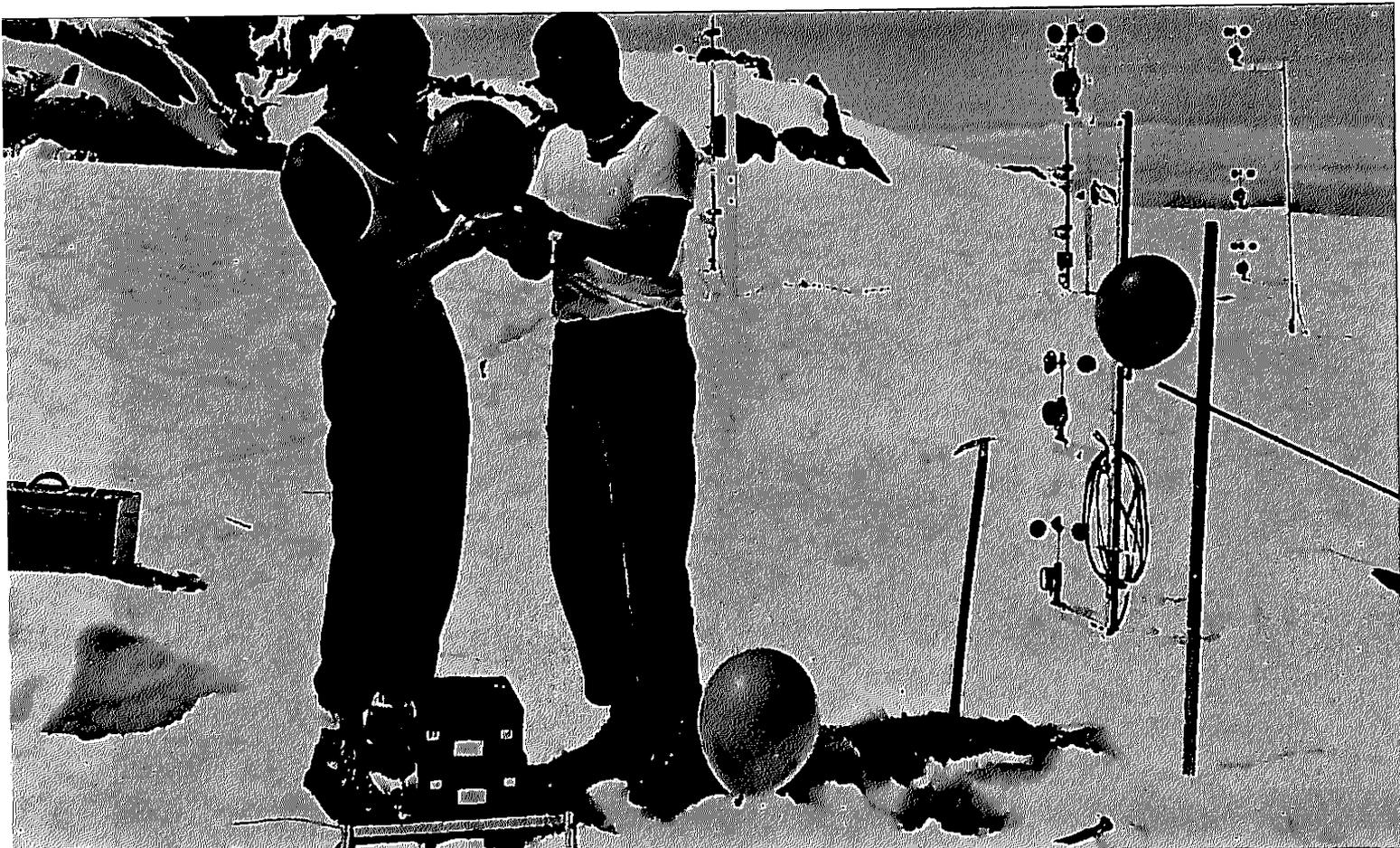
Second Year

AUTUMN QUARTER	CREDITS
505 ORG. FOR INTEGRAL SOCIAL WORK SERVICES	2
530 ADVANCED SOCIAL CASEWORK (2) OR 524, ADVANCED SOCIAL GROUP WORK (2)	2
535 ADVANCED FIELD INSTRUCTION	4-8
PSYC 533 PSYCHODYNAMICS AND PSYCHOPATHOLOGY	2
593- FIELD PRACTICE IN RESEARCH (2-) OR 700 THESIS (*)	2

WINTER QUARTER	CREDITS
506 ORG. FOR COMPLEMENTAL SOCIAL WORK SERVICES	2
531 ADVANCED SOCIAL CASEWORK (2) OR 525, ADVANCED SOCIAL GROUP WORK (2)	2
535 ADVANCED FIELD INSTRUCTION	4-8
ELECTIVE	?
-594- FIELD PRACTICE IN RESEARCH (-2-) OR 700 THESIS (*)	2

SPRING QUARTER	CREDITS
ELECTIVE	2
532 ADVANCED SOCIAL CASEWORK (2) OR 526, ADVANCED SOCIAL GROUP WORK (2)	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

*Credit to be arranged.



GEOFYSICS

**Chairman of Geophysics Executive Committee and
Graduate Program Adviser**

J. A. Businger
201A Atmospheric Sciences

Geophysics Executive Committee:

Professors

Kenneth C. Clark (Physics), George W. Fairhall (Physics and Chemistry), George W. Farwell (Graduate School; ex officio), Robert G. Fleagle (Atmospheric Sciences), Peter H. Misch (Geology), Maurice Rattray, Jr. (Oceanography), Howard M. Swarm (Electrical Engineering), Lawrence Wilets (Physics)

Associate Professors

Joost A. Businger (Atmospheric Sciences), Joe S. Creager (Oceanography)

Assistant Professor

Gerald K. Czamanske (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 Committee in 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.



INTERDISCIPLINARY GRADUATE DEGREE PROGRAMS

Admission

The minimum undergraduate preparation for embarking on the graduate program in geophysics should include the following courses or their equivalents:

Math. 222 (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 Magnetism, 10 credits); Physics 371, 372 (Properties of Matter, 6 credits); Chemistry 140, 150, 160 (General Chemistry, 9 credits); Chemistry 151 (General Chemistry Lab, 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 Lab, 4 credits); Physics 461, 462, 463 (Introduction to Atomic and Nuclear Physics, 9 credits); Physics 471, 472, 473 (Atomic and Nuclear Physics, 9 credits).

Six credits are selected from the following courses in the area of continuous media: Civil Engineering 494 (Introduction to Mechanics of Continuous Media, 3 credits); Aeronautics and Astronautics Engineering 575 (Electrodynamics and Thermodynamics Continuous Media, 3 credits); Atmospheric Sciences 541 (Dynamic Meteorology, 3 credits); Oceanography 511 (Marine Hydrodynamics, 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 (Advanced Field Theory, 4 credits); Physics 513 (Electricity and Magnetism, 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, which cover this field reasonably well; 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 and Electrical Engineering.

Intermediate areas. In the intermediate areas between the areas of 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.

The intermediate area between continuous media and electromagnetics is being developed and is expected to be available for the year 1965-66. At that time a course in magnetohydrodynamics will be introduced. 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 their application to geophysical phenomena. Students who fail the qualifying examination may, upon recommendation of the examining committee, be permitted to take the examination again within one calendar year.

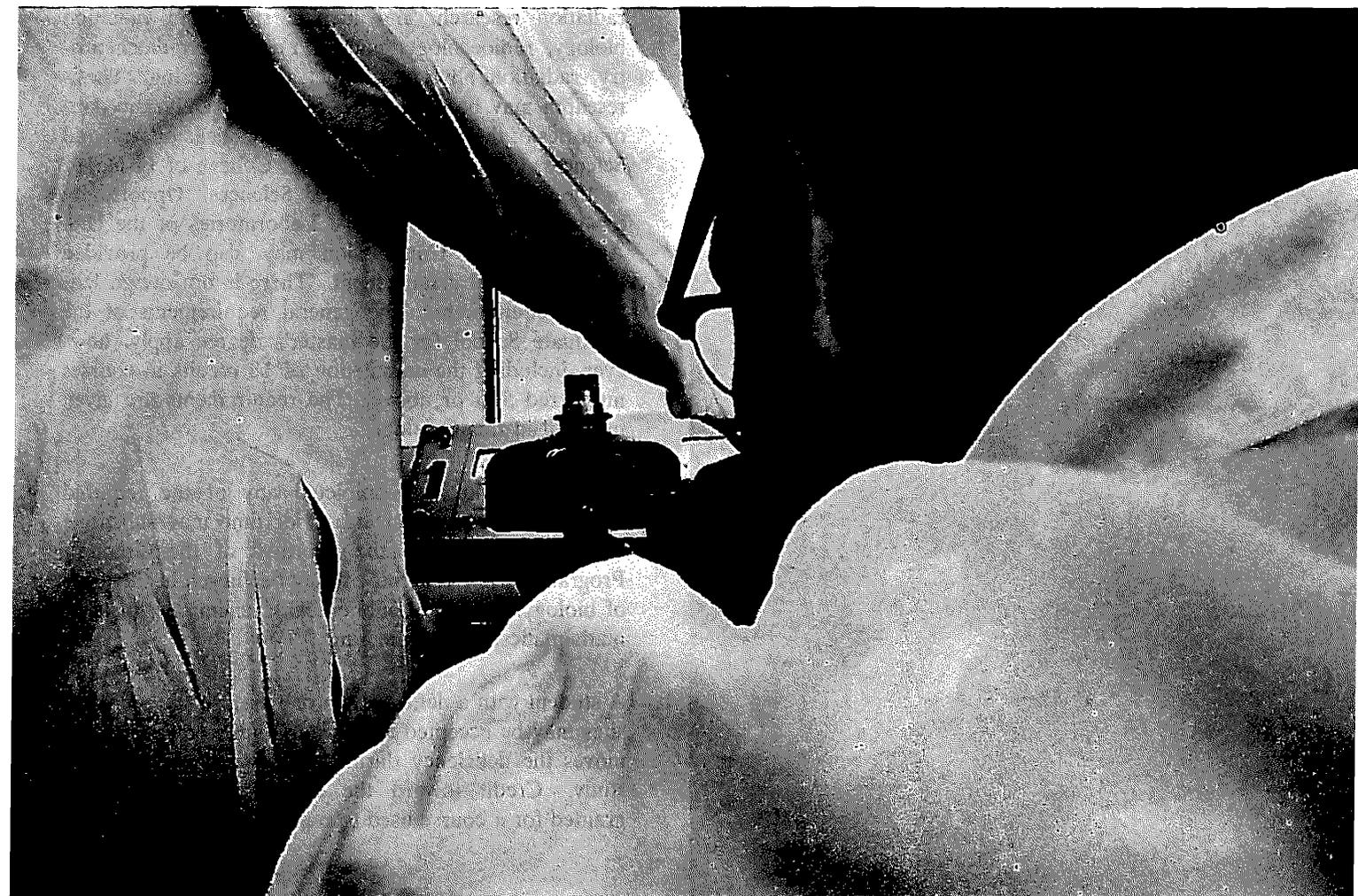
Doctor of Philosophy

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.



RADIOLOGICAL SCIENCES

Chairman, Radiological Sciences Group

George W. Farwell
3 Administration Building

Graduate Program Adviser

Kenneth L. Jackson
104 Fisheries Center

The degree of Master of Science in Radiological Science is offered by the Radiological Sciences Group of the Graduate School. Candidacy 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 some-

what 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 the biological sciences, together with instruction in radiation physics, physical chemistry, radiochemistry, radiation biology, and other areas of radiological science.

Specific course requirements of 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. The requirements are given in detail in this Catalog.

A student who has completed any of the required 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 221 (Differential Equations) or the equivalent, and a year of general biology at the college level.

REQUIRED COURSES*	CREDITS
CHEM 410 RADIOCHEMICAL TECHNIQUES AND RADIOACTIVITY MEASUREMENTS	
OR	
NUC E 485 NUCLEAR INSTRUMENTS	3
FISH 473 RADIONUCLIDES IN THE AQUATIC ENVIRONMENT	3
NUC E 484 INTRODUCTION TO NUCLEAR ENGINEERING	4
NUC E 559 CONTROL OF RADIOACTIVE WASTES	3
PHYS 471, 473 ATOMIC AND NUCLEAR PHYSICS LABORATORY	3, 3
RAD 485 RADIATION DOSIMETRY	4
RAD 501, 501L, 502, 502L BIOLOGICAL EFFECTS OF IONIZING RADIATION	2, 1, 2, 1

*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 specific departmental course descriptions given elsewhere in this Catalog.



RAD 493	SPECIAL PROBLEMS IN RADIOLOGICAL HEALTH	2
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.

REQUIRED COURSES*	CREDITS	
6 CREDITS IN 500-LEVEL COURSES IN BIOLOGICAL SCIENCES (COURSES ARE TO BE SELECTED WHICH WILL DEVELOP PROFICIENCY IN THE STUDENT'S FIELD OF MAJOR INTEREST.)		
RAD 501, 501L, 502, 502L	BIOLOGICAL EFFECTS OF IONIZING RADIATION	2, 1, 2, 1
RAD 493	SPECIAL PROBLEMS IN RADIOLOGICAL HEALTH	2
FISH 473	RADIONUCLIDES IN THE AQUATIC ENVIRONMENT	3
CHEM 410	RADIOCHEMICAL TECHNIQUES AND RADIOCHEMISTRY MEASUREMENTS	
OR		
FISH 472	RADIONUCLIDES IN THE AQUATIC ENVIRONMENT	3
CHEM 350, 351	ELEMENTARY PHYSICAL CHEMISTRY	3, 3
PHYS 320	INTRODUCTION TO MODERN PHYSICS	3
PHYS 323	INTRODUCTION TO NUCLEAR PHYSICS	3
RAD S 520	RADIOLOGICAL SCIENCES SEMINAR	2
RAD S 700	THESIS	9

NUCLEAR ENGINEERING

Chairman of Nuclear Engineering Group and
Graduate Program Adviser

Albert L. Babb
Nuclear Reactor Building

The Nuclear Engineering Group, with members from the Departments of Chemical, Civil, Electrical, Mechanical, and Metallurgical Engineering, supervises the interdepartmental program in nuclear engineering and the research activities relating to the release, control, and utilization of energy from nuclear sources. The Group offers courses of study leading to the degrees of Master of Science in Engineering and Doctor of Philosophy.

Details of the program may be found in the *Engineering* section of this Catalog. Additional information may be obtained by writing to: Chairman, University of Washington Nuclear Engineering Group, Nuclear Reactor Building.



DESCRIPTION OF COURSES

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.

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*.

COLLEGE OF ARCHITECTURE AND URBAN PLANNING

ARCHITECTURE

Courses for Undergraduates

- 100, 101 Architectural Appreciation (2,2)**
HERRMAN
Survey of architectural design from an historical viewpoint. For nonmajors.
- 105 The House (2)**
HERRMAN
Analysis of domestic architecture. For nonmajors.
- 106 Introduction to Architecture and Urban Planning (5)**
STEINBRUECK
Survey of architecture, urban planning, and the environmental designs, and construction. Historical and contemporary.
- 124, 125, 126 Architectural Design, Grade I (6,6,6)**
Design and drawing fundamentals to provide a working knowledge, language, and tools for the architect. Prerequisite, permission or 124.
- 200, 201, 202 History of Architecture (3,3,3)**
ALDEN, JOHNSTON
Comparative study of the Classic, Byzantine, Romanesque, Gothic, Renaissance, and Baroque periods.
- 224, 225, 226 Architectural Design, Grade II (6,6,6)**
Prerequisite, 126.
- 235, 236, 237 Mechanical Equipment of Buildings (2,2,2)**
Analysis and methods of plumbing and sanitation; electric wiring and illumination; heating, ventilation, and air conditioning.
- 276 Statics (3)**
Basic analysis of forces and force systems by analytical and graphic methods. Stress analysis of trusses. Prerequisite, Mathematics 105.
- 277 Strength of Materials (3)**
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)**
ALBRECHT, TANG, TORRENCE
Determination of roof loads. Complete design of various types of roof trusses in timber and steel. Prerequisite, 277.
- 303 History of Architecture (3)**
JOHNSTON
Analysis of architectural developments since the Baroque.

- 314, 315, 316 Architectural Drawing (4,4,4)**
Orthographic projection, shades and shadows, perspective, drafting, and rendering techniques.
- 324, 325, 326 Architectural Design, Grade III (6,6,6)**
Prerequisite, 226.
- 330 Materials and Their Uses (3)**
POMEROY
Manufacture, properties, and design potentials of building materials. Prerequisites, Physics 103 and 109.
- 338 Illumination Seminar (1)**
FITZMAURICE
Principles of illumination as applied to buildings. Prerequisite, senior in architecture.
- 339 Acoustics Seminar (1)**
TOWNE
Principles of acoustical designing as applied to buildings. Prerequisite, senior in architecture.
- 360 Design Theory and Analysis (3)**
STEINBRUECK
Design theory, analysis of planning, and building types. Prerequisite, 226.
- 369 Specifications and Contracts (2)**
MITHUN
Form and composition of building specifications and related contract documents. Prerequisite, 330.
- 370 Building Economics (2)**
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)**
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)**
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.
- 424, 425, 426 Architectural Design, Grade IV (7,7,7)**
Prerequisite, 326.
- 430, 431, 432 Contract Drawings (3,3,3)**
CURTIS, VAREY
Lectures and drafting-room practice. Prerequisites, 326 and 378.

468 Professional Practice (2)

DIETZ
Introduction to the architectural office, business operation, and professional procedure. Prerequisite, senior in architecture.

BUILDING TECHNOLOGY AND ADMINISTRATION

Courses for Undergraduates

- 201 Building Materials (3)**
POMEROY
The basic building materials, their uses, physical and chemical properties, processing, fabrication, potentialities, limitations, and procurement.
- 301 Building Materials (3)**
Organization and functioning of the building industry, legal, ethical, business, and management aspects.
- 302 Building Industry (3)**
(Continuation of 301.)
- 310 History of Building (3)**
An historical survey of building techniques and materials as conditioned by environmental, technical, and social influences.
- 320 Building Equipment and Techniques (3)**
The equipment and construction techniques of the building industry with emphasis on rationalizing trends. Prerequisite, 302.
- 401 Building Estimating (3)**
The principles of building costs, estimating, and construction cost control. Prerequisite, 201.
- 402 Building Estimating (3)**
(Continuation of 401.)
- 410 Senior Study (3)**
Independent study of a specific building industry problem with assigned proctor. Prerequisite, senior standing.
- 420 Building Financing (2)**
The financing of building construction, financial institutions, regulations, government participation, and financing principles. Prerequisites, 302 and Real Estate 301.
- ## LANDSCAPE ARCHITECTURE
- ### Courses for Undergraduates
- 230 Theory and Perception (2)**
HAAG
General survey, orientation, and introduction to basic theory of landscape architecture. Prerequisite, Architecture 126, or permission.
- 231 History (3)**
JOHNSTON
A critical and historical analysis of man's progress in designing land and outdoor space.

**334, 335, 336 Construction (4,4,4)**

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)

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)

HAAG, SAKUMA

Advanced study in the analysis, approach, solution, and presentation of complex landscape architectural problems. Prerequisite, 352.

465 Planting Design (4)

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)

HAAG

A study of the professional practice and ethics of the landscape architect. Prerequisite, fifth-year student in landscape architecture.

URBAN PLANNING**Courses for Undergraduates****400 Introduction to Urban Planning (3)**

NORTON, WOLFE

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.

451J Regional Planning Development (3 or 5)

THOMAS, ULLMAN, MORRILL, MARTS

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)

WOLFE

Evolution of the urban form. Development of the physical setting as related to building groupment, open spaces, and circulation patterns. Cultural influences on the city structure.

480 Urban Planning Analysis I (3)

WOLFE

The urban plan and plan making. Emphasis on comprehensive, coordinative urban planning. Various planning surveys with methodology and techniques discussed. Prerequisite, 400 or permission.

481 Urban Planning Analysis II

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)

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 (2)

Survey of housing and redevelopment problems, theories, standards, and practice. Prerequisite, 400 or permission.

490, 491, 492, 493 City Planning Design (7,7,7,7)

Planning problems, with emphasis on urban design based on the interpretation of social, economic, and physical data. Prerequisite, Architecture, 325 or permission.

ARCHITECTURE**Courses for Graduates Only****524, 525, 526 Advanced Architectural Studies (6,6,6)**

Advanced experimental studies dealing with significant architectural relationships involving scholarly investigation, development and presentation of results.

560, 561, 562 Graduate Seminar (3,3,3)

Lectures and discussions by members of the faculty and visiting specialists in order to develop a broad understanding of the forces influencing the creation of the human environment.

600 Research (*)

Student research will be permitted and encouraged when the studies support departmental interests.

700 Thesis (*)**URBAN PLANNING****Courses for Graduates Only****500 Urban Design Analysis Seminar (2)**

WOLFE

Studies of the various arrangements of urban forms that affect perceptual experiences. Urban design considerations of the location of

structures and open space and methods of implementing public policy decisions affecting urban design.

505 Seminar in Urban Renewal (2)

Analysis of urban renewal needs and practices. Particular emphasis on problems encountered and on potential new directions of development.

527J Quantitative Methods of Urban Analysis (3)

See Geography for course description.

528J Computer Applications to Urban Analysis (3)

See Geography for course description.

529J Data Systems Development for Environmental Studies (3)

See Geography for course description.

530J Research Seminar: Geography and Development (3, max. 6)

THOMAS

Offered jointly with the Department of Geography.

590, 591, 592, 593 Urban Planning Problems (5,5,5,5)

Typical planning problems using the city as a laboratory. Emphasis on urban research, evaluation of basic data, planning proposals, and presentation techniques. Prerequisite, graduate student in urban planning.

600 Research (*)**700 Thesis (*)****COLLEGE OF ARTS AND SCIENCES****ANTHROPOLOGY****Courses for Undergraduates****100 Introduction to the Study of Man (5)**

VALENTINE

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 civilizations. Ethnology, social anthropology, and linguistics: living societies of the world, their languages and cultures. (Not open to students who have had 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, sophomore standing.

- 202 Cultural Anthropology: Comparison and Analysis (5)**
HARPER
Social, political, and religious institutions in selected communities around the world which illustrate diversity and universality in human cultures. Prerequisite, sophomore standing.
- 203 Archaeology: The Dawn of Tradition (5)**
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, sophomore standing.
- 210 North American Indians (3)**
GUNTHER
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 Native Peoples of South America (3)**
WATSON
Indigenous cultures of South America. Indian elements in modern Latin America.
- 250 The Nature of Culture (2)**
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)**
GREENGO
Methods and techniques as demonstrated through field experience. (Offered Summer Quarter only.) Prerequisite, permission.
- 272 Prehistoric Cultures of North America (3)**
GREENGO
Archaeology from the earliest evidence to the coming of Europeans.
- 274 Prehistoric Cultures of South America (3)**
GREENGO
From earliest evidence of man to the period of conquest by the Spanish. (Not offered 1964-65.)
- 280 Theories of Race (2)**
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 had 100 or 201.)
- 311 Indian Cultures of the Pacific Northwest (3)**
GARFIELD
Comparative analysis of material culture and social, religious, and political institutions.
- 312J South Asia (5)**
HARPER, KAR, M. MORRIS
Analysis of origins, development, and present outlines of settlement, cultures, resource use, and economic structures in the Indian subcontinent. Offered jointly with Department of Geography and the Far Eastern and Russian Institute.
- 314J Peoples of Central and Northern Asia (3)**
Offered alternate years jointly with the Far Eastern and Russian Institute; offered 1964-65. Prerequisite, major standing in anthropology or Far Eastern, or permission.
- 315 Peoples of the Far North (3)**
GARFIELD
Arctic and Sub-Arctic peoples of Asia and North America; nonliterate peoples of Old and New World and cultural history of the Far North. (Not offered 1964-65.)
- 317 Ethnology of Southeast Asia (3)**
A survey and analysis of the cultural diversity and unity of the peoples of Burma, Thailand, Indo-China, Malaya, Indonesia, and the Philippines. Prerequisite, major standing in anthropology or Far Eastern, or permission.
- 320 Primitive Technology (5)**
GUNTHER
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)**
FOGELSON, RAY
A survey of beliefs and practices designed to provide a world ethnographic sample of the materials. Prerequisite, upper-division standing.
- 350 Basis of Civilization (3)**
WATSON
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. (Not offered 1964-65.)
- 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)**
Development and relationships of primates, including man, traced from comparative and paleontological data.
- 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)**
RAY
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)**
RAY
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)**
RAY
Planned and directed social and cultural change. Prerequisite, 202 or permission.
- 431 Primitive Literature (3)**
GARFIELD
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)**
GUNTHER
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)**
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)**
OTTENBERG
Comparative analysis if selected nonliterate societies. Prerequisite, 202.

**438 The Analysis of Kinship Systems (3)**

READ

Organization and types of kinship structures among western and nonwestern peoples. Prerequisites, 202, or permission.

441 Introduction to Culture and Personality (3)

FOGELSON

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)

SPIRO

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)

FOGELSON

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 with B grade.

450 Introduction to Language (3)

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)

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. Prerequisite, permission.

454J Methods in Comparative Linguistics (3)

Method and theory of comparative linguistics in relation to anthropological research. Offered jointly with the Department of Linguistics.

455J Areal Linguistics (3, max. 6)

Linguistic analyses of the languages of a selected area. Offered jointly with the Department of Linguistics.

460 History of Anthropology (3)

JACOBS, OTTENBERG

Systematic discussion of developments in the several fields of general anthropology. Prerequisite, 15 credits in anthropology.

462J, 463J Morphology and Syntax (3,3)

SAPORTA

The structuring of meaningful elements in language; practical experience with a wide variety of languages; field techniques. Offered jointly with the Department of Linguistics.

470 Culture History of Austronesia (3)

GREENGO

Indonesia and the islands of the southwest Pacific; relationships with southeast Asia, China, and Japan. (Not offered 1964-65.)

475 The Prehistoric Near East (3)

FAIRSERVIS

The evolution of Near-Eastern cultures from a hunting-gathering level to a stage anticipating civilization. Prerequisite, permission.

476 The Character of Egyptian Civilization (3)

FAIRSERVIS

The cultural features of ancient Egypt, their origin, function and change. Prerequisite, permission.

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. Prerequisite, permission.

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. Prerequisite, permission. (Not offered 1964-65.)

480 Physical Anthropology: Anatomy (3)

Prerequisites, 201, 202, and 203 or Biology 101J-102J.

481 Physical Anthropology: Structure and Function (3)

Prerequisites, 201, 202, and 203 or Biology 101J-102J. (Not offered 1964-65.)

482 Physical Anthropology: Genetics (3)

Prerequisites, 201, 202, and 203 or Biology 101J-102J.

499, 499H Undergraduate Research

(*; max. 12; max. 18 for honors students only)

Prerequisite, permission.

Courses for Graduates Only**500, 501, 502 Preceptorial Reading (5,5,5)**

A "core" course for the beginning graduate student in which the fields and problems of contemporary anthropology are systematically surveyed.

505 Field Techniques in Ethnography (3)

WATSON

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)

FOGELSON

An advanced comparative treatment of selected aspects of the Indian cultures and societies of North America. (Not offered 1964-65.)

511 Cultural Problems of the Northwest Coast (3, max. 6)

GARFIELD

The major ethnological questions of the region are examined. (Not offered 1964-65.)

512 Seminar on Oceania (3)

An advanced comparative treatment of selected aspects of the cultures and societies of Oceania. (Not offered 1964-65.)

513 Seminar on Africa (3)

OTTENBERG

An advanced comparative treatment of selected aspects of the cultures and societies of Africa.

515 Seminar on South America (3)

WATSON

An advanced comparative treatment of selected aspects of the cultures and societies of South America. (Not offered 1964-65.)

516 Seminar on Southeast Asia (3)

SPIRO

An advanced comparative treatment of selected aspects of the cultures of Southeast Asia. (Not offered 1964-65.)

517 Seminar on South Asia (3)

HARPER

An advanced analysis of selected problems in South Asian ethnology and social structure. (Not offered 1964-65.)

518 Seminar on Middle America (3)

RAY

An advanced comparative treatment of selected aspects of the cultures and societies of Middle America.

519J Seminar on Asia (3, max. 6)

The large cultural regions of the continent are studied in succession with special reference to anthropological problems. Offered alternate years jointly with the Far Eastern and Russian Institute; offered 1964-65.

521 Native American Culture History (4)

RAY

An historical interpretation of the geographical distribution of critical aspects of North and South American Indian cultures.

522 Cultural Problems of Western America (3)

RAY

Analysis of the components of representative Indian cultures west of the Rocky Mountains and research on selected problems. (Not offered 1964-65.)

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. (Not offered 1964-65.)

525 Seminar in Culture Processes (3, max. 6)

WATSON

The concept of process and its application to the study of culture.

527 Acculturation (3)

WATSON

Systematic analysis of psychological, social, and cultural implications of the contact of peoples.

530 Structures and Functions of Oral Literature (3)

JACOBS

Of interest to students of language and literature.

531 Analysis of Oral Literature (3, max. 6)

JACOBS

Various approaches to the study of folklore and myth. Of interest to students of language and literature.

532 Content Analysis of Oral Literature (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.

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)

Offered jointly with the Department of Linguistics.

559 Seminar in Language and Culture (3)

JACOBS

Theoretical and methodological problems in language and culture.

561 Seminar in Methods and Theories (3, max. 9)

SPIRO

563 Structural-Functional Analysis (3-9)

OTTENBERG

565, 566, 567 History of Anthropological Sciences (3,3,3)

FOGELSON, OTTENBERG

A "core" course for beginning graduate students, in which the growth and development of anthropological science is analyzed.

570 Seminar in Archaeology (3)

KRIEGER

571 Field Course in Archaeology (5)

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. (Offered Summer Quarter only.)

580 Anthropology in Contemporary Problems (3)

GUNTHER

(Not offered 1964-65.)

582 Seminar in Race and Genetics (3)

600 Research (*)

700 Thesis (*)

ART

Courses for Undergraduates

Humanities 102 The Arts (5)

Painting, sculpture, music, architecture, the dance, and drama studied through example, discussion, and criticism.

100 Introduction to Art (5)

Lecture and studio work. For nonmajors.

105, 106, 107 Drawing (3,3,3)

Perspective, light and shade, composition, pencil and charcoal. Prerequisites, 105 for 106; 106 for 107.

109, 110, 111 Design (3,3,3)

Art structure as the basis for creative work. Organization of line, space, and color. Lectures, discussion, and supplementary reading. Prerequisites, 109 for 110; 110 for 111.

129 Appreciation of Design (2)

Lectures on design fundamentals, illustrated with slides and paintings, pottery, textiles, etc. Reading and reference work.

201, 202, 203 Ceramic Art (3,3,3)

Pottery: hand-building processes, wheel throwing, glazing, kiln firing. Prerequisites, 107, 110, 129 for 201; 201 for 202; 202 for 203.

205 Lettering (3)

Design and composition of letters. Prerequisites, 107, 110, 129.

212, 213, 214 History of Western Art (3,3,3)

An introduction to major achievements in the principal media from prehistoric times to the present. Illustrated lectures. 212, Ancient and Medieval; 213, Renaissance and Baroque; 214, Modern.

253, 254, 255 Design and Materials (3,3,3)

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)

Oil painting; still life and landscape. Prerequisites, 107, 110, 129.

258 Water Color (3)

Prerequisites, 107, 110, 129.

259 Advanced Water Color (3)

Prerequisite, 258.

261 Elementary Interior Design (2)

Study of basic residential spaces and furnishings. Scale drawings. materials, and color.

262 Essentials of Interior Design (2)

Illustrated lectures.

265, 266, 267 Advanced Drawing (3,3,3)

Advanced drawing from the model, still-life, and landscape. Prerequisites, 107, 110, 129 for 265; 265 for 266; 266 for 267.

272, 273, 274 Beginning Sculpture Composition (3,3,3)

Fundamentals of composition in the round and in relief; concept and form relationships stressed. Work in clay, plaster, and wood. Discussions and sketchbook. Prerequisites, 107, 110, 129 for 272; 272 for 273; 273 for 274.

280, 281, 282 Furniture Design (3,3,3)

Design and construction of furniture at full scale including working drawings, scale models, and layout. Prerequisites, 107, 110, 129, Architecture 124, 125, 126.

283 History of Furniture and Interior Architecture (3)

FOOTE

Illustrated lectures on the evolution of furniture and interior architecture.

300 Art Education: Crafts (3)

FULLER

Design in leather. Exploration of techniques and processes leading to creative work. Prerequisite, junior standing in art.

302 Art Education: Crafts (3)

Bookbinding. The design and construction of books and decorative paper techniques. Prerequisite, junior standing in art.

303 Art Education: Crafts (3)

Sculptural form through paper structure. Prerequisite, junior standing in art.



- 304 Art Education: Crafts (3)**
Textile techniques and processes. Prerequisite, junior standing in art.
- 305 Art Education: Crafts (3)**
Mosaic, enamel, and other techniques. Prerequisite, junior standing in art.
- 307, 308, 309 Portrait Painting (3,3,3)**
Prerequisite, 257.
- 310, 311, 312 Interior Design (5,5,5)**
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.
- 316, 317, 318 Design for Industry (3,3,3)**
SMITH
Product design, working drawings, models, presentation drawings, product analysis, display, marketing. Prerequisites, junior standing in industrial design: 316 for 317; 317 for 318.
- 320 History of Modern Sculpture (2)**
DU PEN
Since the Renaissance; lectures and slides. Prerequisites, 212, 213, 214.
- 322, 323, 324 Life Sculpture (3,3,3)**
DU PEN
Work in clay from the posed model. Figure composition, discussions, reading, and sketchbook. Prerequisites, 274 and junior standing in art.
- 326 History of Painting Since the Renaissance (2)**
MOSLEY
Illustrated lectures. Prerequisite, 212, 213, 214.
- 327 History of Printmaking (2)**
ALPS
Origins and history of the woodcut, wood and metal engraving, etching, aquatint, intaglio, lithography, and serigraphy in Western and Oriental art, contemporary printmaking. (Not offered 1964-65.) Prerequisite, junior standing in art or permission.
- 332, 333, 334 Intermediate Sculpture Composition (3,3,3)**
DU PEN
Advanced work in various media and techniques, wood and stone carving, metal casting, welding, cement, and terra cotta. Reading, discussions, and sketchbook. Prerequisite, 324.
- 340 Design for Printed Fabrics (3)**
PENINGTON
Hand-block and silk-screen printing; mass-production design. Prerequisite, 255 or permission.
- 341J Greek Archaeology and Art (2)**
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)**
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.
- 350 Introduction to Printmaking (3)**
ALPS
Studio work in original expressive plate-making, plate-printing, studio proofs, editions in collagraphy. Introductory work in woodcut, wood engraving, lithography, serigraphy, and intaglio etching. Prerequisite, junior standing in art or permission.
- 351 Printmaking (3)**
ALPS
Continuation of 350. Prerequisite, 350.
- 352 Printmaking**
ALPS
Prerequisite, 351.
- 353, 354, 355 Advanced Ceramic Art (5,5,5)**
Pottery—advanced work in forming, decorating and glazing. Prerequisites, 203, 353 for 354; 354 for 355.
- 357 Metal Design (3)**
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)**
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 Enamelling (3)**
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)**
Drawing and painting from the model. Prerequisites, 257 for 360; 360 for 361; 361 for 362.
- 366, 367, 368 Graphic Design (3,3,3)**
WELMAN
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)**
Design of clothing with emphasis on line, color, materials, use. (Not offered 1964-65.) Prerequisites, junior standing in art, or permission for 369; 369 for 370; 370 for 371.
- 382 Art of India (3)**
ROGERS
- 383 Art of China (3)**
ROGERS
- 384 Art of Japan and Korea (3)**
ROGERS
- 386 Art of the Ancient Near East (3)**
ROGERS
(Not offered 1964-65.)
- 387 Islamic Art (3)**
ROGERS
(Not offered 1964-65.)
- 388 Medieval Art (3)**
ROGERS
Prerequisites, 212, 213, 214.
- 390 History of Renaissance Art in Italy (3)**
MERRILL
The art of the fifteenth and early sixteenth centuries with attention to preliminary, late medieval, and succeeding mannerist developments, and to northern European influences. (Assume acquaintance with vocabulary of art or related history.)
- 391 Renaissance Art in Northern Europe (3) Europe (3)**
MERRILL
Painting, sculpture and the graphic arts in the Netherlands, Germany, Austria, and Switzerland during the fifteenth and sixteenth centuries. (Assume acquaintance with vocabulary of art or related history.)
- 392 Post-Renaissance and Baroque Art in Europe (3)**
MERRILL
The painting, sculpture, and architecture of sixteenth century Italy, Spain, and France and of all Western Europe in the seventeenth and early eighteenth centuries. (Assume acquaintance with vocabulary of art or related history.)
- 402 Greek and Roman Pottery (3)**
EDMONSON
Shapes, fabrics, and decorations from the Neolithic period to the sixth century A.D. Offered jointly with the Department of Classics. (Offered alternate years; offered 1964-65.)
- 404J Greek and Roman Sculpture (3)**
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. (Offered alternate years; offered 1964-65.)

410 Illustration (5)

RAND

Book and magazine illustration. Composition and history. Prerequisite, senior standing in art.

423, 424, 425 Art History and Criticism (3,3,3)

A critical discussion of significant material from the Renaissance through the most recent publications, with emphasis on specific periods and works of art.

426 Origins of Modern Art (3)

Prerequisite, 326.

428 Oriental Ceramic Art (2)

ROGERS

Chinese, Korean, and Japanese ceramics from neolithic times to the present. Prerequisites, 383 and 384, or major in ceramic art.

436, 437, 438 Sculpture Composition (5,5,5)

DU PEN

Individual compositions in various media in large scale and professional quality; architectural considerations. Reading and seminar discussion. Prerequisites, 334 and senior standing in art.

445, 446, 447 Advanced Industrial Design (5,5,5)

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)

ALPS

Lithography, etching, serigraph, linoleum block, woodcut, and wood-engraving. Prerequisites, 350, 351, 352 for 450; 450 for 451; 451 for 452.

457 Advanced Metal Design (3)

PENINGTON

Individual problems in metal design and construction. Prerequisite, 357.

458 Advanced Jewelry Design (3)

PENINGTON

Individual problems in jewelry design and construction. Prerequisite, 358.

459 Advanced Enameling (3)

PENINGTON

Individual problems in enameling. Prerequisite, 359.

463, 464, 465 Composition (3,3,3)

Development of individuality in painting through creative exercises. Prerequisite, 257.

466, 467, 468 Graphic Design (5,5,5)

CAPLAN

Composition in advertising art; expression of ideas in terms of design. Variety of mediums and reproduction processes. Prerequisites, 368 for 466; 466 for 467; 467 for 468.

472, 473, 474 Advanced Interior Design (5,5,5)

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)

Prerequisites, 360, 361, 362, 463, 464, 465.

479, 480 Fashion Illustration (3,3)

RAND

Prerequisites, 410 for 479; 479 for 480.

485, 486, 487 Advanced Ceramic Art (5,5,5)

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)

JOHNSON

Planned especially for administrators and teachers needing help in problems relating to the teaching of art in the schools. Working in materials will be integrated with lectures and discussions. No previous art experience necessary.

498 Individual Projects (3 or 5, max. 15)

Prerequisite, permission.

Courses for Graduates Only**500, 501, 502 Seminar in Art Education (3 or 5 each)**

JOHNSON

Special problems in the teaching and supervision of art in the public schools. Prerequisite, one year teaching experience in the public schools.

503, 504, 505 Seminar in the General Field of Art (3 or 5 each)

MERRILL

507, 508, 509 Advanced Portrait Painting (3,3,3)**510 Advanced Illustration (3 or 5)**

RAND

522, 523, 524 Advanced Sculpture (3 or 5 each)**530, 531, 532 Advanced Design (3 or 5 each)****550, 551, 552 Advanced Printmaking (3 or 5 each)**

ALPS

553, 554, 555 Advanced Ceramic Art (3 or 5 each)**560, 561, 562 Advanced Life Painting (3 or 5 each)****563, 564, 565 Composition (3 or 5 each)****600 Research (*)****700 Thesis (*)****ASTRONOMY****Courses for Undergraduates****101 Astronomy (5)**

JACOBSEN

Celestial sphere, solar, sidereal universe.

411 Spherical and Practical Astronomy (3)

JACOBSEN

Spherical triangles, precession, aberration. Prerequisites, 101 or equivalent, calculus, permission.

421 Solar System and Dynamical Astronomy (3)

JACOBSEN

Planetary motion, special subjects. Prerequisites, 101 or equivalent, calculus, permission.

431 Stellar Astronomy and Astrophysics (3)

JACOBSEN

Stellar spectra; motions, types of stars. Prerequisites, 101 or equivalent, calculus, physics, permission.

499 Undergraduate Research (*, max. 15)

JACOBSEN

Current or special astronomical problems. Prerequisite, permission.

ATMOSPHERIC SCIENCES**Courses for Undergraduates****101 Survey of the Atmosphere (5)**

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)

Properties of the atmosphere introduced in relation to the larger field of geophysics. The physical nature of the earth's interior, the geomagnetic field, the sun, the oceans, and the atmosphere. Open to qualified students interested in the geophysical sciences. Prerequisites, Mathematics 124 and Physics 123 or equivalents.

321 Physical Climatology (5)

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)
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)
BUETTNER

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.

340 Introduction to Atmospheric Physics (5)
BUSINGER, HOBBS

Earth's field of gravity; properties and distribution of atmospheric gases. Prerequisite, Mathematics 125 or permission.

350 Introduction to Atmospheric Analysis (5)
REED

Analysis of surface and upper-level charts and vertical cross sections. Elementary applications of hydrostatic and geostrophic equations. Prerequisites, one year of calculus and general physics.

360 Meteorological Instruments and Observations (5)
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 (*)

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)
BUSINGER

The atmosphere in 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, 431H Atmospheric Physics (5)

BUSINGER, HOBBS

Properties of cloud particles, solar and terrestrial radiation, transfer processes and applications. Prerequisites, 340 or Physics 371, and Mathematics 325.

432 Atmospheric Physics (3)
BUSINGER

Electromagnetic principles and application to the atmosphere, properties of waves, atmospheric probing, natural signal phenomena, effects of nuclear explosions. Prerequisites, 340 or Physics 371, and Mathematics 325.

441, 442; 441H, 442H Atmospheric Motions (5,5)

FLEAGLE, REED, HOBBS

441: preliminary mathematics, vector operations, fundamental equations, simple manipulations of equations. Prerequisites, 340 or permission, and Mathematics 325. 442: circulation and vorticity, barotropic and baroclinic wave theory, numerical weather predictions. Prerequisite, 441.

451, 451H Atmospheric Analysis (5)
REED

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)
REED

Daily practice in map analysis and forecasting, using current weather data. Use of thermodynamic diagrams. Severe storm forecasting. Statistical methods. Prerequisite, 451.

462 Sea-Air Transfer Processes (6)
FLEAGLE, BADGLEY

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. (Offered at Friday Harbor, Washington, Summer Quarter only.) Prerequisite, 442 or permission.

492 Readings in Meteorology or Climatology (*)

Prerequisite, permission.

493 Special Problems in Meteorology or Climatology (*)

Prerequisite, permission.

494 Meteorological Statistics (5)

Courses for Graduates Only

522 Advanced Regional Climatology (3)
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)
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)
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 438 and Physics 320, or permission.

532 Atmospheric Electricity (3)
BUETTNER

Formation and disappearance of atmospheric ions. Normal air electrical field. Lightning and its causes. Earth magnetic field. Prerequisite, 531 or permission.

533 Atmospheric Radiation (3)
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 438.

535 The Physics of Clouds (3)
HOBBS

Study of the microphysical processes leading to the formation of clouds and production of rain, snow, and thunderstorm electrification. Prerequisite, 431 or permission.

541, 542 Dynamic Meteorology (3,3)
FLEAGLE

541: basic equations of dynamic meteorology, circulation and potential vorticity theorems, barotropic and baroclinic atmospheres, large and small scale approximations. Prerequisite, Mathematics 418 or Aeronautics and Astronautics 567 or equivalent. 542: particle dynamics applied to large scale motions and to stability criteria, linearized barotropic wave, numerical forecasting equations, baroclinic, diabatic, and topographic effects. Prerequisites, 541 and Mathematics 238.

543, 544 Atmospheric Wave Theory (3,3)
FLEAGLE

543: perturbation equations in Eulerian and Lagrangian form, wave motions in incompressible and compressible fluids, wave theory of cyclones, flow over mountains. Prerequisites, 442, Mathematics 438, or permission. 544: structure of baroclinic wave, baroclinic instability, general circulation, dispersion of waves, associated Legendre equation, wave motion on spheres, atmospheric tides. Prerequisite, 543.

546, 547, 548 Atmospheric Turbulence (3,3,3)

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)

REED

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)

BADGLEY

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 (2)

HOBBS

Detailed study of recent work on microphysics of clouds. Prerequisite, permission.

572 Seminar on Polar Meteorology (3)

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)

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 (*)

BOTANY

Courses for Undergraduates

BIOLOGY

Courses in biology are administered jointly by the Departments of Botany, Genetics, 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). See Genetics Course Listing.

101J-102J General Biology (5-5)

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.

401 Cytology (3)

HSU

Structure and function of the cell. Prerequisites, Genetics 451, Botany or Zoology 112, or permission.

401L Cytology Laboratory (2)

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.

472 Principles of Ecology (3)

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)

EDMONDSON

Prerequisites, 472 concurrently and permission.

473 Limnology (3)

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)

EDMONDSON

Examination of biota of fresh waters, survey of limnological methods, and analysis of data. Prerequisites, 473 and permission.

BOTANY

105 Practical Botany (5)

BLASER

General theory and practice as applied to structure, growth, physiology, selection, and

cultivation of ornamental plants. Intended primarily for public school teachers. Not open to those who have had 111. (Offered Summer Quarter only; not offered 1965.)

111 Elementary Botany (5)

Structure, physiology, and reproduction of plants, with emphasis on seed producing groups. Suitable for the nonscience major, since general biological principles are stressed. Open to those who have had 105 only by permission of instructor.

112 The Plant Kingdom (5)

BLASER

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 101J-102J, or Zoology 112.

113 Elementary Plant Classification (5)

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.

201, 202, 203 Plant Propagation (2,2,2)

MUHLICK

201: propagation by seeds, cuttings, grafts, etc. 202: identification and culture of garden plants. 203: care and treatment of seeds and seedlings. 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 101J-102J, or permission.

216 Physiology of Seed Plants (4)

WALKER

Mineral nutrition, water relationships, metabolism, and growth, with some emphasis on the woody plant. For forestry majors.

331 Ornamental Plants (3)

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 nonmajors, teaching majors in biology, students in forestry and landscape design.

332 Taxonomy Field Trip (*, max. 27)

361 Forest Pathology (5)

STUNTZ

Common wood-destroying fungi and diseases of forest trees. Intended for forestry majors. Prerequisite, 115 or equivalent.

371 Elementary Plant Physiology (5)

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 and Chemistry 102, or permission.

**421 Bryology (3)**

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. (Offered 1964-65.) Prerequisite, 113 or equivalent.

431, 432 Advanced Taxonomy (5,5)

HITCHCOCK

Morphology and phylogeny of families of seed plants; flora of western North America. (Offered in alternate years; not offered 1964-65.) Prerequisite, 113 or equivalent.

441, 442, 443 Morphology (5,5,5)

BLASER

Comparative morphology and theories of evolution. 441 considers the nonseed plants, psilophytes through ferns. 442 considers pteridperms through angiosperms. 443 considers the structure and evolution of algae and bryophytes. Prerequisite, 112 or permission.

444 Plant Anatomy (5)

BLASER

Tissues of vascular plants; origin and development of the stele; practice in histological analysis of plant materials. (Offered alternate years; not offered 1964-65.) Prerequisite, 111.

445 Marine Algology (6)

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, Summer Quarter only.) Prerequisite, 112 or permission.

446 Algology (5)

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 20 credits in biology.

447 Phytoplankton Morphology and Taxonomy (4)

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.

461 Yeasts and Molds (5)

STUNTZ, WHISLER

Development, structure, and classification of fungi that can be grown in culture. Prerequisite, 15 credits in botany, microbiology, or zoology.

462, 463 Mycology (5,5)

STUNTZ, WHISLER

462: structure and classification of Basidiomycetes. Prerequisites, 111 and 112, or equivalent as determined by instructor. 463: structure and development of slime molds and Phycomycetes. Prerequisites, 111 and 112, or permission.

465 Marine Mycology (6)

WHISLER

Taxonomy and morphology 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 20 credits of biology.

471 Mineral Nutrition (5)

WALKER

Absorption, translocation, and utilization of essential mineral elements. The soil and culture solutions as nutrient media for the growth of plants considered in theory and practice. (Not offered 1964-65.) Prerequisites, 111 or 216, 10 credits in chemistry.

472 Plant Physiology (5)

MEEUSE, CLELAND

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 216, and completion of, or concurrent registration in Chemistry 232, or permission.

473 Advanced Plant Physiology (3)

MEEUSE

Metabolism of organic compounds, with emphasis on photosynthesis and cellular respiration. (Offered alternate years; offered 1964-65.) Prerequisites, 472 or 371, and Chemistry 232, or permission.

473L Advanced Plant Physiology Laboratory (2)

MEEUSE

Must be accompanied by 473.

474 Advanced Plant Physiology (3)

WALKER

Permeability, water relationships, and mineral nutrition with special emphasis on influences affecting growth and development of plants in the field. (Offered alternate years; not offered 1964-65.) Prerequisite, 216 or 371 or 472, or permission.

474L Advanced Plant Physiology Laboratory (2)

WALKER

Must be accompanied by 474. (Offered alternate years; not offered 1964-65.)

475 Problems in Algal Physiology (6)

Metabolic activity of the algae. (Offered at Friday Harbor Laboratories, Summer Quarter only.) Prerequisites, 472 or 371, Chemistry 232, and permission.

498 Special Problems in Botany (1-15)

Students with suitable background in botany may enroll to do special study in algology, anatomy, bryology, morphology, physiology, or taxonomy. Prerequisite, permission of instructor.

Courses for Graduates Only**BIOLOGY****501 Advanced Cytology (5)**

HSU

Detailed study of the structure and function of the cell.

508 Cellular Physiology (3)

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)

WHITELEY

Prerequisites, concurrent registration in 508 or 509, and permission.

509 Cellular Physiology (3)

WHITELEY

Chemistry and physiology of the interkinetic and dividing nucleus, nucleocytoplasmic interactions, physiology of differentiated cells. (Not offered 1964-65.) Prerequisite, Zoology 400 or permission. (Biology 508 and 509 may be elected separately, or in either sequence.)

573 Topics in Limnology (3)

EDMONDSON

May be repeated for credit.

BOTANY**520 Seminar (1)**

Prerequisite, permission.

521 Topics in Plant Physiology (2, max. 10)

MEEUSE, WALKER

Modern trends and methods in plant physiology. Prerequisite, permission.

522 Seminar in Morphology and Taxonomy (*, max. 5)

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)

STUNTZ, WHISLER

Selected topics from all phases of mycology. Prerequisite, permission.

524 Topics in Algology (2)

Selected topics from all phases of algology.

600 Research (*)

Original investigations of special problems in algology, genetics, morphology, mycology, taxonomy, or plant physiology.

700 Thesis (*)

CHEMISTRY

Courses for Undergraduates

100 Chemical Science (5)

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.) No credit to those who have had one unit or more of high school chemistry.

101 General Chemistry (5)

For nonscience and non-engineering 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)

Organic compounds; hydrocarbons, alcohols, aldehydes, ketones, ethers, acids, aromatics, fats and oils, proteins and carbohydrates. (Formerly 120.) Students who plan to take 231 should not take 102. Prerequisite, 101.

140, 140H General Chemistry (3)

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. (Formerly 110.) 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. (Not offered 1964-65.)

150, 150H General Chemistry (3)

Stoichiometry, aqueous solutions, kinetics, acid and base equilibria, electrochemistry, oxidation and reduction. Prerequisite, 140.

151, 151H General Chemistry Laboratory (2)

Experiments illustrating the quantitative relationships in chemistry. Prerequisites, 140 and concurrent registration in 150.

160, 160H General Chemistry (3)

Periodic system, phase equilibria, metals and nonmetals, metallurgy, and nuclear reactions. Prerequisite, 150.

170, 170H Qualitative Analysis (3)

Semi-microqualitative analysis for common cations and anions; separation and identification procedures. Prerequisites, 151 and 160 (the latter may be taken concurrently with 170).

199, 199H Special Problems (1 max. 6)

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)

Volumetric and gravimetric. Prerequisite, 170.

231 Organic Chemistry (3)

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)

Continuation of 231. Prerequisite, 231.

241 Organic Chemistry Laboratory (2)

Usually to accompany 231. Preparation of representative compounds. Prerequisite, 231, which may be taken concurrently.

242 Organic Chemistry Laboratory (2)

Usually to accompany 232. Preparations and qualitative organic analysis. Prerequisites, 232 (which may be taken concurrently) and 241.

335 Organic Chemistry (3)

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)

Continuation of 335. Prerequisite, 335.

337, 337H Organic Chemistry (3)

Continuation of 336. Prerequisite, 336.

345, 345H Organic Chemistry Laboratory (2)

Usually to accompany 335. Organic syntheses. Prerequisite, 335, which may be taken concurrently.

346, 346H Organic Chemistry Laboratory (1)

Continuation of 345. Usually to accompany 336. Prerequisites, 336 (which may be taken concurrently) and 345.

347, 347H Organic and Qualitative Organic Laboratory (3)

Continuation of 346. Usually to accompany 337. Prerequisites, 337 (which may be taken concurrently) and 346.

350 Elementary Physical Chemistry (3)

Survey of some major topics in physical chemistry. Prerequisites, two quarters general chemistry, Physics 103, Mathematics 124.

351 Elementary Physical Chemistry (3)

Continuation of 350, which is prerequisite.

401 Principles of Chemistry (3)

Primarily for high school teachers. Principles of chemistry, atomic and molecular nature of matter, periodic system, stoichiometry, chemical reactions, modern terminology and nomenclature. (Offered Summer Quarter only.)

402 Techniques of Chemistry (2 credits in a given quarter or 3 credits in a given quarter)

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. (Offered Summer Quarter only.)

410, 410H Radiochemical Techniques and Radioactivity Measurements (3)

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 103, or permission.

415 The Chemical Bond (3)

The nature of the chemical bond, complex compounds. Prerequisite, 457.

416 Inorganic Chemistry (3)

Study of elements in relation to the periodic system. Prerequisite, 457.

418 Radiochemistry (3)

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)

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)

ROBINSON

Special analytical methods. Prerequisite, 221, 455 or permission.

426 Instrumental Analysis (3)

CRITTENDEN

Introduction to electrical and optical methods of analysis. Prerequisites, 221 and 458.

427 Advanced Quantitative Theory (3)

CRITTENDEN

Theoretical principles of analytical chemistry. Prerequisites, 221, 232 or 337, 457, or permission.

**428 Chemical Microscopy (3)**

ROBINSON

Theory of the polarizing microscope and its application to chemistry. Prerequisite, 457 or permission.

429 Microquantitative Analysis (3)

ROBINSON

Principles and techniques. Prerequisite, 425 or permission.

445, 445H Qualitative Organic Analysis (3)

Identification and characterization of simple organic compounds. Prerequisite, 347 or permission.

446 Advanced Organic Analysis and Synthesis (3)

Advanced techniques of isolation, identification, and characterization of organic compounds. Prerequisite, 445 or permission.

455 Physical Chemistry (4)

Introduction to quantum chemistry, statistical mechanics, kinetic theory of gases. Prerequisites, 160, Mathematics 126, and college physics.

456 Physical Chemistry (3)

Thermodynamics, phase equilibria, colligative properties of solutions, electrolytes, and electrochemistry. Prerequisites, 455 and Mathematics 126.

457, 457H Physical Chemistry (3)

Chemical kinetics, transport properties, molecular structure, the solid state, surfaces, and macromolecules. Prerequisite, 456.

458, 458H Physical Chemistry Laboratory (4)

Prerequisite, 457, which may be taken concurrently.

499 Undergraduate Research (*, max. 12)

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**511 Advanced Inorganic Chemistry (2)**

CADY

Halogens; less familiar metals; chelate, clathrate, interstitial and nonstoichiometric compounds; other selected topics. Prerequisite, 416 or permission.

512 Advanced Inorganic Chemistry (2)

RITTER

Acid-base theory; mechanism of certain reactions; compounds of nonmetals of groups 3, 4, and 5. Prerequisite, 416 or permission.

513 Advanced Nuclear Chemistry (2)

FAIRHALL

Nuclear reactions, fission, complex radioactive decay, absolute counting techniques, radiochemical separations, low-level techniques, geochemistry, cosmochemistry, chemistry of the synthetic elements. Prerequisite, 418 or permission.

526 Advanced Instrumental Analysis (3)

CRITTENDEN

Absorption and emission spectroscopy, polarography, potentiometry, and dielectric properties as applied to problems in analytical chemistry. Prerequisite, 426 or permission.

530, 531, 532 Advanced Organic Chemistry (3,3,3)

Consideration of synthetic methods, structure determinations, and reaction mechanisms for acyclic, alicyclic, and aromatic compounds of synthetic and natural origin, with emphasis on modern theory and practice. Prerequisites, 337 and 445, or permission.

540 Current Problems in Organic Chemistry (3, max. 18)

For doctoral candidates in organic chemistry. Discussions of topics of current interest and importance, e.g., modern organic synthetic methods, free radical reaction, organic reaction kinetics, theoretical organic chemistry, heterocycles, and natural products. Prerequisite, 532 or permission.

550, 551, 552 Advanced Physical Chemistry (3,3,3)

Thermodynamics, statistical mechanics, kinetic theory, chemical kinetics, quantum mechanics. Prerequisites, 457 or equivalent for 550; 550 for 551; 551 for 552.

560 Current Problems in Physical Chemistry (3, max. 18)

For doctoral candidates in physical chemistry. A discussion of topics selected from active research fields, e.g., chemical kinetics, thermodynamics, crystallography, electron dynamics, molecular dynamics, statistical mechanics, solid state, and related topics. Prerequisite, 522 or permission.

581 Topics in Inorganic Chemistry (3, max. 18)

Open only to students accepted for doctoral work in chemistry.

582 Topics in Analytical Chemistry (3, max. 18)

Open only to students accepted for doctoral work in chemistry.

583 Topics in Organic Chemistry (3, max. 18)

Open only to students accepted for doctoral work in chemistry.

585 Topics in Physical Chemistry (3, max. 18)

Open only to students accepted for doctoral work in chemistry.

590 Seminar in General Chemistry (1, max. 18)**591 Seminar in Inorganic Chemistry (1, max. 18)****592 Seminar in Analytical Chemistry (1, max. 18)****593 Seminar in Organic Chemistry (1, max. 18)****595 Seminar in Physical Chemistry (1, max. 18)****600 Research (*)****700 Thesis (*)****CLASSICS****Courses for Undergraduates****GREEK****101-102, 103 Elementary Greek (5-5,5)**

101-102: an intensive study of grammar, with reading and writing of simple Attic prose; 103: reading of selections from classical Greek literature.

201 Plato: Shorter Dialogues (3)

Selections from the Socratic dialogues. Prerequisite, 101.

202 Attic Orators (3)

Selections to illustrate the political and social background of Greece in the late fifth and early fourth centuries B.C. Prerequisite, 201.

203 Homer (3)

Selections from the *Iliad* or *Odyssey*. Prerequisite, 202.

207, 208 Grammar and Composition (2,2)

Systematic review of grammatical principles; exercises in prose composition. To be taken concurrently with 201 and 202.

209 Survey of Greek Literature (3)

A brief history of Greek literature, with an introduction to the materials and methods of classical scholarship. Prerequisite, 202 or permission.

300 Greek Language, Accelerated (3)

WYATT

Rapid survey of grammar, with readings in classical Greek. Prerequisite, junior standing and permission.

309 Advanced Grammar and Composition (1, max. 4)

Prerequisite, 208 and permission.

- 413 **The Pre-Socratic Philosophers (3)**
MCDIARMID
(Offered alternate years; offered 1964-65.)
- 414 **Plato (3)**
ROSENMEYER
(Offered alternate years; offered 1964-65.)
- 415 **Aristotle (3)**
MCDIARMID
(Offered alternate years; offered 1964-65.)
- 420 **Greek Epic (3)**
ROSENMEYER
(Offered alternate years; not offered 1964-65.)
- 422 **Herodotus and the Persian Wars (3)**
EDMONSON
(Offered alternate years; not offered 1964-65.)
- 424 **Thucydides and the Peloponnesian War (3)**
EDMONSON
(Offered alternate years; not offered 1964-65.)
- 442, 443, 444 **Greek Drama (3,3,3)**
MCDIARMID
Euripides, Sophocles, Aeschylus, Aristophanes. (Offered alternate years; not offered 1964-65.)

451 **Lyric Poetry (3)**
ROSENMEYER
(Offered alternate years; offered 1964-65.)

453 **Pindar: The Epinician Odes (3)**
MCDIARMID
(Offered alternate years; offered 1964-65.)

455 **Hellenistic Poetry (3)**
(Offered alternate years; offered 1964-65.)

490, 490H **Supervised Study (3-6, max. 18)**
Special work in literary and philosophical texts for graduates and undergraduates.

499 **Undergraduate Research (*, max. 15)**

LATIN

101-102, 103 **Elementary Latin (5-5,5)**
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: Cicero (3)**
Readings from the speeches, philosophical works, and letters of Cicero. Prerequisite, two years of high school Latin or 103.

202 **Intermediate Latin: Introduction to Poetry (3)**
Introduction to Latin poetry through the reading of selections from the lyric and elegiac poets. Prerequisite, 201 or permission.

203 **Intermediate Latin: Vergil (3)**
READ
Selections from the first six books of the *Aeneid*. Prerequisite, 202 or permission.

207, 208 **Grammar and Composition (2,2)**
READ
Systematic review of grammatical principles; exercises in prose composition. Prerequisite, two years of high school Latin or 103.

209 **Survey of Latin Literature (2)**
A brief history of Latin literature, with an introduction to the materials and methods of classical scholarship. Prerequisite, 202 or permission.

300 **Latin Language, Accelerated (3)**
WYATT
Rapid survey of grammar, with readings in classical and medieval Latin. Prerequisites, junior standing and permission.

309 **Advanced Grammar and Composition (1, max. 4)**
Prerequisites, 208 and permission.

401 **Medieval Latin (3)**
PASCAL
Prerequisite, permission.

412 **Lucretius (3)**
GRUMMEL
(Offered alternate years; not offered 1964-65.)

413 **Cicero's Philosophical Works (3)**
GRUMMEL
(Offered alternate years; not offered 1964-65.)

414 **Seneca (3)**
GRUMMEL
(Offered alternate years; not offered 1964-65.)

422 **Livy (3)**
GRUMMEL
(Offered alternate years; offered 1964-65.)

423 **Cicero's Orations (3)**
GRUMMEL
(Offered alternate years; offered 1964-65.)

424 **Tacitus (3)**
EDMONSON
(Offered alternate years; offered 1964-65.)

430 **Latin Novel (3)**
PASCAL
(Offered alternate years; not offered 1964-65.)

442 **Roman Drama (3)**
PASCAL
(Offered alternate years; offered 1964-65.)

451 **Roman Satire (3)**
FREDRICKSMEYER
(Offered alternate years; not offered 1964-65.)

455 **Catullus (3)**
FREDRICKSMEYER
(Offered alternate years; offered 1964-65.)

456 **Horace (3)**
FREDRICKSMEYER
(Offered alternate years; offered 1964-65.)

458 **Roman Epic (3)**
FREDRICKSMEYER
(Offered alternate years; not offered 1964-65.)

475LJ **Improvement of Teaching: Latin (5)**
GRUMMEL
Survey of modern teaching techniques, materials, and linguistic theories, supplemented by lectures on the history of the Latin language and literature. Offered jointly with the College of Education. (Offered Summer Quarter only.)

475XJ **Caesar for High School Teachers (2½)**
PASCAL
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. (Offered Summer Quarter only.) Prerequisite, teaching experience or permission.

490, 490H **Supervised Study (3-6, max. 18)**
Special work in literary and philosophical texts for graduates and undergraduates.

499 **Undergraduate Research (*, max. 15)**

CLASSICS COURSES IN ENGLISH

101 **Latin and Greek in Current Use (2)**
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)**
EDMONSON, FREDRICKSMEYER, GRUMMEL, MCDIARMID, PASCAL, READ, ROSENMEYER, 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)**
ROSENMEYER
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*. (Not offered 1964-65.)

426 **Greek and Roman Epic in English (3)**
ROSENMEYER
A study of the *Iliad*, the *Odyssey*, the *Aeneid*, and selections from other ancient epics.



427 Greek and Roman Drama in English (3)
MCDIARMID

The origin and development, with particular emphasis on philosophical attitudes and structural principles of the major dramatists.

430 Greek and Roman Mythology (3)
FREDRICKSMEYER, GRUMMEL

The principal myths found in classical and later literature.

435 The Ancient Novel (3)
ROSENMEYER

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.

CLASSICAL ARCHAEOLOGY

341J Greek Archaeology and Art (2)
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)
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)
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; offered 1964-65.)

404J Greek and Roman Sculpture (3)
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; offered 1964-65.)

406 Greek Architecture (3)
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; offered 1964-65.)

Courses for Graduates Only

GREEK

520 Seminar (3, max. 27)

599 Graduate Reading (*, max. 18)
Supervised reading in selected fields.

600 Research (3-5, max. 15)

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

LATIN

520 Seminar (3, max. 27)

599 Graduate Reading (*, max. 18)
Supervised reading in selected fields.

600 Research (3-5, max. 15)

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

CLASSICAL ARCHAEOLOGY

511 Mycenaean Archaeology (3)
EDMONSON

The art, architecture, and culture of Greece in the late Bronze Age, with emphasis on recent archaeological and linguistic discoveries. (Offered alternate years; not offered 1964-65.)

513 Athenian Topography (3)
EDMONSON

Detailed consideration of the topography and monuments of ancient Athens from the beginning through the Roman period. (Offered alternate years; not offered 1964-65.)

515 Attic Epigraphy (3)
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; not offered 1964-65.)

CLASSICAL LINGUISTICS

501 Comparative Phonology of Greek and Latin (3)
WYATT

The phonological developments of Greek and Latin from Indo-European to the classical periods of both languages. (Offered alternate years; not offered 1964-65.)

503 History of the Greek Language (3)
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; not offered 1964-65.)

505 History of the Latin Language (3)
WYATT

The morphological and syntactical development of the Latin language; the development of Latin as a literary language. (Offered alternate years; not offered 1964-65.)

506 Italic Dialects (3)
WYATT

The principal remains of the non-Latin languages and dialects of ancient Italy. (Offered alternate years; offered 1964-65.)

508 Greek Dialects (3)
WYATT

The non-Attic dialects of ancient Greek, based on a study of inscriptions and the literary remains. (Offered alternate years; offered 1964-65.)

510 Mycenaean Greek (3)
WYATT

A study of the Linear-B tablets found in Crete and on the Greek mainland. (Offered alternate years; offered 1964-65.)

COMMUNICATIONS

Courses for Undergraduates

COMMUNICATIONS

201 Communications Today (2)
BENSON

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)
AMES, SMITH

A study of the men and ideas which shaped the development of the press in America.

203 The Press in Contemporary America (2)
AMES, EDELSTEIN

A study of responsibility of the mass media in relation to the political and economic spheres of society. Special emphasis on ethics of journalism.

226 Introduction to Advertising (3)

Economic and social aspects; organizational structure; comparison of major media, and the elements of creating and producing advertising. Open to nonmajors. (Formerly Advertising 226.)

303 Public Relations (3)
BRIER, CHRISTIAN

Principles and practice of public relations in business, industry, government, and social agencies; policy and conduct as fundamentals in good relationships. Open to nonmajors. Prerequisite, upper-division standing or permission.

310 Introduction to Mass Communications Research (3)

SAMUELSON

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)

BENSON

Analysis of the factors affecting communications 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)

Background and significance of international, national, and local newsworthy events. Primarily a discussion course. (Not offered 1964-65.)

320 Legal Aspects of Communications (5)

BENSON

Regulations governing publication in the mass media.

402 Government and Mass Communication (3)

BENSON

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)

CHRISTIAN

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)

AMES, CLARKE

An analysis of the role of newspapers, magazines, radio, television, and movies, to determine how well they are fulfilling their functions.

408, 409, 410 Communication Research (3,3,3)

CLARKE, SAMUELSON

Development of the rationale and methods of behavioral science in the context of communication research and theory. Prerequisite for 409, Psychology 301 or equivalent; for 410, Psychology 345.

414 History of Mass Communications (3)

AMES, SMITH

Growth and development of the press, with emphasis on journalism in the United States, its social, political, and ethical responsibilities. Open to nonmajors. Prerequisite, 5 or more credits in American history or permission.

415 Comparative Communication Systems (3)

CLARKE, SMITH

Analysis of contemporary international, national, and regional media.

416 Press and World Affairs (3)

Problems and projects in the coverage of national and international news; government and pressure group influences. (Not offered 1964-65.) Prerequisite, 316.

470 Theory and Criticism of Broadcasting (3)

SHADEL

The development of social, economic, and critical standards of broadcasting and the function of radio-television in the mass communications process.

480 Propaganda (3)

CLARKE, EDELSTEIN

Peacetime, wartime, and cold war programs of the United States and other nations, with emphasis on the period immediately prior to, during, and after World War II. Open to nonmajors. Prerequisites, 10 credits or more in area history or political science.

498 Problems of Communications (1-5, max. 10)

Research and individual study. Prerequisite, permission of director and staff.

ADVERTISING

333 Layout and Production (3)

DENIS

Theory and problems in the design and production of advertisements for printed media.

340 Advertising Procedures (5)

DENIS

Fundamentals of copywriting, layout, and mechanical production in the creation of printed advertising. Open only to nonmajors. Prerequisites, Communications 226 or Marketing 391.

341 Basic Advertising Copy (2)

WARNER, WINTER

Principles of copywriting and layout and their interdependence; problems in the preparation of copy and layout.

342 Media Representation (4, max. 8)

WINTER

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)

WARNER

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)

WARNER, 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)

WARNER

Individual study, research, and discussion of selected problems. Open to senior and graduate students. Prerequisite, permission of instructor.

448 Advertising Research (3)

WINTER

The application of standard survey methods and behavioral science techniques to creative concepts and media measurement, with special emphasis on secondary research potentialities.

JOURNALISM

200 News Writing (3)

Structure of news and feature stories. Not open to freshmen. Open to nonmajors by permission. Reasonable proficiency in the use of the typewriter required.

291 Photography (3)

Elementary news photography, photo processing, and picture editing. Open only to majors in the School of Communications.

301 Copy Editing (3)

Editing news copy, writing cutlines, captions, and headlines; newspaper makeup. Open to nonmajors. Prerequisite, 200 or permission.

317 Reporting Legal Procedures (2)

BENSON

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)

SHADEL

Reporting of contemporary news scene with special emphasis on national affairs.

319 Reporting Public Affairs (3)

CHRISTIAN

Covering the principal news beats for the press; operations of local governing institutions; supplementary city assignments.

347 Newspaper Operation (3)

BRIER

Problems of the display, classified, circulation, plant, and promotion departments of large and small newspapers; finance and management trends. (Not offered 1964-65.)

375J Teachers' Course in Journalism (3)

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)**

BRIER

Nonfiction writing for national magazines and for specialized publications. Open to nonmajors. Prerequisites, upper-division standing and permission.

405 Short Story Writing (3)

BRIER

Fiction writing for national magazines. Open only to upper-division students, with permission, and limited to twenty students. Open to nonmajors.

413 Editorial Writing, Policies, and Research (3)

BENSON

Concepts of editorial responsibility; outstanding editorial pages; research for preparing editorial page material, including analytical, interpretive, and persuasive writing.

475J Advanced Teachers' Course in Journalism (2½)

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. (Offered Summer Quarter only.)

RADIO-TELEVISION**250 Survey of Radio and Television (3)**

SHADEL

History of the media; organization and regulation of the industry; commercial aspects; educational use; programming. Open to lower-division nonmajors by permission.

251 Broadcast Performance (3)

Problems of performance, including techniques of demonstration and interviewing.

260 Radio Production (3)

Studio and microphone setups; timing, use of sound effects and incidental music; performance.

270 Elements of Radio Writing (3)

RYAN

Principles of writing for listeners. Reasonable proficiency in the use of the typewriter required.

350 Laboratory Work on KUOW (1-3, max. 9)

Practical work in programming and production with the University's FM radio station. Prerequisites, 260 and 270. Permission required for election in excess of 5 credits.

352 Radio and Television Advertising (5)

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)

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. Prerequisites, one approved university writing course and permission.

376 Radio and Television News Writing (3)

Gathering, writing, editing, and programming news for the broadcast media, including visual treatment for television and film. Prerequisite, Radio-Television 270 or Journalism 200.

450 Broadcast Programming (3)

RYAN

A study of basic concepts and problems, including principles of development and visual treatment of ideas.

455 Television Film Techniques (2 or 3)

Film-camera and editing techniques; film selection and procurement; video recording. Lectures may be taken without laboratory for 2 credits. Prerequisite, permission. (Not offered 1964-65.)

456 Television Staging and Graphics (2 or 3)

The art phases of television production; set building and decoration; preparation of visual aids. Prerequisite, permission. (Not offered 1964-65.)

459J Television in the Schools (3)

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)

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)

RYAN

Principles of production of educational matter, for teachers who expect to teach over television or to supervise school-oriented television activities. Offered jointly with the College of Education. (Offered Summer Quarter only.)

465 Television Workshop Laboratory (2-4, max. 8)

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 Advanced Radio News Writing (2, max. 6)

CRANSTON

Writing and editing news for radio under broadcast conditions. Prerequisites, 376 and permission.

477 Seminar in Broadcasting Problems (3)

Functions and relationships of broadcast station departments. For majors only. (Formerly 475.)

Courses for Graduates Only**COMMUNICATIONS****502 Seminar in Government and Mass Communication (3)**

BENSON

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 the Mass Media (3)

AMES

Use of current documents and data in examining and evaluating the functions of the press. Open to nonmajors. Prerequisite, Communications 406 or permission.

511 Seminar in Mass Communications Research (3)

SAMUELSON

Advanced individual projects in quantitative research design, methods, and techniques. Reports on new developments in research. Topics will vary each year. Open to nonmajors. Prerequisites, Communications 408 and a course in statistics, or permission.

514 Seminar in History and Communications (3)

AMES, SMITH

Aspects of the American press through a study of original source material. Open to nonmajors. Prerequisite, Communications 414 or permission.

570 Seminar in Theory and Criticism of Broadcasting (3)

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 Propaganda (3)

CLARKE, EDELSTEIN

Topics for individual study. Prerequisite, Communications 480 or permission.

598 Selected Readings (1-5, maximum 5)

Open to qualified graduate students by permission.

600 Research (3-5)**700 Thesis (*)**

COMPARATIVE LITERATURE

Courses for Undergraduates

300 World Classics of Western Europe (5)

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)

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)

Great works of Chinese and Japanese 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)

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)

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)

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)

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)

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.

600 Research (*)

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

DRAMA

Courses for Undergraduates

101, 102, 103 Introduction to the Theater (2,2,2)

FALLS

101, the broad range of modern American theater, professional and nonprofessional, as well as the theater artists who work on the production of a play; 102, types of modern American plays; 103, types of contemporary American drama and theater.

146, 247, 248 Theater Voice and Speech (3,2,2)

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)

CARR, GRAY, HARRINGTON, ROSS

Theory and practice of fundamentals: 151, analysis and practice in aptitudes necessary in acting (focus, recall, imagination, characterization) through improvisation; 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; 247 and 152 for 253.

210, 211, 212 Theater Technical Practice (4,4,4)

CRIDER, DAVIS, LOUNSBURY

Intensive lecture, laboratory course in basic theories, techniques and equipment of stage scenery, lighting, costumes and scene painting. 210, scene construction; 211, costumes and scene painting; 212, lighting and technical stage procedures. Crew work required. (Formerly 300, 403, 405, 409.)

230 Introduction to Children's Drama (2)

CARR, HAAGA, SIKS, VALENTINETTI

Survey of the history and development, the philosophy and fundamental practices, and its significance in the twentieth century to include both children's theater and creative dramatics. (Formerly 201.)

298, 498 Theater Production (½-1,½-1, max. 4)

A laboratory course for students participating in School of Drama productions. Prerequisites, 152 for 298; 253 for 498.

316 Theatrical Make-Up (2)

DAVIS

Basic principles, with intensive practice in application of make-up for use on proscenium and arena stages. (Formerly 406.)

324 Children's Theater (3)

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)

CONWAY, GRAY

A course for nonmajors only. 325 fundamentals of scenery, lighting and costume design and construction (formerly 300); 326 fundamentals of directing, especially for high school, with some acting. (Formerly 426.)

331 Puppetry (3)

VALENTINETTI

Introduction to puppetry; construction and use of simple puppets as a visual aid in education, recreation, and therapy. For nonmajors. (Formerly 307.)

338 Creative Dramatics (3)

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)

CARR, GALSTAUN, GRAY, ROSS

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)

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)

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)

CONWAY

Theory, practice, and rendering of scene designs. Repeat of course involves intermediate designs, models, etc. Prerequisite, 210. (Formerly 404 and 414.)

**415 Stage Costume Design (2, max. 4)**

CRIDER

Theory, practice and rendering of costume designs for the theater. Repeat of course involves intermediate designs. Prerequisite, 211.

416 History of Theatrical Costumes (2)

CRIDER

Survey of costumes worn on stage from the Attic theater to end of nineteenth century, including drama, opera, ballet, and a brief history of oriental clothing. Open to nonmajors. (Formerly 407.)

418 Scene Painting (2)

DAVIS

Pigments, color mixing, and techniques of application to stage scenery. Prerequisites, 211 and permission.

419 Stage Lighting (2)

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)

VALENTINETTI

Puppetry as a theater 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)

VALENTINETTI

Projects and participation in formal theater productions or field work in hospitals, clinics, and special schools. Prerequisite, 331 or 431, or permission.

435, 435L Children's Theater Directing and Laboratory (2,1)

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)

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. Not recommended that 438L be taken concurrently with 438. Prerequisites, 338 for 438; 438 and permission for 438L.

451, 452 Advanced Acting (3,3)

ROSS

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)

CARR, GALSTAUN, ROSS, STAFF

Style; Mime; Musical; Individual. Prerequisite, 452. (Formerly 423.)

455 Historic Manners and Movement (2)

CRIDER

Survey of historic costume in the Western world and the manners and movements associated therewith, beginning with Greece and continuing to the end of the nineteenth century. Open to nonmajors. Prerequisite, 253. (Formerly 405.)

461, 461L Theory and Fundamentals of Directing and Laboratory (2,1)

HARRINGTON

Lectures and required reading on the principles of dramatic directing. Practical application in the laboratory. Prerequisites 253 for 461; 461 for 461L. (Formerly 481, 481L.)

462 Musical Comedy Direction (3)

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)

HARRINGTON

Prerequisites, 461L, 451, 452. (Formerly 482.)

471, 472; 473 History of World Theater and Drama (5,5,5)

CONWAY, FALLS

471: Classic and Oriental. 472: Medieval and Renaissance. 473: Modern.

Great playwrights and dramatic literature correlated with the history and development of world theater, the physical playhouse, and methods of production. Open to nonmajors. (Formerly 441, 442, 443.)

474 History and Aesthetics of the Motion Picture (3)

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. (Formerly 440.)

475 History of Far Eastern Theater and Drama (5)

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)

A study of American drama and theater from colonial to modern times.

482J Music in Theater (1-3)

BERGSMAN

Survey, criticism of representative examples of musical theater. Observation, criticism of class productions. For composers, conductors, playwrights, stage directors; above plus collaborative creation and production. Offered jointly with the School of Music.

490 Special Studies (1-5, max. 5)

Prerequisite, permission.

492 Playwriting (3, max. 9)

A professional course. Prerequisites, English 374, 375, and permission. (Formerly 445.)

495J Special Studies in the Theater Arts of Asia (3, max. 9)

MCKINNON AND VISITING ARTISTS

Fundamentals in the theory and practice of the theater arts of Asia. The study of a given form or tradition of theater 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 Theater Organization and Management (2)

Personnel, box-office procedures, advertising, production costs, royalties, and executive policies. Prerequisite, senior standing.

499 Undergraduate Research (1-5, max. 10)

Prerequisite, permission.

Courses for Graduates Only**501 Nature of Graduate Study in Drama (2)**

FALLS

Prerequisite, graduate standing.

510 Seminar in Production (3)

CONWAY, CRIDER, DAVIS, LOUNSBURY

Prerequisite, senior or graduate standing. (Formerly 500.)

513 Technical Direction (3)

LOUNSBURY

Prerequisites, 210, 413, and permission.

514 Advanced Scene Design (3)

CONWAY

Prerequisites, 4 credits in 414. (Formerly 504.)

515 Advanced Stage Costume Design (3)

CRIDER

Prerequisite, 4 credits in 415. (Formerly 505.)

530 Seminar in Children's Drama (3)

HAAGA, SIKS

Prerequisites, 435, 438, and permission.

551-552-553 Teaching of Acting (2-2-2)

HARRINGTON

Prerequisites, 451, 452, and permission.

561 Advanced Directing (5)

HARRINGTON

Theories and problems of advanced directing with special emphasis on pre-modern plays. Prerequisites, 451, 452, 455, 463 and permission. (Formerly 581.)

562 Advanced Directing Projects (3, max. 6)

HARRINGTON

Prerequisite, 561 and permission.

580 Seminar in Drama (5)

FALLS

599 Advanced Studies in Theater Arts (1-5, max. 10)

No more than 5 credits in any emphasis area. Prerequisite, permission.

600 Research (*)

Prerequisite, permission.

700 Thesis (*)

ECONOMICS

Courses for Undergraduates

INTRODUCTORY COURSES

200 Introduction to Economics (5)

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)

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.

202-203 Economic Principles and Price Determination (3-3)

Condensation of 201, plus additional aspects of the economics of the firm, with special reference to the determination of product prices. Primarily for business administration students; other students by permission. No credit for 202- until -203 has been completed. Prerequisites, 200, Mathematics 157, or equivalent, or permission. No credit is allowed if 201 has been taken.

211 General Economics (3)

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 200 has been taken.

260 American Economic History (5)

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. (Formerly 160.)

300 Intermediate Price Theory (5)

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)

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)

GORDON

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. Prerequisite, 200, 201, or equivalent, or permission.

312 Current Economic Problems (5)

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. (Offered Summer Quarter only.)

411 Introduction to the Use of Mathematics in Economic Theory (5)

JOHNSON

Applications of elementary calculus to price, income, and growth theory. Designed to develop ability to read the literature in formal economic theory. Prerequisites, 300, 301, and Mathematics 130 (or equivalent), or permission.

412 Topics in Mathematical Economics (5)

JOHNSON

Study of recently developed applications of mathematics to economic analysis, including such topics as linear programming, input-output analysis, and game theory. Prerequisites, 300, 301, and Mathematics 130 (or equivalent), or permission.

416J Regional Income Analysis (5)

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)

CRUTCHFIELD, FLOYD

Nature and functions of money; the banking system, other credit-granting institutions, and the relationship of money and bank deposits to the economy. Prerequisite, 200 or equivalent, or permission.

421 Money, Credit, and the Economy (5)

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)

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)

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)

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.

LABOR ECONOMICS

340 Labor Economics (5)

BUECHEL, 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. Prerequisite, 200 or equivalent, or 211, or permission.

441 Union-Management Relations (5)

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)

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)

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)**

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. Prerequisite, 200 or equivalent, or permission.

PUBLIC FINANCE AND TAXATION**350 Public Finance and Taxation (5)**

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.

451 Public Finance and Taxation (5)

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)**

MORRIS

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)

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)

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)

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 and Far East, Geography, or Anthropology 312J recommended.

INTERNATIONAL TRADE**370 Economic Principles of Foreign Trade (5)**

HUBER, FLOYD, MAH

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)

HUBER, FLOYD, 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)**

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)

NORTH, THOMAS

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)

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)

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)**

DOWDLE

Basic statistical concepts; characteristics of economic data; statistical analysis of economic data. Prerequisites, 200 and 201.

481 Economic Statistical Analysis (5)

BARZEL, OI, DOWDLE

Applications of statistical techniques to economic problems. Prerequisites, 201 and Mathematics 281, or equivalent, or permission.

482 Advanced Economic Statistical Analysis (5)

BARZEL, OI

Advanced applications of statistical techniques to economic problems. Prerequisite, 481 or equivalent, or permission.

JOINT OFFERINGS**408J Problems of Peace and Conflict Resolution (3)**

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 Departments of Political Science and Psychology. Prerequisite, permission.

416J Regional Income Analysis (5)

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)

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.

460J Economic History of Europe (5)

MORRIS

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)

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)**

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)

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)

May not be applied to an advanced degree. Prerequisite, permission.

Courses for Graduates Only

GRADUATE CORE PROGRAM

500 Micro-Economic Analysis I (3)

Techniques of economic theory; maximizing behavior of individual economic units; analysis of production and demand functions and the resulting pricing of products and productive services; allocation of resources under partial equilibrium. Relies on formal abstract theorizing and model building. Prerequisites, 300 and 301, or permission.

501 Micro-Economic Analysis II (3)

Advanced economics of the firm and of demand theory; linear programming; game theory; aspects of welfare economics; consideration of current literature and research in micro-economics. Prerequisite, 500.

502 Macro-Economic Analysis I (3)

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)

Recent developments. Prerequisite, 502 or permission.

504 Economic History and Economic Development (3)

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)

GORDON

Marxian, classical, and earlier economic thought.

ECONOMIC THEORY AND HISTORY OF ECONOMIC THOUGHT

507 History of Economic Thought (3)

(See Graduate Core Program.)

510 Value and Distribution Theory (3)

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)

Seminar in advanced micro-theory. Selected topics of special interest and significance. Prerequisites, 500 and 501.

512 Advanced Macro-Economic Theory—Selected Topics (3)

Seminar in advanced macro-theory. Selected

topics of special interest and significance. Prerequisites, 502 and 503.

516J Research Seminar: Regional Economics (3)

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)

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)

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.

LABOR ECONOMICS

541 Labor Economics (3)

GILLINGHAM

Selected topics in labor economics. Prerequisite, permission.

542 Labor Economics (3)

HOPKINS

Prerequisite, permission.

PUBLIC FINANCE AND TAXATION

550 Public Finance (3)

TIEBOUT

Fiscal policy instrumentalities and comparative effects on income and employment; limitations of fiscal policy; review of current literature. Prerequisite, permission.

551 Public Finance (3)

Special problems in the fields of taxation and public debt; review of current literature. Prerequisite, permission.

553 Economic Analysis and Government Programs (3)

TIEBOUT

Applications of economic analysis to public enterprises and programs. Prerequisite, 451.

ECONOMIC HISTORY

504 Economic History and Economic Development (3)

(See Graduate Core Program.)

561 European Economic History (3)

MORRIS

Emphasis on the period since 1750. Prerequisite, permission.

562 American Economic History (3)

NORTH

Emphasis on theoretical issues involved in American economic development.

INTERNATIONAL TRADE

571 International Trade Theory (3)

MAH

Modern developments in national income theory and welfare economics, with relation to international trade. Prerequisite, permission.

572 International Economic Theory (3)

Problems of foreign trade and exchange controls, and international monetary policies. Prerequisite, permission.

ECONOMIC SYSTEMS AND DEVELOPMENT

591 Theoretical Issues in Economic Development (3)

Exploration and analysis of theoretical issues in economic development; for advanced students. Prerequisite, 504.

595 Soviet Economics (3)

Analysis of problems of economic measurement, economic development, optimum resource allocation, national income, and planning in the Soviet Union. Prerequisite, permission.

STATISTICS AND ECONOMETRICS

580 Econometrics I (3)

Study of empirical significance of economic theory and related methodological problems.

581 Econometrics II (3)

Advanced study of econometric methods and techniques. Prerequisites, 481, 482, and 580.

GENERAL

600 Research (*)

Prerequisite, permission.

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.



ENGLISH

Courses for Undergraduates

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 Composition (3,3,3)

Required of all students in the College of Arts and Sciences; may not be counted toward a major in English. Composition courses, with collateral readings in fiction and nonfiction, designed to develop techniques of factual writing. Exemption from one or more quarters may be granted to students who demonstrate competence in writing beyond the level of any one of these courses.

101H, 103H Composition—Honors (3,3)

Writing courses, with reading designed to parallel the content of 257, 258, and 259. Offered Autumn and Winter Quarters only. 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)

151 Intermediate English for Foreign Students (5)

303 Advanced English for Foreign Students (3)

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 (5) (Identical with Humanities 101.)

210 Introduction to European Literature (5) (Identical with Humanities 201.)

257 Introduction to Poetry (5)

Poetic techniques; readings from nineteenth- and twentieth-century English and American poets.

258 Introduction to Fiction (5)

Fictional techniques; analysis of short stories and novels.

259 Introduction to Modern Drama (5)

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)

Readings in principal works and authors, with examples of romances, ballads, and drama.

265 English Masterpieces: Donne through Blake (1600-1800) (5)

Includes Milton, Restoration plays, Pope, Swift, Fielding, Johnson, and others.

266 English Masterpieces: Wordsworth through Hardy (1800-1900) (5)

Includes Romantic and Victorian poets, novelists, and essayists.

267 American Masterpieces: Beginnings to 1900 (5)

Includes Edwards, Franklin, Thoreau, Hawthorne, Melville, Twain.

WRITING COURSES FOR MAJORS AND NONMAJORS

271, 272 Expository Writing (3,3)

Practice in writing information and opinion papers to develop easy and effective expression. 272 is somewhat more advanced. Prerequisite, freshman composition requirement or equivalent.

274, 275, 276 Verse Writing (5,5,5)

Prerequisite, freshman composition requirement or equivalent.

277, 278 Beginning Short Story Writing (3,3)

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)

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; not offered 1964-65.)

324 Shakespeare (5)

Introduction to plays of various types.

325 Shakespeare (5)

Comedies and Histories. Prerequisite, 324.

326 Shakespeare (5)

Tragedies and Romances. Prerequisite, 324.

331 Literature: 1600-1660 (5)

Donne, Herbert, Marvell, Bacon, Browne, Burton.

332 Milton (5)

Major poems and selected prose.

335 Restoration Literatures: 1660-1700 (5)

Restoration plays, Dryden, diarists, essayists.

336 Early Eighteenth-Century Literature (5)

Swift, Pope, Defoe, Addison, and Steele.

337 Later Eighteenth-Century Literature (5)

Johnson, Boswell, dramatists, novelists, pre-romantic poets.

341 Romantic Poets (5)

Blake, Wordsworth, Coleridge.

342 Romantic Poets (5)

Keats, Shelley, Byron.

344 Victorian Poets (5)

Tennyson, Browning, and others.

347 Nineteenth-Century Prose (5)

Lamb, Hazlitt, Carlyle, Mill, Ruskin, Morris, Newman, Huxley.

348 Modern British Poetry: A Survey (5)

Housman, Bridges, Yeats, Eliot, Auden, Thomas.

361 American Literature: Beginnings to 1800 and the Transcendentalists (5)

Including Taylor, Edwards, Franklin, Emerson, Thoreau.

362 American Literature: 1800-60 (5)

Including Irving, Cooper, Poe, Hawthorne, Melville.

363 American Literature: 1860-1900 (5)

Including Whitman, Twain, Dickinson, James, Howells, Henry Adams.

NONPERIOD COURSES FOR MAJORS AND NONMAJORS

374, 375 Beginning Playwriting (3,3)

387 English Grammar (5)

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)

For nonmajors; English majors may use as elective beyond the 50 specified credits.

LITERARY TYPES**410 Types of Dramatic Literature: Comedy (5)**

Analysis of dramatic structures.

411 Types of Dramatic Literature: Tragedy (5)

Analysis of dramatic structures.

413, 414, 415 Types of Contemporary Poetry (5,5,5)**417 The English Novel (5)**

Eighteenth century: Swift, Defoe, Richardson, Fielding, Smollett, Sterne.

418 The English Novel (5)

Early and middle nineteenth century: Scott, Austen, Brontes, Dickens, Thackeray, Trollope.

419 The English Novel (5)

Later nineteenth century: Eliot, Meredith, Hardy, the Naturalists, Conrad.

423 Romances and Folk Literature (5)

Alternates with 424.

424 The Popular Ballad (5)

Extensive reading of the English and Scottish popular ballads. Origins, transmission, themes, and music of the ballad form. Alternates with 423. (Not offered 1964-65.)

PERIODS AND OTHER TOPICS**425 Chaucer (5)**

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.)

430 English Literature: 1900-1930 (5)

Early Joyce, Lawrence, Woolf, Forster, Shaw, O'Casey, and selected poets.

431 English Literature: Since 1930 (5)

Later Joyce, Huxley, Green, Greene, Waugh, Amis, Snow, Powell, and selected dramatists and poets.

434 American Literature: 1900-1930 (5)

The Naturalists (Norris, Crane, Dreiser), Anderson, Lewis, Cather, Robinson, Frost. No credit for students who took English 466 prior to Autumn Quarter, 1962.

435 American Literature: Since 1930 (5)

Fitzgerald, Hemingway, Faulkner, Pound, Eliot, Williams, Stevens, etc. No credit for students who took English 466 prior to Autumn Quarter, 1962.

437 Modern European Literature (5)

Mann, Kafka, Proust, Hesse, Moravia, Sartre, Camus.

LANGUAGE AND WRITING**447 History of the English Language (5)**

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. (Not offered 1964-65.)

451 Advanced Expository Writing (5)

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)**457, 458 Advanced Short Story Writing (5,5)**

Prerequisite, 277, 278, or permission.

461, 462, 463 Novel Writing (5,5,5)

Prerequisite, permission.

480, 481 Current Developments in English Studies (5,5)

Emphasis on composition, practical criticism, language study, and selected readings in literature. Open only to high school teachers and teaching cadets.

490, 491 Major Conference (3,3)

Individual study by arrangement with instructor.

493, 494 Advanced Writing Conference (3-5, 3-5)

Revision of manuscripts. Preliminary work on writing projects should be completed before entrance. Prerequisite, permission.

499 Special Studies in Literature (5, max. 10)

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)**506 Studies in Literary Genres (5, max. 15)****507, 508 Literary Criticism (5,5)****509 Methods of Contemporary Criticism (5)****510, 511, 512 The Renaissance and Spenser (5,5,5)****513 Shakespeare's Dramatic Contemporaries (5)****515, 516 Chaucer (5,5)****517, 518, 519 Shakespeare (5,5,5)****521, 522, 523 Seventeenth-Century Literature (5,5,5)****524, 525, 526 American Literature (5, max. 10 each)****527, 528 Studies in Medieval Literature (5,5)****530 The English Language (5)****531 Introductory Reading in Old English (5)****532 Advanced Reading in Old English (5)****533 Foundations of American English (3)****534 American English Dialectology (3)**
(Not offered 1964-65.)**538, 539, 540 Early Nineteenth-Century Literature (5,5,5)****541, 542, 543 Victorian Literature (5, max. 10 each)****544, 545, 546 Eighteenth-Century Literature (5,5,5)****547 Rhetoric (5)**
(Not offered 1964-65.)**548 Twentieth-Century Literature (5)****553 Current Rhetorical Theory (5)**
(Not offered 1964-65.)**586 Graduate Writing Conference (5)****599 Special Studies in Literature (5, max. 15)****600 Research (*)****700 Thesis (*)****702 Degree Final (6)**

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)

MAKI, MICHAEL, TAYLOR, WILLISTON

Social, economic, and political problems of China, Japan, Korea, the Philippines, Indonesia, and Southeast Asia. Includes 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)

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)

SHIH

China's material civilization—including fine arts, literature, religion, and thought—in relation to general development of Chinese society.

242 Korean Civilization (3)

WILLISTON

Korea's material civilization—including fine arts, literature, religion, and thought—in relation to general development of Korean society.

243 Russian Civilization (5)

SPECTOR

Russia's material civilization—including fine arts; literature; history; political, social, and legal institutions; religion; and thought—in relation to general development of Russian society.

290 History of China (5)

WILLISTON

From earliest times to the present; emphasis on development of Chinese society.

292 History of Korea (5)

WILLISTON

From earliest times to the present; emphasis on the modern period.

302J World Classics of the Orient (5)

Great works of Chinese and Japanese 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.

303J Monsoon Asia (5)

EARLE

Geography. Historical and current patterns and development of settlement and human activities in Monsoon Asia. Regional frameworks; resources; problems of urban and

agrarian development, industrialization, and economic growth. Offered jointly with the Department of Geography.

305J Eastern Europe (5)

Geography. An analysis of the physical, historical and socioeconomic characteristics of Eastern Europe. Offered jointly with the Department of Geography.

310 The Far East in the Modern World (5)

MAKI, MICHAEL, TAYLOR, WILLISTON

Social, economic, and political problems of China, Japan, Korea, the Philippines, Indonesia, 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.

312J South Asia (5)

HARPER, KAR, M. MORRIS

Analysis of origins, development, and present outlines of settlement, cultures, resource use, and economic structures in the Indian subcontinent. Offered jointly with the Departments of Anthropology and Geography.

313J East Asia (5)

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)

Offered alternate years jointly with the Department of Anthropology; offered 1964-65. Prerequisite, major standing in Anthropology or Far Eastern, or permission.

316 History of Southeastern Asia (5)

WILLISTON

Impact of India, China, and the West upon native cultures of Burma, Siam, Indo-China, British Malaya, Indonesia, and the Philippines. Evolution of social, political, and economic institutions.

329 Russia and the Muslim World (5)

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)

EARLE

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)

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)

MAKI

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)

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)

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)

WYLIE

Political, religious, and cultural history of the theocratic period: seventeenth century to the present.

345J Japanese Government (5)

MAKI

Characteristics from 1868 to 1945; governmental changes since 1945. Offered jointly with the Department of Political Science.

378 Russia in Asia (3)

Relations of tsarist Russia and the Soviet Union with eastern Asia. (Offered alternate years; offered 1965-66.)

382J Civilization of India: Indian Thought (5)

SPELLMAN

A history of ideas in India. Offered jointly with the Department of History. (Not offered 1964-65.)

383J Civilization of India: Impact of Islam and the West (5)

SPELLMAN

Offered jointly with the Department of History. (Not offered 1964-65.)

384J Civilization of India: Literature and Arts (5)

SPELLMAN

From earliest times to the present. Offered jointly with the Department of History. (Not offered 1964-65.)

- 401, 402 Marxism-Leninism and the Thought of Mao Tse-tung (5,5)**
WITTFOGEL
401: Marxism-Leninism as an analytic and operational doctrine. Marx' and Engels' theoretical and political position. The development of Leninism. 402: Marxism-Leninism in the USSR and China: Stalin, Khrushchev, Mao. Parallels and divergencies in Russian and Chinese Communism. Prerequisite, modern Chinese or Russian history or politics, or Political Science 413, or permission.
- 410 Far Eastern Workshop (3)**
Far Eastern teaching methods and materials. (Offered Summer Quarter only.)
- 421J Kievan and Muscovite Russia, 850-1700 (5)**
BOBA, SZEFTEL
Development of Russia from earliest times to the reign of Peter the Great. Offered jointly with the Department of History. Prerequisites, Social Science 101 and 102, or History 101, or permission.
- 422J Imperial Russia, 1700-1900 (5)**
KEEP, SZEFTEL, TREADGOLD
Development of Russia from Peter the Great to Nicholas II. Offered jointly with the Department of History. Prerequisites, 421J or Social Science 101 and 102, or History 102, or permission.
- 423J Twentieth-Century Russia (5)**
KEEP, TREADGOLD
Russia and the U.S.S.R. 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. (Not offered 1964-65.)
- 426 Origins of the East European States (5)**
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-)**
BOBA, 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)**
BOBA, 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)**
SPECTOR
Soviet-Muslim relations from the Russia Revolution of 1917 to the present, with emphasis on the Soviet impact on Turkey, Iran, Afghanistan, Pakistan, Indonesia, and the Arab States.
- 430 Survey of Mongol Culture (3)**
POPPE
Nomadic culture and tribal organization in ancient times; present state and cultural life of Mongolia. (Offered alternate years; offered 1965-66.)
- 433J Geographic Problems in Soviet Development (3 or 5)**
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)**
EARLE
Analysis of regional and political structures, resources, economic activities and problems of development, overseas and internal relationships. Offered jointly with the Department of Geography.
- 435J Problems in the Geography of China (5)**
CHANG
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)**
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.
- 443 Chinese Social Institutions (5)**
HSIAO
General survey of traditional institutions and their changes in modern times. (Offered alternate years; offered 1965-66.)
- 448J History of Russian Culture to 1800 (5)**
SZEFTEL
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 alternate years jointly with the Department of History; offered 1965-66. Prerequisites, 421J or History 101 or Social Science 101 and 102, or permission.
- 449J Russian Historiography (5)**
SZEFTEL
Offered jointly with the Department of History. Prerequisites, 421J or 448J, or Social Science 101 and 102, or History 101, or permission. (Not offered 1964-65.)
- 450 Survey of Turkic Culture of Central Asia (3)**
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. (Offered alternate years; offered 1964-65.) Prerequisites, 110 or 310, Anthropology 202, or permission.
- 452J Early Japanese History (5)**
BUTOW
The political, social, economic, and cultural development of Japan to the beginning of the Tokugawa period (seventeenth century). Offered jointly with the Department of History.
- 453J Modern Japanese History (5)**
PYLE
Political, social, economic, and cultural development of Japan from the beginning of the Tokugawa period (seventeenth century) to the present. Offered jointly with the Department of History.
- 456J Senior Seminar in Far Eastern Diplomatic History (5)**
BUTOW
Far Eastern international relations from the sixteenth century to the present, with emphasis on the period from 1793 to 1945. Offered jointly with the Department of History. (Not offered 1964-65.)
- 461, 462, 463 Studies in Buddhism (5,5,5)**
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 Senior Seminar in Far Eastern 221 B.C. (5)**
WILHELM
Pre-imperial China. (Offered alternate years jointly with the Department of History; offered 1964-65.)
- 466J Chinese History: 221 B.C. to A.D. 960 (5)**
WILHELM
Development of the imperial Chinese state. (Offered alternate years jointly with the Department of History; offered 1964-65.)
- 467J Chinese History: A.D. 906 to A.D. 1840 (5)**
WILHELM
The Wu Tai, Sung, Yuan, Ming, and early Ch'ing periods. (Offered alternate years jointly with the Department of History; offered 1964-65.)

**468J Modern Chinese History (5)**

MICHAEL

Modern Chinese society from 1840 to the present. Offered jointly with the Department of History.

482J History of India: Earliest Times to A.D. 647 (5)

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.

483J History of India: 647 to 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: 1525 to the Present (5)

SPELLMAN

Modern India; emphasis on forms of political organizations and economic life, social organizations and cultural developments. Offered jointly with the Department of History.

489 Russian and East European Bibliography (5)

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)

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 Theater Arts of Asia (3, max. 9)

MCKINNON AND VISITING ARTISTS

Fundamentals in the theory and practice of the theater arts of Asia. The study of a given form or tradition of theater 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 (3)

SWAYZE

Honors Program seminar. Prerequisite, permission of Arts and Sciences Honors Program adviser.

499 Undergraduate Research (3-5, max. 15)

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.

505J Research Seminar: China and Northeast Asia (3, max. 6)

MURPHEY

Geography. Offered jointly with the Department of Geography.

506J Research Seminar: Southeast Asia (3, max. 6)

EARLE

Geography. Offered jointly with the Department of Geography.

507J Research Seminar: Soviet Union (3, max. 6)

JACKSON

Geography. Offered jointly with the Department of Geography.

509J Research Seminar: Japan (3, max. 6)

KAKIUCHI

Geography. Offered jointly with the Department of Geography.

510 Seminar in Soviet Literary Politics (5)

SWAYZE

Examination of literary policies of the Soviet regime and their impact on Soviet belles-lettres. Prerequisites, History 423 or Political Science 441, Russian 421, or permission. Reading knowledge of Russian desirable.

519J Seminar on Asia (3, max. 6)

The large cultural regions of the continent are studied in succession, with special reference to anthropological problems. (Offered alternate years jointly with the Department of Anthropology; offered 1964-65.)

520J Seminar on the Foreign Policy of the Soviet Union (3)

RESHETAR

Offered jointly with the Department of Political Science. Prerequisite, permission.

521, 522, 523 Seminar on Modern Asian History (3,3,3)

TAYLOR

(Not offered 1964-65.)

525, 526 Seminar on Far Eastern Diplomacy (3,3)

WILLISTON

528J History of Eastern Europe, 1772-1939 (5)

SUGAR, THOMSON

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, 531 Seminar on China (3,3)

WILHELM

Problems of Chinese history. (Not offered 1964-65.) Prerequisite, permission.

533 Seminar: Problems of Chinese and Russian Communism (5)

WITTFOGEL

Institutional analysis of representative periods and key aspects of Chinese society.

534J Modern Russian History (3-6)

KEEP, TREADGOLD

Offered jointly with the Department of History.

535J-536J-537J Seminar in Modern Russian History (3-6)-(3-6)-(3-6)

KEEP, TREADGOLD

Seminar in modern Russian history. Offered jointly with the Department of History. Prerequisite, reading knowledge of Russian.

538 Seminar on Modern China (3)

MICHAEL

Studies of problems in Chinese government, politics, ideology, and social and economic issues from 1911 to the present.

539J Medieval Russian History (3-6)

SZEFTEL

Offered jointly with the Department of History. Prerequisite, 421J, 448J or permission; Russian, or French and German. (Not offered 1964-65.)

540 Seminar on Eurasian History (3)

(Offered every three years; offered 1965-66.)

541J The Soviet Political System (4)

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)

MAKI

Offered jointly with the Department of Political Science.

535J-536J-537J Seminar in Modern Russian History (3-6)-(3-6)-(3-6)

TREADGOLD, KEEP

Offered jointly with the Department of History. Prerequisite, reading knowledge of Russian.

546J-547J Seminar in Medieval Russian History (3-6)-(3-6)

BOBA, SZEFTEL

Offered jointly with the Department of History. Prerequisites, Russian and permission.

548J History of Eastern Europe, 1939 to the Present (5)

SUGAR

Prerequisite, a reading knowledge of one major European language or one East European language. (Offered alternate years jointly with the Department of History; not offered 1964-65.)

549J Japanese History (3-6)

BUTOW

Field course. Prerequisite, permission. (Offered alternate years jointly with the Department of History; offered 1964-65.)

550J-551J-552J Seminar in Japanese History (3-6)-(3-6)-(3-6)

BUTOW

Offered jointly with the Department of History. Prerequisite, permission.

572-573 Seminar in Modern English History (3-6)

COSTIGAN

598 Inner Asia Research Colloquium (5, max. 15)

HURVITZ, 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)

HIAO, MAH, MELJER, MICHAEL, SHIH, TAYLOR

A research seminar that deals with various aspects of Chinese society, modern and contemporary. Prerequisite, permission.

600 Research (*)

Prerequisite, permission.

700 Thesis (*)

FAR EASTERN AND SLAVIC LANGUAGES AND LITERATURE

Courses for Undergraduates

BULGARIAN

401, 402 Elementary Bulgarian (5,5)

Introduction to Bulgarian phonology and grammar in terms of the modern spoken language. Writing conventions of literary Bulgarian. (Not offered 1964-65.) Prerequisite, Russian 305 or 310, or permission.

411 Readings in Bulgarian (5)

Reading in modern authors to increase student's command of grammar and vocabulary. (Not offered 1964-65.) Prerequisite, 402.

CHINESE

101 Chinese, Intensive AB (10)

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)

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. (Offered Summer Quarter only.)

200 Chinese, Non-Intensive D (5)

LAO

Continuation of 150. Prerequisite, 150 or permission.

201 Chinese, Intensive CD (10)

LI

Continuation of 101. Prerequisite, 101 or equivalent.

250 Chinese, Non-Intensive E (5)

LAO

Continuation of 200. Prerequisite, 200 or permission.

300 Chinese, Non-Intensive F (5)

LAO

Continuation of 250. Prerequisite, 250 or permission.

301 Chinese, Intensive EF (10)

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)

YEN

Selected readings in modern Chinese literature, philosophy, history, and political science (including newspaper materials). Prerequisite, 300 or 301, or equivalent.

350 Third-Year Accelerated Chinese (15)

Prerequisite, 300 or 301 or equivalent. (Offered Summer Quarter only.)

405, 406, 407 Classical and Documentary Chinese (5,5,5)

REIFLER

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)

WILHELM

Introduction to the methodology of Sinology. (Offered alternate years; offered 1964-65.) Prerequisite, 300 or 301, or equivalent.

430 Readings in Chinese Philosophical Texts (5)

SHIH

(Not offered 1964-65.) Prerequisite, permission.

455, 456, 457 Chinese Literature (5,5,5)

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. (Offered alternate years; offered 1965-66.) Prerequisite, 300 or 301, or equivalent.

460 Advanced Modern Chinese (5, max. 15)

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)

For Far Eastern majors. Prerequisite, permission.

CZECH

401, 402 Elementary Czech (5,5)

Introduction to the essentials of spoken and written Czech. Prerequisites, Russian 305, 310, or permission.

411 Readings in Czech (5)

Modern Czech prose, leading to a command of the language as a research tool and providing an adequate basis for further study. Prerequisite, 402.

JAPANESE

101-102, 103 First-Year Conversational Japanese (5-5,5)

TATSUMI

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 (15)

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. (Offered Summer Quarter only.)



201, 202, 203 First-Year Reading Japanese (5,5,5)

MATSUDA, NIWA

Reading and translation of modern Japanese. Also oral work in Japanese. Prerequisites, 101, 102, and 103 or equivalent.

301, 302, 303 Second-Year Reading Japanese (5,5,5)

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)

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.)

401, 402, 403 Third-Year Reading Japanese (5)

Reading of newspapers and other modern materials. Discussions in Japanese in class. Prerequisite, 303, 313, or permission.

451, 452, 453 Japanese for China Specialists (5,5,5)

HURVITZ

Enables student with reading knowledge of Chinese to read Japanese high-school level material on China. (Offered alternate years; offered 1965-66.) (Formerly 351, 352, 353.) 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. (Offered alternate years; offered 1964-65.) Prerequisite, permission.

499 Undergraduate Research (3-5, max. 15)

For Far Eastern majors. Prerequisite, permission.

KOREAN

302-303 Elementary Spoken Korean Language (5,5)

SUH

(Offered alternate years; offered 1964-65.)

304 Intermediate Korean (5)

SUH

(Offered alternate years; offered 1964-65.) Prerequisite, -303 or equivalent.

405 Korean Grammar (5)

SUH

Phonetics, grammar, and syntax of the language, both colloquial and written. (Offered alternate years; offered 1965-66.) Prerequisite, 304 or equivalent.

406, 407 Advanced Korean Reading (5,5)

SUH

Composition, literature, and advanced reading. (406 not offered 1964-65.) Prerequisite, permission.

499 Undergraduate Research (3-5, max. 15)

SUH

For Far Eastern majors. Prerequisite, permission.

MONGOLIAN

302 Introduction to Mongolian (5)

PAO, POPPE

Beginner's grammar, easy texts.

303 Modern Mongolian Literary Language (5)

PAO, POPPE

Grammar, syntax, and styles of modern Mongolian based on colloquial, and Cyrillic alphabet. Prerequisite, 302.

304 Colloquial Mongolian (5)

PAO, POPPE

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)

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)

PAO, POPPE

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)

POPPE

For Far Eastern majors. Prerequisite, permission.

POLISH

401, 402 Phonetics, Grammar, and Vocabulary (5,5)

SOLECKI

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.

411 Readings in Polish (5)

SOLECKI

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.

RUSSIAN

101-105 Russian A-B (5-5)

GREKOFF, NOVIKOW, PAHN, THOMPSON

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 Accelerated Russian AB (10)

GREKOFF, GROSS, THOMPSON

Covers material of 100-105 in one quarter. Two hours weekly: lectures on pronunciation, grammar and writing (in English). Eight hours weekly: practice sessions conducted entirely in Russian. For continuation, see 210.

130 Scientific Russian (5)

GERSHEVSKY

Introduction to written Russian as a research tool for science students. Readings in chemistry and physics, etc. Closed to Russian majors.

150 Accelerated Russian ABC (15)

KONICK

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. (Offered Summer Quarter only.)

200 Russian C (5)

GREKOFF, NOVIKOW, PAHN, THOMPSON

Continuation of 100-105. Prerequisite, -105, 110, or permission.

205 Russian D (5)

NOVIKOW, PAHN, TRACY

Sequel to 200. For continuation, see 300, 305. Prerequisite, 150, 200, or permission.

210 Accelerated Russian CD (10)

GREKOFF, GROSS, THOMPSON

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)

GERSHEVSKY

Introduction to written Russian as a research tool for science students only. Readings in chemistry and physics. Closed to Russian majors. (Offered Summer Quarter only.)

250 Accelerated Russian DEF (15)

KONICK

Continuation of 150. For Summer Quarter students who wish to complete a second 15 credits of Russian. Prerequisite, 150, 200, or permission. (Offered Summer Quarter only.)

300, 305 Russian, E, F (5,5)

NOVIKOW, PAHN, TRACY

Continuation of 205. Prerequisite, 205 or 210, or permission. 300, 305 will have an Honors Program section.

310 Accelerated Russian EF (10)

GREKOFF, GROSS, THOMPSON

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)

GRIBANOVSKY

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, 310, or permission.

315 Intermediate Russian Conversation (2-3, max. 9)

GRIBANOVSKY, 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)

GERSHEVSKY

Reading and translation of articles, mainly in the fields of chemistry and physics. Closed to Russian majors. Prerequisite, 130 or 230 or permission.

411, 412, 413 Advanced Conversation and Composition A, B, C (5,5,5)

GRIBANOVSKY

Class conversation and composition based on reading. Prerequisites, 313 for 411; 411 for 412; 412 for 413.

451, 452 Structure of Russian (3,3)

ABERNATHY

Descriptive analysis of Russian morphology. Prerequisites, 313 or equivalent for 451; 451 for 452, or permission.

455 History of Russian Standard Language (5)

ABERNATHY

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)

KONICK

Discussion and analysis of Russian prose, poetry, and drama in Russian. Prerequisite, 313 or permission of instructor.

464 The Russian Symbolist Movement (3)

A study of Russian poetry and prose of the "Symbolist" period (1895-1910). (Not offered 1964-65.)

465 Modern Russian Poetry (Acmeism and Futurism) (3)

IVASK

A study of Russian poetry in its renaissance, from 1890 to 1925. (Offered alternate years; offered 1965-66.) Prerequisite, 413 or equivalent.

467 Soviet Literature Since Stalin (3)

SWAYZE

Prerequisites, 421, reading knowledge of Russian.

468 Contemporary Russian Literary Criticism (3)

SWAYZE

Recent trends in the Russian study of literature.

470 Russian Versification (3)

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)

For Far Eastern majors only. Prerequisite, permission.

SERBO-CROATIAN**401-402 Phonetics, Grammar, and Vocabulary (5-5)**

A comprehensive introduction to both spoken and written literary Serbo-Croatian. Prerequisite, Russian 305 or 310, or permission.

411 Reading in Serbo-Croatian (5)

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.

SLAVIC**450 Introduction to Slavic Philology (3)**

ABERNATHY

Slavic languages and their geographical and dialectical 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)**

LI

Introduction to the structure of modern spoken and written Thai. One hour lecture and five hours intensive oral practice (in Thai) per week. (Offered alternate years; offered 1965-66.) Prerequisites, none for 301; 301 for 302; 302 for 303.

401, 402, 403 Intermediate Thai (5,5,5)

LI

Reading of more complicated material in preparation for classes conducted in Thai where material is discussed. Review of structure. (Offered alternate years; offered 1964-65.) Prerequisites, 303 or equivalent for 401; 401 for 402; 402 for 403.

TIBETAN**401, 402, 403 Colloquial Tibetan (3,3,3)**

NORNANG

Introduction to phonology, morphology, and syntax of spoken Tibetan (Lhasa dialect) by the inductive method.

404, 405, 406 Literary Tibetan (3,3,3)

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)

NORNANG, WYLIE

Selections from various Tibetan materials including newspapers and magazines. Prerequisite, 406 or equivalent.

499 Undergraduate Research (3-5, max. 15)

NORNANG, WYLIE

For Far Eastern majors. Prerequisite, permission.

TURKIC**301, 302, 303 Introduction to Modern Eurasian Turkic (3,3,3)**

Phonological, grammatical, and syntactical analysis of texts of three representative Eurasian Turkic languages. Three may be selected from the following twelve: Turkman-Karaim-Tuvanian, or Uzbek-Kazakh-Kirkhiz, or New Uighur-Tatar-Altai, or Azeri-Bashkir-Khakas. (Offered every three years; offered 1966-67.) Prerequisite, permission.

311, 312, 313 Modern Turkey Turkish (3,3,3)

Phonology, grammar, and syntax of both colloquial and written language; conversation in Turkish. (Offered every three years; offered 1964-65.) Prerequisite, permission.

405, 406 Arabic for Turkologists (3,3)

Acquaints student with the principal morphological and syntactic features of the Classic Arabic language. (Offered every three years; offered 1964-65.) Prerequisite, permission.

**407 Persian for Turkologists (3)**

Acquaints student with the principal morphological and syntactic features of the New Persian (Classic) language. (Offered every three years; offered 1965-66.) Prerequisite, permission.

408, 409 Chuvash and Yakut (3,3)

Introduction to phonology, grammar, and syntax of Chuvash and Yakut in comparison with the proper Turkic, the Mongol, and Tungus languages; reading of texts and translation. (Offered every three years; offered 1965-66.) Prerequisites, 303 or 313, Russian.

VIETNAMESE**301, 302, 303 Basic Vietnamese (5,5,5)**

THOMPSON

Introduction to the structure of modern spoken and written Vietnamese. One hour lecture and five hours intensive oral practice (in Vietnamese) per week. (Offered alternate years; offered 1964-65.) Prerequisites, none for 301; 301 for 302; 302 for 303.

401, 402, 403 Intermediate Vietnamese (5,5,5)

THOMPSON

Reading of more complicated material in preparation for classes conducted in Vietnamese where material is discussed. Review of structure. (Offered alternate years; offered 1965-66.) Prerequisites, 303 or equivalent for 401; 401 for 402; 402 for 403.

LITERATURE COURSES IN ENGLISH**Chinese 320 Chinese Literature in English (5)**

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; offered 1964-65.)

Japanese 420 Japanese Literary Tradition (5)

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)

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)

MCKINNON

Traditions and techniques; systematic investigation of the major poetic forms, focusing on representative poets and their works. (Offered alternate years; offered 1964-65.)

Japanese 423 Studies in Japanese Drama in English (5)

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. (Offered alternate years; offered 1965-66.)

Korean 320 Korean Literature in English (5)

SUH

Historical development of Korean literature. Special consideration to the relationship with Chinese and Japanese literature. (Offered alternate years; offered 1965-66.)

Mongolian 320 Mongolian Literature in English (5)

POPPE

(Offered alternate years; offered 1965-66.)

Russian 320 Russian Literature in English (5)

KONICK

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)

SWAYZE

From Gorky to Sholokov.

Russian 422 Russian Plays in English (5)

KONICK

From 1782 to 1948.

Russian 426 The Russian Novel in English (5)

KONICK

Gogol, Goncharov, Turgenev.

Russian 427 The Russian Novel in English (5)

KONICK

Dostoevsky.

Slavic 320 Polish Literature in English (5)

Historical outline from the Middle Ages to our time, in English translation. (Offered alternate years; offered 1965-66.)

Courses for Graduates Only**CHINESE****522, 523, 524 Readings in Classical Chinese (5,5,5)**

REIFLER

525 Structure of Chinese Characters (5)

REIFLER

526, 527, 528 Studies in Chinese Literature (5,5,5)

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 1965-66.)

529 Chinese Phonology (3)

LI

530 Studies in Chinese Prose (5)

WILHELM

(Offered alternate years; offered 1965-66.)

531 Studies in Chinese Poetry (5)

SHIH

(Offered alternate years; offered 1964-65.)

532 Studies in Chinese Drama and Novel (5)

SHIH

(Offered alternate years; offered 1964-65.)

535 Chinese Epigraphy (3, max. 6)

REIFLER

Introduction to texts in ancient character forms; selected readings of inscriptions on bronzes and oracle bones.

536, 537, 538 Readings in Chinese Political Thought and Institutions (5,5,5)

HSIAO

For students wishing to develop proficiency in using Chinese source material. Different texts each quarter, selected primarily on basis of students' needs. (Offered alternate years; offered 1964-65.) Prerequisite, permission.

550 Seminar on Chinese Literature (4, max. 8)

SHIH

(Offered alternate years; offered 1965-66.)

555 Seminar on Chinese Linguistics (3, max. 9)

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.

560 Modern Chinese Readings (5, max. 15)

LAO

Selections from learned journals in intermingled style (colloquial and literary Chinese). Prerequisite, 304.

600 Research (*)

Prerequisite, permission.

700 Thesis (*)**JAPANESE****500 Readings in Bibliographical Materials (5)**

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)

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)

MCKINNON

Readings in prose, poetry, and drama, antiquity to nineteenth century. Prerequisite, permission. (Offered alternate years; offered 1965-66.)

551, 552, 553 Advanced Japanese for China Specialists (5,5,5)

HURVITZ

Enables student who has taken Japanese 451, 452, 453 to read any typical Japanese book or article dealing with China. (Offered alternate years; offered 1964-65.) (Formerly 451, 452, 453.) Prerequisite, 453 or permission.

570 Seminar in Japanese Literature (3-5, max. 15)

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; offered 1964-65.)

600 Research (*)

Prerequisite, permission.

700 Thesis (*)

KOREAN

501, 502, 503 Seminar in Korean (3-5,3-5,3-5)

SUH

(Offered alternate years; offered 1965-66.)

512, 513, 514 Readings in Korean Documents (5,5,5)

SUH

512: Korean bibliography and references. Prerequisite, 407 or equivalent. 513, 514: readings in political essays and historical works. Primarily for students in the social sciences who major in the Korean field. Prerequisite, 512 or equivalent. (Offered alternate years; offered 1964-65.)

521, 522 Modern Korean Literature (5,5)

SUH

Readings in important works in Korean literature of the twentieth century. Prerequisite, 512 or equivalent. (Offered alternate years; offered 1964-65.)

600 Research (*)

SUH

Prerequisite, permission.

MONGOLIAN

521 Ancient Mongol: hPhagspa Script (3)

POPPE

Script and grammar of hPhagspa texts; reading and translation. Prerequisite, 304. (Offered alternate years; offered 1965-66.)

522 Mongol: Ancient Texts (3)

POPPE

Grammar and reading of Mongol texts of the fourteenth to seventeenth centuries. Historical texts are emphasized. (Offered alternate years; offered 1965-66.)

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.

600 Research (*)

POPPE

Prerequisite, permission.

RUSSIAN

551 Advanced Russian Syntax (3)

ABERNATHY

Detailed structural analysis of sentence types in the Russian literary language, with emphasis on grammatical categories and word classes. (Offered alternate years; offered 1965-66.)

560 Studies in Early Russian Literature (4)

IVASK

(Offered alternate years; offered 1965-66.)

561 Gogol (3)

Close analysis of Gogol's novels, plays and stories in Russian. (Offered alternate years; offered 1965-66.)

565 Russian Eighteenth-Century Literature (5)

IVASK

Discussion of representative works of poetry, prose, fiction, and criticism in the formative period in history of Russian letters. (Offered alternate years; offered 1964-65.) Prerequisite, 320 or permission.

566 Pushkin (4)

IVASK

Analysis of the works of Alexander Pushkin. (Offered alternate years; offered 1964-65.)

567 Studies in Russian Prose (4)

IVASK

Close analysis of representative works of nineteenth-century prose fiction in original texts. (Offered alternate years; offered 1964-65.)

568 Nineteenth-Century Russian Poetry Since Pushkin (3)

IVASK

Discussion of the masters of nineteenth-century Russian lyric poetry since Pushkin. (Offered alternate years; offered 1965-66.)

570 Seminar in Russian Literature (3)

IVASK

Examination and discussion of Russian masterpieces.

590 Seminar in Russian Literary History (4, max. 8)

IVASK

Close examination of selected periods or figures. Prerequisite, 10 graduate credits in Russian literature.

600 Research (*)

Prerequisite, permission.

700 Thesis (*)

SLAVIC

552 Phonetic Structure of Slavic Languages (3)

ABERNATHY

A detailed analysis of the phonological evolution from earliest period of the Common Slavic language. (Offered alternate years; offered 1965-66.) Prerequisite, 450.

553 Morphological Features of Slavic Languages (3)

ABERNATHY

Development of various grammatical forms of the Slavic languages from the Common Slavic period. (Offered alternate years; offered 1965-66.) Prerequisite, 552.

555 Old Church Slavonic (3)

ABERNATHY

Rise and development of earliest Slavic literary language and a descriptive study of its orthography, phonology, morphology, and syntax. (Offered alternate years; offered 1964-65.)

556 Readings in Old Church Slavonic (3)

ABERNATHY

Reading and grammatical interpretation of a selected group of texts. (Offered alternate years; offered 1964-65.)

TIBETAN

500 Advanced Literary Tibetan (3, max. 9)

NORNANG, WYLIE

Reading of manuscripts and xylographs with emphasis on biographical, historical, and geographic material. Prerequisite, 406 or equivalent.

502, 503, 504 Comparative Study of Chinese, Mongolian, Tibetan, and Sanskrit Texts (5,5,5)

HURVITZ, LABRANG, LI, NORNANG, POPPE, WYLIE

Prerequisite, permission.

**534 Buddhist Tibetan (2, max. 6)**

NORNANG

Reading of Buddhist literature in translation and original Tibetan compositions. Prerequisite, 406 or equivalent.

544 Ancient Tibetan Documents (2, max. 6)

WYLIE

Reading of selections from ancient documents, inscriptions, and annals. Prerequisite, 406 or equivalent.

600 Research (*)

LABRANG, NORNANG, WYLIE

Prerequisite, permission.

TURKIC**504, 505 Middle Turkic (3,3)**

Introduction to the comparative phonology, morphology, and syntax of the Middle Turkic languages; reading and translation of texts in Karakhanian (11th-13th century), Khwarezm Turkic (13th-15th century), Old Ottoman Turkic (13th-15th century), Kipchak (13th-15th century) and Chaghatai (15th-16th century); in Arabic, Latin, and Armenian scripts. (Offered every three years; offered 1965-66.) Prerequisites, 303 or 313, 406, 407.

506, 507 Old Uighur (3,3)

Introduction to script systems, phonology, morphology, and syntax; reading and translation of texts in Uighur (Soghdian) and Manichaean scripts (8th-11th century). (Offered every three years; offered 1965-66.) Prerequisites, 303 or 313, German or Russian.

510, 511 Ottoman Texts (3,3)

Readings in prose, poetry, and drama antiquity to nineteenth century, in Arabic script; readings in official documents. (Offered every three years; offered 1966-67.) Prerequisites, 313, 406, 407.

512, 513 Old Turkic (3,3)

Türkküt. Introduction to script system, phonology, morphology, and syntax of the oldest form of Turkic; reading and translation of 7th-8th century texts in Runic script. (Offered every three years; offered 1964-65.) Prerequisites, 313 and permission.

521, 522 Comparative and Historical Grammar of Turkic Languages (3,3)

Script systems, phonology, morphology, syntax and basic lexicon. (Offered every three years; offered 1966-67.) Prerequisites, 303 or 313, 507 or 513.

523 Seminar on Turkic Literature (3)

Oral literature (epic, tales, songs); written literature: traditions and techniques; special consideration to the relationship with Persian and Arabic literatures on one side, and French and Russian on the other. (Offered every three years; offered 1966-67.) Prerequisite, any Turkic language, Russian, or German, Arabic, or Persian.

GENERAL AND INTERDEPARTMENTAL**Courses for Undergraduates****Biology 101J-102J General Biology (5-5)**

ILLG, KOHN, KRUCKEBERG, MEEUSE, ORIANS

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.

Comparative Literature 300 World Classics of Western Europe (5)

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)

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)

Great works of Chinese and Japanese 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)

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 College Honors Program. Prerequisite, permission.

General Studies 301H Honors Colloquium (Social Science) (2)

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 College Honors Program. Prerequisite, permission.

General Studies 302H Honors Colloquium (Science) (2)

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 College Honors Program. Prerequisite, permission.

General Studies 391 Supervised Study in Selected Fields (*, max. 6)

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 451 Sources of the Modern Cultural Crisis (2-6)

Individual reading assigned by members of the interdepartmental staff. May be repeated in various fields. Prerequisites, either anticipated or current enrollment in 455-456, and permission.

General Studies 455-456 Critical Problems of Our Culture (3-3)

Economic, psychological, scientific and technological, artistic, moral, religious aspects; essential conflicts; the problem of synthesis. Open to seniors; juniors by permission.

Humanities 101 Literature (5)

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. (Identical with English 110.)

Humanities 102 The Arts (5)

Painting, sculpture, music, architecture, the dance, and drama studied through example, discussion, and criticism.

Humanities 103 Philosophy (5)

Methods of reflective thinking and the use of them in considering such essential questions as the existence and nature of God, the meaning of a good life and a good social order, the nature and limits of human knowledge, the relationship between mind and body, and the nature of the universe. This course may be offered in partial fulfillment of the requirements for a major in philosophy. (Identical with Philosophy 100.)

Humanities 201 Literature (5)

Reading and critical discussion of some of the greatest works in world literature. (Identical with English 210.)

General Studies 493 Senior Study (1-5)

For majors only. Prerequisites, permission of supervisor of study and General Studies Office.

Liberal Arts 101 Introduction to Modern Thought (5)

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)

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)

BRIDGMAN, COHEN, FERRILL, GRIFFITHS, HANKINS, KAMINSKY, KATZ, LEVY, RICHARDSON, SPELLMAN, SUGAR, THOMAS, VORZIMMER, 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)

BRIDGMAN, COHEN, FERRILL, GRIFFITHS, HANKINS, KAMINSKY, KATZ, LEVY, RICHARDSON, SPELLMAN, SUGAR, THOMAS, VORZIMMER, 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)

BRIDGMAN, COHEN, FERRILL, GRIFFITHS, HANKINS, KAMINSKY, KATZ, LEVY, RICHARDSON, SPELLMAN, SUGAR, THOMAS, VORZIMMER, 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.

GENETICS

Courses for Undergraduates

351 Human Genetics (3)

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)

A general course recommended for majors in the biological sciences. Prerequisite, 10 credits in biological science.

451L Genetics Laboratory (2)

Must be accompanied by 451.

452 Advanced Genetics (3)

SANDLER

A detailed discussion of chromosomal structure, mutation, chromosomal aberrations, and population genetics. (Offered alternate years; offered, 1964-1965.)

499 Undergraduate Research (*)

Prerequisite, permission.

Courses for Graduates Only

501 Introduction to Research Materials (3, max. 9)

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)

Prerequisite, permission.

531 Problems in Human Genetics (2)

MOTULSKY

An advanced course in human genetics emphasizing modern aspects and research methods. Prerequisites, 351, 451, or permission.

551 Genetics of Microorganisms (3)

The contributions of research with microorganisms are discussed in relation to basic genetic concepts. Prerequisite, 451 or permission.

553 Biochemical Genetics (3)

Recent advances in our understanding of the molecular bases of heredity: biochemical studies of DNA replication, mutagenesis, recombination, phenotypic expression, and the genetic control of metabolism. Prerequisites, 551, Biochemistry 481, or permission.

554 Topics in Genetics (2, max. 6)

Current problems and research methods. Prerequisite, permission. (Formerly Biology 453.)

561 Chromosomal Behavior (3)

SANDLER

Properties of chromosomes with special emphasis on recombination and segregation. (Offered alternate years; offered, 1965-1966.)

600 Research (*)

700 Thesis (*)

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)

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)

A study of the world's regional structure; analysis and interpretation of the world's cultural, economic, and resource patterns. (Not offered 1964-65.)

205 Physical Geography (5)

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)

THOMAS, ULLMAN

World survey of extractive, manufacturing, and distributing activities; 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)

HEATH, SHERMAN

Categories of maps and aerial photographs and their special uses; map reading and interpretation.

INTERMEDIATE AND ADVANCED COURSES

Systematic Fields

325 Historical Geography of America (3)

Exploration, migration routes, pioneer settlement, and the moving frontier in relation to geographical phenomena. Criteria for differential development of regional cultures. (Not offered 1964-65.)

350 Intermediate Economic Geography (5)

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)

Principles and practices in effective utilization of resources; public policies relating to conservation. (Not offered 1964-65.)

375 Political Geography (5)

A study of the spatial variations and interrelationships of political activities and systems.

411J Geomorphology (4)

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.

**416J Regional Income Analysis (5)**

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 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 Economics; alternates annually with 441.

441 Geography and Industrial Change (3 or 5)

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 1964-65; alternates annually with 440J.)

442 Social Geography (3 or 5)

MORRILL

Spatial patterns of population distribution and settlement; of migration and the spread of ideas; of social characteristics and social relations; of social regions. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor.

444 Geography of Water Resources (3 or 5)

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)

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 Development (3 or 5)

MARTS, MORRILL, THOMAS, ULLMAN

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 cred-

its; independent study, 2 additional credits with permission of instructor. Offered jointly with the Department of Urban Planning.

477 Urban Geography (3 or 5)

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 1964-65.)

302 The Pacific Northwest (3)

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.

303J Monsoon Asia (5)

EARLE

Historical and current patterns and development of settlement and human activities in Monsoon Asia. Regional frameworks; resources; problems of urban and agrarian development, industrialization, and economic growth. Offered jointly with the Far Eastern and Russian Institute.

304 Western Europe (5)

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)

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 1964-65.)

307 Australia and New Zealand (5)

EARLE

Pastoral and agricultural development; industrial potential; urbanization; immigration and trade policies; external economic and political relations.

308 Latin America (5)

HEATH

Present and future development and problems of Caribbean and South America in terms of their natural resources, economic activities, and ethnic and settlement patterns. (Formerly 305.)

312J South Asia (5)

HARPER, KAR, M. MORRIS

Analysis of origins, development, and present outlines of settlement, cultures, resource use, and economic structures in the Indian subcontinent. Offered jointly with the Department of Anthropology and the Far Eastern and Russian Institute.

313J East Asia (5)

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)

EARLE

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)

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)

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 Europe (5)

VELIKONJA

Emphasis on problems stemming from contemporary political and socioeconomic changes underway in Europe. Topics include urbanization, regional development, economic integration, and patterns of trade.

433J Geographic Problems in Soviet Development (3 or 5)

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)

EARLE

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.

435J Problems in the Geography of China (5)

CHANG

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 Far Eastern and Russian Institute.

437J Problems in the Geography of Japan (5)

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)

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)

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)

HEATH

Training in the use of aerial photographs as source materials in map compilation and other geographic purposes. Prerequisite, 360.

425J Graphic Techniques in the Social Sciences (5)

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. Offered jointly with the Department of Sociology. Prerequisite, Sociology 223 or equivalent.

458 Map Intelligence (3)

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)

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)

HEATH

Processes and photographic techniques applicable to cartographic and geographic presentations. Prerequisite, 360.

INTRODUCTORY RESEARCH TECHNIQUES

426 Statistical Measurement and Inference (5)

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. (Not offered 1964-65.)

Courses for Graduates Only

500 Contemporary Geographic Thought (3)

501 Geographic Analysis (3)

502 Professional Writing in Geography (*, max. 6)

HUDSON

503 Source Materials in Geographic Research (3)

(Not offered 1964-65.)

504 Research Seminar: Europe (3, max. 6)

505J Research Seminar: China and Northeast Asia (3, max. 6)

MURPHEY

Offered jointly with the Far Eastern and Russian Institute.

506J Research Seminar: Southeast Asia (3, max. 6)

EARLE

Offered jointly with the Far Eastern and Russian Institute.

507J Research Seminar: Soviet Union (3, max. 6)

JACKSON

Offered jointly with the Far Eastern and Russian Institute.

508 Research Seminar: Anglo-America (3, max. 6)

(Not offered 1964-65.)

509J Research Seminar: Japan (3, max. 6)

KAKIUCHI

Offered jointly with the Far Eastern and Russian Institute.

510 Research Seminar: Settlement and Urban Geography (3, max. 9)

ULLMAN

516J Research Seminar: Regional Economics (3)

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)

HEATH, SHERMAN

526 Research Seminar: Quantitative Methods in Economic Geography (3, max. 6)

MORRILL

527J Quantitative Methods of Urban Analysis (3)

HORWOOD

Spatial and econometric models of urban land use and activities. Population distribution and allocation models. Programming theories and feedback and review techniques. Offered jointly with the Departments of Civil Engineering and Urban Planning. Prerequisites, Mathematics 281 or Sociology 223, or equivalent.

528J Computer Applications to Urban Analysis (3)

HORWOOD

Data storage and retrieval systems and data bank design. Computer methods of mapping and graphing from card input data. Multi-phasic data screening techniques and automation of records search. Offered jointly with the Departments of Civil Engineering and Urban Planning. Prerequisite, 527J or permission.



529J Data Systems Development for Environmental Studies (3)

HORWOOD

Methods of handling large scale data inputs. Computer methods of graphing and mapping from magnetic tape input data. Computer applications to statistical analysis and simulation models. Offered jointly with the Departments of Civil Engineering and Urban Planning. Prerequisites, 528J, Mathematics 374, Electrical Engineering 477, or permission.

530J Research Seminar: Geography and Development (3, max. 6)

THOMAS

Offered jointly with the Department of Urban Planning.

538 Research Seminar: Geography of Transportation (3, max. 6)

ULLMAN

539 Research Seminar: Utilization of Water Resources (3, max. 6)

(Not offered 1964-65.)

540 Research Seminar: Industrial Geography (3, max. 6)

THOMAS

575 Research Seminar: Political Geography (3, max. 6)

JACKSON

600 Research (*)

700 Thesis (*)

GEOLOGY

Courses for Undergraduates

101 Physical Geology (5)

BARKSDALE, PORTER, MCKEE

A study of minerals and rocks as well as the processes which have been important throughout geologic time, both on and beneath the surface, in giving the earth its present form. With laboratory. For nonscience majors.

102 Geology in World Affairs (5)

BARKSDALE

Geological occurrence, world distribution, and production of coal, petroleum, and the important industrial materials. With laboratory. For nonscience majors. Prerequisite, 101.

103 Earth History (5)

MALLORY

Geology through time, including the elements of stratigraphy and paleontology. With laboratory. For nonscience majors. Prerequisite, 101.

205 Physical Geology (5)

MCKEE

The origin and development of minerals, rocks, landforms, and earth structures. With laboratory. For science majors. Prerequisite, high school chemistry.

220 Mineralogy (5)

A systematic study of rock-forming and ore minerals, with emphasis on crystal structure and methods of mineral identification. Prerequisite, 101, 205, or 310, or permission.

225 Igneous and Metamorphic Petrology (5)

CZAMANSKE

Systematic study of igneous and metamorphic rocks. Prerequisites, 205 and 220.

310 Geology for Engineers (4)

Elements of geology for civil engineers. Prerequisite, civil engineering major or permission.

326 Sedimentary Petrology (5)

BARKSDALE

Origin and classification of sedimentary rocks; emphasis on field identification. Prerequisite, 225.

330 General Paleontology (5)

MALLORY

Systematic study of invertebrate fossils and the principles of paleontology. Prerequisite, 205 or permission.

340 Structural Geology (5)

MCKEE

Interpretation of rock structures and their genesis. Prerequisites, 205, 326, or permission.

361 Stratigraphy (5)

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)

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)

Advanced or field work in general geology. Prerequisite, permission. (Offered Spring Quarter only.)

405J Introduction to Geophysics: The Earth (5)

BENNINGTON

Solid material in space, internal structure of the earth, sources of forces and stresses, the crust, tectonic cycles. Time scale and dating, correlations of rock types and structural setting. Offered jointly with the Committee on Geophysics. Prerequisite, permission.

411J Geomorphology (4)

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.

412 Geology of North America (6)

PORTER

Regional geology as it applies to surface forms. Prerequisite, senior standing in geology or permission.

413 Glacial and Pleistocene Geology (5)

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.

423 Optical Mineralogy (5)

VANCE

Petrographic microscope and recognition of common minerals in thin section. Prerequisites, 205 and 220.

424 Petrography and Petrology of Igneous Rocks (5)

VANCE

Systematic study with the petrographic microscope. Prerequisite; 423.

425 Petrography and Petrology of Metamorphic Rocks (5)

VANCE

Systematic study of metamorphic rocks and their origin, using the petrographic microscope. Prerequisite, 424.

436 Micropaleontology (5)

MALLORY

Principles of paleontology as applied to micropaleontology; the systematic study of foraminifera. Prerequisites, 330 and permission. (Offered odd-numbered years.)

443 Advanced Structural Geology (5)

MISCH

Analysis in space and time; genetic interpretation; principles of geotectonics. Prerequisite, 340.

450 Elements of Geophysics (3)

Basic elements of earth physics emphasizing areas pertinent to geology. Prerequisites, senior standing in geology and permission.

472 Elements of Geochemistry (4)

CZAMANSKE

Introduction to the interpretation and understanding of geological processes from the chemical standpoint. Prerequisite, senior standing in geology or permission.

480 History of Geology (3)

BARKSDALE

For those contemplating graduate study. A study of the contribution of individuals to the evolution of geological concepts. Prerequisites, senior standing in geology and permission.

481 Preparation of Geologic Reports and Publications (3)

COOMBS

Organization, writing, and illustration of geologic reports. Prerequisites, senior standing in geology and permission.

487 Ore Deposits (5)

PORTER

Form, structure, mineralogy, petrology, and mode of origin of ore deposits. Prerequisite, permission.

498 Undergraduate Thesis (5)

The thesis must be submitted at least one month before graduation.

499 Undergraduate Research (*, max. 5)

Prerequisites, senior standing and permission.

Courses for Graduates Only**510 Research in Geomorphology and Pleistocene Geology (6, max. 10)**

PORTER

511 Seminar in Geomorphology (2)

PORTER

512 Seminar in Pleistocene Research (2)

PORTER

520 Advanced Studies in Mineralogy, Petrography, and Petrology (*)

MISCH, VANCE, MCKEE

521 Metamorphic Minerals (5)

(Offered odd-numbered years.)

522 Regional Metamorphism and Granitization (5)

MISCH

(Offered even-numbered years.)

523 Advanced Mineralogy (3)

MCKEE

524 Advanced Igneous Petrography and Petrology (3 or 5)

VANCE

(Offered odd-numbered years.)

526 Advanced Petrography and Petrology of Sedimentary Rocks (3)

BARKSDALE

(Offered even-numbered years.)

527 Sedimentary Minerals (3)

MCKEE

530 Advanced Studies in Paleontology (*)

MALLORY, WHEELER

(Offered even-numbered years; alternates with 563.)

531 Biostratigraphy (5)

MALLORY

(Offered even-numbered years.)

540 Advanced Studies in Structural Geology (*)

MCKEE, MISCH

545 Structure of Europe (5)

MISCH

(Offered even-numbered years.)

546 Structure of Asia and West Pacific Rim (5)

MISCH

(Offered odd-numbered years.)

547 Literature on Structural Geology (3 or 5)

MISCH

550 Advanced Studies in Geophysics (*)**560 Advanced Studies in Stratigraphy (*)**

MALLORY, WHEELER

563 West Coast Cenozoic Stratigraphy (5)

MALLORY

(Offered odd-numbered years; alternates with 530.)

565 Paleozoic Stratigraphy (5)

WHEELER

(Offered even-numbered years.)

568 Mesozoic Stratigraphy (4)

WHEELER

(Offered odd-numbered years.)

570 Advanced Studies in Geochemistry (*)

CZAMANSKE

571 Engineering Geology (3)

COOMBS

573 Topics in Advanced Geochemistry (4)

CZAMANSKE

574 Seminar in Geochemistry (2)

CZAMANSKE

580 Advanced Studies in Economic Geology (*)

SINCLAIR

590 Seminar (*)**600 Research (*)****700 Thesis (*)****702 Degree Final (6)**

Limited to students completing a nonthesis degree program.

GERMANIC LANGUAGES AND LITERATURE**Courses for Undergraduates****101-102, 103 First-Year German (5-5,5)**

The methods and objectives are primarily oral-aural.

121, 122 First-Year Reading German (5,5)

A special beginning course devoted exclusively to the reading objective. For graduate students only. (Offered Summer Quarter only.)

201 Basic Second-Year German (5)

Readings and oral practice in German, plus grammar review. Prerequisite, 103 or equivalent.

202 Intermediate Second-Year German (5)

Continuation of 201. Prerequisite, 201 or equivalent.

203 Advanced Second-Year Reading (3)

Majors and minors take concurrently with 207. Prerequisite, 202 or equivalent.

207 Advanced Second-Year Conversation (2)

Discussion of general topics to develop oral fluency. Prerequisite, 202 or equivalent.

260 Lower-Division Scientific German (3)

Prerequisite, 202 or permission.

301, 302, 303 Grammar and Conversation (2,2,2)

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)

Not open to those who have had 301, 302, 303. (Offered Summer Quarter only.)

310, 311 Introduction to the Classical Period (3,3)

AMMERLAHN, COTTRELL, SAUERLANDER

Lessing, Schiller, Goethe. Prerequisite, 15 credits in second-year German.

312 Introduction to the German Novelle (3)

COTTRELL, SAUERLANDER

Representative writers, such as Keller, Meyer, and Storm; theory of the Novelle. Prerequisite, 15 credits in second-year German.

**330 Conversational German (5)**

For participants in the Living-Language Group program only. (Offered Summer Quarter only.) Prerequisite, 207 or permission.

401, 402, 403 Grammar and Composition (2,2,2)

Primarily for majors and minors. Prerequisites, 301, 302, and 303.

404 History of the German Language (5)
MEYER

From early Germanic to the present. Open to junior majors. (Offered 1965-66.)

405 Linguistic Analysis of German (3)
REED

Prerequisite, third-year German, or permission.

407 Advanced Composition (5)

Not open to those who have had 401, 402, 403. (Offered Summer Quarter only.)

410, 411, 412 Survey of Modern German Literature and Culture (3,3,3)

IMMERWAHR, HERTLING, BAUMGAERTEL

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)

HRUBY, HERTLING

Literature before 1800, with special consideration of its cultural background. Prerequisite, 15 credits of third-year German or permission.

416 Nineteenth-Century Drama (3)

SAUERLANDER

Prerequisite, permission.

417 Nineteenth-Century Prose (3)

REY

Prerequisite, permission.

430 Advanced Conversational German (5, max. 10)

For participants in the Living-Language Group program only. (Offered Summer Quarter only.) Prerequisite, 330 or permission.

434 Goethe I (3)

AMMERLAHN

Prerequisite, permission.

435 Goethe II (3)

AMMERLAHN

Prerequisite, permission.

438 Schiller (3)

BAUMGAERTEL

Prerequisite, permission.

490H Contemporary German Literature (2)

Interpretation of selected works by contemporary German authors. A senior colloquium for honors majors. Prerequisite, permission.

491H Introduction to Literary Analysis (2)

An introduction to various methods of interpretation and to their practical application. For senior honors majors. Prerequisite, permission.

492H History of Germanic Philology (2)

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)**498 Studies in the German Language (1-5, max. 15)****COURSE IN ENGLISH****464 Thomas Mann in English (3)**

REY

Courses for Graduates Only**500 Methodology (3)**

(Offered 1965-66.)

501 Bibliography (3)**502 History of German Criticism (3)**

REY

503 Modern Poetry (3)

(Offered 1965-66.)

515 Romanticism (3)

IMMERWAHR

518 Twentieth-Century Literature (3)

REY

520 Seminar in Medieval Literature (3)

HRUBY

521 Seminar in the Literature of the Reformation and Renaissance (3)

(Offered 1965-66.)

522 Seminar in Baroque (3)**524 Seminar in Eighteenth-Century Literature (3)**

BAUMGAERTEL

(Offered 1965-66.)

525 Seminar in Romanticism (3)

IMMERWAHR

(Offered 1965-66.)

526 Seminar in Nineteenth-Century Drama (3)

SAUERLANDER

527 Seminar in Nineteenth-Century Prose (3)

REY

(Offered 1965-66.)

528 Seminar in Twentieth-Century Literature (3)

BAUMGAERTEL

531 Lessing (3)

BAUMGAERTEL

544 Seminar in Goethe (3)

AMMERLAHN

550 Gothic (3)

MEYER

(Offered 1965-66.)

552 Old High German (3)

REED

(Offered 1965-66.)

555 Old Saxon (3)

REED

556 Middle High German (3)

MEYER

557 Middle High German Literature in the Original (3)

HRUBY

558 Studies in Medieval German Literature (3)

HRUBY

(Offered 1965-66.)

560 Modern Dialects (3)

REED

590, 591, 592 Seminar in Literary History (1-5, 1-5, 1-5)**595, 596, 597 Seminar in Germanic Philology (1-5, 1-5, 1-5)****600 Research (*)****700 Thesis (*)****702 Degree Final (6)**

Limited to students completing a nonthesis degree program.

HISTORY

Courses for Undergraduates

INTRODUCTORY COURSES

Social Science 101 History of Civilization: The Great Cultural Traditions (5)

BRIDGMAN, COHEN, FERRILL, GRIFFITHS,
HANKINS, KAMINSKY, KATZ, LEVY,
RICHARDSON, SPELLMAN, SUGAR, THOMAS,
VORZIMMER, 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 Tradition in World Civilization (5)

BRIDGMAN, COHEN, FERRILL, GRIFFITHS,
HANKINS, KAMINSKY, KATZ, LEVY,
RICHARDSON, SPELLMAN, SUGAR, THOMAS,
VORZIMMER, 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. (Not open to students who have taken History 305.)

Social Science 103 History of Civilization: The Contemporary World (5)

BRIDGMAN, COHEN, FERRILL, GRIFFITHS,
HANKINS, KAMINSKY, KATZ, LEVY,
RICHARDSON, SPELLMAN, SUGAR, THOMAS,
VORZIMMER, 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. (Not open to students who have taken either History 306 or 307.)

101 Medieval European History (5)

COHEN, GRIFFITHS, KAMINSKY, LYTLE

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 305.)

102 Modern European History (5)

BRIDGMAN, EMERSON, LEVY, LYTLE,
SUGAR, TREADGOLD

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)

FERRILL, KATZ

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)

BESTOR, HOLT, PRESSLY, SAVELLE,
RICHARDSON

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)

COSTIGAN

England from the earliest times to the present, stressing the origins of American institutions and social patterns.

ANCIENT HISTORY

201-202 Ancient History (5-5)

FERRILL, KATZ

See Introductory Courses.

401 Greece in the Age of Pericles (3)

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; offered 1964-65.)

402 Alexander the Great and the Hellenistic Age (3)

EDMONSON, KATZ

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 1965-66.)

403 The Roman Republic (3)

FERRILL

Political, social, economic, and cultural history, with emphasis on the last century of the Republic, the period of Cicero and Caesar.

404 The Roman Empire (3)

FERRILL

A study of the political, social, economic, and cultural history with special emphasis on the decline of ancient civilization.

410 The Byzantine Empire (5)

KATZ

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)

COHEN, GRIFFITHS, KAMINSKY, LYTLE

See Introductory Courses.

408 Church and State in the Middle Ages (5)

KAMINSKY

Changing theories and realities of relationship between religious and secular elements of medieval civilization.

409 The Vikings (5)

COHEN

A detailed study of the Vikings at home and abroad. Emphasis on art, archaeology, religion; events in England, France, Russia. The problem of Vinland. (Not offered 1964-65.)

410 The Byzantine Empire (5)

KATZ

See Ancient History.

411 Medieval Europe, 500-1100 (5)

COHEN, KAMINSKY

The dark ages, feudalism, emergence of the medieval order of civilization, and the development of Romanesque culture.

412 Medieval Europe, 1100-1300 (5)

COHEN, KAMINSKY, THOMSON

Europe in the High Middle Ages: culture of cathedrals and universities, formation of national states, development of urban society. (Offered 1964-65.)

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. (Not offered 1964-65.)

426 Central Europe in the Middle Ages (5)

KAMINSKY

Origins and medieval history of Germany, Austria, Bohemia, and Poland, considered as a region within the sphere of Western European civilization. (Not offered 1964-65.)

Early Modern Period

305 Early Modern European History, 1450-1648 (5)

BRIDGMAN, EMERSON, GRIFFITHS, LEVY,
LYTLE, THOMSON, TREADGOLD

Political, social, economic and cultural history from the Late Renaissance to the Peace of Westphalia.

414 Culture of the Renaissance (5)

GRIFFITHS, THOMSON

Art, literature, politics, philosophy, science, and religion in Italy from 1300 to the death of Michelangelo.

415 The Reformation (5)

GRIFFITHS, THOMSON

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)

BOBA, 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)

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)

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 alternate years jointly with the Far Eastern and Russian Institute; offered 1965-66.) Prerequisites, 421J or 101, or Social Science 101 and 102, or permission.

Modern Period

102 Modern European History (5)

BRIDGMAN, EMERSON, LEVY, LYTLE, SUGAR, TREADGOLD

See Introductory Courses.

306 Modern European History, 1648-1815 (5)

BRIDGMAN, EMERSON, LEVY, LYTLE, SUGAR, TREADGOLD

Political, social, economic, and cultural history from the Peace of Westphalia to the fall of Napoleon.

307 Contemporary European History Since 1815 (5)

BRIDGMAN, EMERSON, GRIFFITHS, LEVY, LYTLE, SUGAR, TREADGOLD

Political, social, economic, and cultural history from the fall of Napoleon to the present.

370 History of Scandinavia (5)

COHEN

The background of prehistoric, Viking and medieval Scandinavia; the Reformation and Renaissance; the Swedish hegemony; Napoleonic era; the birth of democracy and the welfare state.

422J Imperial Russia, 1700-1900 (5)

KEEP, 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)

KEEP, TREADGOLD

Russia and the U.S.S.R. 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 Department of History. (Not offered 1964-65.)

427J- Eastern Europe, 1772-1918 (5-)

BOBA, 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-)

BOBA, 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)

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, 1814-70 (5)

EMERSON, LYTLE, SUGAR

The development of Europe during the age of Metternich, the revolutions of 1848, and the emergence of new national states. (Not offered 1964-65.)

432 Europe, 1870-1914 (5)

EMERSON, SUGAR

The impact of population increase and technological change on European society; stresses and strains in European life and outlook. (Not offered 1964-65.)

433 Europe, 1914-45 (5)

EMERSON

The politics and society of Europe in the age of the concentration camp.

434 Europe Since 1945 (5)

Political, economic, and military developments in Europe under the impact of the cold war. (Not offered 1964-65.)

436 Germany, 1648-1914 (5)

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; offered 1964-65.)

437 Germany, 1914-45 (5)

BRIDGMAN, EMERSON

Politics and society from the collapse of the Bismarckian empire to the collapse of Hitler's empire. (Offered alternate years; offered 1964-65.)

438- History of the Near East, 622-1789 (5)

SUGAR

The Arab countries (Turkey, Iran), from the emergence of Islam to the accession of Sultan Selim III. (Not offered 1964-65.)

-439 History of the Near East, 1789-1959 (5)

SUGAR

The Arab countries (Turkey, Iran), from the first westernizing reform movements to the present. (Not offered 1964-65.)

444 France Since 1815 (5)

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)

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 alternate years jointly with the Department of History; offered 1965-66. Prerequisite, 421J or History 101 or Social Science 101 and 102, or permission.

449J Russian Historiography (5)

SZEFTTEL

Offered jointly with the Far Eastern and Russian Institute. (Not offered 1964-65.) Prerequisites, 101 or 421J or 448J or Social Science 101 and 102, or permission.

460J Economic History of Europe (5)

MORRIS

Origins of contemporary economic institutions; emergence of the capitalistic system; problems of nineteenth-century economic organization; international conflict, the growth of new systems; patterns of economic organization. Offered jointly with the Department of History. Prerequisite, Economics 200 or equivalent, or permission.

UNITED KINGDOM, BRITISH EMPIRE, AND COMMONWEALTH HISTORY

271-272, 273 English Political and Social History (5-5,5)

COSTIGAN

See Introductory Courses.

469 England in the Sixteenth Century (5)

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)

LEVY

Political, administrative, and social history from the accession of James I to the Glorious Revolution.

472 England in the Nineteenth Century (5)

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. (Not offered 1964-65.)

473 England in the Twentieth Century (5)

COSTIGAN

From the Boer War to the present; conservatism, liberalism, and socialism; England in two world wars; the decline of British imperialism. (Not offered 1964-65.)

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. (Not offered 1964-65.)

475 History of Canada (5)

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. (Not offered 1964-65.)

477 History of Australia and New Zealand (5)

WILLIAMS

The techniques of overseas colonization of the nineteenth century and development of egalitarian democratic communities in the late nineteenth and twentieth centuries. (Not offered 1964-65.)

478 Africa South of the Sahara (5)

BRIDGMAN

Political and cultural evolution of the peoples inhabiting these lands.

480 History of the British Empire, 1783-1870 (5)

WILLIAMS

The founding and development of the colonies of settlement; British involvement in the Caribbean, Africa, India, Southeast Asia, and the Pacific; Colonial policy and the reasons for British expansion.

481 History of the British Empire and Commonwealth Since 1870 (5)

WILLIAMS

The new imperialism; the development of the Dominions; colonial policy; nationalism and the liquidation of the Empire.

AMERICAN HISTORY**241 Survey of the History of The United States (5)**

BESTOR, HOLT, PRESSLY, SAVELLE, RICHARDSON

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.) (Not offered 1964-65.)

341 Foundations of American Civilization (5)

SAVELLE

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)

BESTOR

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)

BURKE, 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 American History: The Colonial Period (5)

ALDEN

Discovery and founding of Spanish and Portuguese empires in the New World and their development until the eve of independence.

387 Latin American History: The National Period (5)

ALDEN

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)

SAVELLE

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. (Not offered 1964-65.)

442 The Colonial Mind (5)

SAVELLE

443 The Intellectual History of the United States (5)

SAVELLE

Lectures and discussions devoted to the development of the American mind, from historical beginnings to the present. (Not offered 1964-65.)

445 American Constitutional History to End of the Civil War (5)

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 American Constitutional History, Since the Civil War (5)

BESTOR

Constitutional aspects of Reconstruction, laissez-faire and the Supreme Court, crisis and change in the 1930's, current issues of civil rights.

463 The Westward Movement (5)

CARSTENSEN

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)

CARSTENSEN, RICHARDSON

Exploration and settlement; economic development; growth of government and social institutions; statehood.

486 The History of Mexico, 1517 to the Present (5)

ALDEN

Political, social, and economic history of Mexico from its discovery by the Spanish to the present. (Not offered 1964-65.)

487 The History of Brazil: Colonial Period to the Present (5)

ALDEN

Colonial foundations; the first and second empires; the old and new republics; current problems; prospects for the future.

HISTORY OF SCIENCE**316 Science in Civilization: Antiquity to 1600 (5)**

HANKINS, VORZIMMER

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)

HANKINS, VORZIMMER

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.

419 Origins of Modern Science: The Biological Sciences (5)

VORZIMMER

A history of the biological sciences from their beginnings to their emergence as distinct disciplines. Emphasis will be placed on the origins of the key ideas which changed the shape of biology as exemplified in case studies from original sources. Prerequisite, one introductory course in a biological science.

420 Science and the Enlightenment (5)

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)

VORZIMMER

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

381 History of India, 1600 to the Present (5)

SPELLMAN

Impact of British trade upon Hindu and Moslem life; changes in economic, social, and political institutions; evolution of nationalism; partition, independence, and new international status. Special emphasis on the period since 1784. (Not offered 1964-65.)

382J Civilization of India: Indian Thought (5)

SPELLMAN

Main currents of Indian thought: a history of ideas in India. Offered jointly with the Far Eastern and Russian Institute. (Not offered 1964-65.)

383J Civilization of India: Impact of Islam and the West (5)

SPELLMAN

Offered jointly with the Far Eastern and Russian Institute. (Not offered 1964-65.)

384J Civilization of India: Literature and Arts (5)

SPELLMAN

From earliest times to the present. Offered jointly with the Far Eastern and Russian Institute. (Not offered 1964-65.)

452J Early Japanese History (5)

BUTOW

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 Modern Japanese History (5)

PYLE

Political, social, economic, and cultural development of Japan from the beginning of the Tokugawa period (seventeenth century) to the present. Offered jointly with the Far Eastern and Russian Institute.

456J Senior Seminar in Far Eastern Diplomatic History (5)

BUTOW

Far Eastern international relations from the sixteenth century to the present, with emphasis on the period from 1793 to 1945. Offered jointly with the Far Eastern and Russian Institute; offered 1964-65.

465J Chinese History: Earliest Times to 221 B.C. (5)

WILHELM

Pre-imperial China. Offered alternate years jointly with the Far Eastern and Russian Institute; offered 1964-65.

466J Chinese History: 221 B.C. to A.D. 906 (5)

WILHELM

Development of the imperial Chinese state. Offered alternate years jointly with the Far Eastern and Russian Institute; offered 1964-65.

467J Chinese History: A.D. 906 to A.D. 1840 (5)

WILHELM

The Wu, Tai, Sung, Yuan, Ming and early Ch'ing periods. Offered alternate years jointly with the Far Eastern and Russian Institute; offered 1964-65.

468J Modern Chinese History (5)

MICHAEL

Modern Chinese society from 1840 to the present. Offered jointly with the Far Eastern and Russian Institute.

482J History of India: Earliest Times to A.D. 647 (5)

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.

483J History of India: A.D. 647 to 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: 1525 to the Present (5)

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.

UNDERGRADUATE HONORS AND RESEARCH

390H-391H Colloquium in the History of Ideas (5-5)

BURKE, KAMINSKY

Discussion of selected topics in the history of ideas; writing of an interpretive essay.

490H-491H Historical Method (5-5)

ALDEN, BESTER, BURKE, LYTTLE

The purposes, materials, and techniques of historical scholarship. Theory, practice, and criticism.

499 Undergraduate Research (1-5, max. 10)

Courses for Graduates Only

HISTORIOGRAPHY

500 Historiography: Ancient and Medieval European (3)

HOLT

501 Historiography: Early Modern European (3)

HOLT

502 Historiography: Early Modern European and American (3)

HOLT

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)

FERRILL

Roman History, 31 B.C. - A.D. 37.

513 Byzantine History (3-6)

KATZ

514 Medieval History (3-6)

KAMINSKY

515 Renaissance and Reformation (3-6)

GRIFFITHS, THOMSON

520 History of Science (3-6)

HANKINS, VORZIMMER

(Not offered 1964-65.)

528J History of Eastern Europe, 1772-1939 (5)
SUGAR, THOMSON

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)
EMERSON

533 Modern European History: France (3-6)
LYTLE

534J Modern Russian History (3-6)
TREADGOLD, KEEP

Offered jointly with the Far Eastern and Russian Institute.

538 Twentieth-Century European Diplomatic History (3-6)

539J Medieval Russian History (3-6)
SZEFTTEL

Offered jointly with the Far Eastern and Russian Institute. Prerequisites, 421J, 448J, or permission; Russian or French, and German. (Not offered 1964-65.)

540 American Constitutional History (3-6)
BESTOR

541 American History: Early (3-6)
SAVELLE

542 American History: Western (3-6)
CARSTENSEN

543 American History: Civil War (3-6)
PRESSLY

544 American History in the Nineteenth Century (3-6)
HOLT, BESTOR

545 American History: Twentieth Century (3-6)
BURKE

548J History of Eastern Europe, 1939 to the Present
SUGAR

Offered alternate years jointly with the Far Eastern and Russian Institute (not offered 1964-65). Prerequisite, reading knowledge of one major European or one East European language.

549J Japanese History (3-6)
BUTOW

Field course. Offered alternate years jointly with the Far Eastern and Russian Institute. (Offered 1964-65.) Prerequisite, permission.

574 English History: Tudor and Stuart (3-6)
LEVY

(Not offered 1964-65.)

575 English History (3-6)
COSTIGAN, LEVY

576 British Empire History (3-6)
WILLIAMS

580 Latin American History (3-6)
ALDEN
Prerequisite, permission.

581 Latin American History: National Period (3-6)
ALDEN

SEMINARS

503-504 Seminar in Philosophy of History (3-6)-(3-6)
COSTIGAN
(Not offered 1964-65.)

517-518-519 Seminar in Medieval History (3-6)-(3-6)-(3-6)
KAMINSKY

521-522-523 Seminar in Modern European History (3-6)-(3-6)-(3-6)
EMERSON, LYTLE

525, 526-527 Seminar in the History of Science (3-6),(3-6)-(3-6)
HANKINS, VORZIMMER
(Not offered 1964-65.)

529-530-531 Seminar in the Renaissance and Reformation (3-6)-(3-6)-(3-6)
GRIFFITHS
(Not offered 1964-65.)

535J-536J-537J Seminar in Modern Russian History (3-6)-(3-6)-(3-6)
TREADGOLD, KEEP

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)
SZEFTTEL, BOBA

Offered jointly with the Far Eastern and Russian Institute. Prerequisites, reading knowledge of Russian and permission.

550J-551J-552J Seminar in Japanese History (3-6)-(3-6)-(3-6)
BUTOW

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)
SAVELLE

563-564-565 Seminar in American History: Western (3-6)-(3-6)-(3-6)
CARSTENSEN

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, HOLT

593-594-595 Advanced Seminar (3-6)-(3-6)-(3-6)
HOLT

RESEARCH

600 Research (*)

700 Thesis (*)

SCHOOL OF HOME ECONOMICS

Courses for Undergraduates

110 Food and Nutrition (5)
CRUM, GRANBERG

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)
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)
MURDOCH, 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)
HENDERSON

Management of resources to achieve family goals. Principles of management, work simplification, heating, lighting, wiring, and selection and care of household equipment.

216 Food Preparation and Meal Management (1-3)
CRUM

Principles of food selection and preparation, with emphasis on meal management. Prerequisites, 148, Chemistry 101 or equivalent.

231 Clothing Selection (2)

Sociological, psychological, economic, and aesthetic aspects of clothing for the individual. Not open to students who have had 134.

**234 Costume Design (3)**

SHIGAYA, SMITH

As expressed in flat pattern techniques and applied to wool fabrics. Prerequisites, 125, 134, and Art 109, or 129, or equivalent.

240 Home Furnishing (3)

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)

CRUM

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)

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 (5)

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)

NIELSEN

Principles and techniques of food and equipment demonstrations; food photography; recipe development. Prerequisites, 315 or permission.

319 Family Nutrition (4)

MONSEN

Metabolism of the nutrients essential for maintenance of health. Normal nutritional needs of the family; simple dietary modifications. Food selection. For student nurses and dental hygienists. (Formerly 119.) Prerequisites, Conjoint (Medical) 316, 317-318, or permission.

321 Applied Design (2)

PAYNE

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. (Offered alternate years; offered 1964-65.)

322 Applied Design (2)

PAYNE

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. (Offered alternate years.)

329 Hand Weaving (2)

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)

PAYNE

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)

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 (5)

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.

348 Home-Management House (3)

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)

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 (5)

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)

KLEMER

Principles underlying good family relationships; wholesome adjustment of the home to a changing society.

372 Institution Food Preparation (5)

ZIGLER

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)

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.

407 Advanced Nutrition (3)

JOHNSON, 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)

MONSEN

Nutrition as a curative and preventive factor in disease. Journal readings. Prerequisite, 407.

415 Experimental Foods (3)

NIELSEN

Illustrating scientific principles by subjective and objective testing of foods. Individual research problems. Prerequisites, 315 or permission.

425 Advanced Textiles (3)

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)

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)

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, and permission.

433 History of Costume and Textiles (4)

PAYNE

Continuation of 432 from the Renaissance to the present time. Prerequisite, 432.

434 Costume Design (3)

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)

PAYNE

Application of the principles of flat pattern designing to problems in custom and mass production. Prerequisites, 334, 434 and Art 369.

436 Advanced Costume Design (5)

PAYNE

Application of the art of draping to custom and mass production. Prerequisite, 435.

447 Advanced Home Furnishing (3)

SCHROEDER

Individual projects relating to quality and price in specific fields of furnishings. Evaluation of standards in professionally constructed furniture and furnishings in local workrooms. Laboratory problems. Prerequisites, 240 and permission, or 347.

454 Advanced Family Economics and Finances (2)

HALL

Family adjustment to differing social and economic conditions. Legislation affecting consumers. Prerequisites, 350 and permission, or 354.

456 Family Relationships (3)

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 Sociology 352, or permission.

457 Child Nutrition and Care (3)

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)

TERRELL

Market organization, buying procedures, payment and credit; food selection and care; inspection of merchandise. Prerequisites, 315 and 372.

473 Institution Management (5)

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)

SANDSTROM

Food and food service accounting problems. Recording financial transactions; cost controls; profit and loss statements. Prerequisite, 372.

475 Institution Equipment (3)

TERRELL

Equipment requirements and flow of work in institutions. Institution kitchens and serving units; equipment selection, operation, and care; repair and depreciation records. Prerequisites, 372 and permission.

495 Special Problems in Home Economics (*, no more than 10 credits toward any one degree)

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)

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 (*)**

MONSEN

Library research. Prerequisite, 407 or equivalent.

515 Readings in Food Selection and Preparation (*)

MONSEN

Professional literature on recent developments. Prerequisite, 315 or equivalent, or permission.

525 Seminar in Textiles (3)

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 (3-5)

HALL

Selected topics in the family economics field. Prerequisites, 454 or equivalent and permission.

562 Home Economics Education (*)

MCADAMS

Study of achievements, trends, functions, methods, and teaching materials.

576, 577, 578 Supervised Field Work (4,4,4)

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 (*)

In registration, field of interest should be indicated by area letter (see 495). Prerequisite, permission.

700 Thesis (*)**LINGUISTICS****400 Survey of Linguistic Method and Theory (3)**

SAPORTA, FERGUSON

The background and scope of modern linguistics; languages of the world; language analysis; relation to other disciplines.

404, 405, 406 Indic and Indo-European (3,3,3)

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)

FILONOV

Relationship between linguistic structures, linguistic universals, and the poetic uses of language; linguistic description in the analysis of literature. Prerequisite, 400 or permission.

451J, 452J, 453J Phonetics and Phonemics (3,3,3)

GREKOFF

Detailed study of speech sounds, mechanisms of their production, and structuring of sounds in languages. Experience with a variety of languages. Field techniques. Offered jointly with the Department of Anthropology.

454J Methods in Comparative Linguistics (3)

FILONOV

Method and theory with special reference to anthropological research. Offered jointly with the Department of Anthropology. Prerequisite, permission.

455J Areal Linguistics (3, max. 6)

LUKOFF

Linguistic analyses of the languages of a selected area. Offered jointly with the Department of Anthropology.

**462J, 463J Morphology and Syntax (3,3)**

SAPORTA, CONTRERAS

Study of the structuring of meaningful elements in language. Experience with a wide variety of languages. Field techniques. Offered jointly with the Department of Anthropology. Prerequisite, 400 or permission.

464 Phonetic Transcription (2½)

Practice in the transcription and analysis of phonological data from non-Indo-European languages. (Offered Summer Quarter only.) Prerequisite, L451J which may be taken concurrently.

465 Grammatical Exercises (2½)

Practice in eliciting, recording, and analyzing grammatical data of a non-Indo-European language. (Offered Summer Quarter only.) Prerequisite, 462J; may be taken concurrently.

471-472 Phonological Analysis (2½-2½)

Discussion of phonological theory. Advanced training in the analysis of tone, stress, and intonation. (Offered Summer Quarter only.) Prerequisite, 452J or equivalent.

478 Introduction to Southeast Asian Linguistics (3)

THOMPSON, LI

Survey of language families of Southeast Asia. Typology and relationships. Research needs and problems. Prerequisites, 452J, 462J.

481-482 Grammatical Analysis (2½-2½)

Discussion of grammatical theory. Advanced training in grammatical analysis. (Offered Summer Quarter only.) Prerequisite, 463J or equivalent.

484-485 Informant Techniques (2½-2½)

Guide practice in analyzing the phonology and grammar of a non-Indo-European language. (Offered Summer Quarter only.) Prerequisites, 471, 481; may be taken concurrently.

499 Undergraduate Research (1-5)**Courses for Graduates Only****500 Proseminar (3)**

REED

Introduction to bibliography and research in Linguistics.

501, 502, 503 Linguistic Analysis Laboratory (3,3,3)

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)

WYATT

Sound systems of the principal families of Indo-European and the relation of these to a hypothetical parent tongue. (Offered alternate years; offered 1963-64.) Prerequisite, 406, or permission.

505, 506 Indo-European Comparative Grammar (2,2)

WYATT

Systematic treatment, with extensive surveys of individual language groups. Prerequisite, 504.

514, 515, 516 Seminar in Comparative Linguistics (2,2,2)

Advanced problems emphasizing work with languages having few or no written records. Prerequisite, 406 or permission.

530 Dialectology (3)

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)

FERGUSON

Offered jointly with the Department of Anthropology. Prerequisite, permission.

565 Contrastive Analysis (3)

LUKOFF

The bases for the systematic comparison of linguistic structures; problems of interference between native and target languages. Prerequisites, 452J, 463J.

578 Seminar in Southeast Asian Linguistics (3, max. 9)

LI, THOMPSON

Advanced consideration of specialized problems in Southeast Asian Linguistics. Reports on individual research. (Offered alternate years; offered 1964-65.)

579J Comparative Altaic Linguistics (3)

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.

580 Problems in Linguistics (2-4, max. 12)

FERGUSON

For advanced students of linguistics, dealing with significant movements, techniques, skills, and theories in the field. Prerequisite, permission.

599 Linguistics Colloquium (1, max. 6)

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)**700 Thesis**

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); 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); Southeast 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 the section of this catalog pertaining to 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.

MATHEMATICS**Courses for Undergraduates****101 Intermediate Algebra (5)**

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)

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)

Real and complex number systems; sets and equations; simultaneous equations and matrices; inequalities; functions and relations; algebraic, exponential, and logarithmic functions. Not open to students who have taken 155, 156. Prerequisites, one and one-half years of high school algebra and qualifying test, or 101.

114 Elementary Computer Programming (2)

Programming and coding of problems for automatic digital computers. Flow charts, loops, subroutines. Codes written will be executed by machine. Prerequisite, 101 or equivalent.

124, 125, 126 Calculus with Analytic Geometry (5,5,5)

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, four years of high school mathematics and qualifying test, or 104 (or exemption by qualifying test) and 105 (or 156) for 124; 124 or 134H for 125; 125 or 135H for 126.

130 Differential Calculus (5)

Derivatives, logarithmic differentiation, differentials, Lagrange multipliers. Applications to economics. No more than 5 credits from among 124, 130, 134H, and 157 may be counted toward any degree. Prerequisites, 105 or 156.

134H, 135H, 136H Calculus with Analytic Geometry (5,5,5)

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.

155, 156 College Algebra (3,3)

Real and complex number systems; sets and equations; simultaneous equations and matrices; inequalities; functions and relations; algebraic, exponential, and logarithmic functions; applications to problems in business administration. Not open to students who have taken 105. Prerequisites, one and one-half years of high school algebra and qualifying test, or 101 for 155; 155 for 156.

157 Elements of Calculus (3)

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 156.

170, 171 Theory of Arithmetic (3,3)

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.

201H, 202H, 203H Selected Topics in Mathematics (3,3,3)

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)

Infinite series, complex functions, elementary differential equations. Prerequisite, 126.

234H, 235H, 236H Advanced Calculus (3,3,3)

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)

Elementary methods of solution, linear differential equations of second and higher order. (Formerly 221.) Prerequisite, 136H or 224.

281 Elements of Statistical Method (5)

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 or 156.

301 Elementary Number Theory (3)

A brief introduction to some of the fundamental ideas of elementary number theory. Prerequisite, 126 or 136H.

305 Introduction to Mathematical Logic (3)

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)

Functions of several variables, transformations and mappings, implicit function theorem. Prerequisite, 224 or 136H.

325 Advanced Calculus II (3)

Vector analysis, theorems of Stokes, Gauss, and Green. Prerequisite, 224 or 136H; 324 recommended.

374 Principles of Digital Computers and Coding (5)

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 124H or 134H, and permission of instructor.

382, 383 Statistical Inference in Applied Research (5,5)

Elements of probability; discrete and continuous distribution; binomial, Poisson, and normal distributions. Elements of sampling; confidence limits; simple tests of statistical hypotheses, analysis of variance, and applications to biological problems. (Under normal circumstances does not count toward a mathematics major.) Prerequisites, 124H or 134 and 281, or permission, for 382; 382 for 383.

391 Elementary Probability (3)

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)

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.

400 Elementary Set Theory (3)

Basic axioms of set theory, algebra of sets, Peano axioms, axiom of choice and Zorn's Lemma, transfinite recursion, cardinal numbers and arithmetic. Prerequisite, 236, or 325, or permission.

401 Matrices (3)

Determinants; the algebra of matrices; groups of transformations. Not open for credit to students who have taken 413. Prerequisite, 126, or 136H, or 130.

402, 403 Introduction to Modern Algebra (3,3)

The number systems of algebra; groups, rings, and fields; polynomials. Not open for credit to students who have taken 411, 412. Prerequisites, 401 for 402; 402 for 403.

404 Linear Algebra (3)

Vector spaces; linear transformations; reduction of bilinear, quadratic, and Hermitian forms. Prerequisite, 401 or 413.

405 Introduction of Metamathematics (3)

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)

Mathematical approach to game theory and linear programming with applications to economics and operations research. Prerequisite, 401 or 413.

411, 412, 413 Linear and Modern Algebra (3,3,3)

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 401. Prerequisites, 126 or 136H for 411; 411 for 412; 412 for 413.

**424, 425, 426 Fundamental Concepts of Analysis (3,3,3)**

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)

427: Elementary complex variable. Prerequisite, 224 or 136H. 428, 429: Orthogonal functions and boundary value problems, calculus of variations. Prerequisites, 238H or 236H for 428; 428 for 429.

438 Principles of Differential Equations (3)

Linear systems, existence of solutions, solution by series, special functions. Prerequisite, 236H or 224.

441, 442, 443 Advanced Geometry (3,3,3)

Selected topics from among: projective geometry, differential geometry, advanced analytic geometry, algebraic geometry, algebraic topology, and the geometry of convex bodies. Prerequisites, 126 or 136 and 401, or permission, for 441; 441 for 442, 442 for 443.

444, 445 Foundations of Geometry (3,3)

Axiomatic treatment of the foundations of Euclidean geometry. Introduction to non-Euclidean geometry. Designed for teaching majors. Prerequisite, 126H or 136H for 444; 444 for 445.

464 Numerical Analysis I (3)

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)

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, 374, 401, 404, and 464.

466 Numerical Analysis III (5)

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)

Fundamental concepts; discrete and continuous random variables; mathematical expectations; law of large numbers; important types of distributions; characteristic functions; central limit theorem. Prerequisites, 224 and 391, or permission.

482 Statistical Inference (3)

Universe, sample, parameters, and statistics; point estimates and confidence regions; distributions of classical statistics and their use in estimation and test of hypotheses. Prerequisites, 392, 401, 481.

483 Theory of Correlation (3)

Multivariate distributions; variances, covariances, regression, and correlation; specialization of multivariate normal distributions; sampling of bivariate normal variables. Prerequisite, 481.

484 Distribution-Free Inference (3)

Some distribution-free methods of testing hypotheses and estimations. Distribution of Chi-square, and Chi-square tests. Prerequisite, 482.

485 Analysis of Variance (3)

General linear hypothesis—tests and estimates. Distribution theory of tests. Tests of all contrasts. Fixed, mixed, and random models. Prerequisites, 482 and 483.

486 Experimental Design (3)

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 485.

496H Honors Seminar (*, max. 9)

Problem seminar for senior honors students and first-year graduate students. Prerequisite, permission.

497J Special Topics in Mathematics for Teachers (2-5, max. 15)

Offered jointly with the College of Education when demand is sufficient.

498 Special Topics in Mathematics (2-5, max. 15)

Problem seminar for senior honors students and for first year graduate students.

Courses for Graduates Only**501, 502, 503 Mathematical Logic (3,3,3)**

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)

Theory of groups, rings, integral domains, and fields; polynomials; vector spaces, Galois Theory, and theory of ideals. Prerequisite, 403 or equivalent for 504; 504 for 505; 505 for 506.

510 Seminar in Algebra (*, max. 5)

Prerequisite, permission.

511, 512, 513 Special Topics in Algebra (2-3, 2-3, 2-3)

Each may be repeated twice 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.

521, 522, 523 Probability (3,3,3)

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)

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)

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 and Applications (3,3)

Spectral theorem for bounded Hermitian operators, statement for unbounded operators, application to ordinary and partial differential operators with Fourier transforms, construction of Green functions, Schrödinger equation, eigenvalue distributions, perturbation theory; contour integral representation, special functions. Prerequisites, 527 for 528; 528 for 529.

530 Seminar in Analysis (*, max. 5)

Prerequisite, permission.

531, 532, 533 Special Topics in Analysis (2-3, 2-3, 2-3)

Each may be repeated twice 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)

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.

538, 539 Non-Linear Ordinary Differential Equations (3,3)

Phase plane; analysis of critical points (nodes, saddle points, foci); theory of oscillations, limit cycles, Poincaré-Bendixon theory; topological methods, fixed-point theorems. Prerequisites, 438 and 324 (or 236H) for 538; 538 for 539. Offered alternately with 578, 579. (Not offered 1964-65.)

544, 545, 546 Differential Geometry (3,3,3)

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, 404 and 426 for 544; 544 for 545; 545 for 546.

550 Seminar in Geometry (*, max. 5)

Prerequisite, permission.

551, 552, 553 Special Topics in Geometry (2-3,2-3,2-3)

Each may be repeated twice for credit. In recent years the following subjects have been covered: Riemannian Geometry, Differentiable Manifolds, Complex Manifolds, Geometry of Convex Bodies.

561, 562, 563 General Topology (3,3,3)

Theory of sets; metric spaces; topological spaces; compactness and other covering properties; function spaces; polyhedra; dimension theory. Prerequisites, 426 for 561; 561 for 562; 562 for 563.

564, 565, 566 Algebraic Topology (3,3,3)

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)

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)

Prerequisite, permission.

571, 572, 573 Special Topics in Topology (2-3,2-3,2-3)

Each may be repeated twice for credit; special topics from general and algebraic topology.

578, 579 Special Functions (3,3)

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)

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, 484 and 485 or permission for 581; 581 for 582; 582 for 583.

590 Seminar in Probability and Statistics (*, max. 5)

Prerequisite, permission.

591, 592, 593 Special Topics in Statistics (3,3,3)

Each may be repeated twice 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 (*)

Prerequisite, permission.

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

MICROBIOLOGY

For course listings in Microbiology, see this section under *School of Medicine*.

MUSIC

Courses for Undergraduates

Courses Primarily for Nonmajors (See also ENSEMBLES.)

107 Survey of Music (5)

CLARKE

Illustrated lectures with supplementary readings to provide the general student with understanding of common musical forms, idioms, and styles.

108 The Orchestra (2)

HOKANSON, SOKOL

Development of the orchestra and its literature.

109 Choral Music (2)

SOKOL

Prerequisite, 107 or 108.

117 Symphonic Music: Nineteenth Century (2)

HOKANSON, SOKOL

Prerequisite, 107 or 108.

118 Symphonic Music: Seventeenth and Eighteenth Centuries (2)

HOKANSON, SOKOL

Prerequisite, 107 or 108.

119 Symphonic Music: Contemporary (2)

HOKANSON, SOKOL

Prerequisite, 107 or 108.

121, 122, 123 Elementary Music Theory (2,2,2)

BRIDGES

Prerequisites, 121 for 122; 122 for 123.

217, 218, 219 Opera (2,2,2)

CHAPPLE

227 The Concerto (2)

SOKOL

Prerequisite, 107 or 108.

314, 315, 316 Music Cultures of the World (3,3,3)

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)

FERRIN

Survey of literature for ensembles. Prerequisite, 107 or 108.

347 Music in the United States (2)

CLARKE

Contribution of music to development of American culture.

349 History of Jazz (3)

GARFIAS

The development of jazz in the United States from its beginnings to its present trends.

482J Music in Theater (1-3)

BERGSMAN

Open to majors and nonmajors who are conductors, composers, playwrights, or stage directors. Survey of representative examples of musical theater; 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)

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.

106 The Basis of Musical Expression (1)

CHAPPLE

114, 115, 116 Sight Singing (1,1,1)

BABB, KECKLEY, STAFF

To be taken concurrently with 101, 102, 103. Prerequisite, permission.

131, 132, 133 Piano Sight-Reading Laboratory (1,1,1)

GEISSMAR

For majors in piano and organ. Exemption by examination. Others by permission.

**191 Elementary Composition (2, max. 6)**

BEALE, BERGSMA, KECHLEY,
MCKAY, VERRALL

One half-hour private lesson and a two-hour laboratory session each week. Intended to develop skill in creative musical expression. Prerequisite, permission.

201, 202, 203 Second-Year Theory (3,3,3)

KECKLEY, BEALE, 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)

CLARKE

To be taken concurrently with 201, 202, 203. Prerequisites, 103 and 116.

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)

BEALE, BERGSMA, KECHLEY, MCKAY,
VERRALL

One half-hour private lesson and a two-hour laboratory session each week. Prerequisite, 191 or permission.

303 Keyboard Harmony (3)

BABB, BEALE

Prerequisite, one quarter of 130A or equivalent.

321 Modal Counterpoint (3)

BABB

Sixteenth-century style. To be taken concurrently with 307.

322 Tonal Counterpoint (2)

VERRALL

The process of invention as exemplified in the music of the Baroque era. To be taken concurrently with 308.

323 Contemporary Idioms (3)

MCKAY

Analytical studies of present-day composition techniques with emphasis on contrapuntal qualities. To be taken concurrently with 309.

352 Musical Form (3)

WOODCOCK

Analysis of principal forms of musical composition.

353 Orchestration (3)

MCKAY, VERRALL

391 Composition (2, max. 6)

BEALE, BERGSMA, KECHLEY,
MCKAY, VERRALL

One half-hour private lesson and a two-hour laboratory session each week. Prerequisite, 291.

421 Modal Counterpoint (3)

BABB

Prerequisite, 321.

422 Tonal Counterpoint (3)

VERRALL

The evolution of fugal practice from the Baroque era to the present. Prerequisite, 322.

423 Contemporary Idioms (3)

MCKAY

Prerequisite, 323.

452 Musical Form (3)

WOODCOCK

Prerequisite, 352.

453 Orchestration (3)

MCKAY

Prerequisite, 353.

481 Harmonic Analysis (3)

BEALE

491 Composition (2, max. 12)

BEALE, BERGSMA, KECHLEY,
MCKAY, VERRALL

One half-hour private lesson and a two-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)

TERRY, WOODCOCKE

To be taken concurrently with 321, 322. Prerequisite, 307 for 308.

309 Music Since 1920 (2)

BEALE

Neoclassicism; neoromanticism, serialism, electronic music. To be taken concurrently with 323.

348 Twentieth-Century Music in the Americas (2)

CLARKE

Stylistic tendencies since 1900; analysis of representative works. Prerequisites, 203, 208 or permission.

357 Church Music (3)

WOODCOCK

Survey of liturgy, chant, hymn, anthem and solo. Prerequisite, 308 or permission.

367 History of Chamber Music (3)

FERRIN

407 Medieval and Renaissance Music (3)

IRVINE

408 Baroque Music (3)

TERRY

Prerequisite, 308 or permission.

409 Contemporary Music (3)

MCKAY

427 Haydn and Mozart (3)

TERRY

Prerequisite, 308 or permission.

428 Beethoven (3)

WOODCOCK

437 Rococo and Preclassic Music (3)

TERRY

Prerequisite, 308 or permission.

447 Schumann and Brahms (3)

WOODCOCK

449 Late Nineteenth-Century Music (3)

IRVINE

467 History of Keyboard Music (3)

WOODCOCK

Development of organ, clavichord, harp, harpsichord and piano; idioms of corresponding types of keyboard music and styles of performance. Prerequisite, 308 or permission.

471 Introduction to Ethnomusicology (3)

GARFIAS

Prerequisite, permission.

472 Musical Instruments (3)

GARFIAS

History and classification of instruments. Prerequisite, permission.

473 Ethnomusicology Field Methods (3)

GARFIAS

Consideration of the basic problems encountered in field work in ethnomusicology, with attention given to recording and transcription. Prerequisite, permission.

487, 488 History of Opera (3,3)

CHAPPLE

Periods and styles, with special study of representative works in the light of cooperative contributions of voice, orchestra, and libretto. 487: pre-opera through Mozart; 488: opera since Mozart.

497, 498 History of Choral Music (3,3)

TERRY

497: Josquin through Bach; 498: Haydn to the present.

SCORE ANALYSIS AND CONDUCTING**384 Instrumental Conducting (2)**

WELKE

Prerequisite, 203.

385 Choral Conducting (3)

EICHENBERGER, TERRY

Style and interpretation. Prerequisites, 116, 203, and 209.

484 Instrumental Conducting (1)

COLE

485 Choral Conducting (2)

KECHLEY

486 Instrumental Conducting (1)

CHAPPLE

495 Advanced Choral Conducting (3)

KECHLEY

Prerequisite, permission.

MUSIC TEACHING**104 Music Fundamentals (2)**

For majors in elementary education. (Prerequisite for Education 377.)

124-125 Instrumental Laboratory (1-1)

Group instruction on orchestral instruments for noninstrumental majors in music teaching.

214, 215, 216 Instrumental Techniques (1,1,1)

Violin and viola.

224, 225, 226 Instrumental Techniques (1,1,1)

Cello, clarinet, trumpet.

246 Instrumental Techniques (1)

Flute.

254, 255, 256 Instrumental Techniques (1,1,1)

Lower brass, double reed, percussion.

344 Elementary School Music (3)

HEFFERNAN, NORMANN

Prerequisites, 385, Education 370S, and examination in piano and voice.

346J Teachers' Course in Secondary School Music (3)

NORMANN

Offered jointly with the College of Education. Prerequisites, 344, 385, Education 209, 370S.

354 Band Arranging (2)

WELKE

Prerequisite, 203.

414, 415 School Choral Materials (1,1)

Study of choral music for the junior and senior high school. Prerequisite, 344.

424, 425 School Instrumental Materials (1,1)

COLE, NORMANN

Prerequisite, 344.

474 The Curriculum in Music Education (2)

NORMANN

476 The General Music Class (2)

HEFFERNAN

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)

(Offered Summer Quarter only.)

- 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 the High School Institute.

VOICE AND INSTRUMENTS**Class Instruction****Piano 110A (1, max. 6)**

Prerequisite, permission.

Piano 210A (2, max. 12)

Prerequisite, examination.

Voice 110C (1-1-1, max. 3)

Prerequisite, examination.

Voice 120C (1-1-1, max. 3)

Prerequisite, 110C or equivalent.

Voice 210C (2, max. 12)

Primarily for majors not specializing in performance. Prerequisite, examination.

Private Instruction**130 Vocal or Instrumental Instruction (2-3, max. 9)**

Primarily for majors not specializing in performance; 30 minutes or 60 minutes of private instruction per week. For teacher designation see 150. Prerequisite, examination.

150 Vocal or Instrumental Instruction (3-4, max. 12)

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.

A. PIANO

Jacobson (AA), Bostwick (AB), Geissmar (AC), Hokanson (AD), Moore (AE)

B. VIOLIN OR VIOLA

Zetlin (BA), Sokol (BB), Ferrin (BC)

C. VOICE

Harris (CA), Koster (CB), Lishner (CC)

D. VIOLINCELLOHeinitz (DA)
DOUBLE BASS
Harnett (DB)**E. ORGAN**

Eichinger (E)

F. WOODWIND

Zeitlin (flute, FA), Allport (oboe, FB), Shapiro (oboe, FC), Phillips (clarinet, FD), Welke (clarinet, FE), Bedford (bassoon, FF)

G. BRASS

Welke (horn, GA), W. Cole (horn, GB), Richards (horn, GC), Welke (trumpet, GD), Cole (trumpet, GE), Cloud (trombone, GE)

H. HARP

Palmer (H)

J. TIMPANI, PERCUSSION

Baunton (J)

K. HARPISCHORD

Bostwick (K)

L. VIOLA DA GAMBA

Heinitz (L)

M. NONWESTERN INSTRUMENTS

Garfias (MA), Sumi Tani (MB), Araki (MC)

230 Vocal or Instrumental Instruction (2-3, max. 9)

For description see 130; for teacher designation see 150. Prerequisite, examination.

250 Vocal or Instrumental Instruction (3-4, max. 12)

For description and teacher designation see 150. Prerequisite, examination.

330 Vocal or Instrumental Instruction (2-3, max. 9)

For majors not specializing in performance. For description see 130; for teacher designation see 150. Prerequisite, examination.

350 Vocal or Instrumental Instruction (3-4, max. 12)

To be taken concurrently with 337, 338, and 339 in the junior year. For description and teacher designation see 150. Prerequisite, examination.

351 Junior Recital (1)

For participants in departmental honors program only.

430 Vocal or Instrumental Instruction (2-3, max. 18)

For majors not specializing in performance. For description see 130; for teacher designation see 150. Prerequisite, examination.

450 Vocal or Instrumental Instruction (3-4, max. 24)

For description and teacher designation see 150. Prerequisite, examination.

451 Senior Recital (1)**PERFORMANCE TECHNIQUES****111, 112, 113 Rhythmic Movement (1,1,1)**

ROSINBUM

Muscular coordination with musical rhythms.



- 211 Music Theater Technique (1)**
ROSINBUM
Stage department and dramatic movement for singers. Prerequisite, 113.
- 331, 332, 333 Keyboard Transposition and Improvisation (2,2,2)**
BEALE
Prerequisite, 303.
- 334, 335, 336 Accompanying (2,2,2)**
HOKANSON
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)**
JACOBSON, HARRIS, EICHINGER
For applied music majors. To be taken concurrently with 350 during the junior year.
Section A. PIANO
Section C. SONG
Section E. ORGAN
- 341 Keyboard Performance Practices (2)**
BOSTWICK
Problems in interpreting early keyboard music with special reference to the harpsichord. Prerequisite, permission.
- 377, 378, 379 Score Reading (1,1,1)**
IRVINE
Reading from score at the piano as a technique for the investigation of ensemble literature.
- 434, 435, 436 Pedagogy (2,2,2)**
MOORE, ZETLIN, HARRIS
Principles of effective studio teaching; survey and evaluation of teaching materials.
Section A. PIANO
Section B. STRING
Section C. VOICE
- 464, 465 Opera Direction and Production (4,4)**
ROSINBUM
Practical experience with problems of the theater. Prerequisite, 464 for 465.
- ENSEMBLES**
Open to nonmajors. All except 100 require auditions or permission.
- 100 University Singers (1,1,1, max. 6)**
HEFFERNAN
- 140 University Concert Band (1, max. 6)**
WELKE
- 160 University Symphony Orchestra (1, max. 6)**
CHAPPLE
- 170 Chamber Music (1, max. 6)**
HEINITZ
- 171 Piano Ensemble (1, max. 6)**
GEISSMAR
- 172 Woodwind Ensemble (1, max. 6)**
WELKE
- 173 Brass Ensemble (1, max. 6)**
COLE
- 174 Percussion Ensemble (1, max. 6)**
BAUNTON, COLE
- 175 Nonwestern Ensemble (1, max. 6)**
GARFIAS
- 180 Opera Workshop (1, max. 6)**
ROSINBUM
- 190 Madrigal Singers (1, max. 6)**
KECHLEY
- 200 University Chorale (1)**
EICHENBERGER
- 240 Marching Band (1, max. 3)**
COLE
No credit for music majors.
- 300 University Singers (1-1-1, max. 6)**
HEFFERNAN
Prerequisite, junior standing.
- 340 University Concert Band (1, max. 6)**
WELKE
- 360 University Symphony Orchestra (1, max. 6)**
CHAPPLE
- 370 Chamber Music (1, max. 6)**
HEINITZ
- 371 Piano Ensemble (1, max. 6)**
JACOBSON
- 372 Woodwind Ensemble (1, max. 6)**
WELKE
- 373 Brass Ensemble (1, max. 6)**
COLE
- 374 Percussion Ensemble (1, max. 6)**
BAUNTON, COLE
- 375 Nonwestern Ensemble (1, max. 6)**
GARFIAS
- 380 Opera Workshop (1, max. 6)**
ROSINBUM
- 390 Madrigal Singers (1, max. 6)**
KECHLEY
- 395 Conductors' Chorus (1, max. 6)**
KECHLEY
- 400 University Chorale (1)**
EICHENBERGER
(See 200.)
- 440 Wind Sinfonietta (2, max. 6)**
WELKE
(Offered Summer Quarter only.)
- 460 Sinfonietta (1, max. 9)**
CHAPPLE
- 470 Chamber Music (1, max. 6)**
HEINITZ, JACOBSON, ZETLIN
Prerequisite, graduate standing.
- 480 Opera Theater (2, max. 6)**
CHAPPLE, FERRIN, ROSINBUM
Preparation for participation in public performance of roles in chamber opera.
- 490 Collegium Musicum (1, max. 6)**
BOSTWICK, HEINITZ, TERRY
- UNDERGRADUATE RESEARCH**
- 499 Undergraduate Research (*, max. 6)**
- COURSES FOR GRADUATES ONLY**
- 500 Methods of Musical Research (3)**
IRVINE
Bibliography and research techniques. Designed to prepare students for their work in seminars, individual research, and the writing of theses.
- 507 Seminar in Renaissance and Baroque Music (3, max. 6)**
TERRY
Prerequisite, one or more courses from 407, 408, 467, 487, 497.
- 508 Seminar in Classic and Romantic Music (3, max. 6)**
WOODCOCK
Prerequisite, one or more courses from 427, 428, 447, 449, 488.
- 509 Seminar in Modern Music (3, max. 6)**
VERRALL
Prerequisite, one or more courses from 409, 423, 449, 488, 498.
- 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.
- 524 Seminar in Music Education (3)**
HEFFERNAN
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)**
NORMANN
Special problems in the teaching and administration of music in the secondary school and junior college. Prerequisite, one year of teaching experience and permission.
- 526 Music and Society (3)**
NORMANN
Philosophical foundations in music education. Prerequisite, one year of teaching experience and permission.
- 547 Seminar in American Music (3, max. 6)**
CLARKE
History and literature of music in the United States from 1600 to the present.
- 550 Vocal or Instrumental Instruction (3, max. 12)**
For graduate performance majors; 60 minutes of private instruction per week. Prerequisite, jury examination.
- 561 Problems in Choral and Orchestral Scoring (2-5)**
VERRALL
Special techniques of choral, orchestral, and dramatic composition. Original composition and research, with emphasis on the evolution of ensemble types and forms.
- 566 Opera Direction and Production (4 or 6, max. 12)**
ROSINBUM
Practical experience with problems of the opera theater.
- 568, 569 Historiography and Criticism (3,3)**
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)**
IRVINE
577: Gregorian notation; ars antiqua; ars nova. 578: white mensural notation; lute and organ tablatures.
- 579 Seminar in Musicology (3, max. 6)**
CLARKE
Selected topics in music history, literature, and theory. Prerequisite, permission.
- 584, 585, 586 Advanced Conducting (1-3,1-3,1-3)**
CHAPPLE
Analysis of scores leading to rehearsal and preparation of musical groups.
- 590 Recital (2, max. 6)**
Public performance in one solo recital and in chamber music, cantata, concerto, opera, or oratorio.
- 591 Graduate Composition (*)**
BERGSMA, MC KAY, VERRALL

- 600 Research (*)**
Prerequisite, permission.
- 700 Thesis (*)**
- 702 Degree Final (6)**
Limited to students completing a nonthesis degree program.

OCEANOGRAPHY

Courses for Undergraduates

- 101 Survey of Oceanography (5)**
CREAGER, ENGLISH, GROSS
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)**
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. Prerequisite, College of Arts and Sciences Honors Program.
- 110-111-112 Lectures in Oceanography (1-1-1)**
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)**
Research with a departmental program. Prerequisites, College of Arts and Sciences Honors Program and permission. (Offered Summer Quarter only.)
- 203 Introduction to Oceanography (5)**
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.
- 280H Introduction to Oceanography-Honors (5)**
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)**
COACHMAN
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)**
Research under faculty supervision. Prerequisites, junior standing in College of Arts and Sciences Honors Program and permission. (Offered Summer Quarter only.)
- 401, 402 General Physical Oceanography I, II (5,5)**
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.
- 403 Biological Oceanography (5)**
BANSE, ENGLISH
Quantitative distribution of life in the sea; principal habitats; influence of environment. Prerequisites, 401 or 404J, Zoology 111 or Biology 101J-102J, or permission.
- 404J Introduction to Geophysics: The Ocean (5)**
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 Committee on Geophysics. Prerequisites, Mathematics 324, Physics 371, Chemistry 170, or permission.
- 405 Geological Oceanography (5)**
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, and permission.
- 410 Physical Oceanography (3)**
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)**
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)**
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)

SANDS

Vibrating strings, bars, and membranes; plane and spherical acoustic waves; transmission and reflection at boundaries. Prerequisites, 410, Mathematics 238 or 438, Physics 123.

416 Applications of Underwater Acoustics (2)

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)

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)

RICHARDS

Laboratory problems in the analytical and physical chemistry of sea water and marine materials. Prerequisites for 423: 421, Chemistry 221, and permission; for 424: 422 (which may be taken concurrently), and 423.

440 Undergraduate Seminar (1, max. 3)

FLEMING

Reviews of history and literature; description of local waters and applications of oceanography. Prerequisite, senior standing.

443 Regional Oceanography (2)

FLEMING

Application of modern methods to the comprehensive description of selected areas of the oceans. Prerequisite, advanced senior standing.

450 Geological Oceanography (5)

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)

GROSS

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)

GROSS, MCMANUS, 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)

ENBYSK

Ecology and systematics of plant and animal groups contributing to Neogene marine sediments. Emphasis on microfossils. Prerequisites, 403, 450 or Geology 326, 330, or permission.

460 Field Experience in Oceanography (2-6, max. 6)

COACHMAN

Practical work on shipboard and ashore by participation in regular oceanographic operations on the "Brown Bear" 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). (Offered Summer and Autumn Quarters only.) Prerequisites, 402 or 412, 403, 405 or 450, 423.

461 Applications of Oceanography (3)

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)

Independent research. Prerequisites, 180H or 380H, and permission.

488H Field Experience-Honors (2-6, max. 6)

Participation in extended oceanographic field operations on a research vessel; data analysis and reduction, report preparation. Prerequisites, 380H and permission.

489H Undergraduate Thesis-Honors (1-6, max. 6)

A theoretical or experimental contribution to oceanography. Prerequisite, 480H.

499 Undergraduate Research (1-3, max. 6)

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)

RATTRAY

Methods for solving problems in physical oceanography. Prerequisite, a major in a physical science.

515 Waves (2)

RATTRAY

Application of marine hydrodynamics principles to wave motion in oceans. Prerequisite, 513.

516 Ocean Circulation (2)

RATTRAY

Hydrodynamic theories concerning origin and characteristics of major ocean currents. Prerequisite, 513.

517 Oceanography of Inshore Waters (5)

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.

518 Seminar in Physical Oceanography (*, max. 9)

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)

Interchange of heat, water, and energy; study of budgets and of mechanisms of exchange. Prerequisites, 410, Atmospheric Science 462.

520 Seminar (1, max. 6)

521 Seminar in Chemical Oceanography (*, max. 9)

RICHARDS

Lectures, discussions, and readings on selected problems of current interest. Prerequisite, permission.

523 Advanced Problems in Chemical Oceanography (1-4, max. 18)

RICHARDS

Field and laboratory work on selected problems of current interest. Prerequisites, 424 and permission.

530 Marine Primary Productivity (3)

ANDERSON

General concepts of marine phytoplankton production; laboratory and field studies; critical examination of special problems. Prerequisites, 403 and permission. Not open to students who have taken 534.

531 Seminar in Biological Oceanography (*, max. 9)

BANSE, ENGLISH

Lectures, discussions, and field and laboratory work on selected problems of current interest. Prerequisite, permission.

532 Marine Microbiology (1-4)

ORDAL

Ecology and biochemistry of marine bacteria. Prerequisites, Microbiology 400 and permission.

533 Zooplankton Ecology (6)

Adaptations, modifications, and life histories of animals in the plankton. Evaluation of methods and techniques used in field and labo-

ratory studies. (Offered Summer Quarter only in even-numbered years at Friday Harbor Laboratories.) Prerequisite, permission.

534 Phytoplankton Ecology (6)

Contemporary problems in marine phytoplankton investigations. Evaluation of methods used in field and laboratory studies. (Offered Summer Quarter only in even-numbered years at Friday Harbor Laboratories.) Prerequisite, permission.

535 Advanced Plankton Ecology (2)

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)

BANSE

Quantitative consideration of the population of the sea-bed. Discussion of modern methods of sampling and analysis. Factors affecting production. Prerequisite, permission.

550 Seminar in Geological Oceanography (4, max. 9)

CREAGER, GROSS

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)

MCMANUS

Principles and techniques of measuring particle size, shape, and density; methods of data presentation; 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)

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)

GROSS

Analytical techniques and instruments applicable to problems of marine geochemistry. Prerequisite, Chemistry 351.

554 Research Techniques in Marine Geology (3)

CREAGER

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)

GROSS

Topics in geochemistry of the oceans and marine sediments. Prerequisites, Chemistry 351 and permission.

556 Advanced Marine Geology (3)

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)

NAYUDU

Petrography and petrology of submarine volcanics and deep sea sediments; the origin, distribution, and interpretation of environments and paleoclimatic significance. Prerequisites, 450, 452, Geology 423, 424, or permission.

600 Research (*)

700 Thesis (*)

PHILOSOPHY

Courses for Undergraduates

100 Introduction to Philosophy (5)

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. (Identical with Humanities 103.)

110 Introduction to Social Ethics (5)

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)

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)

MICHELSSEN

An introduction to metaphysics and epistemology. A study of the contrasting positions of such contemporary philosophers as Ayer, Russell, Bergson, and Santayana.

215 Introduction to Ethics (5)

MICHELSSEN

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)

RADER

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; not offered 1964-65.)

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)

KEYT

The pre-Socratics; Plato and Aristotle; the Stoics, Epicureans, and Skeptics; Plotinus.

321 History of Medieval Philosophy (5)

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. (Not offered 1964-65.)

322 History of Modern Philosophy (5)

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)

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)

MISH'ALANI

A survey of the main problems in Philosophical Analysis from the English Realist reaction against Idealism to the present.

347 Philosophy in Literature (5)

Study of philosophical ideas expressed in great works of literature. (Not offered 1964-65.)

**370 Intermediate Logic (5)**

KEYT

The notation, basic notions, and proof techniques used in symbolic logic.

410 Social Philosophy (5)

RADER

Philosophical theories of the nature of society. The epistemological, metaphysical, and ethical issues in the conflict between individualism and collectivism.

424 Recent American Philosophy (3)

MISH'ALANI

The philosophies of Pierce, Royce, Dewey, James, and Santayana. Recent developments in analytic and speculative philosophy. Current issues and problems. Prerequisite, 322 or permission.

428 Chinese Philosophy (5)

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. (Not offered 1964-65.)

429 Neo-Confucianism (5)

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. (Not offered 1964-65.) Prerequisite, 428 or permission.

431 Philosophy of Plato (3)

KEYT

A reading of selected middle and late dialogues. (Offered alternate years.)

433 Philosophy of Aristotle (3)

KEYT

A study of the Aristotelian system with emphasis on two major works. (Offered alternate years; not offered 1964-65.) 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. (Not offered 1964-65.) 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. (Not offered 1964-65.) Prerequisite, 322 or permission.

438 Philosophy of Kant (3)

A systematic study of *The Critique of Pure Reason*. (Not offered 1964-65.) Prerequisite, 322 or permission.

440 Advanced Ethics (3)

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)

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 (3)

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.

450 Epistemology (3)

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)

MOULTON

Theories of meaning, reference, predication, and related concepts. Typical authors include Frege, Russell, Strawson, and Austin. Prerequisite, 120 or permission.

456 Metaphysics (5)

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.

460 Introduction to the Philosophy of Science (5)

SMULLYAN

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. Operationist tendencies in recent interpretations of science. (Not offered 1964-65.) Prerequisite, 100 or 120.

463 Philosophy of Mind (3)

LONG

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. (Not offered 1964-65.)

469 Existentialist Philosophy (3)

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)

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)

MISH'ALANI

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)

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)

SMULLYAN

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. (Not offered 1964-65.)

Courses for Graduates Only**520 Seminar in Ancient Philosophy (3, max. 12)**

KEYT

(Not offered 1964-65.)

522 Seminar in Modern Philosophy (3, max. 12)

STERN

- 526 Seminar in Recent Philosophy (3, max. 12)
RICHMAN
- 540 Seminar in Ethics (3, max. 12)
RICHMAN
- 545 Seminar in Philosophy of Art (3, max. 12)
RADER
- 550 Seminar in Epistemology (3, max. 13)
SMULLYAN
- 556 Seminar in Metaphysics (3, max. 12)
LONG
- 565 Seminar in Philosophy of History (3, max. 12)
RADER
(Not offered 1964-65.)

- 567 Seminar in Philosophy of Religion (3, max. 12)
DIETRICHSON

- 570 Seminar in Logic (3, max. 12)
KEYT

584 Reading in Philosophy (1-4, max. 12)
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)
SHALOM

600 Research (1-6)
Prerequisite, permission.

- 700 Thesis (*)

PHYSICAL AND HEALTH EDUCATION

PHYSICAL EDUCATION ACTIVITIES

101 through 255 Physical Education Activities (Men) (1 each)

101, adapted activities; 105 canoeing; 106, handball; 107, basketball; 108, tennis; 109, softball; 110, golf; 111, track; 112, crew (class), prerequisite, swimming; 114, boxing; 115, gymnastics; 117, wrestling; 118, volleyball; 119, swimming; 121, touch football; 122, badminton; 123, archery; 124, calisthenics (body conditioning); 125, skiing; 126, aerial ball; 127, bowling; 128, weight-training; 129, sailing; 131, beginning, 134, intermediate, folk and square dancing; 136, mountain climbing; 151, modern dance; 154, social dance; 156, beginning swimming; 157, intermediate swimming; 158, advanced swimming; 159, springboard diving; 160, skin diving; 161, life saving; 162, water polo; 141, freshman, 241, varsity, basketball; 142, freshman, 242, varsity, crew; pre-

requisite, 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; 126, golf (\$1.50 per quarter); 128, riding; 129, sailing; 131, ski conditioning; 132, elementary skiing; 133, tumbling and apparatus; 134, rebound tumbling; 135, tennis; 136, mountain climbing; 141, basketball; 142, field sports; 143, hockey; 144, softball; 145, volleyball; 148, folk and square dance; 149, international folk dance; 151, contemporary dance; 154, social dance; 155, tap dance; 157, canoeing; 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, ski racing; 231, intermediate skiing; 232, advanced skiing; 235, intermediate tennis; 248, intermediate folk and square dance; 251, intermediate contemporary dance; 252, advanced contemporary dance; 257, intermediate canoeing; 263, intermediate swimming; 264, advanced swimming; 265, aquatic art; 266, diving; 267, lifesaving.

PROFESSIONAL AREAS HEALTH EDUCATION

250 Contemporary Health Concepts (Men and Women) (2)

GAINES, MILLS, REEVES, TRUCANO

Investigation of contemporary health problems and the scientific concepts and knowledges essential to the comprehension and solution of these problems within society.

291 Personal and General Hygiene (Men and Women) (3)

GAINES, MILLS, REEVES, TRUCANO

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)

HENDERSHOTT, MACLEAN, REEVES, STEVENS

The student may meet requirements for both Standard and Advanced American Red Cross First Aid Certification. Includes safety education in schools. Prerequisite for men, junior standing.

429 Methods in Teaching First Aid and Safety (Men and Women) (3)

MACLEAN, REEVES, STEVENS

American Red Cross, Standard, Advanced, and Instructor's First Aid Certification awarded. Prerequisite, junior standing or permission.

451 Workshop in Health Education for the Classroom Teacher (Men and Women) (2½)

Health instruction in elementary schools, including subject matter, source material, and methods of instruction. (Offered Summer Quarter only.)

453 Methods and Materials in Health Teaching (Men and Women) (3)

GAINES, TRUCANO

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)

GAINES, TRUCANO

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)

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.

PHYSICAL EDUCATION

164 Skills and Materials in Aquatics (Men) (2)

TORNEY

165 Skills and Materials in Gymnastics (Men) (2)

SCHWARZKOPF

166 Skills and Materials in Team Sports (Men) (2)

HENDERSHOTT

190 Introduction to Physical and Health Education (Men) (2)

GREEN, 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)

HUGHES

265 Skills and Materials in Low-Organized Games (Men) (2)

KUNDE



- 266 Skills and Materials in Individual Sports (Men) (2)**
- 271 Field Sports (Women) (2)**
MACLEAN
Fundamentals of women's field sports.
- 272 Fundamentals of Movement (Women) (2)**
FOX
Development of understanding of fundamental concepts of human movement.
- 273 Individual Sports (Women) (2)**
Development of an understanding of individual and dual projectile activities through the application of mechanical principles and common movement patterns.
- 281 Women's Gymnastics (Women) (2)**
MACLEAN
Understanding of gymnastic fundamentals and skills in women's basic gymnastic activities.
- 282 Fundamentals of Rhythm (Women) (2)**
HORNE, KIDWELL
Understanding of fundamental rhythm concepts and their application in the development of technique and style in basic dance forms.
- 283 Contemporary Dance (Women) (2)**
Understanding of fundamental rhythm concepts and their application in the development of technique and style in contemporary dance forms.
- 284 Aquatics (Women) (1)**
MACLEAN
Understanding of the mechanics of and development of skills in aquatic activities.
- 280 Introduction to Physical and Health Education and Recreational Leadership (Women) (2)**
Survey of the fields of health education, physical education and recreational leadership; an introduction to the history, philosophy, and literature of these fields.
- 290 Officiating (Men) (2)**
MILLS
Techniques of officiating football, basketball, track and field, swimming, tennis, volleyball, softball, and speedball.
- 293 Physiology of Muscular Exercise (Men and Women) (3)**
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 Functional Swimming and Water Safety (Men and Women) (2)**
BUCKLEY, MACLEAN
(W.S.I. certification) A course designed primarily 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, 119 for men, 267 for women, and American Red Cross life-saving card or permission for men and women.
- 304, 305-306 Officiating (Women) (2,1-1)**
Techniques of officiating in volleyball, basketball; opportunity for national and local ratings. Prerequisites, junior standing or permission; 305- for -306.
- 309 The School Dance Program (Men and Women) (2)**
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.
- 311 Rhythmic Activities for Small Children (Women) (2)**
Activities suited to the kindergarten and primary child. Educational value, significance in child growth and development, and methods of presentation. (Offered Summer Quarter only.)
- 312 Physical Fitness Activities for Children (Men and Women) (2½)**
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. (Offered Summer Quarter only.)
- ✓ **322 Kinesiology (Men and Women) (3)**
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) (1)**
PETERSON
Prerequisite, 292 or permission.
- 340 Administration of Intramural Sports (Men) (3)**
STEVENS
- 345 Principles of Physical Education (Men and Women) (3)**
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.
- 351 Theater Dance (Men and Women) (2)**
Development of dance skills and movement techniques as they apply to choreography; presentation of dramatic problems of dance.
- Prerequisites, 151, 251, 252, or 283, or permission.
- 352 History of Dance (Men and Women) (3)**
GARLAND
Survey of the function and form of dance from primitive culture to its present art form with emphasis on Western Civilization.
- 355 Dance Competition (Men and Women) (2, max. 6)**
Practice in modern dance; analysis of choreography; creative work. Prerequisites, 151 or permission.
- 358 Methods of Teaching Gymnastics (Men) (2)**
HUGHES
Prerequisite, 165 or permission.
- 359 Workshop in Gymnastics (Men and Women) (3)**
HUGHES
Lectures, practice, and supervised teaching in gymnastics. (Offered Summer Quarter only.) Prerequisite, 358 or equivalent.
- 361 Methods of Teaching Wrestling (Men) (2)**
STEVENS
Prerequisite, 264 or permission.
- 363 Methods of Teaching Sports (Men) (2)**
PEEK
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)**
TORNEY
Prerequisite, 164 or equivalent, or permission.
- 370 Coaching of Football (Men) (2)**
OWENS
- 371 Coaching of Basketball (Men) (2)**
DUCKWORTH
- 372 Coaching of Track and Field (Men) (2)**
HISERMAN
- 373 Coaching of Baseball (Men) (2)**
LEHMANN
- ✓ **375 Methods in Physical Education I (Women) (7)**
General methodology, methods in team and individual sports. Prerequisites, 141, 145, 271, 272, 273, 283, or permission.
- ✓ **376 Methods in Physical Education II (Women) (7)**
BROER, MACLEAN
Methods and materials in gymnastics, marching, stunts and tumbling, apparatus, aquatics. Prerequisites, 267, 272, 281, 284, 375, or permission.

377 Methods in Physical Education III (Women) (6)

HORNE, KIDWELL

Methods and materials in ballroom, folk, square, tap, modern dance. Prerequisites, 282, 283, 375, or permission.

435 Adapted Physical Education (Men) (3)

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)

KIDWELL

A study of activities suited to the interests, capacities, and limitations of students with handicaps. Prerequisites, Zoology 118 or 208, or permission.

447 Tests and Measurements (Men and Women) (3)

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)

PEEK, WILSON

Problems of organization and administration. Prerequisites for men, 345; senior standing, or permission; for women, majors or permission.

459-460 Dance Production (Women) (2-2)

Thematic materials for dance in education, writing dance scenario, mechanics of presenting a dance program, choreography, selection of music, music augmentation, costuming, staging, production management. Laboratory experiences. Prerequisites, 151 and 251, or 283.

✓N466 Coaching (Women) (0)

RULIFSON

478J Programs in Elementary Physical Education (Men and Women) (2½)

HORNE

Progress and problems in modern programs. Offered jointly with the College of Education. (Offered Summer Quarter only.)

480 Principles of Movement (Women) (3)

BROER, FOX

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)

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 Special Studies in Physical Education (Women) (2-3, max. 6)

BROER

Prerequisite, permission.

498H Special Studies in Physical Education (Women) (2-3, max. 6)

BROER

Prerequisite, permission.

499, 499H Undergraduate Research (Women) (2-3, max. 6)

BROER

Prerequisite, permission.

RECREATION EDUCATION

254 Recreation Resources (Men and Women) (2)

Directed observations of recreational resources, including general and community, public schools, youth-serving agencies, hospitals, institutional, and industrial organizations.

294 Introduction to Recreation (Men and Women) (2)

KUNDE

Nature, function, and scope of organized recreation; historical background, philosophy, theories of play; leadership implications; organized play in the United States. Prerequisites, Sociology 110 and Psychology 100.

324 Recreation Programs (Men and Women) (3)

KUNDE

Lectures, demonstrations, and reading assignments for orientation in recreation skills and techniques suitable for various age groups; classifying; adapting, and utilizing materials. Prerequisites, 294, and 6 credits in recreation program competencies.

344 Organization and Administration of Camp Programs (Men and Women) (3)

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)

KUNDE

Directed experience in recreational activities and program services for the enhancement of leadership techniques. Prerequisites, 294, 324 and 12 credits in recreation program competencies.

374 Social Recreation Leadership (Men and Women) (2)

KUNDE

Methods and materials in organizing programs for social recreation.

384 Workshop in Camp Counseling (Men and Women) (3)

HUGHES

On-the-job experience in camp counseling. Students will be quartered at Camp Wasko-

witz, act in the capacity of camp counselors for select groups, and assist in the direction of evening and Sunday educational and social activities. (Offered Summer Quarter only.)

434 Management and Operation of Recreation (Men and Women) (5)

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)

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)

GAINES, TRUCANO

Prerequisites, 453, 465, or permission.

508 Administration of the School Health Program (Men and Women) (3)

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.

600 Research (Men and Women) (2-5)

700 Thesis (Men and Women) (*)

PHYSICAL EDUCATION

501 Seminar in Physical Education (Men and Women) (3, max. 9)

BROER, TORNEY, WILSON

Prerequisites, 345 and 450 or equivalents, or permission.

502 Problems in Physical Education (Men and Women) (2½)

(Offered Summer Quarter only.) Prerequisite, permission.



506 The Curriculum (Men and Women) (3)
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)

PEEK

Functions, supervisory organization, evaluation, workshops, in-service education, application of democratic leadership to specific program and personnel problems. (Offered Summer Quarter only.) Prerequisites, 345 and 450, or permission.

547 Seminar in Research Procedures (Men and Women) (3)

BROER, FOX

Prerequisite, 447 or equivalent, or permission.

580 Seminar in Human Performance (Women) (4)

BROER

Analysis of gross human movement considered from the physiological, mechanical, and psychological bases of motor performance. (Offered Summer Quarter only.) Prerequisites, Physical Education 322, 480, or permission.

600 Research (Men and Women) (2-5)

700 Thesis (Men and Women) (*)

RECREATION EDUCATION

504 Administration of Recreation (Men and Women) (3)

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 and Organization for Recreation (Men and Women) (3)

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.

600 Research (Men and Women) (2-5)

700 Thesis (Men and Women) (*)

PHYSICS

Courses for Undergraduates

101, 102, 103 General Physics (4,4,4)

Concurrent registration in 107, 108, 109 recommended and may be required by individual departments. 101: mechanics. Prerequisites,

plane geometry, trigonometry, and one year of high school physics, or its equivalent by permission. 102: sound and electricity. Prerequisite, 101. 103: heat, light, and modern physics. Prerequisite, 102 or concurrent registration in 102.

107, 108, 109 General Physics Laboratory (1,1,1)

107: mechanics laboratory. Prerequisite, 101 or concurrent registration in 101. 108: sound, electricity, and magnetism laboratory. Prerequisite, 102 or concurrent registration in 102. 109: heat and light laboratory. Prerequisite, 103 or concurrent registration in 103.

110, 111, 112 General Physics (3,3,4)

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.

121, 122, 123; 121H, 122H, 123H General Physics (4,4,4)

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 Science Majors Physics Laboratory (1,1,1)

Experimental topics in physics for physical science majors. Prerequisite for 131, 121; for 132, 131 and 122; for 133, 132 and 123.

221, 222 Mechanics (3,3)

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)

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)

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. Prerequisites, 123 or permission.

323 Introduction to Nuclear Physics (3)

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)

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)

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)

A review of the fundamental and modern developments in physics with suggestions for lecture demonstration and laboratory. Primarily for institute students. Prerequisite, permission. (Offered Summer Quarter only.)

401, 402, 403; 401H, 402H, 403H Special Problems (*,*,*)

Supervised individual study. Prerequisite, permission.

440 Basic Concepts of Physical Science (3)

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 Introduction to Atomic and Nuclear Physics (3,3,3)

Foundations of modern atomic and nuclear physics; elementary quantum theory; elementary particles; high energy physics; solid state. Prerequisites, 327 and Mathematics 325 or 236H.

471, 472, 473 Atomic and Nuclear Physics Laboratory (3,3,3)

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)

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)

Prerequisite, permission.

499H Undergraduate Research (2-5, max. 5)

Supervised individual research. Prerequisite, permission.

Courses for Graduates Only

505, 506 Advanced Mechanics (3,3)

Dynamics of a particle; generalized coordinates and Lagrange's equations; variational

principles and Hamilton's equations, kinematics and dynamics of rigid body motion; special relativity; canonical transformations and Hamilton-Jacobi theory; coupled small oscillations and normal coordinates.

509, 510, 511 Atomic, Molecular, and Nuclear Structure (2,2,2)

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 Electricity and Magnetism (4,4,4)

Properties of electric and magnetic fields in free space and material media; boundary value problems; radiation from accelerated charges and electromagnetic waves; relativistic formulation of electrodynamics.

517, 518, 519 Quantum Mechanics (4,4,3)

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; spin angular momentum and identical particles; approximation methods; relativistic wave equations; and quantizations of fields.

524, 525 Thermodynamics and Statistical Mechanics (3,3)

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. Prerequisite, 517 or concurrent registration in 517.

528 Current Problems of Physics (2)

Discussion of research topics which are currently being investigated within the department; detailed study of at least one research problem.

530 Physics Colloquium (1-2)

Seminar. Prerequisite, permission.

531 Seminar in High Energy Physics (1-2)

Prerequisite, permission.

532 Seminar in Atomic Collision and Spectroscopy (1-2)

Prerequisite, permission.

533 Journal Colloquium (1-2)

Seminar. Prerequisite, permission.

534 Seminar in Magnetic Resonance and Solid State Physics (1-2)

Prerequisite, permission.

535 Seminar in Nuclear Physics (1-2)

Prerequisite, permission.

536 Seminar in Low Temperature Physics (1-2)

Prerequisite, permission.

537 Seminar in Theoretical Physics (1-2)

Prerequisite, permission.

538 Seminar in Cosmic Ray Physics (1-2)

Prerequisite, permission.

539 Seminar in General Physics (1-2)

Prerequisite, permission.

552 Conduction Through Gases (3)

558, 559 High Energy Physics (3,3)

Prerequisite, 560.

560, 561 Theoretical Nuclear Physics (3,3)

Prerequisite, 518.

562 Theory of Spectra (3)

Prerequisite, 518.

564 Relativity (3)

Prerequisites, 506 and 515.

566 Topics in Advanced Quantum Mechanics (3)

Prerequisite, 518.

567, 568 Theory of Solids (3,3)

Prerequisite, 518.

570 Quantum Field Theory (3)

Prerequisite, 519.

574 Atomic and Molecular Collisions (3)

Prerequisite, 518.

576 Selected Topics in Experimental Physics (*, max. 6)

Prerequisite, permission.

578 Selected Topics in Theoretical Physics (*, max. 6)

Prerequisite, permission.

600 Research (*)

Research currently is in progress in the following fields: acoustics, high energy physics, gaseous electronics, low temperature physics, magnetic resonance phenomena, natural radioactivity, nuclear physics, solid state physics, spectroscopy, and theoretical physics. Prerequisite, permission.

700 Thesis (*)

Prerequisite, permission.

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

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)

CASSINELLI, HITCHNER, RESHETAR

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)

BONE, GOTTFREID, KESSEL

Popular government in the United States; the theory and practice of national institutions.

203 International Relations (5)

RILEY, SMITH

An analysis of the world community, its politics and government.

POLITICAL THEORY AND PUBLIC LAW

311 Theories of Modern Government (5)

HARBOLD

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)

DEAN

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)

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.

412 American Political Thought (5)

HARBOLD

Major thinkers and movements from the Colonial period to the present.

413 Contemporary Political Thought (5)

HARBOLD

Developments from the eighteenth century to the present, as a basis for contemporary philosophies of democracy, communism, and fascism. Prerequisite, 411 or equivalent.

**414 Oriental Political Thought (5)**

HSIAO

Theories of the Oriental state as exhibited in the writings of statesmen and philosophers. (Offered alternate years; offered 1965-66.)

415 Analytical Political Theory (5)

CASSINELLI

Analysis of principal problems, approaches, concepts, values, and hypotheses of political science.

460 Introduction to Constitutional Law (5)

COLE, DEAN

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)

COLE

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)**

GOTTFRIED

Agrarian, labor, professional, business, and ethnic interest in politics; impact on representative institutions and governmental processes.

351 The American Democracy (5)

CROW

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.

360 The American Constitutional System (3)

WEBSTER

Fundamental principles, function, evolution, and unwritten constitution; recent tendencies.

**370 Government and the American
Economy (5)**

CROW

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.

**375 Problems of Municipal Government and
Administration (5)**

WARREN

The city charter; relationship to the state and other local units; municipal functions and services, with reference to municipalities in the state of Washington. (Not offered in 1964-65.)

**376 State and Local Government and
Administration (5)**

WARREN

Structure, functions, procedures, and suggested reorganization, with special reference

to the state of Washington and its units of local government.

450 Political Parties and Elections (5)

BONE

Organization and methods; the nature and future of party government.

451 The Legislative Process (5)

BONE

Organization and procedure of legislative bodies, with special reference to the theory and practice of representative government; lobbying, and bicameralism.

**452 Political Processes and Public
Opinion (5)**

KESSEL

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)

KROLL

Basic relationship of administration to other agencies of government.

471 Administrative Management (5)

KROLL

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)

SHIPMAN

The legal context of American administration, the public function, public management, administrative powers, the nature of judicial control.

473 Comparative Administrative Systems (5)

KROLL

The nature and process of governmental administration in foreign governments, emphasizing the relationship of administrative organization, behavior, and bureaucracy to societal values and institutions.

480 Metropolitan Area Government (5)

WARREN

Organization (for decision making) and provision of urban services; formal governmental system; political decision-making structure; intra-area, state, and federal relationships.

490 Analysis of Political Behavior (5)

KESSEL

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)**

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.

322 Diplomatic Practices and Procedures (5)

RILEY

Department of State; diplomatic and consular services; American diplomatic practice and procedure.

**323 International Relations of the Western
Hemisphere (5)**

KROLL

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)**

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)**

MANDER

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)

MAKI

Analysis of modern Japanese political, diplomatic, and economic impact on Asia. Offered jointly with the Far Eastern and Russian Institute.

344 Chinese Government (5)

MICHAEL

Imperial government; transition period; national government; present forms of local government; constitutional draft; present political situation. (Offered alternate years. Not offered 1964-65.)

345J Japanese Government (5)

MAKI

Characteristics from 1868 to 1945; governmental changes since 1945. Offered jointly with the Far Eastern and Russian Institute.

346 Governments of Western Europe (5)

HITCHNER

Modern government and politics of France and Germany.

347 Governments of Eastern Europe (3)

RESHETAR

Survey of the Communist regimes of Poland, Hungary, Czechoslovakia, East Germany, and the Balkans. (Offered alternate years. Not offered 1964-65.)

348 The European Community (5)

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)

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. Prerequisite, permission. Offered jointly with the Department of Economics.

420 Foreign Relations of the Soviet Union (5)

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.

425 International Law (5)

ROHN

World law as developed by custom and agreement and as exhibited in decisions of international tribunals and municipal courts.

426 International Politics (5)

SMITH

Principles and practice in the contest for power and influence between the states of the world.

427 International Government and Administration (5)

Law and organization in international affairs; regional and general international institutions.

429 International Relations in the Far East (5)

MAKI

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)

MANDER

Islamic backgrounds. Special countries, Egypt, Turkey, Iran, Israel, Saudi Arabia. Recent crises and their significance.

432 American Foreign Policy in the Far East (5)

TAYLOR

Relationship to diplomacy, trade, and internal politics.

441 Political Institutions of the Soviet Union (5)

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.

444 Systems of Modern Government (5)

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)

HITCHNER

Comparative study of the nature, structure, and function of the major institutions of government, including the party, executive, legislature, and judiciary.

GENERAL

398H Honors Seminar (5, max. 15)

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)

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)

(Offered Summer Quarter only.)

511, 512, 513 Seminar in Readings in Political Science (3,3,3)

COLE

Important writings of the masters in political science; the political classics.

514 Seminar in Problems of Political Theory (3)

HARBOLD, CASSINELLI

Selected topics, historical and conceptual, national, regional, and universal.

515 Scope and Methods in Political Science (3)

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.

520J Seminar on the Foreign Policy of the Soviet Union (3)

RESHETAR

Offered jointly with the Far Eastern and Russian Institute. Prerequisite, permission.

521 Seminar in the Theory of International Relations (3)

MANDER

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)

MANDER

Constitutional organization and administrative procedures, with particular reference to the United Nations, specialized agencies, and other recent developments.

525 Seminar in International Law (3)

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.

526 Seminar in International Politics (3)

ROHN

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)

ROHN

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)

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)

MANDER, SMITH

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.

541J The Soviet Political System (4)

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)**
MANDER
Analysis of the governments of Canada, Australia, and New Zealand; their relations with the United Kingdom.
- 543 Seminar in British Government (3)**
HITCHNER
Advanced studies in British parliamentary government.
- 544 Problems in Comparative Government (3)**
CASSINELLI
Selected problems in the comparative analysis of political institutions, organizations, and systems.
- 545J Seminar in Japanese Government and Diplomacy (3, max. 6)**
MAKI
Offered jointly with the Far Eastern and Russian Institute.
- 550, 551, 552 Seminar in Politics (3,3,3)**
GOTTFREID, KESSEL, BONE
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.
- 562, 563, 564 Public Law (3,3,3)**
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)**
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)**
SHIPMAN
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)**
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.
- 580, 581, 582 Seminar in Metropolitan and Urban Planning Problems (3,3,3)**
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.
- 585, 586 Local, State, and Regional Politics and Administration (5,5)**
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)**
KESSEL
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.
- ## PSYCHOLOGY
- ### Courses for Undergraduates
- 100 General Psychology (5)**
FIELDS, LOUCKS, WOODBURNE
An introduction to, and survey of, the principles and experimental studies of human and animal behavior.
- 190, 190H Introduction to the Scientific Analysis of Behavior (5)**
BAER, GALANTER, LOCKARD, SMITH
The concepts and methods of psychology, including the scope and limitations of the science. No attempt is made to survey the substantive findings of psychology. Recommended to students interested in science. Prerequisite for 190H, permission of College of Arts and Sciences Honors Adviser.
- 191, 191H Laboratory in the Scientific Analysis of Behavior (5)**
BIRNBRAUER, GALANTER, HORTON
Application of the experimental method to some problems of psychology using both human and animal subjects. Prerequisite, 100 or 190; for 191H, permission of College of Arts and Sciences Honors Adviser.
- 301 Statistical Methods (5)**
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 Abnormal Psychology (5)**
STROTHER
Introduction to the field of psychopathology; analysis of forms, nature, and causes of disorders of behavior and personality. Prerequisites, 10 credits in psychology, including 100 or 190, or permission.
- 306 Developmental Psychology (5)**
BAER, BIJOU, BIRNBRAUER
An analysis of psychological development of the child in relation to biological, physical, and sociological antecedent conditions from infancy to adolescence. One hour arranged for supervised observation, analysis and interpretation of behavior in the Laboratory Pre-School.
- 307 Personality (5)**
SARASON
An introduction to theory and research in the field of personality. Prerequisite, 100 or 190, or permission. (Formerly 405.)
- 316 Animal Behavior (5)**
HORTON, LOCKARD
A study of laboratory and field investigations of the behavior of animals from protozoa to man, including theoretical accounts of selected problems. Prerequisite, 100 or 190.
- 345 Social Psychology (5)**
STOTLAND, WELLS
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)**
MCKEEVER
Intensive study of selected research problems of contemporary interest. Prerequisites, 191H or equivalent, junior standing and permission of departmental honors adviser.
- 355 Cognitive Processes (5)**
WELLS
Empirical and theoretical approaches to thinking, problem-solving, and concept formation. Prerequisite, 191 or equivalent, or permission.
- 400 Learning (5)**
MCKEEVER
Experimental research and basic theories in the psychology of learning. Prerequisite, 301.
- 421 Neural Basis of Behavior (5)**
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.
- 422 Physiological Psychology (5)**
LOUCKS
Physiological mechanisms basic to emotion, fatigue and sleep, learning and memory. Prerequisite, 421 or permission.

423 Sensory Basis of Behavior (5)

HORTON

Sensory and perceptual phenomena; sensory equipment; theories of sense-organ function. Prerequisites, 421 or equivalents, or permission.

430 Measurement in Psychology (5)

LUNNEBORG

Survey of techniques of measurement in psychology and an introduction to their applications. Prerequisite, 301 or permission.

441 Perception (5)

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.

447 Psychology of Language (5)

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)

Intensive study of selected research problems of contemporary interest. Prerequisites, 350H and permission of departmental honors adviser.

451H-452H Honors Thesis (3-3)

An original contribution to psychology of a theoretical or experimental nature. Prerequisites, 450H, senior standing, and permission of departmental honors adviser.

498 Readings in Psychology (1-3, max. 9)

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)

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 graduate seminars and courses offered by the Department change from quarter to quarter. A list of graduate courses and seminars that are being offered currently, along with

descriptions of their content, can be obtained from the Department of Psychology.)

500-501-502 Proseminar in Psychology (5-5-5)

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. Must be taken in sequence.

514-515-516 Experimental Design and Quantitative Techniques (3-3-3)

EDWARDS

The first two quarters are devoted to the development of topics in statistics and the design of experiments and the third quarter deals with the application of mathematical techniques to psychological problems. This sequence can be followed by 530-531 in the second year. Required of all first-year graduate majors. Must be taken in sequence.

520-521-522 Laboratory Methods in Psychology (4-4-4)

SMITH, GALANTER

Actual practice in the design and conduct of laboratory experiments using both animal and human subjects. Required of all first-year graduate majors. Must be taken in sequence.

540, 541, 542, 543 Experimental Psychology (3-6 each, max. 15 each)

Prerequisite, second-year graduate major standing.

544, 545, 546, 547 Theoretical Psychology (3-6 each, max. 15 each)

Prerequisite, second-year graduate major standing.

548, 549, 550, 551 Physiological Psychology (3-6 each, max. 15 each)

Prerequisite, second-year graduate major standing.

552, 553, 554, 555 Developmental Psychology (3-6 each, max. 15 each)

Prerequisite, second-year graduate major standing.

556, 557, 558, 559 Psychopathology and Psychodiagnostics (3-6 each, max. 15 each)

Prerequisite, second-year graduate major standing.

560, 561, 562, 563 Psychological Measurement (3-6 each, max. 15 each)

Prerequisite, second-year graduate major standing.

564, 565, 566, 567 Personality and Social Psychology (3-6 each, max. 15 each)

Prerequisite, second-year graduate major standing.

568 Field Work (3-5, max. 36)

BIJOU, STROTHER

Prerequisites, second-year graduate major standing and permission.

599 Readings in Psychology (*)

Selected topics. The name of the staff member with whom readings will be done should be indicated in registration. Prerequisite, permission.

600 Research (*)

The name of the staff member with whom nonthesis research will be done should be indicated in registration. Prerequisite, permission.

700 Thesis (*)**ROMANCE LANGUAGES AND LITERATURE****Courses for Undergraduates**

(See courses under English Translation.)

ROMANCE LINGUISTICS AND LITERATURE, GENERAL AND COMPARATIVE**401 Introduction to Romance Linguistics (3)**

CONTRERAS, HEISER

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)

FREY

Comparative historical survey of the development of the principal Romance tongues. Prerequisite, Romance 401.

475DJ, 475EJ The Teaching of Foreign Literature (3,3)

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, 507 Advanced Romance Linguistics (2,2,2)**

CONTRERAS

Advanced problems in the phonological, morphological, and syntactical analysis of the Romance languages. Descriptive, comparative, and historical considerations. Prerequisites, 401, 402. (Offered 1964-65 and alternate years.)



521, 522, 523 Seminar in Romance Linguistics (2,2,2)

Specific problems in linguistic analysis of the Romance languages. Prerequisites, 401, 402. (Offered 1965-66 and alternate years.)

531 Problems in Romance Linguistics (2-5, max. 10)

572J, 573J Romance Language Teachers' Seminar (2½, 2½)

SIMPSON

The teaching of foreign languages. Conducted as a workshop. Opportunity for directed practice teaching of elementary school children. (Offered Summer Quarter only.) Offered jointly with the College of Education.

581, 582, 583 Methodology and Bibliography of Research (2,2,2)

NOSTRAND

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)

NOSTRAND

Individual and collective research in the evolution of concepts common to Romance literature. Open to graduates of this and other departments.

590 Research in Comparative Romance Literature (2-5, max. 20)

599 Research in Romance Linguistics (2-5, max. 15)

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

CATALAN

535 Catalan Language and Literature (5)

Survey of the political and literary history of Catalonia. Readings and reports on modern Catalan literary works.

FRENCH

101-102, 103 Elementary (5-5, 5)

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.

105 Elementary (5)*

A course to prepare senior or graduate stu-

*Prerequisite, 105 or permission.

dents 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)*

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.

201, 202 Intermediate (5,5)

Intensive practice in reading and writing. Systematic review of French grammar. Oral practice through imitation of assigned dialogues and free oral composition. Prerequisite for 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.

222 Introduction to French Literature (5)

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 (2½-4, max. 8)

For participants in the Living Language Group Program only. (Offered Summer Quarter only.) Prerequisites, 103 or equivalent, and permission.

301, 302 Advanced Syntax and Composition (3,3)

Prerequisite for 301: 222 or equivalent, or placement test; for 302: 301.

303 French Stylistics (3)

Functional grammar review; creative written and oral composition and reading with special attention to problems of style. Prerequisite, 302.

304 Survey of French Literature: 1100-1680 (3)

Middle Ages through the classical period. Prerequisite, 222 or equivalent, or placement test.

305 Survey of French Literature: 1680-1800 (3)

The age of enlightenment and pre-romanticism. Prerequisite, 222 or equivalent, or placement test.

306 Survey of French Literature: 1800-1960 (3)

Romanticism, realism, naturalism, symbolism, and twentieth-century literature. Prerequisite, 222 or equivalent, or placement test.

308 Seventeenth-Century French Literature (3)

Extensive readings in seventeenth-century drama, novel, and essay. Lectures and discus-

sions on Baroque, classicism, and the history of genres. Prerequisite, 222 or equivalent, or placement test.

309 Twentieth-Century French Literature (3)

Lectures and historical commentary. Readings and discussions in French of representative works of the twentieth century. Critical papers in French. Prerequisite, 222 (or equivalent), or placement test.

327 Advanced Conversation (2, max. 8)

Prerequisite, 222 or equivalent, or placement test.

330 Conversational French (2½-4, max. 8)

For participants in the Living Language Group Program only. (Offered Summer Quarter only.) Prerequisites, 222 or equivalent, and permission.

390 Supervised Study (2-5, max. 20)

Prerequisite, permission of Chairman of the Department.

400 The Structure of Modern French (3)

Analysis of the spoken language from a linguistic point of view; phonology, morphology, and syntax. (Not offered 1964-65.) Prerequisites, 222, and Romance 401 or Linguistics 400.

404 Old French (3)

FIELD

Designed for acquisition of reading facility in Old French through intensive study of selected texts. Prerequisite, Romance 401.

409 Advanced Phonetics (3)

CREORE

Training in diction and oral expression; interpretation of literary texts; phonetics as a teaching device. Prerequisite, 4 credits in 327 or equivalent.

421 Fiction: 1660-1800 (3)

ELLRICH

Voltaire, Prévost, and Diderot. Prerequisites, 304, 305, and 306.

424 Fiction: 1800-1850 (3)

DALE

Balzac, Stendhal. Prerequisites, 304, 305, and 306.

425 Fiction: 1850-1900 (3)

Flaubert, Maupassant, Zola. (Not offered 1964-65.) Prerequisites, 304, 305, and 306.

426 Fiction: 1900-1950 (3)

WILSON

Proust, Sartre, Camus. Prerequisites, 304, 305, and 306.

430 Advanced Conversational French (1-3, max. 6)

Continuation of 330. Advanced conversational problems. For participants in the Living Lan-

guage Group Program only. (Offered Summer Quarter only.) Prerequisites, 330 or equivalent, and permission.

431 Poetry: Baroque (3)

LEINER

Prerequisites, 304, 305, and 306.

432 Poetry: Romantic (3)

(Not offered 1964-65.) Prerequisites, 304, 305, and 306.

433 Parnassian and Symbolist Poetry (3)

SNYDER

Prerequisites, 304, 305, and 306.

434 Twentieth-Century Poetry (3)

Prerequisites, 304, 305, and 306.

436 Poetry: Renaissance (3)

Sixteenth-century poetry from Marot to D'Aubigné. (Not offered 1964-65.) Prerequisites, 304, 305, and 306.

454 Nonfiction of the Classic Period (3)

La Rochefoucauld and his contemporaries. (Not offered 1964-65.) 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. (Not offered 1964-65.) Prerequisites, 304, 305, and 306.

457 Twentieth-Century Nonfiction (3)

SIMPSON

Péguy, Maurras, and others. Prerequisites, 304, 305, and 306.

461 Seventeenth-Century Drama (3)

Corneille, Racine, Molière. (Not offered 1964-65.) Prerequisites, 304, 305, and 306.

462 Eighteenth-Century Drama (3)

Marivaux, La Chaussée, Voltaire. (Not offered 1964-65.) Prerequisites, 304, 305, and 306.

463 Nineteenth-Century Drama (3)

DALE

The French theater from Hugo to Becque. Prerequisites, 304, 305, and 306.

464 Twentieth-Century Drama (3)

LEINER

Giraudoux, Sartre, Ionesco, and others. Prerequisites, 304, 305, and 306.

474 Application of Linguistics to the Teaching of French (2)

HEISER

Current theory and practical application of methods and techniques of teaching French, as based on the findings of linguistics.

Courses for Graduates Only

513 Old French Literature (3)

Literary backgrounds; reading and discussion of selected texts. Prerequisite, Romance 401.

514 Middle French Literature (3)

Literary backgrounds; reading and discussion of selected texts. (Not offered 1964-65.) Prerequisite, 513 or Romance 401.

520 Renaissance Prose: Rabelais (3)

Seminar on Rabelais: study of his sources, style, and narrative art. (Not offered 1964-65.)

521 Studies in Fiction: 1660-1800 (3)

Detailed investigation of the French novel and *conte philosophique* during the period 1660 to 1800. Diderot and his contemporaries. Marivaux, Prévost, Rousseau, Laclos, and Voltaire. (Not offered 1964-65.)

524 Studies in Fiction: 1800-1850 (3)

Detailed investigation of the development of the French novel in the first half of the nineteenth century. Hugo, Balzac, Sand, and others. (Not offered 1964-65.)

525 Studies in Fiction: 1850-1900 (3)

DALE

Detailed investigation of the French novel in the second half of the nineteenth century; Flaubert, Zola, Bourget, and others.

526 Studies in Fiction: 1900-1950 (3)

Detailed investigation of the French novel in the twentieth century. The works of Proust, Gide, Aymé, Camus, Sartre, and their contemporaries. (Not offered 1964-65.)

530 Studies in Renaissance Poetry (3)

KELLER

531 Renaissance Poetry: Ronsard (3)

Historical and critical study of the works of Ronsard. (Not offered 1964-65.)

532 Studies in Nineteenth-Century Poetry (3)

Research in the poetry of the Romantic period. Critical examination of the works of Hugo, Lamartine, and Vigny. (Not offered 1964-65.)

533 Studies in Parnassian and Symbolist Poetry (3)

Research in the poetry of the Parnassians and Symbolists. Critical examination of the poetry of Leconte de Lisle, Baudelaire, Rimbaud, and Mallarmé.

534 Studies in Twentieth-Century Poetry (3)

Research in French poetry of the twentieth century. Critical examination of the poetry of René Char, Valéry, Artaud, Aragon, and others. (Not offered 1964-65.)

535 Major Poets of Négritude (3)

Reading and discussion of the works of the major poets (Senghor, Césaire, Diop, Rabelmananjara) involved in the African social and literary movement known as *négritude*. (Not offered 1964-65; offered 1965-66.) Prerequisite, graduate standing or permission.

541, 542 History of the French Language (3,3)

HEISER

A survey of the phonological, morphological, and syntactical development of the French language from its origins to the present. (Offered alternate years; offered 1964-65.)

552 Renaissance Prose: Montaigne (3)

KELLER

Seminar on the *Essais* of Montaigne. Study of Montaigne's style, ideas, and sources.

554 Studies in Seventeenth-Century Nonfiction (3)

LEINER

Intensive investigation of critics and essayists of the seventeenth century. Detailed study of La Rochefoucauld, Descartes, Pascal, La Bruyère, and Mme de Sévigné.

555 Studies in Eighteenth-Century Nonfiction (3)

HANZEL

Intensive investigation of critics and essayists of the eighteenth century, such as Voltaire, Montesquieu, Rousseau, and Diderot. (Not offered 1964-65.)

556 Studies in Nineteenth-Century Nonfiction (3)

Intensive investigation of critics and essayists of the nineteenth century, such as Mme de Staël, Chateaubriand, Sainte-Beuve, Tocqueville, Comte, Renan, and Taine. (Not offered 1964-65.)

557 Studies in Twentieth-Century Nonfiction (3)

Intensive investigation of such contemporary critics as Péguy, Maurras, Chartier, Guitton, Thibaudet, Maurier, and Valéry. (Not offered 1964-65.)

558 Moral Themes in Twentieth-Century Nonfiction (3)

DAVID

561 Studies in Seventeenth-Century Drama (3)

Research in the drama of Racine, Corneille, or Molière. (Not offered 1964-65.)

562 Studies in Eighteenth-Century Drama (3)

Research in the drama of the eighteenth century as exemplified in the works of Marivaux, Crébillon, Voltaire, La Chaussée, Diderot, and Beaumarchais. (Not offered 1964-65.)


563 Studies in Nineteenth-Century Drama (3)

Research in the drama of the nineteenth century as exemplified in the works of Hugo, Musset, Scribe, Augier, and Dumas *filis*. (Not offered 1964-65.)

564 Studies in Twentieth-Century Drama (3)
SIMPSON

Research in the drama of the twentieth century as exemplified in the works of Brieux, Currel, Lenormand, Anouilh, Montherlant, Sartre, Cocteau, Giraudoux, Beckett, and Ionesco.

575, 576, 577 Literary Criticism (3,3,3)

Major philosophies of criticism and their exponents. Influences which affected standards, purposes, and methodologies. 575: nineteenth century; 576: 1900-1935; 577: 1935 to the present. (Not offered 1964-65.)

580 Explication de Texte (3, max. 6)

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*. (Not offered 1964-65.)

590 Special Seminar and Conference (2-5, max. 20)

Group seminars and conferences will be scheduled under this number to meet special needs. For individual conferences under this number, permission of the Chairman of the Department is required.

600 Research (2-5, max. 20)
700 Thesis (*)
702 Degree Final (6)

Limited to students completing a nonthesis degree program.

ITALIAN
101-102, 103 Elementary (5-5,5)
210, 211 Elementary Italian Conversation (2,2)

Prerequisite, 103 or permission for 210; 210 or permission for 211.

212, 213, 214 Readings in Modern Italian Literature (3,3,3)

BUDEL

Prose and poetry of the nineteenth and twentieth centuries. Oral practice and language laboratory exercises. Functional review of grammar. Prerequisite, 103 or permission.

390 Supervised Study (2-5, max. 20)

Prerequisite, permission of the Chairman of the Department.

421, 422, 423 Survey of Italian Literature (3,3,3)

BUDEL

Masterpieces of Italian literature from the thirteenth to the twentieth century. 421: Dante, Petrarca, Boccaccio. 422: Pulci, Poliziano, Castiglione, Ariosto, Machiavelli, Michelangelo, Tasso, Bandello, Aretino; Renaissance literary theory. 423: Foscolo, Manzoni, Leopardi, Verga, Carducci, D'Annunzio, Pirandello, Moravia, Pavese, De Filippo, Vittorini.

Courses for Graduates Only
512, 513, 514 Dante (3,3,3)

BUDEL

Dante and the *Dolce stil nuovo*; *La vita nuova*, *Le rime*. Dante's literary aesthetics: *De vulgari eloquentia*, *Il convivio* and *La Divina commedia*. (Not offered 1964-65.)

531 Literary Problems (2-5, max. 20)

BUDEL

Field (see A-F below) must be specified in registration. For individual conferences under this number (but not for group projects), permission of the Chairman of the Department is required.

- A. Middle Ages and fourteenth century
- B. Renaissance
- C. Baroque
- D. Eighteenth century
- E. Nineteenth century
- F. Twentieth century

541, 542, 543 History of the Italian Language (2,2,2)

Phonological, morphological, and syntactical development of the Italian language from its origin to the present. (Not offered 1964-65.)

551, 552, 553 Seminar in Humanist and Renaissance Prose and Poetry (3,3,3)

BUDEL

551: Humanism and Early Renaissance: Petrarca, Boccaccio; Pulci, Poliziano, Lorenzo il Magnifico, Boiardo, Sannazaro, Marsilio Ficino, Pico della Mirandola. 552: High Renaissance: Castiglione, Ariosto, Machiavelli, Folengo, Bembo, Trissino. 553: Late Renaissance: Michelangelo, Tasso, Bandello, Pietro Aretino. Renaissance literary theory from Coluccio Salutati to Scaligero. (Not offered 1964-65.)

561, 562, 563 Italian Literature of the Nineteenth and Twentieth Centuries (3,3,3)

BUDEL

600 Research (2-5, max. 20)
700 Thesis (*)
702 Degree Final (6)

Limited to students completing a nonthesis degree program.

PORTUGUESE
101-102, 103 Elementary (5-5,5)
201, 202, 203 Intermediate (5,5,5)

Modern texts, composition, conversation, and functional grammar. Prerequisite, 103 or equivalent, or permission.

301, 302 Advanced Syntax and Composition (3,3)

Prerequisite for 301: 203 or equivalent, or permission; for 302: 301.

303 Portuguese Stylistics (3)

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)

BERNARD

Masterpieces of the literature during this period. Prerequisite, 203 or equivalent, or permission.

305 Survey of Luso-Brazilian Literature: Seventeenth, Eighteenth, and Early Nineteenth Centuries (3)

BERNARD

Masterpieces of the literature of this period. Prerequisite, 203 or equivalent, or permission.

306 Survey of Luso-Brazilian Literature: Late Nineteenth and Twentieth Centuries (3)

BERNARD

Masterpieces of the literature during this period. Prerequisite, 203 or equivalent, or permission.

327 Advanced Conversation (2, max. 8)

Prerequisite, 203 or equivalent, or permission. (Not offered 1964-65.)

390 Supervised Study (2-5, max. 20)

Prerequisite, permission of the Chairman of the Department.

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. (Not offered 1964-65.)

Course for Graduates Only
541, 542, 543 History of the Portuguese Language (2,2,2)

Phonological, morphological, and syntactical development of the Portuguese language from its origin to the present. Prerequisite, Romance 401 or equivalent. (Not offered 1964-65.)

PROVENÇAL

534 Old Provençal (3) FIELD

SPANISH

101-102, 103 Elementary (5-5,5)

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.

105 Elementary (5)

A course to prepare senior or 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 and 106 may not be applied toward an advanced degree. Prerequisite, graduate standing or permission of the Chairman of the Department.

106 Elementary (5)

Continuation of 105. Students who have received credit for -102 and/or 103 may also receive credit for 106. Credits in 105 and 106 may not be applied toward an advanced degree. Prerequisite, 105 or permission.

201, 202, 203 Intermediate (5,5,5)

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 (2½-4, max. 8)

For participants in the Living Language Group Program only. (Offered Summer Quarter only.) Prerequisites, 103 or equivalent, and permission.

301, 302 Advanced Syntax and Composition (3,3)

Prerequisite for 301: 203 or equivalent, or placement test; for 302: 301 or equivalent, or placement test.

303 Spanish Stylistics (3)

Functional grammar review; creative written and oral composition and reading with special attention. Prerequisite, 302.

304 Survey of Spanish Literature: 1140-1498 (3)

Masterpieces of Spanish literature from *Poema de Mio Cid* to 1498. Prerequisite, 203 or equivalent, or placement test.

305 Survey of Spanish Literature: 1498-1681 (3)

Masterpieces of Spanish literature from 1498 to 1681. Prerequisite, 203 or equivalent, or placement test.

306 Survey of Spanish Literature: 1681 to the Present (3)

Masterpieces of Spanish literature from 1681 to the present. 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 equivalent, or placement test.

309 Contemporary Spanish Literature (3)

Extensive reading of the works of contemporary poets, novelists, and essayists. Prerequisite, 203 or equivalent, or placement test.

327 Advanced Conversation (2, max. 8)

Prerequisite, 203 or equivalent, or placement test.

330 Conversational Spanish (2½-4, max. 8)

For participants in the Living Language Group Program only. Prerequisites, 203 or equivalent, and permission. (Offered Summer Quarter only.)

390 Supervised Study (2-5, max. 20)

Prerequisite, permission of the Chairman of the Department.

400 The Structure of Modern Spanish (3)

CONTRERAS

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)

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 (2)

A study of Hispanic lyric poetry from the late Middle Ages through the sixteenth century. Prerequisites, 304, 305, and 306. (Not offered 1964-65.)

411 Hispanic Poetry: Seventeenth through the Nineteenth Century (2)

A study of Hispanic lyric poetry from the seventeenth through the nineteenth century. Prerequisites, 304, 305, and 306. (Not offered 1964-65.)

412 Hispanic Poetry: The Twentieth Century (2)

A study of Hispanic lyric poetry in the twentieth century. Prerequisites, 304, 305, and 306. (Not offered 1964-65.)

418 Cervantes and Modern Fiction (3)

PENUELAS

A study of Cervantes' *Don Quijote* as a milestone in modern fiction. Prerequisites, 304, 305, and 306. (Offered alternate years; offered 1964-65.)

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 (1-3, max. 6)

Continuation of 330. Advanced conversational problems primarily for teachers. For participants in the Living Language Group Program only. Prerequisites, 330 or equivalent, and permission. (Offered Summer Quarter only.)

441, 442, 443 Drama (3,3,3)

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. (Not offered 1964-65.)

451, 452, 453 Spanish Literature Since 1700 (3,3,3)

451: 1700 through the Romantic Period. 452: 1850-1898. 453: 1898 to the present. Prerequisites, 304, 305, and 306. (Not offered 1964-65.)

461, 462, 463 Spanish Literature of the Golden Era (3,3,3)

W. WILSON, PENUELAS

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)

PENUELAS

This course is devoted to one or more representative Spanish or Spanish-American authors. In Winter Quarter, 1965, Unamuno and Ortega y Gasset. Prerequisites, 304, 305, and 306.

474 Application of Linguistics to the Teaching of Spanish (2)

FREY

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)

SAUNDERS

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)

VARGAS-BARON

Leading Romantic and Costumbrista authors (1810-1890). Prerequisites, 304, 305, and 306.



486 The Modernista Movement in Spanish-American Literature (3)

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)

VARGAS-BARON

Prerequisites, 304, 305, and 306.

488 Cultural Background of Latin-American Literature (2)

SOMMERS

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

500 Seminar in Spanish Linguistics (3)

CONTRERAS

Problems in the phonological and grammatical analysis of modern Spanish. Prerequisite, 400.

511, 512, 513 Early Spanish Literature (3,3,3)

FREY

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. (Offered 1964-65 and alternate years.)

515 The Contemporary Spanish-American Short Story (3)

SOMMERS

521, 522 The Renaissance in Spain (3,3)

A study of the major literary works of the fifteenth and sixteenth centuries in Spain.

531 Literary Problems (2-5, max. 20)

Field (see A-H below) must be specified in registering. For individual conferences under this number (but not for group projects) permission of the Chairman of the Department is required. 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 colonial literature
- H. Latin America

541, 542 History of the Spanish Language (3,3)

FREY

A survey of the phonological, morphological, and syntactical development of the Spanish language, with particular emphasis on early literary texts. (Offered 1965-66 and alternate years.)

553 The Generation of '98 (3)

PENUELAS

A study of the significance of the works of Unamuno, Machado, Baroja, Azorín, and their contemporaries.

561 Latin-American Literature from 1940 to the Present (3)

SOMMERS

Study of the current generation of novelists who mark a new stage in the development of Latin American literature.

562 Spanish Literature from 1940 to the Present (3)

Study of the Spanish novelists and poets who have flourished since 1940. (Not offered 1964-65.)

571 The Modern Essay (3)

Leading essayists of Spain and Spanish America. (Not offered 1964-65.)

572 Modern Poetry (3)

Romanticism and later movements in Spanish and Spanish-American poetry. (Not offered 1964-65.)

575 Hispanic Literary Criticism (3)

A study of the doctrinal foundations of the critique of such great critics as Menendez Pelayo, Dámaso Alonso, Alfonso Reyes, Pedro Henríquez Ureña, and others. (Not offered 1964-65.)

600 Research (2-5, max. 20)

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

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

415 Survey of Negro French African Literature (3)

SNYDER

The problem of French Negro African literature in its historical aspects; development of the *négritude* movement, with emphasis on the role played by Sartre and others; study of significant works and poems (in translation) by Senghor, Césaire, Diop, etc. Prerequisite, junior standing.

416 Rabelais and Montaigne in English (3)

KELLER

417 Racine and Molière in English (3)

(Not offered 1964-65.)

418 Literature of the Enlightenment in English (3)

Voltaire, Rousseau, Diderot.

419 Nineteenth-Century Fiction in English (3)

(Not offered 1964-65.)

420 Twentieth-Century Fiction in English (3)

(Not offered 1964-65.)

ITALIAN

318 Italian Literature in English (5)

(Not offered 1964-65.)

384 Renaissance Literature of Italy in English (5)

Lectures and collateral reading. May be counted as an elective in an English major or minor. (Not offered 1964-65.)

481, 482 Dante in English (2,2)

May be counted as an elective in an English major or minor. (Not offered 1964-65.)

ROMANCE LITERATURE

460 The Literature of the Renaissance in English (5)

The place of the Renaissance in the formation of modern attitudes and values. Principal intellectual trends are studied through the literature, particularly the writings of Erasmus, Castiglione, Vives, Rabelais, Montaigne, and Bacon. (Not offered 1964-65.)

SPANISH

315 Latin-American Authors in English (5)

An approach to Latin-American civilization and its characteristic values, through lectures and the reading and discussion of several outstanding literary works in translation. (Not offered 1964-65.)

345 Spanish Literature of the Renaissance in English (3)

A study of prose and poetry emphasizing the picaresque novel, the theater, and the secular and religious poets. (Not offered 1964-65.)

420 Contemporary Spanish Essay and Drama in English (3)

Unamuno, Ortega, and Lorca: their critique of modern culture. Existentialist anticipations; mass man and dehumanized art. (Not offered 1964-65.)

SCANDINAVIAN LANGUAGES AND LITERATURE

Courses for Undergraduates

DANISH

101-102, 103 Elementary Danish (3-3,3)
Fundamentals of oral and written Danish.

104-105, 106 Danish Reading (2-2,2)

Should accompany 101-102, 103.

220 Introduction to Danish Literature (2)

Selected short stories by contemporary authors. Prerequisite, -102 or equivalent.

221 Introduction to Danish Literature (2)

H. C. Branner and his novels. Prerequisite, -102 or equivalent.

222 Introduction to Danish Literature (2)

Kaj Munk and his dramas. Prerequisite, -102 or equivalent.

300 Modern Danish Literature (3)

Reading of representative works from nineteenth- and twentieth-century novels. Prerequisite, 222 or equivalent.

301 Modern Danish Literature (*, max. 3)

Reading of representative works from nineteenth- and twentieth-century drama. Prerequisite, 222 or equivalent.

302 Modern Danish Literature (3)

Reading of representative works from nineteenth- and twentieth-century poetry. Prerequisite, 222 or equivalent.

490 Supervised Reading (*, max. 5)

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, 302 or permission.

NORWEGIAN

101-102, 103 Elementary Norwegian (3-3,3)

ARESTAD

Fundamentals of oral and written Norwegian.

104-105, 106 Norwegian Reading (2-2,2)

Should accompany 101-102, 103.

220 Introduction to Norwegian Literature (2)

ARESTAD

Hamsun's *Victoria* and one other novel. Prerequisite, -102 or equivalent.

221 Introduction to Norwegian Literature (2).

Ibsen's *A Doll's House* and one other play. Prerequisite, -102 or equivalent.

222 Introduction to Norwegian Literature (2)

Selected poetry and short stories. Prerequisite, -102 or equivalent.

223, 224, 225 Conversational Norwegian (2,2,2)

Prerequisite, -102 or equivalent.

226, 227, 228 Norwegian Composition (1,1,1)

Prerequisite, -102 or equivalent.

300 Modern Norwegian Literature (*, max. 3)

ARESTAD

Reading representative works of Ibsen and Bjornson. Prerequisite, 222 or equivalent.

301 Modern Norwegian Literature (*, max. 3)

ARESTAD

Reading selected novels of Kielland, Hamsun, Undset. Prerequisite, 222 or equivalent.

302 Modern Norwegian Literature (*, max. 3)

ARESTAD

Reading representative poetry of Wergeland, Welhaven, Vogt, Bull, and Overland. Prerequisite, 222 or equivalent.

303, 304, 305 Advanced Conversational Norwegian (2,2,2)

Prerequisite, 225 or equivalent.

306, 307, 308 Advanced Norwegian Composition (1,1,1)

Prerequisite, 228 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 genre. (Not offered 1964-65.) Prerequisite, 222 or equivalent.

490 Supervised Reading (*, max. 5)

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 (3-3,3)

Fundamentals of oral and written Swedish.

104-105, 106 Swedish Reading (2-2,2)

Should accompany 101-102, 103.

220 Introduction to Swedish Literature (2)

JOHNSON

Fröding and his poetry. Prerequisite, -102 or equivalent.

221 Introduction to Swedish Literature (2)

JOHNSON

Hjalmer Söderberg and his short stories. Prerequisite, -102 or equivalent.

222 Introduction to Swedish Literature (2)

JOHNSON

Malmberg and his short stories. Prerequisite, -102 or equivalent.

223, 224, 225 Conversational Swedish (2,2,2)

Prerequisite, -102 or equivalent.

226, 227, 228 Swedish Composition (1,1,1)

Prerequisite, -102 or equivalent.

300 Modern Swedish Literature (2)

JOHNSON

An introduction to Lagerkvist's major works. Prerequisite, 222 or equivalent.

301 Modern Swedish Literature (2)

JOHNSON

Martinson's *Aniara*. Prerequisite, 222 or equivalent.

302 Modern Swedish Literature (2)

JOHNSON

Bellman or modern poetry. Prerequisite, 222 or equivalent.

303, 304, 305 Advanced Conversational Swedish (2,2,2)

Prerequisite, 225 or equivalent.

306, 307, 308 Advanced Swedish Composition (1,1,1)

Prerequisite, 228 or equivalent.

450 History of Swedish Literature (3)

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 genre. Prerequisite, 222 or equivalent.

455 History of the Swedish Language (3)

JOHNSON

(Not offered 1964-65.) Prerequisite, 222 or equivalent.

490 Supervised Reading (*, max. 12)

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)

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)

ARESTAD

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. (Not offered in 1964-65.)

309 The Scandinavian Novel in English (2)

JOHNSON

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 Hamsun, Dinesen, Duun, Lagerkvist, and Undset.

382 Twentieth-Century Scandinavian Drama in English (2)

A study of representative Scandinavian plays of our time.

480 Ibsen and His Major Plays in English (2)

ARESTAD

481 Strindberg and His Major Plays in English (2)

JOHNSON

Courses for Graduates Only

500, 501, 502 Old Icelandic (2,2,2)

JOHNSON

(Not offered 1964-65.)

506 Ibsen's Early Plays (3)

ARESTAD

(Not offered 1964-65.)

507 Ibsen's Later Plays (3)

ARESTAD

(Not offered 1964-65.)

508 Nineteenth-Century Danish-Norwegian Novel (3)

ARESTAD

509 Twentieth-Century Danish-Norwegian Novel (3)

ARESTAD

510, 511, 512 Strindberg (3,3,3)

JOHNSON

(Not offered 1964-65.)

515 Modern Danish and Norwegian Poetry (3)

ARESTAD

(Not offered 1964-65.)

516 Modern Danish and Norwegian Drama (3)

ARESTAD

(Not offered 1964-65.)

517 Modern Swedish Poetry (3)

JOHNSON

518 The Swedish Novel (3)

JOHNSON

(Not offered 1964-65.)

519 Recent Swedish Drama (3)

JOHNSON

700 Thesis (*)

JOHNSON

SOCIOLOGY

Field I: SOCIOLOGICAL THEORY

110 Survey of Sociology (5)

LARSEN

Basic principles of social relationships. For freshmen and sophomores only. Not open to students who have taken 310.

310 General Sociology (5)

LARSEN

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)

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. (Not offered 1964-65.)

411, 412, 413 Systematic Sociology (3,3,3)

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)

SCHRAG

Modern scientific theory applied to social behavior; sociology as a natural science. Prerequisite, 20 credits in social science.

415 Theory of Social Organization (5)

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)

Monthly meetings with reports on independent research by graduate students and staff members.

Field II: RESEARCH METHODS AND SOCIAL STATISTICS

223 Social Statistics (5)

COSTNER

Methods and sources for quantitative investigation. Prerequisite, 110 or 310.

420 Methods of Sociological Research (5)

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. (Not offered 1964-65.)

423 Advanced Social Statistics (5)

COSTNER

Application of statistical methods to the analysis of sociological data. Prerequisite, 223.

425J Graphic Techniques in the Social Sciences (5)

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. Offered jointly with the Department of Geography. Prerequisite, 223 or approved equivalent.

426 Methodology: Quantitative Techniques in Sociology (3)

COSTNER

Measures of relationships among variables and among attributes; calculation techniques; application to typical sociological problems; interpretation. Prerequisites, 223 and 423, or equivalents. (Not offered 1964-65.)

427 Statistical Classification and Measurement (3)

COSTNER

Application of statistical principles and methods to problems of classification and measurement in social research. Prerequisite, 423 or equivalent. (Not offered 1964-65.)

428-429 Sampling and Experimentation (3-3)

COSTNER, LEIK

Application of statistical principles and methods to problems of sampling and experimentation in social research. Prerequisite, 423 or equivalent.

521, 522, 523 Seminar in Methods of Sociological Research (3,3,3)

Prerequisites, 223, 414, and 420, or equivalents. (Not offered 1964-65.)

528 Seminar in Selected Statistical Problems in Social Research (3)

COSTNER

Prerequisite, 426. (Not offered 1964-65.)

Field III: ECOLOGY AND DEMOGRAPHY**230 Introduction to Human Ecology (5)**

SCHMID, WATSON

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)

WATSON

Major quantitative and qualitative problems of population in contemporary society. Prerequisite, 110 or 310.

430 Human Ecology (5)

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)

SCHMID

Prerequisites, 230 or 430, and 15 credits in social science.

531 Demography (3)

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)**

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)

PARIS

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)

LARSEN

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)

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)

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)

How social systems control the behavior of their constituent groups, and persons, through the socialization process, sanctions, power, allocation of status and rewards. Prerequisites, 110 or 310, and permission. (Not offered 1964-65.)

448 Sociometric Analysis and Group Structure (5)

SCHRAG

Analysis of the theory and techniques used in the description and experimental investigation of group structure and process. Study of formation, organization, cohesion, and disorganization of social groups through sociometric techniques. Prerequisites, 223, 240, and senior standing.

540, 541 Seminar in Social Interaction (3,3)

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)

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 for nonmajors, permission.

543 Communications Seminar (3)

LARSEN

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.

Field V: SOCIAL INSTITUTIONS**352 The Family (5)**

BARTH

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)

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)

CATTON

Basic trends in American life; frames of reference for analysis of social change; forces causing social change. Prerequisite, 15 credits in social science. (Not offered 1964-65.)

453 Social Factors of Marriage (3)

LEIK

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. (Not offered 1964-65.)

458 Institutional Forms and Processes (5)

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: Latin America (3)

HAYNER

Latin American social values; differential changes in social institutions of village, town, and city; special attention to Mexico. Prerequisites, 110 or 310 and senior standing. (Not offered 1964-65.)

550, 551, 552 Marriage and the Family (3,3,3)

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)**

BARTH, NOEL

Interracial contacts and conflicts. Prerequisite, 110 or 310.

365 Urban Community (5)

COHEN

Comparative and analytic study of organization and activities of urban groups. Prerequisite, 110 or 310.

**460 Social Differentiation (5)**

BARTH

Analysis of societal organization based on sex, age, residence, occupation, community, class, caste, and race. Prerequisite, 110 or 310.

463 American Negro Community (3)

BARTH

Internal structure of class and caste patterns; resultant personality and institutional development. Prerequisite, 110 or 310.

466 Industrial Sociology (5)

WAGER

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)

WAGER

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. (Not offered 1964-65.)

468 Sociology of Occupations and Professions (5)

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.

566, 567 Industrial Sociology Seminar (3,3)

WAGER

Research training in industrial sociology. Readings and field projects. Prerequisite, 466 or equivalent.

Field VII: SOCIAL DISORGANIZATION**270 Social Disorganization and Deviant Behavior (5)**

SCHRAG

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)

SCHRAG

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)

HAYNER, SCHRAG

Factors in delinquency, juvenile courts, detention, probation. Programs of treatment and

prevention. Volunteer services. Prerequisite, 371 or equivalent.

473 Corrections (5)

HAYNER, SCHRAG

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)

HAYNER

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)

SCHRAG

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)

HAYNER

Prisons and juvenile reformatories as communities. Prerequisites, 371 and 473.

572 Analysis of Criminal Careers (3)

HAYNER

Personal and social factors in criminal maturation and reformation. Prerequisites, 371 and 473, or equivalent.

573 Crime Prevention (3)

HAYNER

Critical consideration of programs for delinquency prevention. Prerequisites, 371 and 472. (Not offered 1964-65.)

574 Seminar in Methods of Criminological Research (3)

SCHRAG

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)

Open only to qualified undergraduate students by permission.

496H, 497H, 498H Senior Seminar (3)

CHAMBLISS

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)

Open only to qualified undergraduate students by consent of instructor.

599 Reading in Selected Fields (2-5, max. 15)

Open only to qualified graduate students by permission.

600 Research (2-5)

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 (*)**SPEECH****Courses for Undergraduates****GENERAL****100 Basic Speech Improvement (5)**

LARUSSO

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)

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)

RAHSKOPF

The nature of speech as an activity of daily life and as a field of study.

499 Undergraduate Research (1-5, max. 15)

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 Voice Improvement (2)**

TIFFANY

Study and application of principles basic to good voice quality, vocal variety, and the

effective use of the voice in reading and speaking. Group and individual listening and speaking projects make use of laboratory and recording facilities. Two class meetings and one laboratory hour per week.

111 Articulation Improvement (2)

TIFFANY

Introductory study of the sounds of American English and application of this study to individual problems in articulation and pronunciation. Analysis and correction of substandard speech patterns. Group and individual listening and speech projects with laboratory and recording facilities. Two class meetings and one laboratory hour per week.

211 Phonetics (3)

TIFFANY

Phonetic and phonemic analysis of the sound system of the English language with special application to the problems of speech improvement and speech correction.

310 Voice Science (5)

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.

411 Anatomy of the Vocal Organs and Ear (5)

PALMER

Structure and function of the organs concerned with phonation, articulation, and hearing. Not open to students who have credit for 495. Prerequisite, 5 credits in anatomy, physiology, or zoology, or permission.

415 Advanced Voice and Phonetics (5)

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)

NILSEN

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 120 prior to Autumn Quarter, 1961. Special section for honors students. Offered Autumn Quarter only.

320 Public Speaking (5)

FRANZKE

Continuation of 220, with emphasis on organization and delivery. Practice in preparation and presentation of a variety of types of public speeches based on study of their structure and form. Primarily for students not majoring in speech. Prerequisite, 220 or permission.

327 Extempore Speaking (3)

FRANZKE

Primarily for students in engineering and industrial design. Not open to other students in the College of Arts and Sciences, nor to those who have taken 220 (formerly 120).

420 Advanced Public Speaking (5)

BASKERVILLE

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)

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.

423 Studies in Greek and Roman Rhetoric (5)

RAHSKOPF

Critical analysis of writings on rhetoric by Plato, Aristotle, Cicero, Quintilian, and others. Formerly 521.

425, 426 American Public Address (5,5)

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. (425, Winter; 426 not offered 1964-65.)

428 British Public Address (5)

STROTHER

Historical and critical study of principal speakers and speeches and of their relationship to British political and social life. Rhetorical analysis of speeches. (Not offered 1964-65.)

ARGUMENT AND DISCUSSION

230 Essentials of Argument (5)

PENCE

Argument as a technique in the investigation of social problems; evidence, proof, refutation, persuasion; training in argumentative speaking.

235 Parliamentary Procedure (3)

FRANZKE

Methods of organizing and conducting public meetings, based on *Robert's Rules of Order*.

332 Principles of Group Discussion (5)

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)

STROTHER

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)

STROTHER

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)

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.

436 Methods of Public Discussion (5)

FRANZKE

Includes practice in the use of the panel, symposium, lecture forum, and debate forum. Prerequisite, 220 or 230.

ORAL INTERPRETATION OF LITERATURE

140 Oral Interpretation (5)

Development and use of fundamental techniques for analysis and reading aloud of prose and poetry.

340 Oral Interpretation of Fiction (3)

Study of literary prose, especially narrative, for the purpose of developing ability to communicate its full meaning to an audience. Prerequisite, 140.

345 Choral Speaking (3)

Group speaking as a classroom method in teaching speech and literature; selection and use of prose and poetry materials for group utterance. 140 is recommended.

349 Readers Theatre (2, max. 10)

Presentation of literature before audiences on and off campus. The student should confer with the workshop director before completing registration. Prerequisite, 140.

440 Oral Interpretation of Poetry (3)

Problems of interpretation pertaining to oral presentation of various types of poetry. Prerequisite, 140 or 340.

444 Oral Interpretation of Modern Dramatic Literature (3)

POST

Study of dramatic literature from Ibsen to the present, for purposes of developing understanding, appreciation, and ability to communicate its meaning. Prerequisite, 140 or 340.

**TEACHING OF SPEECH****359 Speech in the Classroom (2 or 3)**

NELSON

The place of speech in education and the use of speech projects in teaching. Primarily for nonmajors and minors. 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)

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. (Offered Summer Quarter only.)

RADIO-TV SPEECH**260 Radio-TV Speech (3)**

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. Prerequisites, 110 and 111, or permission.

361 Advanced Radio-TV Speech (3)

BIRD, HOGAN

Analysis of audience situations, group discussions, and audience participation programs. Prerequisite, 260 or permission.

SPEECH CORRECTION**N79 Speech Clinic (0)**

PALMER

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)

For premajors desiring general orientation in speech and hearing therapy.

370, 371 Speech Correction (3 or 5, 5)

CARRELL, HANLEY

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. Only 3 credits can be obtained in 370 through off-campus extension; 5 credits in residence. (Formerly 470, 471.)

373 Diagnostic Methods in Speech Correction (5)

WINGATE

(Formerly 473.) Prerequisite, 371.

374 Clinical Practice in Speech Correction (1-5, max. 15)

KUNZE

Total undergraduate credits in 374 and 484 together cannot exceed 20 credits. (Formerly 474.) Prerequisites, 371 and 373, which may be taken concurrently.

475 Stuttering (3)

WINGATE

Nature, etiology, and treatment of stuttering. Prerequisite, 370 or permission.

476 Language Development of the Child (3)

WINGATE

Principles of growth and development with emphasis on normal and abnormal speech and language development.

477 Stuttering Therapy (2)

CARRELL

(Formerly 575.) Prerequisite, 475 or permission.

478 Interview Techniques for Speech and Hearing Rehabilitation (3)

WINGATE

(Not offered 1964-65.)

479J Physical Medicine and Rehabilitation Information for Speech Pathology (3)

MORSE, CARRELL

Orientation information for speech pathology students on rehabilitation principles and techniques. Offered jointly with the Department of Physical Medicine and Rehabilitation.

HEARING**480 Introduction to Audiology (3 or 5)**

HANLEY

Description of normal audition; elementary structure and function of the hearing mechanisms; types of deficient hearing and their effects on speech. Only 3 credits can be obtained through off-campus extension; 5 credits in residence.

481, 482 Principles and Methods of Aural Rehabilitation (5,5)

PALMER

481: comprehensive 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 Clinical Practice in Aural Rehabilitation (1-5, max. 15)

PALMER

Total undergraduate credits in 374 and 484 together cannot exceed 20 credits. Prerequisites, 480 and 481.

485 Medical Background for Audiology (2)

Diseases and injuries of the ear resulting in reduced audition.

487 Audiometry (3)

HANLEY

Theory and practice of audiometry and other methods of measuring hearing. Prerequisite, 480 or permission.

488 Hearing Aid Evaluation and Selection (2)

HANLEY

Types and characteristics of group and individual hearing aids; special tests and fitting procedures. Prerequisite, 487 or permission.

Courses for Graduates Only**N500 Departmental Seminar (0)**

Reports of research by graduate students and staff members.

501 Introduction to Graduate Study in Speech (3)

CROWELL

510 Experimental Phonetics (3)

TIFFANY

Application of experimental methods to research in voice and phonetics; critical review of research literature. Prerequisite, 415 or permission.

522 Studies in Medieval and Renaissance Rhetoric (5)

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. (Not offered 1964-65.)

523 Studies in Modern Rhetoric (5)

PENCE

Critical analysis of writings on rhetoric by Cox, Wilson, Bacon, Campbell, Blair, Whately, and others. No open to students who received credit for 522 prior to Spring Quarter, 1957.

524 Studies in Contemporary Rhetoric (3)

NILSEN

Critical analysis of recent developments in and contributions to rhetorical thought. Prerequisite, graduate standing or permission. (Not offered 1964-65.)

525 Rhetorical Criticism (3 or 5)

BASKERVILLE

The history and method of rhetorical criticism. Application of critical standards to notable British and American speeches. Prerequisite, 425, 426, or 428. (Not offered 1964-65.)

530 Experimental Problems in Public Address (3-5)

PENCE

Analysis of theoretical considerations in audience and listening behavior; application of measurement techniques. Prerequisites, 430 or equivalent, and permission. (Not offered 1964-65.)

540 Studies in Oral Interpretation (3)
Critical analysis of writings by Sheridan, Walker, Rush, Delsarte, Bell, Curry, Emerson, and others. Prerequisite, 440. (Not offered 1964-65.)

550 Studies in Speech Education (3)
NELSON
Philosophical, curricular, and methodological problems of speech instruction.

570, 571, 572, 573 Organic Disorders of Speech (3,3,3,3)
Etiology, diagnosis, and therapy. 570: morphogenic disorders, especially cleft palate and dental malocclusions. 571: dysarthria, especially cerebral palsy. (Not offered 1964-65.) 572: aphasia. 573: pathologic disorders of voice. (Not offered 1964-65.) Prerequisite for each course, 371 or permission.

574 Advanced Clinical Practice in Speech Correction (1-5, max. 10)
Prerequisite, 474.

578 Psychogenic Factors in Speech and Hearing Disorders (2)
WINGATE
Psychogenic factors as etiological agents in speech and hearing disorders. Prerequisite, Psychology 305 or permission. (Not offered 1964-65.)

580 Advanced Audiology (5)
HANLEY
Methods, techniques, and instruments used in the measurement of auditory function. Review of research literature. Prerequisite, 480 or permission.

584 Advanced Clinical Practice in Aural Rehabilitation (1-5, max. 10)
Prerequisite, 484.

587 Advanced Audiometry (2)
HANLEY
Special diagnostic and predictive tests of auditory functions; clinical practice. Prerequisite, 487. (Not offered 1964-65.)

588 Advanced Audiometry (2)
HANLEY
Clinical diagnostic procedures involved in threshold finding, presurgical and surgical audiometry and electroencephalographic audiometry. Prerequisite, 487.

589 Advanced Audiometry (2)
HANLEY
Clinical procedures utilized in the measurement of auditory recruitment and aural overload. Special attention will be placed on the Rainville masking technique. Prerequisite, 487. (Not offered 1964-65.)

590 Seminar in Theory of Speech (2, max. 6)
RAHSKOPF
Prerequisite, permission.

591 Seminar in Voice and Phonetics (2, max. 6)
TIFFANY
Prerequisite, permission. (Not offered 1964-65.)

592 Seminar in Rhetoric and Public Address (2, max. 6)
Prerequisite, permission.

593 Seminar in Argument and Discussion (2, max. 6)
Prerequisite, permission. (Not offered 1964-65.)

594 Seminar in Oral Interpretation (2, max. 6)
Prerequisite, permission.

595 Seminar in the Teaching of Speech (2, max. 6)
NELSON
Prerequisite, permission. (Not offered 1964-65.)

597 Seminar in Speech Correction (2, max. 6)
Prerequisite, permission.

598 Seminar in Hearing (2, max. 6)
Prerequisite, permission.

600 Research (*)

700 Thesis (*)

ZOOLOGY

Courses for Undergraduates

"Permission," in course descriptions below, refers to permission of instructor.

BIOLOGY

101J-102J General Biology (5-5)
ILLG, KOHN, KRUCKEBERG, MEEUSE, ORIANS
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.

401 Cytology (3)
HSU
Structure and function of the cell. Prerequisites, Botany or Zoology, 112, Genetics 451, or permission.

401L Cytology Laboratory (2)
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.

472 Principles of Ecology (3)
EDMONDSON, ORIANS
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)
EDMONDSON, PAINE
Prerequisites, 472 concurrently and permission.

473 Limnology (3)
EDMONDSON
Biological, physical, and chemical features of lakes and other inland waters. Prerequisites, Zoology or Botany 112, one year of college chemistry, and upper-division standing.

473L Limnology Laboratory (2)
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 *Genetics*.)

ZOOLOGY

111, 112 General Zoology (5,5)
GRIFFITHS, OSTERUD, PAINE, WHITELEY
Introduction to general principles of zoology and to major groups of animals. 111: invertebrate phyla through mollusks; protoplasm and cell metabolism: mitosis; principles of embryology. 112: annelids through chordates; gametogenesis, genetics; speciation; organ systems; evolution; ecology. Prerequisite for 111: high school chemistry or 1 quarter of college chemistry; for 112: 111.

114 Evolution (2)
HATCH
General survey of evolution of animals, including man. For nonmajors.

118 Survey of Physiology (5)
MARTIN
Elementary human physiology. For nonmajors.

118L Elementary Physiology Laboratory (1)
MARTIN
Specifically for physical education majors. May be taken by others only with permission. Prerequisite, 118 concurrently.

**201 Cell Biology (4)**

HAGGIS

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.

204 Forestry Zoology (5)

HATCH, RICHARDSON

A nonlaboratory general zoology course with emphasis on arthropods and chordates as the groups of greatest practical importance in the forest fauna. Prerequisites, Botany 114, 115, 216.

208 Elementary Human Physiology (5)

GRIFFITHS

Each organ system is described and its function illustrated in the laboratory. Prerequisites, high school biology and freshman chemistry.

330 Natural History of Marine Invertebrates (5)

RAY

A field and laboratory course emphasizing the habits, habitats, identification, and interrelationships of marine animals. Prerequisite, permission.

362 Natural History of Vertebrates (5)

SNYDER

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. (Not offered 1964-65.) Prerequisites, 112 and permission.

400 General Physiology (5)

FLOREY

Cell environment, metabolism and growth, irritability, general phenomena of organ function. Prerequisites, Chemistry 232, Physics 103 and 109 and 10 credits in biological sciences.

402 History of Zoology (3)

HATCH

Prerequisite, 20 credits in zoology or permission.

403 Comparative Vertebrate Histology (5)

CLONEY, GORBMAN

Microscopic anatomy of the tissues and organs of vertebrates. Prerequisite, 112.

409 Ethology (3)

ORIANI

Perception, nervous integration, movement, motivation, instinct, learning, and social behavior in animals, with emphasis upon their evolution and selective significance. Prerequisite, permission.

409L Ethology Laboratory (2)

ORIANI

Experiments with orientation, motivation, learning, and social behavior in animals, including special student research problems. Prerequisite, permission.

423 Protozoology (5)

OSTERUD

Introduction to the biology of the protozoa, with emphasis on free-living forms. Prerequisite, 20 credits in biological sciences or permission.

432 Marine Invertebrate Zoology (8)

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)

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)

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)

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)

HATCH

Structure, classification, and economic relationships of insects. Prerequisite, 112 or permission.

453-454 Comparative Anatomy of Chordates (5-5)

SNYDER

Phylogeny of the chordates and evolution of their organ systems. Structural modifications are correlated with function. Prerequisite, 112.

456 Vertebrate Embryology (5)

FERNALD, HAGGIS

A descriptive and comparative study of development of chordates. Prerequisite, 112.

457 Experimental Morphogenesis (3)

HAGGIS

An experimental analysis of mechanics of development on the morphological level. Prerequisite, 456.

457L Experimental Morphogenesis Laboratory (2)

HAGGIS

Prerequisite, permission.

458 Vertebrate Physiology (6)

MARTIN

Emphasis on mammalian organ systems. Prerequisites, organic chemistry and 20 credits in biological sciences.

462 Vertebrate Systematics and Life Histories (5)

ORIANI, SNYDER

Systematics, evolution, life history, distribution, behavior, and interrelationships of vertebrate animals. (Alternates with 362.) Prerequisite, permission.

464 Natural History of Birds (5)

RICHARDSON

A lecture, laboratory, and field course. (Offered alternate years; offered 1964-65.) Prerequisites, 111, 112, and permission.

465 Natural History of Mammals (5)

RICHARDSON

A lecture, laboratory, and field course. (Alternates with 464; not offered 1964-65.) Prerequisites, 111, 112, and permission.

490 Undergraduate Seminar (2, max. 6)

KOHN, MARTIN

Supervised reading and group discussion on selected concepts of zoology. Prerequisite, 20 credits in zoology and permission.

498 Special Problems in Zoology (1-5, max. 15)

Prerequisites, 30 credits in zoology and permission.

Courses for Graduates Only

"Permission," in course descriptions below, refers to permission of instructor.

BIOLOGY**501 Advanced Cytology (5)**

HSU

Detailed study of the structure and function of the cell. Prerequisite, permission.

508 Cellular Physiology (3)

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)

WHITELEY

Prerequisites, concurrent registration in Biology 508 or 509, and permission.

509 Cellular Physiology (3)

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.) (Not offered 1964-65.) Prerequisite, Zoology 400 or permission.

573 Topics in Limnology (3)

EDMONDSON

Readings in the literature of limnology, with detailed discussion of modern problems. Prerequisite, permission. May be repeated for credit.

ZOOLOGY

503 Developmental Cytology (3)

CLONEY

Fine structure of cells and tissues with emphasis on changes occurring during ontogeny. Prerequisite, permission. (Not offered 1964-65.)

506 Topics in Experimental Embryology (2, max. 6)

FERNALD, HAGGIS, WHITELEY

Seminars and discussions of aspects of growth of special current interest. Prerequisite, permission.

516 Chemical Embryology (3)

WHITELEY

Physiology of larval development, oöplasmic segregation; differentiation of macromolecular substances; cellular and tissue interactions; nuclear and hormonal control mechanisms in development. Prerequisite, permission.

516L Chemical Embryology Laboratory (2)

WHITELEY

Must be accompanied by 516.

517 Chemical Embryology (3)

WHITELEY

Sex determination; biochemistry of gametogenesis; sperm metabolism; fertilization; mechanisms and syntheses in cleavage. (Zoology 516 and 517 may be elected separately or in either sequence.) (Not offered 1964-65.) Prerequisite, permission.

517L Chemical Embryology Laboratory (2)

WHITELEY

Must be accompanied by 517. (Not offered 1964-65.)

520, 521, 522 Seminar (1,1,1)

533 Advanced Invertebrate Zoology (6)

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 Advanced Invertebrate Embryology (6)

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)

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)

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)

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)

SNYDER

Current problems and trends in vertebrate anatomy emphasizing functional relationships. Prerequisites, -454, 456, and permission.

572 Topics in Ecology (2 or 3)

EDMONDSON, PAINE, KOHN, ORIAN

Graduate seminar on modern problems in ecology. Prerequisites, Biology 472 or equivalent and permission.

574 Ecology of Marine Communities (3)

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)

ORIAN, PAINE

Fundamental properties of populations; population regulation; community productivity and structure. Prerequisites, Biology 472 or equivalent, and permission.

581 Systematic Zoology (5)

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)

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)

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 (*)

700 Thesis (*)

COLLEGE OF BUSINESS ADMINISTRATION

ACCOUNTING

Courses for Undergraduates

INTRODUCTORY ACCOUNTING

210 Fundamentals of Accounting (3)

Basic principles, theories, and procedures for reporting business transactions; development and interpretation of accounting reports. Prerequisite, sophomore standing.

220 Fundamentals of Accounting (3)

Continuation of 210. Prerequisite, 210.

MANAGERIAL ACCOUNTING

230 Basic Accounting Analysis (3)

Analysis of accounting information for decision making. Prerequisite, 220.

311 Cost Accounting (3)

Theory of cost accounting; accumulation and allocation of costs; managerial control through cost data. Prerequisite, 230.

460 Advanced Cost Accounting (3)

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)

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

321 Equity Accounting (3)

Theory and problems in accounting for ownership equity in corporations and partnerships. Quasi-reorganizations, business combinations, income tax allocation, investments. Prerequisite, 230.

331 Income Determination Accounting (5)

Concepts and principles underlying accounting. Theory and problems of financial accounting, including financial statement analysis. Prerequisite, 230.

485 Consolidated Financial Statements (3)

Accounting for parent-subsidiary and branch relationships, domestic and foreign; mergers. Prerequisites, 321, 331.

486 Fiduciary Accounting (2)

Accounting and reporting for estates, trusts, bankruptcies, inheritances, etc. Prerequisite, 321.

490 Advanced Problems (3)

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)

Theory of accounting related to income measurement, assets, and equities. Prerequisites, 321, 331, and senior standing.

INCOME TAX

421 Federal Income Tax (5)

Individual, partnership, and corporation income tax, including installment sales and inventory tax accounting. Prerequisites, 321, 331 or permission.

450 Special Tax Problems (3)

Special problems in income tax, including estates and trusts, corporate reorganizations, gift and estate taxes, basic tax research. Prerequisite, 421.

AUDITING

371 Auditing or Industrial Internship (2)

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)

Generally accepted auditing standards and principles; auditing objectives and their attainment through procedures. Prerequisites, 311, 321, 331.

470 Case Studies in Auditing (5)

Application of standards and principles to case studies in auditing, including practice case. Prerequisite, 411.

SYSTEMS AND DATA PROCESSING

341 Machine Accounting (2)

Study of modern punch-card machines and their application to accounting procedures. Prerequisite, 230.

344 Introduction to Electronic Data Processing (3)

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)

System design and installation, with emphasis on internal control. Prerequisite, 331.

444J Applications of Digital Computers (3)

Methods of programming electronic computers for business operations. Projects in accounting, operations research, and statistics. Offered jointly with Business Statistics. Prerequisite, permission.

INSTITUTIONAL ACCOUNTING

480 Fund Accounting (3)

Fund and budgetary accounting as applied to governments and to institutions such as hospitals and colleges. Prerequisites, 321, 331.

ACCOUNTING RESEARCH

499 Undergraduate Research (3, max. 9)

Prerequisite, permission.

Courses for Graduates Only

500 Managerial Accounting (5)

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)

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)

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)

A critical examination of accounting theories, concepts, and standards pertaining to current assets and liabilities and relevant income determination problems. Prerequisites, 321, 331, and permission.

521 Seminar in Financial Accounting (3)

A critical examination of accounting theories, concepts, and standards pertaining to non-current balance sheet items and relevant income determination problems. Prerequisites, 321, 331, and permission.

522 Seminar in Cost Accounting (3)

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)

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)

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)

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, Policy and Administration 550, and permission.

604 Research (*, max. 10)

Prerequisite, permission.

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

BUSINESS COMMUNICATIONS

Courses for Undergraduates

301 Written Business Communications (3)

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)

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 AND ITS ENVIRONMENT

Courses for Graduates Only

500 Business Economics and Forecasting (5)

Factors underlying the determination of cost and prices for the industry and the firm; forecasting at the level of the industry and the firm.

510 Business and Public Policy (3)

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.

552 Legal Aspects of Business Regulation (3)

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)

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)

See Accounting for description.

590 Business History (3)

Evolution of business institutions with special emphasis upon changing administrative policy, business organization, and methods in America from the colonial period to the present. Prerequisite, permission.

593 Seminar in Business Fluctuations (3)

Business problems arising from fluctuations in prices and demand; analysis of strategic causes

and effects of business policy on fluctuations; methods of adjustment by the firm; appraisal of corrective measures internal and external to business. Prerequisite, permission.

594 Seminar in Business Forecasting (3)

Problems of business forecasting and their setting; appraisal of forecasting methods in current use by corporations, advisory services, and governmental agencies; review of actual cases; techniques of preparing forecasts for the individual firm. Prerequisite, permission.

597 Behavioral Science of Business (3)

Analysis of the business system in the light of the concepts and methods of the behavioral disciplines. Prerequisite, permission.

598 Analysis of Business Behavior (3)

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)

Prerequisite, permission.

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

BUSINESS EDUCATION

For Business Education courses, refer to the *College of Business Administration and College of Education* sections.

BUSINESS LAW

Courses for Undergraduates

201 Legal Factors in the Business Environment (3)

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; the interaction of law and business; the lawyer and the business firm. Prerequisite, English 102.

202 Business Agreements (3)

The nature, development, and operation of those principles of contract law primarily affecting business agreements. (Formerly 301.) Prerequisite, 201.

307 Business Law (3)

A survey for non-Business Administration students who are unable to take more than 3

credits in business law. Not open for credit to Business Administration students. Prerequisite, permission for non-engineers.

403 Commercial Law (5)

Principles of the law of property, sales, negotiable instruments, and security transactions. Prerequisites, 201, 202.

420 Law in Accounting Practice (3)

Advanced business law problems for C.P.A. candidates. Prerequisite, 403.

BUSINESS STATISTICS AND OPERATIONS RESEARCH

Courses for Undergraduates

201 Statistical Analysis (3)

A survey of the basic elements of descriptive statistics; use of the library as a source of business data; measurements useful in analysis of data; methods of data presentation. Introduction to probability and sampling. Prerequisite, College of Business Administration mathematics requirement.

301 Probability and Inference in Business Decision Making (3)

A survey of statistical techniques useful in guiding business decisions; modern and classical statistical inference; correlation and regression. Prerequisite, 201.

330 Time Series Analysis and Index Number Theory (3)

Concepts and techniques useful in the analysis of economic time series, and construction of index numbers; applications in business forecasting. Offered alternate years. Prerequisite, 301.

340 Survey Research Methods for Business (3)

Concepts and techniques useful in survey research in business. Practical experience in their application through a class project. Offered alternate years. Prerequisite, 301.

350 Quantitative Analysis for Business (5)

Introduction to mathematical tools utilized for analysis of business problems; appreciation of the uses of these tools in business situations. Prerequisite, College of Business Administration mathematics requirement or permission.

401 Advanced Business Statistics (4)

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; regression and correlation. Prerequisite, 301.

**444J Applications of Digital Computers (3)**

Methods of programming electronic computers for business operations. Projects in accounting, operations research, and statistics. Offered jointly with Accounting. Prerequisite, permission.

450 Operations Research Techniques I (3)

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 College of Business Administration mathematics requirement.

451 Operations Research Techniques II (3)

Additional techniques of operations research useful in business analysis: queuing theory, simulation and game theory. Prerequisite, 450.

460 Multivariate Analysis for Business (3)

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.

Courses for Graduates Only**500 Business Statistics (3)**

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, permission.

510 Quantitative Methods (3)

A survey of techniques in analytical statistics and operations research useful in guiding business decisions. Prerequisite, permission.

516 Statistical Decision Processes for Business (3)

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)

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)

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. Prerequisites, 344, 444J or equivalent, and permission.

550 Seminar in Operations Research Techniques (3, max. 6)

An intensive study into operations research tools useful in business analysis, such as linear and other programming techniques, queuing theory, and simulation. Prerequisite, permission.

571-572 Research Reports (3-3)

See Accounting for description.

604 Research (*, max. 10)

Prerequisite, permission.

700 Thesis (*)**702 Thesis (6)**

Limited to students completing a nonthesis degree program.

FINANCE**Courses for Undergraduates****320 Money, Financial Institutions, and Income (4)**

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, Accounting 230.

327 International Finance (3)

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)

Sources, uses, cost, and control of funds in business enterprises; financial importance of the enterprise (especially the corporation) in the economy; 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)

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)

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)

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)

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)

Analysis of selected loan and investment cases, from the viewpoint of the loan officer, investment officer, or other credit administrator. Prerequisite, 423 or permission.

450 Problems in Corporation Finance (4)

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. Prerequisite, 350.

453 Capital Allocation (3)

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 201.

461 Investment Analysis (3)

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 331.

499 Undergraduate Research (3, max. 6)

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)**

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 are covered. Prerequisite, permission.

520 Seminar in Banking Problems (3)

Selected problems of contemporary and permanent significance in banking and related financial institutions. Prerequisite, permission.

521 Seminar in Money Markets (3)

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, permission.

527 Seminar in International Finance and Investments (3)

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)

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)

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, permission.

560 Seminar in Investments (3)

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)

See Accounting for description.

604 Research (*, max. 10)

Prerequisite, permission.

700 Thesis (*)**702 Degree Final (6)**

Limited to students completing a nonthesis degree program.

GENERAL BUSINESS**Courses for Undergraduates****101 Business: An Introductory Analysis (5)**

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)

Examination of changing policies, organization, and operations of the business firm in the United States.

439 Analysis of Business Conditions (4)

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)

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)

American business and its role in society; business leadership in different social contexts; the changing framework of responsibilities facing both the company and its leaders.

445 Comparative Enterprise Systems (5)

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)**

Business research methods and techniques. What business research is; how it is done, stressing the scientific method as a research procedure; and who does it. Sources of relevant information. Prerequisite, permission.

604 Research (*, max. 10)

Prerequisite, permission.

700 Thesis (*)**702 Degree Final (6)**

Limited to students completing a nonthesis degree program.

HUMAN RELATIONS IN BUSINESS AND INDUSTRY**Courses for Undergraduates****365 Human Behavior in Organizations (3)**

Content and instructional approach similar to 460 with emphasis on human aspects of labor relations and on administrative behavior. Not open to Business Administration students.

460 Human Relations in Business and Industry (4)

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.

Courses for Graduates Only**500 Human Relations—Organizational Behavior (3)**

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.

INTERNATIONAL BUSINESS**Courses for Undergraduates****310 Principles of International Business (5)**

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.

320 International Business Environment (5)

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)

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)

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)

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.

Courses for Graduates Only**515 Concepts and Policies (3)**

Theoretical and managerial concepts, institutions, and environment of international business; organization and administration of for-



eign operations; conflicts between domestic and international policies and practices. Prerequisite, permission.

520 Business Enterprise in Developing Areas (3)

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)

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)

See Accounting for description.

604 Research (*, max. 10)

Prerequisite, permission.

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

LAW, PREPROFESSIONAL

For Law, Preprofessional Program, see *College of Business Administration* section.

MARKETING

Courses for Undergraduates

301 Marketing, Transportation, and International Business: An Integrative Analysis (5)

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)

Analytical integration of tools, factors, and concepts used by management in planning, establishing policies, and solving problems. (Formerly 400.) Prerequisite, 301.

371 Wholesaling (5)

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)

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)

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)

Sales and distribution planning; sales organization and training; management of the sales force; methods of sales, cost, and performance analysis. Prerequisite, 301.

421 Marketing Research (5)

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.

441 Retail Sales Promotion (3)

The plan and budget; evaluation and use of external and internal media; promotion methods; research; coordination of activities. Prerequisite, 381.

481 Retail Field Work (2, max. 8)

Open to scholarship students only. Prerequisite, permission.

491 Marketing Problems (5)

Analysis of managerial marketing problems of the manufacturer, wholesaler, and retailer. Prerequisite, 350.

Courses for Graduates Only

500 Marketing Fundamentals (2)

Analysis of domestic and foreign markets and institutions, physical distribution, and the role of marketing in the economy.

501 Marketing Management (3)

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)

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)

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)

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)

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)

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)

See Accounting for description.

604 Research (*, max. 10)

Prerequisite, permission.

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

PERSONNEL AND INDUSTRIAL RELATIONS

Courses for Undergraduates

301 Industrial Relations (3)

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)

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)

Job analysis, job evaluation, and wage surveys, wage and salary administration; performance standards, performance rating and review; employee services and fringe benefits. Prerequisite, 301.

346 Personnel Methods and Theory II (3)

Employment interviewing and other types of interviews; recruiting selection, placement; testing, personnel research and statistics; training. Prerequisite, 301.

450 Industrial Relations Administration (5)

A case course directed toward development of administrative skill in dealing with unions. Subjects covered are: nature of unions, institutional forces conditioning collective bargaining practices, and administrative practices in dealing with unions. Includes collective bargaining game.

Courses for Graduates Only

520 Seminar in Personnel and Industrial Relations (3)

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.

521 Current Problems in Personnel and Industrial Relations (3)

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.

571-572 Research Reports (3-3)

See Accounting for description.

604 Research (*, max. 10)

Prerequisite, permission.

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

POLICY AND ADMINISTRATION

Courses for Undergraduates

440 Organization Theory (3)

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)

Deals with current research, measuring organizational effectiveness, planning, leadership patterns, current problems, developments in related disciplines. Prerequisite, 440.

463 Administrative Behavior (4)

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)

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)

Critical analysis of integrated business policy formulation in a complex and dynamic industrial environment by means of simulation (business gaming). Prerequisite, senior standing.

Courses for Graduates Only

550 Organization and Management (3)

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)

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.

571-572 Research Reports (3-3)

See Accounting for description.

575 Human Aspects of Administration (3)

Examines administration process with a primary focus on organizational behavior. Develops the basic contributions of social sci-

ence 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)

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.

580 Planning and Decision Theory (3)

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.

587 Seminar in Advanced Organization Theory (3)

An advanced graduate course appraising various approaches and conceptual models in organization theory with emphasis on research studies and methodology. Prerequisite, 550 or permission.

593, 594 Policy Determination and Administration (3,3)

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)

Prerequisite, permission.

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

PRODUCTION

Courses for Undergraduates

301 Principles of Production (3)

Fundamentals of the production function in business and industry; background of scientific management; organization of production activities; research and product development;



plant location, layout, and equipment; planning and control of production; material and quality control; methods analysis and time standards; budget controls of production programs. Prerequisites, Accounting 230 and Business Statistics 201, or permission.

341 Systems Design in Production (3)

Theory and analysis of production 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, PERT, and work standards. Prerequisite, 301 or permission.

342 Analysis of Production Operations (3)

Principles, procedures, and analysis of purchasing and materials management, facilities planning, equipment replacement, and control of quality in industrial operations. Prerequisites, 301 and Business Statistics 301, or permission.

343 Production and Inventory Control (3)

Theory and analysis of production 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 simulation in system analysis. Prerequisite, 301 or permission.

455 Analytical Techniques in Production Management (3)

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)

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, 341, 342, 343, or permission.

499 Undergraduate Research (3, max. 9)

Individual study or special project in production field. Open only to qualified students majoring in production. Prerequisite, permission.

Courses for Graduates Only

500 Production Management (3)

A study of the production function in business and industry with emphasis on the administration of the production activities of a manufacturing enterprise. Basic concepts, philosophy, and techniques of analysis are covered together with their application and integration in solving production problems. Prerequisites, graduate standing with senior year grade-point average of 3.00 and permission.

520 Seminar in Production (3)

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, and automation. Prerequisite, permission.

521 Seminar in Manufacturing (3)

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, permission.

571-572 Research Reports (3-3)

See Accounting for description.

604 Research (*, max. 10)

Prerequisite, permission.

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

REAL ESTATE

Courses for Undergraduates

301 Urban Land Economics and Real Estate Institutions (5)

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)

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)

Open to qualified undergraduate students. Prerequisites, 301 and permission for 495; 495 for 496.

Courses for Graduates Only

520 Seminar in Real Estate and Urban Land Economics (3)

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)

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)

See Accounting for description.

604 Research (*, max. 10)

Prerequisite, permission.

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

RISK AND INSURANCE

Courses for Undergraduates

310 Fundamentals of Risk and Insurance (5)

An overview for nonmajors. The influence of risk on economic and social activities; 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.

330 Risk Analysis (5)

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. Prerequisite, 310.

438 Advanced Risk Problems II (3)

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 only.) Prerequisite, 330.

480 Risk Management (3)

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 only.) Prerequisite, permission.

499 Undergraduate Research (3, max. 6)

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)

Considers theoretical aspects of the insurance technique. Economic, actuarial, legal, environmental bases for insurance. Reinsurance. (Offered alternate years only.) Prerequisite, permission.

571-572 Research Reports (3-3)

See Accounting for description.

*580 Seminar in Risk Control (3)

An emerging enterprise function. Functional role and responsibilities. Techniques of risk control. Competitive, regulatory, environmental influences on risk control. Criteria for selecting risk control. (Offered alternate years only.) Prerequisite, permission.

604 Research (*, max. 10)

Prerequisite, permission.

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

TRANSPORTATION

Courses for Undergraduates

310 Principles of Transportation (5)

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)

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)

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)

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. Prerequisite, 310.

481 Cases in Transportation Carrier Management (3)

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)

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.

Courses for Graduates Only

520, 521 Trends and Contemporary Problems in Transportation Management, National Policy, and Regulation (3,3)

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)

See Accounting for description.

604 Research (*, max. 10)

Prerequisite, permission.

700 Thesis (*)

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

CONJOINT B.A. HONORS SEMINAR

Courses for Undergraduates

475 Conjoint Honors Colloquium (5, max. 15)

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.

COLLEGE OF EDUCATION

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)

SOUSA

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.

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.

302 Introduction to Child Study and Development (3)

EVANS, HAUCK

Stages of child development; child welfare agencies; theories of some of the great leaders in child study; interplay between forces in the growing organism and the impact of various aspects of development upon each other; the influence of the cultural environment and the attitudes of others on a child's behavior and adjustment. Prerequisites, 288 and 2.50 cumulative grade point.

305 Introduction to Problems of Adolescence (3)

BRAMMER, HAUCK, SALYER

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.

**308 Introduction to Evaluation in Education (3)**

EVANS, LANGEN, STOTT

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, HAUCK, SALYER

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)

HARRIS

A basic course involving the methods, techniques, and materials used in teaching the young child. 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.

320 Teachers' Course in Art (3)

JOHNSON

Prerequisites, 309, 370S.

321 Teachers' Course in Biology (2)

RAY

Prerequisites, 309, 370S, 25 credits in biology.

322 Teachers' Course in Chemistry (3)

RITTER

Prerequisites, 309, 370S, at least 20 credits in college chemistry, with a grade-point average of 3.00.

323 Teachers' Course in Civics (2)

CASINELLI

Prerequisites, 309, 370S.

324 Teachers' Course in Business Education: Bookkeeping and General Business (2)

BRIGGS

Prerequisites, 309, 370S, 9 credits in accounting.

325 Teachers' Course in Business Education: Typewriting, Shorthand, and Transcription (2)

BRIGGS

Prerequisites, 309, 370S, Secretarial Studies X112, X122.

326 Teachers' Course in English (3)

SMITH

Application of educational principles and methods to the teaching of English on the junior and senior high school levels. Prerequisites, 309, 370S.

327 Teachers' Course in 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.

329 Teachers' Course in French (3)

SIMPSON

Prerequisites, 309, 370S, and demonstration of language proficiency.

330 Teachers' Course in German (3)

RABURA

Prerequisites, 309, 370S, German 303 or permission.

331 Teachers' Course in 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 Teachers' Course in Home Economics (5)

MCADAMS

(Two credits count as education and 3 as home economics.) Prerequisites, 309, 25 credits in home economics.

333 Methods of Teaching for Institution Administration Students (3)

MCADAMS

Prerequisites, junior standing and 25 credits in home economics, including Home Economics 307.

334 Teachers' Course in Geography (2)

Prerequisites, 309, 370S.

335 Teachers' Course in Latin (2)

GRUMMEL, PASCAL

Prerequisites, 309, 370S, 20 credits in upper-division Latin courses, or permission.

336 Teachers' Course in Secondary Mathematics (3)

DUBISCH

Emphasis is upon a critical understanding of subject matter; supplementary topics include teaching aids and classroom problems. Two credits count as education and 1 as mathematics. Prerequisites, 309, 370S, Mathematics 224 or equivalent.

337 Teachers' Course in 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)

MILLS, REEVES, TRUCANO

Health procedures and techniques for meeting health needs and problems of elementary

school children, including screening, observation, emergency care, etc.

339 Teachers' Course in Physical Education for Men (2)

PEEK

Prerequisites, 309, 370S, Physical Education 363.

340 Teachers' Course in 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 Teachers' Course in Russian (2)

KONICK

Prerequisites, 309, 370S.

342 Teachers' Course in 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, including Speech 352; for nonmajors, permission.

343 Teachers' Course in Spanish (3)

SIMPSON

Prerequisites, 309, 370S, demonstration of language proficiency.

343E Teachers' Course in Spanish in Elementary Schools (3)

FREY

(Offered Summer Quarter only.) Prerequisite, enrollment in Summer Language Institute.

344 Teachers' Course in Scandinavian (2)

ARESTAD

Special methods in the teaching of Norwegian and Swedish to acquaint prospective teachers with materials, methods, and problems. Prerequisites, 309, 370S, permission.

346J Teachers' Course in 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 344 and 385.

360 Introduction to Curriculum Development (3)

DRAPER

A review of curriculum development in the United States and a comparison of recent trends in the United States with those in Europe and Russia. Each student will develop a resource unit. Techniques of fusion, correlation, and core curriculum will be emphasized. Prerequisite, 309.

370S Introduction to Secondary School Teaching (2)

BOROUGH, BRIGGS, OLSTAD

Fundamental techniques and methods of teaching, with emphasis upon practical considerations. Prerequisite, 309.

371K Directed Teaching, Kindergarten (5-15)

BOROUGH, FOSTER

All directed teaching is done in the public schools, and all day from 8:00 a.m. to 4:00 p.m. must be left free for an assignment. Assignments are made by the Director of Practice 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, 120 minimum credits, permission; 15 credits required for certification.

371E Directed Teaching, Elementary (Grades 1 through 6) (5-15)

BOROUGH, FOSTER

All directed teaching is done in the public schools, and all day from 8:00 a.m. to 4:00 p.m. must be left free for an assignment. Assignments are made by the Director of Practice Teaching the first day of the 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, 120 minimum credits, permission; 15 credits required for certification.

371X Directed Teaching, Junior High School (5-15)

BOROUGH, FOSTER

All directed teaching is done in the public schools, and all day from 8:00 a.m. to 4:00 p.m. must be left free for an assignment. Assignments are made by the Director of Practice 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; permission; 15 credits required for certification.

371S Directed Teaching, Senior High School (5-15)

BOROUGH, FOSTER

All directed teaching is done in the public schools, and all day from 8:00 a.m. to 4:00 p.m. must be left free for an assignment. Assignments are made by the Director of Practice 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; permission; 15 credits required for certification.

374E Reading in the Elementary School (3)

FEA, 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, 302.

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, 370S.

375H Language Arts in the Elementary School (3)

KITTELL

A basic course in planning and teaching elementary school language arts: auditing and speaking, reading, handwriting, spelling, creative, and practical writing. Prerequisite, 302.

375J Teachers Course in 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 200 and 301.

375M Social Studies in the Elementary School (3)

JAROLIMEK, FOSTER

A basic course in the planning and teaching of social studies in the elementary school. Prerequisites, 302, and Geography 100.

375S Science in the Elementary School (3)

OLSTAD

Study of the development of problem-solving skills and scientific attitudes in the elementary grades. Prerequisites, 302, and 5 credits in an approved course in science.

376 Art in the Elementary School (3)

JOHNSON

A course planned to prepare students for teaching art in the elementary classroom. Includes experiences in painting, design, murals, and various simple crafts supplemented with lectures, discussions, and reading assignments. Prerequisites, 302, and a minimum of 3 credits in an approved art course.

377 Music in the Elementary School (3)

ECHENBERGER, 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

A re-examination of elementary mathematics in the light of recent theoretical and pedagogical developments, with emphasis upon a sound knowledge of arithmetic processes and the problems encountered in teaching these to elementary pupils. The subject matter includes that taught in grades one through six. Prerequisites, 302, and Math. 170.

380 Tools and Materials for Industrial Education Teachers (2)

BAILY

Sources, specifications, and costs of shop materials and equipment. Care, repair, and sharpening of hand and machine tools.

381S Supervision of Trade and Industrial Education (3)

BAILY

Fundamental principles, techniques, and methods of supervision; planning and organizing a supervisory program; equipment and instructional materials, relationships of supervisors to administrators and teachers; evaluation of programs. (Offered Summer Quarter only.)

381W Trade and Industrial Education Workshop (3)

BAILY

A survey is made of the various types of instructional aids and methods of evaluating them. The course will deal with the construction and use of films, slides, models, mock-ups, charts, blackboard drawings, and other devices that will save instructional time and accelerate it. Knowledge and skill are to be gained in the methods of using instructional aids and in the operation of audiovisual equipment. (Offered Summer Quarter only.)

383-384 Industrial Education: Woodworking Technology (3,2)

BAILY

Design, construction, and finishing of projects in wood, involving machine operations. Prerequisites, 280 for 383-.

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.

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 constructional activity. Development of basic skills in the use of common hand tools. Related information about industrial technology and its place in our society.

391 Interpretation of Educational Data (2)
LANGEN

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)
FEA, SALYER

Consideration of the major topics in the psychology of learning as applied to the teacher-learner environment. Prerequisite, 309 or equivalent.

404 Exceptional Children (3)
HAYDEN

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)
HUNT

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)
HAUCK

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.

407W Workshop in Teaching the Gifted Child (3)
FREEHILL, HAYDEN

Explanation, demonstration, and development of procedures and methods in working with 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 students, 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.

409FJ The Teaching of Speech to the Deaf (6)
HAYDEN, HUNT

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 instructor.

409GJ The Teaching of Language to the Deaf (6)
HAYDEN, HUNT

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 instructor.

409H Elementary School Methods for the Deaf (6)
HAYDEN

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)
HAYDEN

Consideration of problems of deaf from social, economic, and educational point of view; history of deaf education.

409WJ Advanced Workshop in Mental Retardation (10)
HAYDEN

Advanced Workshop on education of the retarded, with provision for supervised work with retarded children. Offered jointly with the Department of Psychology. Prerequisite, at least 10 hours in course work on the mentally retarded.

410 Educational Sociology (3)
JESSUP

An effort to examine certain aspects of contemporary American society in their relations to and impact upon the conduct of education. Selected educational problems of a socio-political nature will be considered.

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. (Offered Summer Quarter only.)

415 Principles of Safety Education (3)
CORBALLY

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.

417 Adult Education (3)

Introductory professional course in adult education; includes the survey, the analysis, the history, and the examination of the aims and objectives of American adult education; designed to increase the student's understanding and knowledge of the field by giving him a general overview of adult education today.

420 Theory and Technique of Kindergarten and Primary Teaching (3)
HARRIS

A course designed to give the experienced teacher of young children confidence in her endeavor to foster creativity through readiness, varied activities in the subject areas, media, and self-evaluation. Prerequisite, teaching experience.

421 Remedial Education (3)

Experience in and study of analysis of difficulties in school subjects with special reference 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 Remedial Education Clinic (3)

Laboratory observation and practical experience using the more elaborate techniques and equipment unique to the laboratory. The objective of such experience is to aid teachers in referral of pupils and explanation to parents and to give a more complete understanding of the nature and importance of remedial education. Prerequisite, 425 or equivalent.

425 Remedial Reading (3)

Experience in and study of analysis of difficulties in reading and application of appropriate remedial instruction which is both feasible and practical for the teacher working with individuals or with a group. Prerequisites, 374E or 374S, or equivalent.

430 Public School Administration (3)
BOLTON, STRAYER

An introduction to theories and practices of administering public schools, including legal and extra-legal aspects of education, administrative organization, administrative behavior and processes, selection and assignment of personnel, administrative organization, interpretation of the school program to the public, administration of the instructional program, finance and business management, appraisal

of the school system. For superintendents, principals, supervisors, and those who wish to qualify for these positions. Prerequisites, graduate standing and one year of teaching experience.

430P Workshop for Public School Business Officials (2)

STRAYER

Study of practical problems through brief presentations, discussion groups, and committees. Topics will be chosen on the basis of interest from two or more of the following: accounting and budgeting; maintenance and operation; cafeteria administration; purchasing; personnel management; office management; and supply and property administration. (Offered Summer Quarter only.)

430W Workshop in School Administration (1)

BOLTON, STRAYER

Daily general sessions and group meetings of the participants. The staff will consist of regular and visiting faculty members and practicing administrators. The theme and daily topics will be selected with the assistance of the cooperating organizations. Teachers, supervisors, and school administrators may enroll without credit or for 1 quarter credit. A paper will be required if credit is desired.

431 School Finance (3)

STRAYER

Basic principles of public finance; economics of public education; development of school support; principles of school finance; school accounting forms and procedures; administration of the annual budget; interpretation of finance facts to the public; desirable improvements in school finance practices. Prerequisite, 430.

433 Elementary School Organization and Administration (3)

KITTELL

The work of the elementary school principal; plans of organization, promotion schemes, supervisory duties, teacher welfare, student organizations, and public relations. Prerequisite, 430.

434 High School Organization and Administration (3)

BOLTON

Problems peculiar to administering the American high school. Relationship of educational goals to administrative functions, teacher personnel, student body, structural organization, and human relations problems. General plans for organizing high schools, historical perspectives, and modern trends. Prerequisite, 430.

435 Administration and Supervision of Junior High Schools (3)

KITTELL

A general overview of the junior high school with examination of selected topics in such areas as: special functions; curricula and courses of study; cocurricular activities; pupil accounting, classification, and counseling; personnel selection, organization and training; community resources and activities; evaluation

of the program; business problems relating to school plant, budget, and equipment. Prerequisite, 430.

437 School Supervision (3)

BOLTON, JESSUP

Analysis of the problems and techniques of supervising school personnel, including an introduction to the foundations and functions of supervision, leadership, group processes, interpersonal relations, and evaluation of teacher effectiveness. Prerequisite, 430.

438 The Law and Education (2½)

MORRIS

A course designed for educators and administrators to alert them to some of the commonly encountered areas which involve legal problems. Prerequisite, 430. (Offered Summer Quarter only.)

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.

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. (Formerly 445J.)

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. (Offered Summer Quarter only.)

447 Principles of Guidance (3)

BRAMMER, STOTT

An introduction to guidance and, normally, the first course taken by those who plan to offer guidance as a field for an advanced degree. Special emphasis on types of programs in elementary and secondary schools, together with an introduction to tools, techniques, organization, and evaluation for teachers and administrators.

448E Guidance in the Elementary School (3)

Techniques of individual appraisal, preparation, and utilization of guidance records; orientation of pupils and parents; counseling processes; group procedures; case studies and utilization of consultant services. Prerequisite, 447.

448S Guidance in the Secondary School (3)

For junior and senior high school teachers, counselors, and administrators; emphasis on techniques of individual appraisal, counseling,

and keeping records, and on group guidance procedures. Prerequisite, 447.

449 Workshop on Pupil Personnel Services (2 or 3)

Two credits to apply when offered through Extension. Designed for counselors, teachers, administrators, and others concerned with pupil personnel services in elementary and secondary schools. Special attention is given to testing programs, grade prediction, and other pupil inventory services; educational and occupational information services and career development; and counseling services, including teacher-parent conferences. Prerequisite, teaching experience.

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 Auditory and Visual Aids in Teaching (3)

HAYDEN

A study of the utilization of audio-visual equipment and materials to improve instruction.

456 Auditory and Visual Aids in Teaching (3)

HAYDEN

Designed to assist teachers in the preparation and presentation of teaching materials appropriate to the different subject-matter areas and learning levels. Students provide their own materials for their projects. Prerequisite, 455 or equivalent.

457 Audio-visual Aids Management (3)

HAYDEN

Prerequisites, 445 and 456.

459J Television in the Schools (3)

Television programs to supplement classroom work; suitable receiving equipment for schools; 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. Prerequisite, 455.

460J Field Training in Health Education (5)

MILLS, REEVES

Intensive. 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.

461 Elementary School Curriculum (3)

DRAPER

The child as a growing organism developing personality, and as a learner. The curriculum as the guiding life of the school; the development of units, utilization of materials of instruction, social experiences, creative experiences, and evaluation of curriculum material.

**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

Principles of production of educational matter for teachers who expect to teach over television or to supervise school-oriented television activities. Offered jointly with the School of Communications. Prerequisites, 455; open only to teachers. (Summer Quarter only.)

465 The American Secondary School (3)

HANAWALT

A systematic overview of the essential nature of the American high school (junior as well as senior) and of its unique role in American society.

466 Workshop in Curriculum Improvement (1-15, max. 15)

DRAPER

Individual or committee work on curriculum improvement in elementary and secondary schools. Special emphasis will be given to conservation education at all levels in the public schools, and to techniques of organizing the fused curriculum, correlated curricula, and core curriculum programs in the large block of time at the junior high school level. Prerequisite, 467.

467 Principles and Techniques of Curriculum Improvement (3)

DRAPER

Intensive study of the basic principles and techniques utilized in the development of curriculum materials at all levels in the public schools; action research studies in the development and evaluation of objectives, learning experiences, resource units, and learning units. Individual projects will be developed. Prerequisite, 360.

470 Historical Backgrounds of Educational Methods (3)

JESSUP

This course is designed to acquaint students with the influence of various individuals upon the development of educational theory and practice. Selections will be made from such educational theorists as Plato, Aristotle, Quintilian, Plutarch, Comenius, Vives, Montaigne, Locke, Milton, Rousseau, Pestalozzi, Herbart, Froebel, and Spencer.

471D Observation and Student Teaching of Deaf Children (2-6, max. 6)

BOROUGH

Observation of classroom procedures and student teaching at several grade levels under the direct supervision of certified teachers of the deaf.

471E,X,S Advanced Directed Teaching (4-16)

BOROUGH

This series of courses (471E, X, and S) provides teaching experience in the public schools

beyond certification requirements for those desiring more specialized training. Assignments are approved by the Director of Practice Teaching the first day of the quarter. Prerequisites, 371E, X, or S. (Additional fee, \$6.00 per credit.)

471NJ Advanced Directed Teaching: School Nursing (4)

BOROUGH

Directed school nursing practice in public schools, including health education and health services. Offered jointly with the School of Nursing.

474 Workshop in Instructional Improvement (2, max. 6)

A study through individual research projects of the adaptation of instruction to meet individual differences.

474GJ Seminar in Language Teaching (3)

RABURA

Designed to improve foreign language teaching through study of the latest teaching methods and materials and their use in the classroom and laboratory; observation and discussion of demonstration classes. Offered jointly with the Department of Germanic Languages and Literature. Restricted to NDEA Language Institute participants. (Summer Quarter only.)

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.

475A Improvement of Teaching: Secondary 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: Arithmetic (3)

VOPNI

Designed for teachers of arithmetic, grades one through six. Emphasis is placed on the contributions of research to the improvement of the teaching of arithmetic. Prerequisite, teaching experience.

475DJ, 475EJ The Teaching of Foreign Literature (3,3)

CREORE

The methodology of teaching a foreign literature, particularly the method of *explication de texte* adapted to high school classes. Course conducted in English. Explanation and demonstration by the instructor. Students will practice with literary works of their choice, in French or Spanish. Discussions with faculty members concerning how best to prepare students for third-year college courses and for Advanced Placement examinations. Consideration of national lists of literary texts recommended for junior and senior high school.

Offered jointly with the Department of Romance Languages and Literature. Prerequisite, senior standing.

475GJ Geography in the Social Studies Curriculum (5)

A discussion of the concepts and content of geography essential to effective social studies curricula. Offered jointly with the Department of Geography. (Summer Quarter only.)

475H Improvement of Teaching: Language Arts (3)

KITTELL, SEBESTA

A study of important and recent research in elementary or secondary language arts, and a consideration of its practical implications for teaching. This course will be elementary or secondary emphasis, depending upon the instructor. The student is urged to check emphasis before registering for the course.

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 Advanced Teachers' Course in Journalism (3)

SAMUELSON

Advanced course in teaching high school journalism. For experienced publications advisers. No credit if Education 375J has been taken. Offered jointly with School of Communications. (Summer Quarter only.)

475K Improvement of Teaching: Elementary School Music (3)

HEFFERNAN

Advanced studies in the teaching of music in the elementary school.

475LJ Improvement of Teaching: Latin (5)

GRUMMEL

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. One lecture a week on such topics as Roman private life, literature, and politics. Offered jointly with the Department of Classics. (Summer Quarter only.)

475M Social Studies Education: Current 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. (Summer Quarter only.)

**475S Improvement of Teaching:
Elementary School Science (3)**

VOPNI

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. Of special interest to science teachers, administrators, and curriculum consultants. Prerequisite, teaching experience.

**475XJ Caesar for High School Teachers
(2½)**

GRUMMEL

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. (Summer Quarter only.)

**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.

**476I Principles and Problems in
Distributive Education (3)**

BAILY

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)**

BAILY

Stresses fundamentals, records and reports, the use of advisory committees, course titles, qualifications, coordinating activities, course content, and work training stations. (Summer Quarter only.)

**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.

**478J Programs in Elementary
Physical Education (2½)**

HORNE

Consideration and study of current programs and problems; influencing factors and basic considerations for a modern program in elementary school physical education. Offered jointly with the Department of Physical and Health Education for Women. (Summer Quarter only.)

480 History of Education (3)

BURGESS

Survey of educational theory and practice in Western culture. Not open to students who have taken Education 492, 493, 494, or 495.

**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
Education 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 Comparative Education (3)

JESSUP

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.

**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, problems, and researches in industrial education and their application in the field.

490 Educational Statistics (5)

Extension of Education 391. Sampling, probability, binomial distributions, T-distributions, normal distributions, Chi-square, analysis of variance, zero-order regression. Brief introduction to multiple and partial correlation, analysis of covariance, and nonparametric measures. Prerequisites, 308 and 391, or equivalent.



491 Advanced Educational Measurements (3)
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, 391, and 490, or Psychology 301 or equivalent.

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)

TOSTBERG

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)

TOSTBERG

Development of American education in cultural context: progressive education, recent criticism, continuing issues and trends.

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.

499 Undergraduate Research (2-5)

For undergraduates. Registration must be accompanied by a study prospectus endorsed by the appropriate faculty adviser for such work. Students developing studies under this course heading 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. Prerequisite, permission.

Courses for Graduates Only

501 Seminar in Educational Psychology (3)

FEA, FREEHILL

The psychology of children's thinking. Course will emphasize study of research results in concept development and critical thinking, with application to classroom learning situations. Prerequisite, 309 or equivalent.

502 Seminar in Educational Psychology (3)

FEA

The psychology of children's thinking. Each student will work intensively in one of the following: an area of cognition, a level of child development, a school subject. Prerequisite, 501 or equivalent.

503 Dissertation Seminar in Educational Psychology (3)

FEA

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.

506 Internship in Special Education (2-10, max. 10)

HAYDEN

Supervised experiences in special education for advanced students. Prerequisite, 404 or equivalent.

510 Seminar in Educational Sociology (3)

JESSUP

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.

525 Seminar in Elementary Education (3)

An exploration into the philosophy, history, curriculum, and method of the elementary school, with emphasis upon individual research. Prerequisite, elementary school teaching experience.

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. The relation of costs to efficiency; preparation of the budget, salary schedules, sources of school revenue, problems of state and local school support, and state and local control of school funds; financing capital outlay, research, and public relations. Prerequisites, 430 and 431.

533 Seminar in Administration: School Buildings (3)

BOLTON

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, 430.

536 Internship in Educational Administration (1-6, max. 6)

BOLTON, 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, 430 and all other requirements for administrator's credential.

538 Public Relations for Public Schools (3)

STRAYER

Relationship between the public schools and the public, with emphasis on the two-way flow of ideas between school and community; the school board, administrators, advisory groups, and the public relations program; school personnel and the public; pupils, parents, and community attitudes; proven techniques and media; special versus continuous public relations programs; special problems such as school finance, school extracurricular activities, and building programs. Prerequisite, 430.

540 Individual Testing (5)

FREEHILL

A study of intelligence testing with supervised experience. The emphasis is on the Stanford Binet and the Weschler Intelligence Scale for Children. Prerequisites, 308 and permission of instructor.

541 Student Appraisal (3)

STOTT

Emphasis on the utilization of objective measures for purposes of guidance. Prerequisite, 447.

542 Information Services (3)

SALYER

Emphasis on educational and vocational guidance. Prerequisite, 447.

543 Counseling (3)

BRAMMER

Emphasis on the theory and practice of pupil counseling. Prerequisite, personality theory and 545.

544 Organization and Administration of Guidance Programs (3)

Basic considerations in planning, organizing, and operating school guidance programs; analysis of issues and problems encountered in formulating policy and evaluating services. Prerequisite, minimum of 9 credits in guidance courses.

545 Interviewing (3)

BRAMMER

A study of interviewing and supervised practice of interviewing, primarily with children and parents. Prerequisite, 6 credits in guidance courses.

546 Internship in Guidance (2-10, max. 10)

BRAMMER

Supervised practice in guidance activities for advanced students. Prerequisite, permission of instructor.

547 Seminar in Guidance (3)

Individual problems in the areas of organization, supervision, and administration of guidance in the elementary and secondary schools. Prerequisite, 15 credits in guidance courses.

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.

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.

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. Prerequisites, 430 and 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. Prerequisites, doctoral candidacy or permission of the 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)

GILES, MADSEN

Intensive study of selected problems and proposals for research in higher education. Prerequisite, doctoral candidacy with higher education an area, and permission of instructors.

560 Seminar in Curriculum: Cooperative Research in Curriculum (3)

DRAPER

Research studies in the field of curriculum development will be designed for experimentation in the public schools. An analytical study

will be made of the place of action research in the curriculum field. Prerequisite, 467.

561 Seminar in Curriculum: Studies in Fusion, Correlation, and Child-Centered Programs (3)

DRAPER

Research in relating curriculum materials and guidance activities in fused, correlated, and child-centered programs. Prerequisite, 467.

562 Internship in Curriculum Direction (3, max. 9)

DRAPER

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.

568 Seminar in Secondary Education (3)

DRAPER

Research studies in the areas of extraclass activities, curriculum improvement, guidance and counseling, foreign education systems, and the professionalization of secondary school teachers. Prerequisite, 467.

570 Problems in Modern Methods (3)

FOSTER

The course is designed to develop an understanding of selected aspects of the history of educational methods. The course involves the exploration of various classical sources of educational theories which have provided the basis for development of educational method.

571 Problems in Modern Methods (3)

BOROUGHES

The course provides for the study of contemporary educational methods. The theory and application of these methods are explored with regard to trends, research data, and problems of implementation.

572J, 573J Romance Language Teachers' Seminar (3,3)

SIMPSON

Class activities will include use of the Language Laboratory, examination and evaluation of new methods, materials, and textbooks, and acquaintance with recent professional literature. Questions presented by the registrants will be considered, and each member of the seminar will work on some project of his own choice. The class time scheduled permits observation in the Young People's Classes offered by the Division of Continuing Education for those preparing to teach French or Spanish in the elementary or secondary schools, and workshop activities for others. Residence in the appropriate Living-Language Group is recommended. Students with schedule conflicts should consult the instructor. Offered jointly with the Department of Romance Languages and Literature.

574J The Application of Linguistics to the Teaching of Romance Languages (2)

FREY

Current methods and techniques of foreign language instruction, based on the findings of scientific linguistics. 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, 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 the instructor.

576E,S Seminar in Science Education: Elementary Emphasis; Secondary Emphasis (3 each emphasis)

VOPNI

Investigation of curriculum and instruction in science at elementary (or secondary) school levels; review of research and preparation of proposals. 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.

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. Permission of instructor required.

587 Seminar in Philosophy of Education (3)

TOSTBERG

Open to all advanced degree candidates.

588 Seminar in Philosophy of Education (3)

BURGESS

Intended for doctoral candidates. Prerequisite, 587.

589 Seminar in Philosophy of Education (3)

BURGESS

Intended for advanced degree candidates majoring in history and philosophy of education. Prerequisites, 587, 588, and permission of instructor.

**591 Methods of Educational Research (3)**

BOLTON, STOTT

An introduction to procedures for conducting educational research, including formulation of problems, use of controls, data collection, data analysis and interpretation, formulation of conclusions, and writing reports. Required of candidates for advanced degrees. Prerequisite, 490 or permission of the 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 whose proposals for the master's thesis or doctoral dissertation have been officially approved. Such registration requires the permission of the faculty supervisor and will be endorsed by the Graduate Program Adviser upon the receipt of a copy of the approved thesis proposal. Work may be done in *absentia* by special permission of the Graduate School. Prerequisite, 591 or equivalent.

SECRETARIAL STUDIES

The Secretarial Studies program, administered by the Division of Evening and Extension Classes, offers extension credit courses which may be taken as electives by both day and evening students. A day student may register for a course scheduled for either the daytime or evening without additional fee. (The course titles as listed under *Business Education* are descriptive only.)

X111 Secretarial Studies (2)

Further development of typewriting speed and accuracy; emphasis on business letters and other business forms; personal typewriting problems. Prerequisite, one or two semesters of high school typewriting or equivalent.

X112 Secretarial Studies (2)

Continuation of X111. Prerequisite, X111.

X115 Office Machines (3)

Instruction and practice in the operation of full-bank and ten-key adding machines; rotary, printing, and key-driven calculators; introduction to digital computer (optional).

X120- Gregg Shorthand (3)

Theory of Gregg shorthand, simplified. 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.

-X121 Gregg Shorthand (-3)

Students with one or more high school units in shorthand should consult department advisers for proper course placement. Prerequisite, X120- or permission.

X122 Advanced Gregg Shorthand (3)

New matter dictation and introduction to transcription. Prerequisite, -X121 or permission.

X310 Advanced Secretarial Studies (5)

Advanced shorthand dictation and transcription; general office practice and procedures. Prerequisites, X112 and X122 or permission.

X311 Advanced Secretarial Studies (5)

Continuation of X310. Prerequisite, X310.

X320 Secretarial Practice (5)

Application of skills acquired in shorthand, typewriting, office machines, business letter writing; machine transcription, electric typewriting, duplicating processes, filing systems; office procedures. Prerequisites, X112 and X122.

**COLLEGE OF
ENGINEERING****GENERAL ENGINEERING****Courses for Undergraduates****100 Engineering Orientation (1)**

MACARTNEY

Lectures, discussion, and reading assignments on the functions of engineering, the various fields of the profession, and on the College of Engineering.

101 Engineering Graphics (3)

COLLINS

Use of instruments, scales; techniques of lettering and line work. Fundamentals of orthographic projection, including sections. Simple isometric drawings. Orthographic and isometric sketches. Introduction to dimensioning of shop drawings. Simple rectilinear graphs.

102 Engineering Graphics (2)

MESSER

Continuation of orthographic projection, reading and interpretation of engineering drawings, diagrams, notes, and other forms of graphical representation. The making of freehand sketches and drawings. Study of shop and engineering practices and their applications to dimensions and notes used in engineering drawings. Prerequisite, 101.

103 Applied Descriptive Geometry (3)

BOEHMER

Application of fundamental principles to the solution of problems in the different fields of engineering by graphics. Includes point, line,

and plane problems, intersections and developments, and vectors in three dimensions. Prerequisites, 101 and 102.

104 Engineering Graphics (3)

HOAG

Fundamentals of orthographic projection, including sections and auxiliary views, isometric and oblique drawings. Technical sketching. Making, dimensioning, and interpretation of engineering drawings. Prerequisites, aptitude test and permission.

105 Engineering Graphics (3)

HOAG

Continuation of making, dimensioning, and interpretation of engineering drawings. Limit dimensions. Charts and graphs, application of principles of descriptive geometry in various fields of engineering. Includes point, line, and plane problems, intersections and developments, and vectors in three dimensions. Prerequisite, 104.

111 Engineering Problems (3)

SEABLOOM

An introduction to some fundamental principles, including dimensional analysis, statics, rectilinear motion with uniform and nonuniform acceleration, vector algebra, and Newton's Laws. 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, qualifying test in algebra and in trigonometry, and Mathematics 105, which may be taken concurrently.

112 Statics (3)

ALEXANDER

A fundamental and rigorous course in engineering statics using the vector notation treatment. Prerequisites, 101, 111, and Mathematics 124, which may be taken concurrently.

115 Introduction to Digital Computing (2)

DOUTHWAITE

The language of Fortran applied to engineering problems. Flow charts, problem organization, and basic computer statements. Introductory problems solved on IBM 709. Prerequisites, Mathematics 124 and 125, which may be taken concurrently, or permission.

121 Plane Surveying and Measurements (3)

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, 102 and trigonometry.

351 Inventions and Patents (1)

SEED

Law and procedures for patenting inventions, employer-employee relationship, and trade-marks. Primarily for engineering students. Prerequisite, junior standing.

AERONAUTICS AND ASTRONAUTICS

Courses for Undergraduates

200 Introduction to Aeronautics and Astronautics

BOLLARD

Introduction to the field of aeronautical engineering; discussion of basic concepts and typical problems.

300 Aerodynamics (3)

GANZER, STREET

Properties of the atmosphere; continuity, momentum, and energy equations for compressible flow; dimensional analysis; stream function and circulation theory; aerodynamic characteristics of airfoils in perfect and real fluids at subsonic and supersonic speeds. Prerequisites, Civil Engineering 291, Mechanical Engineering 320, Physics 217, 218, 219, and Mathematics 238 or accompanied by 322.

301 Aerodynamics (3)

GANZER

Incompressible ideal flow; kinematics and dynamics of flow fields; two-dimensional flow about bodies and thin airfoils. Three-dimensional flow about axially symmetric bodies. Prerequisite, 300.

302 Aerodynamics (3)

GANZER

Three-dimensional wing characteristics, subsonic and supersonic. Viscous flow; boundary layer in incompressible flow; effects of compressibility. Similarity laws. Prerequisite, 301.

N320-N321-322 Junior Laboratory (0-0-3)

PARMERTER

330 Structural Analysis (3)

MARTIN, PARMERTER

Elasticity and plasticity; virtual work and Castigliano's theorem; stress and deflection of trusses; torsion of rods and box beams.

331 Structural Analysis (3)

MARTIN

Bending of unsymmetrical and tapered beams; shear stresses in thin skin structures; buckling of rods; analysis of statically indeterminate structures. Prerequisite, 330.

332 Structural Analysis (3)

MARTIN

Plane stress; bending and buckling of plates; stresses in shells. Prerequisite, 331.

N390-N391-392 Seminar (0-0-1)

Preparation and presentation of at least one topic by the student. Prerequisite, senior standing.

400 Introduction to Theoretical Aerodynamics (3)

AHLSTROM

Euler's equations of motion; potential and stream functions; sources, sinks, and vortex flow; two and three dimensional flow; airfoil theory. (Formerly 404.) Prerequisite, 302.

401 Elements of Gas Dynamics (3)

AHLSTROM

Thermodynamics of perfect gases; one-dimensional gas dynamics; flow in ducts and channels; waves in supersonic flow; general equations of motion; small perturbation theory; similarity rules. (Formerly 405.) Prerequisite, 302.

402 Aerodynamics of Viscous Flow (3)

AHLSTROM

Equations of motion of an ideal, heat-conducting gas. Derivation of boundary layer equations. The flat plate solution. Integral equations and their solutions. (Formerly 406.) Prerequisite, 401.

410 Aircraft Design (3)

GANZER, JOPPA

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)

GANZER, JOPPA

Stability and control; elementary dynamics of the rigid airplane; flight and handling loads; FAA load requirements. Prerequisite, 410.

412 Aircraft Design (3)

MARTIN

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)

Prerequisite, 322.

425 Flight Test Laboratory (3)

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)

MARTIN

Introduction to matrix methods of structural analysis. Prerequisite, 331.

431 Plates and Shells (3)

MARTIN

Introduction to the theory of plates and shells. Prerequisite, 331.

432 Special Topics in Structural Analysis (3)

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)

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.

451 Astronautics (3)

BOLLARD

Space propulsion systems; communications; astronavigation; structures and materials; human factors. Prerequisite, 450.

441 Advanced Structural Design (3)

MARTIN

Design of missile, aircraft, and space structures. Prerequisite, 332.

450 Astronautics (3)

STREET

Celestial mechanics; calculation of terrestrial and interplanetary trajectories and orbits; fundamental rocket principles; dynamics of rocket flight; introduction to aerodynamic, thermal, and other problems associated with hypersonic flight. Prerequisite, senior standing.

460 Aircraft Engines (3)

EASTMAN

Performance and operating characteristics of reciprocating and jet engines for aircraft. (Formerly 360.) Prerequisite, Mechanical Engineering 320.

461 Jet Propulsion (3)

GANZER

Study of jet and rocket engines with regard to flow through inlets, compressors, burners, turbines, and nozzles. Prerequisite, senior standing.

462 Propellers and Moving Wing Systems (3)

EASTMAN

Aerodynamic characteristics common to all moving wings; analysis of the screw propeller, the helicopter, and other possible types of moving wing systems. Prerequisite, 461.

470 Analytical Problems in Aeronautics (3)

Application of mathematical methods to problems in aerodynamics, structures, and dynamics. Prerequisite, Mathematics 238 or permission.

480 Systems Dynamics (3)

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)

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)**

An investigation on a special project by the student under the supervision of a staff member. Prerequisite, senior standing.

Courses for Graduates Only**501 Physical Gas Dynamics (3)**

STREET

Thermodynamics of real gases; reacting gas mixtures; derivation of thermodynamic properties from classical statistical mechanics of gases; equilibrium and nonequilibrium properties of air; reaction rates; introduction to kinetic theory as a nonequilibrium model.

504 Aerodynamics of Nonviscous Fluids I (3)

AHLSTROM

Equations of motion of an ideal, compressible fluid; incompressible potential flow; airfoil theory using conformal mapping; theory of the finite wing in incompressible flow; extension to high subsonic flow. Prerequisite, 404 or permission.

505 Aerodynamics of Nonviscous Fluids II (3)

AHLSTROM

Transonic flow in the physical and hodograph planes; shock wave theory; expansion flow; exact solution for supersonic flow around a cone; small perturbation theory applied to bodies of revolution and two-dimensional wings in supersonic flow; conical flows and the delta wing. Prerequisite, 504 or permission.

506 Aerodynamics of Nonviscous Fluids III (3)

AHLSTROM

Hypersonic flow theory; shock waves in hypersonic flow; Newtonian flow and small disturbance theory; hypersonic flow past blunt-nosed bodies. Prerequisite, 505.

507 Aerodynamics of Viscous Fluids I (3)

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, 501 or permission.

508 Aerodynamics of Viscous Fluids II (3)

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)

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)

FYFE

Time dependent fluid flow problems; wave and shock propagation in gases and solids; the interaction of different wave forms and boundaries. Prerequisite, 532 or permission.

511 Unsteady Aerodynamics (3)

O'BRIEN

Oscillating airfoils at subsonic and supersonic speeds; consideration of wings and bodies in unsteady flow. Prerequisite, 404, 405 or permission.

512 Magneto-Fluid Dynamics (3)

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)

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 ultrahigh altitude flight. Prerequisites, 501 and permission.

516 Stability and Control I (3)

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 or permission.

517 Stability and Control II (3)

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)

JOPPA

Prerequisites, E516, E517 or Electrical Engineering 479, or permission.

N520-N521-522 Seminar (0-0-1)**523 Seminar in Aerodynamics (1-3, max. 12)**

STREET

Study of recent advances in aerodynamics with students and staff reporting on recent publications. Topics vary from year to year. Open only to students having the M.S. degree or its equivalent.

530 Theory of Elastic Structures (3)

MARTIN

Stresses, strains, displacements; Hooke's law; basic equations of elasticity; virtual work and energy theorems; application of theory to selected problems; approximate methods.

531 Analysis of Shells (3)

O'BRIEN

Kinematical, equilibrium and material-behavior relationships for arbitrary thin shells; considerations of orthotropy, finite deflections, inertia loads, and nonuniform temperature distributions; applications to advanced aerospace structures. Prerequisite, 567 or permission.

532 Mechanics of Solids (3)

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)

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. Prerequisite, permission.

540 Matrix Structural Analysis (3)

MARTIN

Analysis of geometrically and physically linear structures using finite elements; formulation of matrix equations from basic structural principles; application to problems and use of digital computing equipment in obtaining solutions.

545, 546 Bioastronautics I, II (3,3)

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. 545 for 546.

550 Space Dynamics (3)

FYFE

Basic concepts of dynamics. Variational principles and Lagrange's equations. Rigid body motion. Variable mass systems.

551 Aerospace Systems (3)

BOLLARD

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 or permission.

553 Vibrations of Aerospace Systems (3)

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 or permission.

555 Special Topics in Aerospace Systems (3, max. 6)

BOLLARD

556 Aeroelasticity (3)

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. Prerequisite, 481, 553, or permission.

557 Nonlinear Problems in Aerospace Systems (3)

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. Prerequisite, permission.

565 Approximate Analysis I (3)

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)

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)

Mathematical methods for solving problems arising in engineering. 567: vector analysis, matrices, tensors, complex variables; 568: calculus of variations, Sturm-Liouville problems, series solutions and special functions for ordinary differential equations, orthogonal functions. Prerequisite, Mathematics 238.

569J Partial Differential Equations (3)

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 Flight Mechanics I (3)

Equations of motion for rocket vehicles and for vehicles powered by air-breathing propulsion systems. Scalar equations for flight over a flat earth. Quasi-steady flight of subsonic and supersonic aircraft. Nonsteady flight of supersonic aircraft, hypervelocity gliders, skip vehicles, and ballistic missiles. Prerequisites, 550, 567 or permission.

572 Flight Mechanics II (3)

Equations of motion for unpowered and powered flight. The two-body problem. Ballistic transfer and low-thrust transfer. Optimization theory: Lagrange multipliers and variational approach. Prerequisite, 571 or permission.

573 Astrodynamics (3)

The two-body problem; the three-body problem; the n-body problem. Perturbation theory. Relativistic effects. Prerequisite, 550.

575 Thermo- and Electrodynamics of Continua (3)

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.

580, 581, 582 General Theory of Continuous Media I, II, III (3,3,3)

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. Prerequisite, 567 or permission.

583 Special Topics in Solid Mechanics (3)

DILL

Study of recent advances in the mechanics of solids. May be repeated for credit by permission.

599 Special Projects (2-5, max. 15)

An investigation on a special project by the student under the supervision of a staff member.

600 Research (*)

Prerequisite, permission of Department chairman.

700 Thesis (*)**702 Degree Final (6)**

Limited to students completing a nonthesis degree program.

CHEMICAL ENGINEERING**Courses for Undergraduates****271, 272, 273 Introduction to Chemical Engineering (1,1,1)**

Calculation techniques; material balances, heat balances; plant visits. Prerequisite, sophomore standing or permission.

N381 Field Trip (0)

A two-to four-day field trip during the Spring Quarter in which various chemical industries in the Pacific Northwest are visited. Prerequisite, junior standing or permission.

N382 Field Trip (0)

A two-to four-day field trip during the Spring Quarter in which various chemical industries in the Pacific Northwest are visited. Prerequisite, senior standing or permission.

384 Industrial Stoichiometry (4)

JOHANSON

Introduction to first law of thermodynamics. Heat balances; thermophysics and thermochemistry. Prerequisite, 273 or permission.

385 Chemical Engineering Thermodynamics (4)

Thermodynamic definitions and laws. P-V-T and thermal relations; calculation of the thermodynamic functions. Heat and work of state change. Compressor and expander engines and power cycles. Phase equilibria and chemical equilibria in multicomponent systems. Prerequisites, 384 or permission and Chemistry 455.

451 Chemistry of Wood (3)

SARKANEN

Chemical and physical properties of cellulose and lignin, the chemistry of pulping and bleaching processes, wood as a raw material for the chemical industry. Prerequisites, Chemistry 231 and 232, or permission.

452 Pulp and Paper Technology (3)

SARKANEN

Morphology of wood fibers, manufacture of mechanical kraft and sulfite pulps, rheology of paper, coated papers and paper-plastic combinations. Prerequisites, Chemistry 231 and 232, or permission.

453 Pulp and Paper Laboratory (2)

SARKANEN

Laboratory experiments in the pulping of wood, fiber technology, and in the physical and chemical characterization of paper and pulp. Prerequisite, 452.

470 Transport Process Principles (4)

BABB

Rates of heat, mass, and momentum transfer are discussed with particular emphasis on fluid flow. Molecular and turbulent mechanisms are considered. The applications to flow measurement, friction losses, and pumping are treated. Prerequisite, 385.

471 Unit Operations (3)

HEIDEGER

Applications of transport principles are made to problems of engineering significance. Special emphasis is given to heat transfer applications including the evaluation of heat transfer coefficients and of exchange rates under steady state conditions. Additional topics include radiant heat transmission and special fluid flow problems. Prerequisite, 470.

472 Unit Operations (3)

HEIDEGER

Specific applications of mass transfer principles are made to the area of physical separations. Methods are developed for the evalua-



tion of mass transfer coefficients and for the analysis of continuous operations. Problems of simultaneous mass and heat transfer are considered. Prerequisite, 471.

474 Unit Operations Laboratory (2)

The laboratory experiments cover primarily the subject matter of 470. Prerequisite, 470.

475 Unit Operations Laboratory (2)

The laboratory experiments cover the subject matter of 471, together with evaporation and instrumentation. Prerequisite, 471.

476 Unit Operations Laboratory (2)

The laboratory experiments cover primarily the subject matter of 472. Prerequisite, 472.

481 Process Design Principles I (3)

DAVID

Homogeneous reaction kinetics, instrumentation, and process control. Prerequisite, 470 or permission.

482 Process Design Principles II (3)

DAVID

Introduction to chemical engineering design, engineering economics pertinent to chemical engineering design and operations, market survey and plant site location, initial stages in the design of a specific process. Prerequisites, 471 and 472 concurrently.

483 Chemical Engineering Process Design (5)

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. Prerequisites, 472 and 482.

485 Industrial Electrochemistry (3)

MOULTON

Theoretical and applied electrochemistry; units and laws; overvoltage and polarization; analysis; oxidation and reduction; deposition; refining; metallurgy; electrothermics. Prerequisite, Chemistry 457 or permission. (Offered when demand is sufficient.)

499 Special Projects (1-6, max. 6)

An assigned problem in unit operations or applied chemistry is investigated first in the literature and then in the laboratory and the results are incorporated into a thesis.

Courses for Graduates Only

N520, N521, 522 Seminar (0,0,1)

523 Seminar in Chemical Engineering (0-3, max. 12)

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)

MCCARTHY

Review of principles of thermodynamics; statistical foundations. Applications to problems in multiphase and multicomponent systems. Irreversible thermodynamics. (Formerly 575.) Prerequisite, undergraduate thermodynamics.

530 Introduction to Transport Phenomena (3)

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. (Formerly 570.) Prerequisite, 470 or permission.

531 Topics in Transport Phenomena (1-3, max. 6)

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. (Not offered 1964-65.)

540, 541 Fluid Mechanics (3,3)

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. (540 formerly 574.) Prerequisites, 530 and Aeronautics and Astronautics 567 or permission.

542 Hydrodynamic Stability (3)

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 of graduate fluid mechanics.

543, 544 Fluid Turbulence (3,3)

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 of graduate fluid mechanics. (Not offered 1964-65.)

550 Heat Transfer (3)

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. (Formerly 571.) Prerequisites, 525 and 530, or permission.

551 Topics in Heat Transfer (1-3, max. 6)

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. (Not offered 1964-65.)

560 Mass Transfer (3)

HEIDEGER

Diffusion equations; transfer of material between phases; mathematical models. Dispersion in flow systems; residence time analyses. Simultaneous mass transfer and chemical reaction. (Formerly 572.) Prerequisite, graduate standing.

561 Topics in Mass Transfer (1-3, max. 6)

HEIDEGER

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. (Not offered 1964-65.)

565 Kinetics and Catalysis (3)

JOHANSON

Homogeneous and heterogeneous systems with emphasis on chemical engineering principles applied to industrial reactor design. (Formerly 581.) Prerequisite, 525.

566 Topics in Reaction Kinetics (1-3, max. 6)

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)

MCCARTHY, SARKANEN

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. (Formerly 586.) Prerequisite, an undergraduate sequence in organic chemistry. (Not offered 1964-65.)

571 Cellulose and Lignin (3)

MCCARTHY, SARKANEN

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. (Formerly 587.) Prerequisite, an undergraduate sequence in organic chemistry.

575 Topics in Analysis in Chemical Engineering (1-3, max. 6)

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 Chemical Separations Processes (3)

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 of the Graduate Program Adviser. (Offered when demand is sufficient.)

600 Research (*)

Prerequisite, permission of the Graduate Program Adviser.

700 Thesis (*)

CIVIL ENGINEERING

Courses for Undergraduates

201 Civil Engineering Projects I (2)

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)

HENNES

Layout, site location, and preliminary design of a comprehensive project including compo-

nents from hydraulic, sanitary, structural, and transportation engineering. Prerequisite, 201.

216 Geometronics (4)

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 Mathematics 391 taken concurrently.

291 Dynamics (3)

W. M. 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)

WILSON

An introduction to the mechanics of solids. Strain and deformation, stress, stress-strain relationships; torsion, stresses due to bending. Prerequisites, General Engineering 112, Mathematics 126 (may be concurrent), Physics 121 or 217.

293 Mechanics of Materials II (3)

WILSON

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 concurrent).

310 Highway Location and Design (4)

CHITTENDON, COLCORD

Reconnaissance, preliminary, and location surveys of transportation routes. Alignment problems; circular, parabolic, and spiral curves. Earthwork computation; mass diagram in economic route design. Application of electronic computers. Engineering astronomy. For students in the College of Forestry only. (Formerly 210.) Prerequisites, General Engineering 121 and Mathematics 125.

320 Transportation Engineering I (3)

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 or General Engineering 121, or permission.

342 Fluid Mechanics I (4)

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 or 253.

345 Fluid Mechanics II (3)

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)

BOGAN, CARLSON, SYLVESTER

The engineer and his relation to the quality of man's water and air environment. Lectures and laboratory exercises on the character and significance of substances found in water, waste water, and air. Engineering principles of water and waste water treatment, and pollution control.

363 Constructional Materials I (3)

W. M. MILLER, VASARHELYI

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)

MEESE, MITTET, SHERIF

Physical properties of nonmetallic mineral constructional materials. Design of Portland cement and bituminous concrete mixes. Prerequisite, 363.

380 Basic Structural Engineering (2)

A. L. MILLER, MITTET

Planning, design, and construction aspects of structural projects. Criteria for structural adequacy applied to typical structures. Prerequisite, 293.

381 Structural Analysis I (3)

A. L. MILLER, RHODES

Primary stresses and deflections of suspensions, trusses, and space frames. Strength and deflection of beams and girders.

382 Structural Analysis II (3)

A. L. MILLER, MITTET

Stresses and deflections of continuous and rigid frame structures. Theory of strength and deflection of reinforced concrete, steel, and wood members. Prerequisites, 364 and 381.

405 Critical Path Methods of Construction Scheduling (3)

HORWOOD

Network flow theory and arrow diagramming of construction activities, the critical path algorithm, activity time-cost functions; program evaluation, review techniques and computer applications in construction scheduling. Prerequisites, Mathematics 105, or 155 and 156.

410 Traffic Engineering—Fundamentals (2)

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)**

CHITTENDEN, COLCORD

Geometrical characteristics of photographs and photogrammetric equipment, flight planning and control considerations for photogrammetric mapping, stereoscopy, parallax measurement and computations, mosaicing, tilt determination, consideration of accuracies and error sources. Prerequisite, 216 or permission.

417 Cadastral Surveys (2)

COLCORD

Boundaries; the system of public lands; riparian rights; subdivision. Prerequisite, senior standing in civil engineering, or permission.

419 Celestial Methods in Geodesy (2)

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)

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. (Not offered 1964-65.)

424 Highway Pavement Design (3)

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.

441 Intermediate Fluid Mechanics (3)

CHENOWETH, RICHEY

Dimensional analysis, similitude, hydraulic models. Introductory study of boundary layer theory and potential flow. Prerequisite, 342.

442 Introduction to Hydrodynamics (3)

NECE, RICHEY

Fundamentals of the flow of an ideal fluid. Complex variables and conformal mapping. Application to flow past immersed bodies and fixed boundaries. Prerequisites, 441, Mathematics 238, or permission.

445 Hydraulic Machinery (3)

MORITZ

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)

RITCHEY

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, 451 taken concurrently. (Not offered 1964-65.)

447 Applied Hydrology (3)

CAMPBELL, RICHEY

Theory and application of hydrology, with emphasis on water-power development. Precipitation, runoff, maximum and minimum flows, flood routing. Economics of storage and transportation of water. Types of hydroelectric installation; multiple-use projects. Prerequisite, 446.

448 Reclamation (3)

CAMPBELL

The transportation of water by gravity flow. Analysis and design of canals, flumes, transitions, energy dissipators, and similar structures. Special problems in irrigation engineering. Prerequisite, 446.

451 Sanitary Engineering II (5)

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. (Not offered 1964-65.)

455 Sanitary Biology (3)

CARLSON, OGLESBY

Fundamental principles of microbiology, population dynamics, and ecology as applicable to nutrient-rich environments and certain biological aspects of public health. Prerequisite, 350.

456 Process Chemistry for Sanitary Engineers (4)

BOGAN, 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)

CARLSON, CHRISTMAN

Theory and application of instrumentation used in water and air quality measurement, research, and monitoring. Lecture and laboratory. Prerequisite, 456 or equivalent.

466 Soil Mechanics (3)

HENNES, MEESE

Mechanical properties of soils. Theoretical mechanics and engineering practice in the evaluation of lateral earth pressures, bearing ca-

capacity, and settlement of foundations. Underground exploration and sampling techniques. Prerequisite, 364 or permission.

467 Earthwork Engineering (3)

HENNES, MEESE

Further development of the principles of soil mechanics, with emphasis on problems involving plastic equilibrium and seepage forces. The stability of earth cuts and embankment. Prerequisite, 466.

481 Bridge Design (3)

CLANTON, RHODES

The design of highway bridges. Characteristics of various types. Corequisite, 484.

482 Advanced Reinforced and Prestressed Concrete (3)

CLANTON, MITTET

Materials and procedures of prestressed concrete construction. Design for flexure, shear, bond, composite sections, continuous spans, and columns. Special problems in reinforced concrete. Prerequisite, 484 or graduate standing.

483 Structural Design I (3)

RHODES, SERGEV, VASARHELYI

Introduction to the design of steel, wood, and concrete members and connections. (Not offered 1964-65.)

484 Structural Design II (3)

CLANTON, A. L. MILLER, SERGEV

Design of structural systems of buildings including roofs, floors, walls, columns, and foundations. (Not offered 1964-65.)

485 Applied Structural Analysis (3)

A. L. MILLER

Theory of statically indeterminate structural assemblies including rigid frames and continuous trusses. Redundant members. Members of nonuniform sections. Introduction to arches and curved members. Moment-area, moment-distribution, and strain-energy methods. Prerequisite, 382.

494 Introduction to the Mechanics of Continuous Media (3)

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, Mathematics 238, or permission.

498 Special Topics (1-5)

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. in one field 15)

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 Highway Finance, Policy, and Programming (2)
HENNES, HORWOOD

Consideration of the factors affecting transportation planning and the establishment of priorities in construction scheduling. Alternative methods for financing road and street facilities. Prerequisite, graduate standing.

505 Economic Analysis of Public Works (2)
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. Prerequisite, graduate standing.

510 Traffic Engineering—Analysis (2)
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 Operations (2)
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)
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)
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.

518 Geodesy (3)
COLCORD

Introduction to problems of gravimetric and geometric geodesy. Potential attraction, gravity observation and reduction. Properties of the ellipsoid and geoid and computations of geo-

detic position and distances. Prerequisite, permission.

520 Seminar (1, max. 6)

Students should register for H (hydraulics), M (mechanics), S (structures), T (transportation), or W (sanitary). Prerequisite, permission.

521 Seminar in Urban Transportation Planning (2)
HORWOOD, SAWHILL

Prerequisite, graduate standing in civil engineering or urban planning, or permission.

522 Transportation Systems (3)
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)
EKSE, HENNES

Coordination of transportation facilities. Port and harbor installations. Airports. Rail belt lines and terminals. Prerequisite, 421.

524 Rapid Transit (3)
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 Quantitative Methods of Urban Analysis (3)
HORWOOD

Spatial and econometric models of urban land use and activities. Population distribution and allocation models. Programming theories and feedback and review techniques. Offered jointly with the Departments of Geography and Urban Planning. Prerequisites, Mathematics 281, or Sociology 223, or equivalent.

528J Computer Applications to Urban Analysis (3)
HORWOOD

Data storage and retrieval systems and data bank design. Computer methods of mapping and graphing from card input data. Multiphasic data screening techniques and automation of records search. Offered jointly with the Departments of Geography and Urban Planning. Prerequisite, 527J or permission.

529J Data Systems Development for Environmental Studies (3)
HORWOOD

Methods of handling large scale data inputs. Computer methods of graphing and mapping from magnetic tape input data. Computer applications to statistical analysis and simulation models. Offered jointly with the Departments of Geography and Urban Planning. Prerequisites, 528J, Mathematics 374, Electrical Engineering 477, or permission.

542 Hydrodynamics I (3)
NECE, RICHEY

Fundamentals of fluid potential motion. Two- and three-dimensional flow examples, including free surface flows. Complex variables, conformal mapping, other solution techniques. Prerequisite, 441 or permission.

543 Hydrodynamics II (3)
NECE, RICHEY

Circulation and lift. Vortex motion. Introduction to viscous flows: the Navier-Stokes equations, and some exact solutions. Instability of laminar flow. Introduction to turbulent flow. Prerequisite, 542.

544 Wave Dynamics (3)
RICHEY

Application of wave theory to the interaction of water waves and objects, emphasizing forces on marine structures. Prerequisites, 542, Oceanography 411, or permission.

547 Advanced Hydrology (4)
CAMPBELL, RICHEY

Theory and application of hydrology, with emphasis on water power development. Precipitation, runoff, maximum and minimum flows, flood routing. Economics of storage and transportation of water. Types of hydroelectric installations; multiple-use projects. Special problems in hydrology and hydraulic power. Prerequisite, 446 or permission; not open to students with credit in 447.

549 Experimental Hydrodynamics (3)
NECE

Experimental studies of steady and unsteady flow phenomena. Model tests as used in hydraulic design. Instrumentation and experimental techniques. Prerequisites, 441 or permission.

550 Sanitary Engineering Unit Operations I (3)
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)
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.

552 Treatment Process and Systems Design (3)
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, 456, 550, 551.

553 Advanced Sanitary Biology (3)

CARLSON, 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, 456 and 455.

554 Advanced Process Chemistry for Sanitary Engineers (3)

BOGAN, 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)

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)

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)

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)

SYLVESTER

Water quality control objectives, methods, receiving water characteristics; dispersion and behavior of pollutants; treatment required for various water usages. Prerequisites, 455, 456 or permission.

559 Water Resource Management and Systems Design (3)

SYLVESTER

Engineering, social, and economic factors involved in water resource development and management. Design considerations for regional water resource systems. Prerequisite, 558 or permission.

560 Topics in Environmental Health Engineering (3)

ROSSANO, OGLESBY

Survey of environmental health practices and problems with emphasis on the role of sanitary engineering.

561 Air Resources Engineering I (3)

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)

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)

ROSSANO

The atmosphere as a vital natural resource. Administrative and legal aspects of air conservation; quality criteria and emerging problems. Prerequisite, 561 or permission.

565 Airphoto Interpretation in Soil Engineering (3)

COLCORD

Use of aerial photographs for terrain evaluation in soil mapping and material surveys, route location problems, urban planning and engineering site locations. Prerequisites, 415, Geology 310, or permission.

566 Engineering Properties of Clay (3)

MEESE, SHERIF

Shearing strength, consolidation characteristics, structural concepts, and related properties of clay. Prerequisite, 466.

568 Seepage and Slope Stability (2)

HENNES

Control of landslides; effect of seepage and porewater pressure on the stability of earth masses. Prerequisite, 467.

569 Applied Soil Mechanics (3)

HENNES, MEESE

Soil mechanics in engineering practice; the application of theory to the analysis of footings, piling, retaining walls, tunnels, and other substructures. Prerequisites, 466 and graduate standing.

570 Advanced Mechanics of Materials I (3)

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)

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)

SERGEV

Theory of elastic stability. Columns. Buckling of frameworks. Lateral and torsional buckling of beams. Stability of plates and shells. Prerequisites, 571 or permission.

573 Structural Mechanics I (3)

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)

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)

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)

SERGEV, WILSON

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.

580 Strain Measurements (3)

HARTZ, 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 (3)

A. L. MILLER

Multistory, multibay rigid frames including wind and earthquake loads. Theory of flexure of members of nonuniform section. Nonrectangular rigid frames. Moment-area and moment-distribution methods. Prerequisite, graduate standing in civil engineering.

582 Advanced Structures (3)

A. L. MILLER

Truss deflection and secondary stresses. Trussed arches. Multispan trusses. Redundant members. Mueller-Breslau, Maxwell-Mohr, and

strain-energy methods. Prerequisite, graduate standing in civil engineering.

583 Advanced Structures (3)

A. L. MILLER

Ideal, two-hinged and hingeless elastic arches. Influence lines for statically indeterminate structures. Castigliano's theorem and strain-energy methods applied to curved members of nonuniform section. Prerequisite, graduate standing in civil engineering.

584 Plastic Design of Structures (3)

VASARHELYI

Plastic (inelastic) behavior of structural materials. Applications to the design of structural members and systems. Principles of upper and lower bound. Limitations and economy of the procedure. Prerequisite, 581.

586 Structural Materials and Design (3)

VASARHELYI

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 Design of Welded Structures (3)

VASARHELYI

A broad review of the factors such as the function of the structure, the mechanical properties of the base metal and welds, structural details, and type of loading which must be considered in the design of a welded structure. Prerequisite, 586.

590 Structures Under Wind (3)

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. (Not offered 1964-65.)

591 Theory of Elasticity I (3)

HARTZ, WILSON

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)

HARTZ, WILSON

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)

HARTZ, WILSON

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)

HARTZ

Dynamic formulation of the theory of elasticity; elastic waves in 2- and 3-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. in one field, 15)

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 (*)

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 (*)

ELECTRICAL ENGINEERING

Courses for Undergraduates

231 Introductory Linear Systems I (5)

Basic concepts of linear systems such as linear electrical and mechanical networks. Formulations of system equations; integrodifferential equations, transient and steady state behavior of systems, complex impedance. Introduction to pole-zero concepts. Prerequisites, General Engineering 111, 115 (115 may be taken concurrently with permission); corequisites, Mathematics 125 and Physics 122.

233 Introductory Linear Systems II (4)

Relationships between pole-zero configurations and the system response under transient and steady state conditions, root locus determination. Systematic methods of analysis, node and loop analysis, matrix methods, electric power, three-phase power systems. To be taken concurrently with 234. Prerequisite, 231; corequisite, Mathematics 126.

234 Electrical Engineering Laboratory I (1)

One three-hour laboratory each week, covering fundamental electrical measurements. To be taken concurrently with 233. Prerequisite, 231.

235 Introductory Linear Systems III (4)

Network theorems-superposition, reciprocity, Thevenin's, Norton's, etc. Introduction to Laplace transform methods. Two-port characterization, mutually-coupled circuits, transformers. To be taken concurrently with 236. Prerequisite, 233.

236 Electrical Engineering Laboratory II (1)

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)

Short course in the analysis of direct- and alternating-current circuits with an introduction to electronics. Includes one three-hour laboratory each week. Prerequisites, Physics 122, Mathematics 237, and General Engineering 111. For nonelectrical engineering majors.

305 Electrical Machinery (5)

Condensed course in the theory, circuits, and performance of direct- and alternating-current electrical machinery. Includes one three-hour laboratory per week. Prerequisite, 303. For nonelectrical engineering majors.

311 Introductory Linear Systems IV (4)

Fourier analysis of systems response; Fourier series, symmetry of functions, sampling theorems, Parseval's theorem, Gibb's phenomena. Properties of Fourier transform, frequency spectra, delta functions. Applications of Fourier transform to linear systems. Properties of Laplace transform. To be taken concurrently with 312. Prerequisites, 235 and Mathematics 225, 238, or 438.

312 Electrical Engineering Laboratory III (1)

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)

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)

A four-hour laboratory on alternate weeks. To be taken concurrently with 321.

323 Electromagnetic Fields and Waves II (4)

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. Prerequisites, 311, 321.

324 Electromagnetic Fields and Waves Laboratory II (1)

A four-hour laboratory on alternate weeks. To be taken concurrently with 323.

325 Electromagnetic Fields and Waves III (4)

Maxwell's equations in time-varying fields; plane wave propagation in lossless and dissi-



pative 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)

Field theory as related to laboratory practice, behavior of plane waves at boundaries, measurement of impedance, resonant cavity modes, properties of lossy media, antenna radiation patterns. To be taken concurrently with 325.

343 Introduction to Electromechanical Energy Conversion (5)

Physical aspects of electromechanical energy conversion; energy relationships. Coupled circuits. Transformers, Rotating machines. Idealized rotating machines. Rotating machines as control devices. Introduction to feedback control systems. Includes one 4-hour laboratory on alternate weeks. Prerequisites, 311, 321.

361 Physical Electronics (4)

Basic ideas underlying the operation of semiconductor, magnetic, vacuum-tube and gas-discharge devices. Prerequisites, 321, Physics 320.

363 Electronic Devices and Circuits (4)

Characteristics of electron tubes and semiconductor devices; equivalent circuits; vacuum tube and transistor amplifier fundamentals. To be taken concurrently with 364. Prerequisites, 311, 361.

364 Electronics Laboratory I (1)

A 3-hour laboratory each week in physical electronics. To be taken concurrently with 363.

365 Electronic Circuits (4)

Continuation of 363, including study of amplification, feedback, oscillation, and modulation. To be taken concurrently with 366. Prerequisite, 363.

366 Electronics Laboratory II (1)

A 3-hour laboratory each week in electronic circuits. To be taken concurrently with 365.

400 Vacuum Tubes and Electronics (5)

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. Prerequisite, 303. For nonelectrical engineering majors.

433 Transistor Circuit Engineering (3) COCHRAN, HANSON

Basic concepts of semiconductor devices including construction, principles of operation, application as amplifiers, oscillators, and switching or control elements. Prerequisite, 365.

441 Linear System Analysis (3)

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) LINDSAY

Linear, time-varying systems. First-order nonlinear systems; exact and approximate solutions. Second-order nonlinear systems; phase-plane, approximate solutions of Ritz and Krylof-Bogoliuboff, forced vibrations, stability. Analog and digital computer methods. Prerequisite, senior standing in electrical engineering.

449 Electrical Machinery I (6) HOARD

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) HOARD

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) GUILFORD

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) 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.

463 Control System Components and Measurements (3)

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. Prerequisites, 311, 343.

469 Advanced Field Theory (4) PEDEN

Applications of Maxwell's Equations to wave propagation, skin effect, circuit impedance ele-

ments, and other time-varying electrical phenomena; wave guides and resonators; electromagnetic radiation and ultra-high frequency techniques. Includes one 3-hour laboratory. Prerequisite, 323.

471 Amplifier Theory (5) HANSON

Theory of analysis and synthesis of small-signal, low-pass, and band-pass amplifiers; analysis of transient response, feedback, and the effects of noise. Includes a laboratory. Prerequisites, 311 and 365.

473 Pulse Circuits (5) COCHRAN, REYNOLDS

Wave-shaping circuits, including clipping circuits, square-wave generators, differentiator and integrator circuits, d-c restoration, and clampers. Free-running and driven trigger circuits. Ringing circuits. Applications to high-frequency circuits including television and radar. Includes one 4-hour laboratory on alternate weeks. Prerequisite, 365.

475 Digital Circuits (4) COCHRAN

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) GOLDE, JOHNSON

Fundamentals of digital computer operation and application. Number systems, Boolean algebra, and general types of computer storage, control, and circuitry. Analysis and programming of simple problems for digital computers. Prerequisite, senior standing or permission.

479 Fundamentals of Automatic Control (4) CLARK, NOGES

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) HARRISON

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.

482 Antennas and Propagation (3) HARRISON, SWARM

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) SWARM

Frequency analysis modulation; mathematical concepts of Fourier Integral and probability

theory; correlation techniques; elementary study of noise and communication theory. Prerequisite, 365.

485 Solid State Electronics (4)

BJORKSTAM, WATT

Elements of atomic spectra, electron energy bands, and lattice vibrations. Principles of operation of parametric amplifiers, masers, lasers, semiconductor devices, etc. Prerequisite, 361.

493 Guidance and Control (4)

CLARK

Analysis and design problems in altitude control and flight-path guidance of aerospace vehicles. Principles of inertial instruments and navigation systems. Solution of special control problems on the analog computer. Prerequisite, 479.

499 Special Projects (2-5, max. 10)

STAFF

Assigned construction or design projects carried out under the supervision of the instructor. Prerequisite, permission of Department chairman.

Courses for Graduates Only

505 Analysis of Random Processes (3)

LYTLE

Probability theory; discrete and continuous random variables; stochastic processes. Spectral analysis of random signals and noise. Introduction to Markov processes. Corequisite, 441.

510 Introductory Network Theory (5)

HSU, LEWIS

Mathematical concepts applicable to network theory. Mesh and nodal formulations in matrix form, linear transformations, and quadratic forms. Elements of complex variable 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)

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)

BERGETH

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)

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)

Required for all graduate students.

531 Solid-State Electronics I (4)

BJORKSTAM, WATT

Matrix formulation of quantum theory, perturbation theory; lattice vibrations; introduction to the band theory of solids; some properties of normal and superconducting metals; dielectric and magnetic properties of materials including some discussion of ferroelectricity and ferromagnetism; luminescence; fundamentals of magnetic resonance. Prerequisite, 485.

532 Solid-State Electronics II (4)

BJORKSTAM, WATT

Advanced treatment of solid-state electronic devices including ferrites, parametric amplifiers, masers, lasers, semiconductor and superconductor devices. Prerequisite, 531.

535 Semiconductor Circuit Analysis (4)

HANSON

Topics in transistor characterization relating to high-frequency and switching behavior. Analysis and design of semiconductor circuits, principally involving transistors. An important part of the course is a laboratory assignment. Prerequisite, 485 or permission.

541 Microwave Circuit Techniques (4)

PEDEN

Microwave and antenna theory as related to experimental practice, representation and measurement of microwave circuits in terms of scattering coefficients. T and pi networks, canonical networks, properties of radiating structures. Prerequisite, 469 or equivalent.

545 Linear Control System Analysis (3)

BERGETH, 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)

CLARK

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)

BERGETH

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)

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, 323.

562 Advanced Physical Electronics (3)

SHIMADA

Advanced topics in vacuum and gaseous electronics. Electron emission from solids, devices utilizing electron and ion emissions, noise. Maxwell-Boltzmann statistics, collision processes in gases, ionization, transport theory, breakdown phenomena, properties of plasma, probe technique. Prerequisite, 485 or permission.

563 Electrical Noise I (3)

SHIMADA

The noise theory and its application to electron devices. Fourier analysis of stationary random process; correlation; noise power spectrum. Statistics; distribution functions; Gaussian distribution. Characterization of noisiness; noise ratio, noise figure, noise measure, noise temperature. Noise measurements; noise in quadratic detector. Prerequisite, 505 or permission.

564 Electrical Noise II (3)

SHIMADA

Noise in vacuum tubes, semiconductors; noise suppression, excess noise. Noise in transistors, mixers, detectors, parametric amplifiers, electron beam devices, masers, and other low noise devices. Prerequisite, 563.

566 Microwave Measurements (2)

HARRISON

Measurements of wave length, admittance, power, dielectric constant, and losses in the microwave frequency region utilizing wave guide techniques. Problems in impedance matching and impedance transformation based on laboratory work. Includes one 3-hour laboratory per week. Prerequisites, 323 and 365.

567 Microwave Vacuum Tubes (4)

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. Prerequisite, 566 or permission.

568 Microwave Electronics (3)

GOLDE

A selection of topics applicable to the study of microwave tubes. Formation and focusing of electron beams. Application of various the-



ories to the interaction of electron beams with electromagnetic fields. Prerequisite, 469.

570 Antenna Theory (3)

REYNOLDS, SWARM

Theory of radiation; impedance characteristics and radiation patterns of thin linear antenna elements; properties of synthesis of antenna arrays; field intensity calculations. Prerequisite, 469.

572 Microwave Network Theory (4)

ISHIMARU

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. Prerequisites, 323 and 469.

574 Microwave Antennas (4)

ISHIMARU

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; corequisite, Mathematics 429 or permission.

575 Microwave Propagation (4)

ISHIMARU

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)

LYTLE

Mathematical theory of communication. Information theory for discrete and continuous systems. Channel capacity and coding. Prerequisite, 505 or permission.

577 Communication Theory II (3)

LYTLE

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, 576 or permission.

578 Radio Propagation I (3)

SWARM

Theory of electromagnetic propagation over a finite conductive earth and in a horizontally stratified media; theory of scattering with applications to the troposphere. Prerequisite, 469.

579 Radio Propagation II (3)

SWARM

Theory of electromagnetic propagation in ionized medium with application to the ionosphere. Theory of ionospheric scattering, meteor reflection, and auroral propagation. Prerequisite, 469.

580 Electroacoustics (4)

ROGERS, HILL

Vibration of strings, bars, and membranes; acoustical wave equation and solutions; electric, acoustic, and mechanical analogies; 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)

CLARK

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)

LINDSEY, 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)

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, 441, 545 or equivalent, and Mathematics 427.

585 Sampled-Data Control System II (4)

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 Electrical Computing Methods (4)

JOHNSON

Theory and practice of number systems, logical analysis, digital computer organization. Generalized and specific digital computer programming. Numerical techniques. Use of computation facilities of Computer Research Laboratory. Prerequisite, graduate standing.

587 Applications of Digital Computers to Engineering Problems (4)

JOHNSON

Evaluation and application of numerical methods in solution of typical engineering problems. Stochastic methods, statistical analysis, error analysis, limitations of specific computers. Prerequisites, 505, 586.

588 Logical Design of Digital Computers I (3)

JOHNSON

Circuit components and binary numbers, Boolean algebra and the simplification of Boolean functions. Memory element input and application equations. Digital computer memories, computer arithmetic units, control units. Computer design organization. Prerequisite, graduate standing.

589 Logical Design of Digital Computers II (3)

JOHNSON

Analysis and synthesis of digital systems from logical models, sequential and time independent logic, Boolean matrix analysis, "nand" and "nor" logic. Evaluation of various analysis and synthesis methods in application to logical problems. Prerequisite, 588.

599 Selected Topics in Electrical Engineering (*)

Prerequisite, permission of Department chairman.

600 Research (*)

Prerequisite, permission of Department chairman.

700 Thesis (*)

Prerequisite, permission of supervisor.

HUMANISTIC-SOCIAL STUDIES

Courses for Undergraduates

265 Techniques of Communication (3)

LEAHY, TRIMBLE

Organization, development, and expression of ideas. Prerequisite, passing of tests.

270 Engineering Report Writing (2)

MISE, SOUTHER, TRIMBLE

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)

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)

SKEELS, WHITE

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)

BOTTING, HUNNER, 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)

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.

491, 492, 493 Literary Heritage of the Western World I, II, III (3,3,3)

HUNNER, LEAHY, SKEELS, WHITE

The nature of literature and its role in culture, studied in an 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.

INDUSTRIAL ENGINEERING

For a description of courses required in this curriculum, see under *College of Engineering* section.

MECHANICAL ENGINEERING

Courses for Undergraduates

201 Metal Casting (1)

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)

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)

ANDERSON

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)

DRUI, 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)

CRAIN, EMERY, GALLE

A laboratory course emphasizing measurements, interpretation of instrument readings, and analysis of errors. Special topics such as themometry, piezometry, and dynamometry. Study of basic mechanical engineering equipment. Prerequisite, sophomore standing in engineering.

260 Mechanism (3)

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 103 and Mathematics 125.

263 Mechanical Systems (3)

BALISE, MILLS, MORRISON

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)

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)

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)

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)

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 (5)

COSTELLO, GALLE, NORDQUIST

A study of the basic thermodynamic laws covering the relationships between heat en-

ergy and work, with particular emphasis on the application of these laws to engineering problems. Prerequisite, 222.

321 Thermodynamics II (5)

COSTELLO, GALLE, NORDQUIST

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)

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)

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)

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)

DAY, FORD, MILLS, 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. Prerequisites, Materials Engineering 250, 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)

BROWNE, CRAIN, KIELING, MORRISON

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)**

BALISE, MORRISON, NORDQUIST, 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.

403 Tool Design (3)

The study and design of specialized tooling from the standpoint of economical manufacture. Fundamental concepts of the press working of metals, of jigs and fixtures, and of production measuring tools. Application of these concepts to the design of production tools. Lecture and laboratory. Prerequisites, 306, 340.

410 Engineering Administration (3)

FORD

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)

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)

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)

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)

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)

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)

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)

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.

424 Power Plants (5)

NORDQUIST, WAIBLER

The application of the elements of thermodynamics, heat transfer, and fluid mechanics to the analysis and design of steam power station components. Prerequisite, senior standing in mechanical engineering or permission.

425 Air Conditioning (3)

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)

CHILDS, DEPEW, EMERY, MCFERON, 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)

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)

CHILDS, COSTELLO, FIREY, 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)

CHILDS, COSTELLO

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)

COSTELLO, 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)

FIREY, MILLS, MORRISON

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)

BALISE, GALLE

Theory and practice of industrial process control; effects of system parameters on difficulty of control; modes of control; analysis of pneumatic components; advantages and limitation of equipment. Lecture and laboratory. Prerequisite, senior standing in engineering or permission.

443 Instrumentation (3)

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)

DAY, 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)

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)

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)

DAY, MORRISON, KIELING

Current topics in engineering design. Projects in the design of major mechanical systems. Prerequisites, 362, 367.

469 Introduction to Advanced Dynamics (3)

BALISE, KOBAYASHI, MORRISON, 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)

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, in-form and performance characteristics of typical engines. Prerequisite, 321.

482 Internal Combustion Engine Laboratory (3)

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.

483 Internal Combustion Engine Design (3)

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)

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)

BARTLETT

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)

BARTLETT

Theory of naval architecture; arrangements, strength, A.B.S. rules, construction, weights. Prerequisite, 490.

492 Naval Architecture

BARTLETT

Launching, resistance, powering, steering, and model testing. Prerequisite, 491.

499 Special Projects (2-5, max. 6)**Courses for Graduates Only****516 Statistical Analysis of Engineering Measurements (3)**

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)**

CHILDS, COSTELLO, 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)

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)

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.

526 Air Conditioning (3)

Study at the graduate level of heat-transfer aspects of air-conditioning problems; special problems in humidifying and dehumidifying; automatic control and zoning; noise and vibration control; laboratory and field tests of air-conditioning installations. Prerequisites, 425 and graduate standing or permission.

529 Advanced Refrigeration (3)

Review of basic cycles and equipment, cold storage practice, refrigeration in food manufacture and distribution, industrial applications, frozen foods and other low temperature applications, capital and operating cost studies, and design problems. Prerequisites, 428 and graduate standing in mechanical engineering or permission.

530 Radiative Heat Transfer (3)

DEPEW, MCFERON

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.

531 Conductive Heat Transfer (3)

COSTELLO, MCFERON, WAIBLER

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.

532 Convective Heat Transfer (3)

CHILDS, 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.

533 Gas Dynamics II (3)

CHILDS, COSTELLO, EMERY

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)

COSTELLO, DEPEW, MCFERON, 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. Prerequisites, 530 and 532 or permission.

536 Gas Dynamics III (3)

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)

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. Prerequisite, 533 or permission.

538 Turbulent Boundary Layer Theory (3)

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.

**541 Advanced Engineering Materials (3)**

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)

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)

BALISE

Concepts in addition to feedback that are important in automatic production, including automatic data processing, computers, numerical control of machine tools, and integrated manufacturing systems. Prerequisite, graduate standing in mechanical engineering or permission.

549 Fluid Power Control (3)

BALISE

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.

551 Applied Elasticity (3)

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)

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)

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)

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.

555 Thermoelasticity (3)

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.

556 Experimental Stress Analysis (3)

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)

DAY

Study of structural similitude, dimensional analysis, and brittle models as they apply to experimental stress analysis. Use of nomographs 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)

DAY

Seminar and individual research on special problems in experimental stress analysis. Prerequisite, 557 or permission.

564 Mechanical Engineering Analysis (3)

BALISE

Application of complex variable theory and vector analysis to various fields in mechanical engineering: analogs in heat transfer, fluid flow, stress distribution, dynamics, and feedback control systems. Prerequisite, graduate standing in mechanical engineering or permission.

565 Mechanical Systems Analysis (3)

BALISE

Analytical methods for identifying characteristics of nonlinear and distributed systems, and random inputs; analogs for mathematically related mechanical engineering systems, emphasizing aspects applicable to servomechanisms. Prerequisite, 564 or permission.

567 Advanced Dynamics (3)

KOBAYASHI, SHERRER

Dynamics of particles and of rigid bodies, with emphasis upon applications involving ma-

chine 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)

KOBAYASHI, MILLS, 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)

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)

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, 565 or 571 or permission.

581 Magneto-Gasdynamics (3)

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. Prerequisite, 537 or permission.

584 Gas Turbines (3)

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)

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)

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.

592 Impact (3)

SHERRER

Theory and physical behavior of colliding solids. Study of stereomechanical impact; vi-

brational aspects of impact; contact phenomena occurring in tool design, explosions, vehicle accidents, etc. Prerequisites, 551 and 568 or permission.

599 Special Projects (1-5, max. 9)

Prerequisite, permission of Graduate Program Adviser.

600 Research (*)

Prerequisite, permission of Graduate Program Adviser.

700 Theses (*)

MINERAL ENGINEERING

MATERIALS ENGINEERING

Courses for Undergraduates

250 Fundamentals of Materials Science (4)

POLONIS, ARCHBOLD, TOOP, FLANAGAN

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)

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)

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)

MUELLER

Theory and application of X-ray diffraction and spectroscopic techniques to the study of materials. Prerequisite, 250 or equivalent.

481 Mineral Industry Economics (3)

PIFER

World mineral resources, their distribution, utilization, and depletion; social, economic, and political effects; international control and trade, industrial organization, government policies, taxation, tariffs; markets and prices; elements of costs in production. Prerequisites, Economics 211 and upper-division standing.

Courses for Graduates Only

512 X-ray Diffraction Analysis I (3)

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)

FLANAGAN

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.

N520 Engineering Materials Science Colloquium (0)

Discussion of theoretical and fundamental aspects of engineering materials. (Not offered 1964-65.)

CERAMIC ENGINEERING

Courses for Undergraduates

201 Introduction to Ceramics (1)

Scope of ceramic materials and ceramic industries; use of ceramics as engineering materials; economic importance.

202 Ceramic Raw Materials (3)

MUELLER

Natural and synthetic materials used in ceramic products; their mineralogy, physical properties, compositions, and sources.

203 Ceramic Measurements (3)

CAMPBELL

Theory and methods used in measuring properties of ceramic materials; control of ceramic processes.

306 Ceramic Engineering Excursion (1)

Plant inspection trip; junior year.

N307 Ceramic Engineering Excursion (0)

Plant inspection trip; senior year.

312 Physical Ceramics: Structure and Rheology (5)

SHEVLIN

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)

Equilibrium diagrams and their applications to ceramic research and control problems. Prerequisite, 312 or permission.

315 Vitreous State (4)

Chemistry and physics of glass, glazes, and porcelain enamels; structure and properties of vitreous materials. Prerequisite, 312 or permission.

401 Process Ceramics: Drying and Firing (4)

CAMPBELL

Drying: evaporation; fluid flow through particles; solid-liquid system structure; heat and humidity requirements; air circulation; time relationships; methods. Firing: time-temperature concepts; reaction rates and physical-chemical changes; type of reactions; firing techniques; heat requirements.

402-403 Equipment and Plant Design (2-2)

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)

Derivation of phase equilibrium relations in ceramics; studies of crystalline solutions and analytical treatment of multicomponent phase equilibrium systems. Prerequisite, 314. (Not offered 1964-65.)

421 Ceramic Bodies Laboratory (3)

SHEVLIN

Quantitative determination of physical properties of ceramic bodies; study of the effects of variables in composition, forming, and firing. Prerequisite, 401.

422 Ceramic Petrography (3)

BRIEN

Polarizing microscope study of natural and artificial minerals peculiar to the ceramic industry.

440 Glass Technology (3)

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)

450 Pyroprocessing of Nonmetallics (3)

BAUER

Composition; reactions; plant control; grinding and burning; manufacture; chemistry and physics of processes. Prerequisites, junior standing and permission.

460 Ceramic-Metal Systems (3)

SHEVLIN

Vitreous and crystalline coatings for metals; ceramic-metal composites. Prerequisite, junior standing.

**470 Refractories (3)**

MUELLER

Physical and chemical composition; properties under service conditions; testing; utilization.

499 Special Projects (*, max. 5)

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)**

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)

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)

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)

SHEVLIN

Multiphase high temperature reactions; phase equilibria involving gas, liquid, and solid phases; material balance interpretation; kinetics as related to equilibrium; surface phenomena.

513 Advanced Physical Ceramics III (3)

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.

520 Seminar (1, max. 6)

Required for all graduate students.

521 Mechanical Behavior of Ceramics (3)

SHEVLIN

Internal stresses; composites in terms of ceramic constituents; theory of glass, adherence to ceramic and metal surfaces; deformations and fracture. Prerequisite, 511 or permission.

522 Transducer Ceramics (3)

CAMPBELL

Principles and theory of conductive, ferromagnetic, ferroelectric, piezoelectric, thermoelectric, and electroluminescent materials. Prerequisite, 512 or permission. (Not offered 1964-65.)

523 Solid-State Ceramics (3)

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. (Not offered 1964-65.)

590 Industrial Minerals Research (*)**599 Special Topics in Ceramics (*)****600 Research (*)**

Prerequisite, permission of director.

700 Thesis (*)**METALLURGICAL ENGINEERING****Courses for Undergraduates****203 Chemical Metallurgy: Introduction (2)**

TOOP, BRIEN

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)

TOOP

Basic physico-chemical 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)

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)

Plant inspection trip; junior and senior years.

321 Principles of Chemical Metallurgy II (2)

TOOP

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)

ARCHBOLD

The quantitative application of thermodynamics in fluids of interest to metallurgists: metals, slags, and gases; and to refractories. A detailed review of thermodynamic quantities and equations of state. Prerequisites, 361, Chemistry 351.

324 Chemical Metallurgy Laboratory (1)

TOOP

Experimental methods in metallurgy adapted from physical chemistry. Prerequisites, 203, Chemistry 356 or taken concurrently.

361 Structure of Solids I (4)

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 II (4)

FLANAGAN

Development of the principles covered in Metallurgical Engineering 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)

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)

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)

Calculations in the physical chemistry aspects of chemical metallurgy.

424 Metallurgical Experimental Techniques (2)

FLANAGAN

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)

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)

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. (Not offered 1964-65.)

460 Deformation of Metals (3)

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)

TOOP

Advanced ternary diagrams; corrosion and oxidation; intermetallic phases. Prerequisite, 363.

464 Applied Physical Metallurgy (3)

FLANAGAN

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)

FLANAGAN

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)

499 Special Projects (*, max. 5)

Laboratory investigation of a metallurgical problem on an independent basis. Total of 5 credits required.

Courses for Graduates Only

520 Seminar (1, max. 6)

Review of research problems and recent literature. Required for all graduate students.

525 Thermodynamic Topics in Metallurgy (3)

TOOP

Selected topics in application of classical and statistical thermodynamics to systems of current metallurgical interest. Prerequisite, 422.

531 Advanced Metallurgy (*)

Study of selected problems, with particular attention to recent publications and scientific applications in physical or extractive metallurgy.

541 Theoretical Structural Metallurgy I (3)

FLANAGAN

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)

POLONIS

Structure of liquid metals; thermodynamics and kinetics of vapor-solid and liquid-solid transformations; metal crystal growth from vapors and aqueous solutions; detailed consideration of solidification including single crystal growth, substructure, segregation phenomena, and zone melting; interface and internal boundaries. Prerequisite, 541.

543 Theoretical Structural Metallurgy III (3)

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)

FLANAGAN

Prerequisite, 363 or equivalent.

561 Phase Transformations in Solid Metals I (3)

POLONIS

An advanced treatment of phase transformations from the standpoint of crystallography, and thermodynamics. Prerequisite, 363.

562 Phase Transformations in Solid Metals II (3)

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)

ARCHBOLD

Theory of diffusion; application of diffusion theory to solid state reactions; thermodynamics of irreversible processes. Prerequisite, 561.

566 Advanced Theory of Metals (3)

FLANAGAN

Modern theories of the metallic state and their relationship to the physical properties of metals. Prerequisite, 466.

599 Special Topics in Metallurgy (*)

FLANAGAN, TOOP

600 Research (*)

Prerequisite, permission of director.

700 Thesis (*)

MINING ENGINEERING

Courses for Undergraduates

221 Explosives and Rock Drilling (2)

ANDERSON

Principles of rock breaking and characteristics of explosives. Theory of fragmentation; design of blast and explosive loading patterns; safe practices, and elements of costs. Applications in tunneling and surface work.

306 Mine Excursion (1, max. 2)

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)

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. Prerequisite, 221 or permission.

325 Mineral Land Valuation (2)

ANDERSON

Sampling methods in mines and placers; drill hole and coring methods; geological aspects; estimation of deposits and reserves; metallic and nonmetallic depletion and financial calculations; reports. Prerequisite, 322.

330 Mine Surveying (2)

ANDERSON

Practice in underground methods, use of special instruments, stope measurements, underground curves, shaft surveying, solar observations, and carrying of meridian underground. Prerequisite, General Engineering 121.

**331 Mine Mapping (1)**

ANDERSON

Plotting of underground field notes to complete a mine control map; production of working and geological maps and sections. Prerequisite, 330.

425 Rock Mechanics (2)

PIFER

Physical properties of rocks; stress around underground openings; behavior of rocks under stress; design of underground openings; measurement of stress in mines; introduction to barodynamics. Prerequisites, 322 and Civil Engineering 292 or permission.

426 Exploration and Development of Mineral Deposits (3)

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. Prerequisite, Geology 487 or permission.

427 Exploration Geophysics: Introduction (2)

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)

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)

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.

463 Mineral Processing: Flotation (3)

BRIEN

Flotation theory and practice. Applied surface chemistry, adsorption, surface tension, theory of flocculation and dispersion and related fundamentals. Laboratory problems designed to illustrate basic chemical and physical phenomena; practical testing and investigation of flotation variables. Prerequisite, Materials Engineering 351.

464 Mineral Processing: Hydrometallurgy (4)

BRIEN

Physical-chemical principles of solution processes; acid, carbonate, ammonia leaching, cyanidation and related processes. Funda-

mental theory applied to effects of pressure, temperature, diffusion rates, pyrometallurgical pretreatment, activities, oxidation and reducing conditions, impurities, contact time, interphase areas, and associated variables. Principles of ion exchange and solvent extraction; their application to hydrometallurgical processes. Laboratory experiments illustrate application of basic principles and demonstrate testing techniques. Prerequisites, Materials Engineering 250, Chemistry 170.

465 Opaque Minerals Microscopy (2)

BRIEN

Elements of quantitative mineragraphy, micro-chemistry, and mineral association and liberation studies of polished ore sections and mounted mill products; grain-count studies of mineral processing products. Prerequisites, Materials Engineering 250, 351.

466 Mineral Processing Practices (2)

BRIEN

Methods of laboratory investigation; advanced quantitative mineragraphy and research; plant operations. Prerequisites, 463 and 465.

467 Mineral Process Plant Design (2)

BRIEN

General arrangement planning and design calculations for beneficiation plants on a project basis. Prerequisites, 463, 465.

476 Coal Preparation (2)

BRIEN

Dry and wet cleaning processes; washability characteristics; control by float-and-sink methods; characteristics of coal and associated impurities; economics of preparation; market requirements. Prerequisite, Materials Engineering 351. (Not offered 1964-65.)

483 Mining Laws (1)

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)

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)**

Lectures and discussions; review of research problems and recent literature. Required for all graduate students.

521 Metal Mining (*)

ANDERSON, PIFER

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)

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 (*)

PIFER

Studies in mining, with particular reference to mechanization. Prerequisite, graduate standing.

525 Rock Mechanics (3)

PIFER

Physical characteristics and mechanics of response by rocks under stress; theories of stress distribution around underground structures; application of theory and practical application to mine design and operation sequence; rock fragmentation; methods of experimental investigation. Prerequisite, 425.

560 Topics in Advanced Mineral Processing (*)

BRIEN

Special problems in preparation and concentration of minerals. Problems of current interest and the application of physical and surface chemical fundamentals in investigative research.

561 Advanced Mineral Processing Theory I (3)

BRIEN

Thermodynamics and electrochemistry of surfaces. Potential differences across interfaces; electrical double layer, surface tension; Gibbs adsorption equation in three-phase flotation systems; anionic and cationic selectivity.

562 Advanced Mineral Processing Laboratory (*)

BRIEN

Experimental study of theoretical principles of preparation and concentration. Arranged concurrently with 561 and 563, or as required.

563 Advanced Mineral Processing Theory II (3)

BRIEN

Rate controlling processes in hydrometallurgical separations. Magnetic and electrostatic fundamentals in concentration. Movement of solids in solid-liquid suspensions. Comminution of solids.

564 Advanced Mineral Processing Design (*)

BRIEN

Plant design studies and discussions of systems of current interest. Subjects may change from year to year.

571 Cooperative Research with United States Bureau of Mines (6)

PIFER

600 Research (*)

Prerequisite, permission of director.

700 Thesis (*)

ENGINEERING MECHANICS

For a description of courses required in this curriculum, see under *College of Engineering* section.

NUCLEAR ENGINEERING

444 Nuclear Materials (4)

POLONIS

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)

POLONIS

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, Materials Engineering 442 or 444 or permission.

484 Introduction to Nuclear Engineering (4)

BABB

An introductory course in nuclear engineering for seniors, graduate students, and practicing engineers. The course covers 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 221.

485 Nuclear Instruments (3)

WILSON

A lecture and laboratory course devoted to the basic design and operation of the instruments used in nuclear engineering, such as badges, dosimeters, Geiger counters, proportional counters, survey meters, scalars, radiation monitors, scintillation spectrometers, etc. Experiments will demonstrate the characteristics of nuclear instruments and associated circuitry. The operating characteristics of the 10-kw nuclear reactor will also be demonstrated. Safety practices will be emphasized throughout the course. Prerequisite, 484 or permission.

486 Nuclear Power Plants (3)

MC FERON

Study of the design, construction, operation, and maintenance of different types of nuclear power plants. Characteristics of various kinds of reactors as related to the heat-power cycle. Heat transfer problems. Engineering management of nuclear power plants. Prerequisite, senior standing in engineering or permission.

487 Tracer Techniques in Engineering Measurements (3)

FIREY

A combined lecture and laboratory course demonstrating the use of radioactive materials for various engineering measurements, including mechanical wear, fluid flow, and thickness. Particular laboratory experiments will measure engine wear, engine deposits, and engine oil consumption. Prerequisite, senior standing in engineering or permission.

500, 501 Nuclear Reactor Theory (4,3)

GARLID, ALBRECHT

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 225, or permission. Equivalent of Mathematics 428 recommended.

505 Nuclear Engineering Laboratory I (3)

GARLID

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 first part is devoted to the determination of reactor parameters including diffusion length, Fermi age, material buckling, effective pile size, and lattice parameters. The second part involves analog computer studies of reactor dynamics. (Formerly 501.) Prerequisite, 500, or permission.

506 Nuclear Engineering Laboratory II (5)

BABB

An advanced laboratory course centered around the UW nuclear reactor. The first part is devoted to nuclear reactor characteristics including calibrations, reactivity effects, power measurements, and critical mass determination. The second part emphasizes utilization of research techniques in selected experiments involving 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, and time-of-flight equipment. (Formerly 502.) Prerequisite, 505 or permission.

510 Nuclear Reactor Engineering (3)

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.

N521, N522, 523 Graduate Seminar (0,0,1)

512 Nuclear Reactor Design (3)

MC FERON

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. (Formerly 539.) Prerequisite, 510.

524 Seminar in Nuclear Systems Analysis (1-2, max. 12)

Studies of recent advances in nuclear systems analysis with students and faculty reporting on recent research and publications. Only open to students having the master's degree or equivalent.

550 Neutron Transport Theory (3)

GARLID, ALBRECHT

A lecture course in which detailed consideration is given to neutron migration and slowing down in a variety of media and the validity of and basis for approximations currently in use. Prerequisite, 501.

559 Control of Radioactive Wastes (3)

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)

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)

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.

588J Nuclear Chemical Separations Processes (3)

BABB

Application 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 Chemical Engineering. Prerequisites, 484, Chemical Engineering 530, 562, or permission.

599 Special Topics in Nuclear Engineering (*)

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—Dr. Albert L. Babb.

700 Thesis (*)

Prerequisite, permission—Dr. Albert L. Babb.



COLLEGE OF FISHERIES

FISHERIES

Courses for Undergraduates

101 Development of Fisheries Science (5)

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.

301 Anatomy of Fishes (5)

WELANDER

Survey of morphology and bodily functions of fishes. Prerequisite, Zoology 112.

302 Microbiology of Fisheries (5)

LISTON

Bacteria, yeasts, mold, and protozoans associated with fish; their characteristics and importance in the fisheries. Prerequisite, Zoology 111.

303 Introduction to Invertebrate Fisheries (5)

SPARKS

Taxonomy, morphology, and phylogeny of the invertebrate groups of importance to fisheries. Prerequisite, permission.

310 Living Resources of the Seas, Lakes and Streams

Fishes of the Pacific area; life histories; fisheries; local, national, and international approaches to conservation. Prerequisite, 10 credits in biology or 15 credits in science, or permission.

402 Economically Important Fishes (5)

WELANDER

Survey of the system of fish classification; distribution of fishes. Prerequisite, 301.

405 Economically Important Mollusca (5)

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)

SPARKS

Classifications, life histories, distribution, methods of capture, and economic importance of crabs, shrimps, lobsters, crayfish, and the smaller crustacea. Prerequisite, Zoology 112.

425 Migrations and Races of Fishes (5)

DELACY

Marking and other methods of determining migrations of fishes and homogeneity of fish populations; implications of these factors in

the management of both freshwater and marine fisheries. Prerequisite, 402.

426 Early Life History of Marine Fishes (5)

DELACY

Reproduction, larval, post-larval life of economically important marine fishes; dispersion and survival rates; implications in management of food fisheries; research methods in this field. Prerequisite, 402.

427 Ecology of Marine Fishes (5)

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, 402.

440 Applications of Digital Computers to Biological Problems (2)

Methods and procedures for processing biological data by means of digital computers. Problem analysis, elementary programming, use of package programs for statistical analysis. Prerequisite, Mathematics 382 or permission.

451 Propagation of Salmonoid Fishes (5)

DONALDSON

Natural propagation; methods of hatching and rearing; collection and incubation of salmon eggs; design, structure, and maintenance of hatcheries, pond systems, and aquaria. Prerequisites, 402 and 10 credits in chemistry.

452 Nutrition of Fishes (5)

DONALDSON

Feeding and efficiency of diets; food costs and supplies; basic nutritional requirements of fish; nutritional diseases of fish. Prerequisites, 402 and 10 credits in chemistry.

453 Freshwater Fisheries Management: Biological (5)

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.

454 Communicable Diseases of Fishes (5)

SPARKS

Organisms causing diseases in fishes; prevention and known treatments of fish diseases. Prerequisites, 402 and Microbiology 301 or Fisheries 302.

460 Water Management and Fish Resources (5)

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, 402, Mathematics 105, and physics, or permission.

461 Water Management and Fish Resources (5)

M. C. BELL

Design of fish protective facilities and actual use of hydraulic turbines and spillways at dams; calibration of nets, etc. Prerequisite, 460 or permission.

465 Problems in Fish Biology (6)

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)

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)

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)

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.

480 Introduction to Commercial Fishing Industry (5)

F. H. BELL

Lectures, demonstrations, and trips conducted by qualified persons from the industry. Commercial fishing operations, marketing, processing, reduction, organization, and labor relations are discussed and observed. Prerequisite, 15 credits in chemistry.

495 Introduction to Fisheries and Food Science Literature (2, max. 6)

Directed training in searching bibliographic sources. Prerequisite, 15 credits in fisheries.

499 Undergraduate Research (1-3, max. 9)

Individual research within the College of Fisheries or on-the-job training in governmental or industrial fisheries organizations. Prerequisite, permission.

FOOD SCIENCE

Courses for Undergraduates

320 Space Biology: Sealed Life-Support Systems (3)

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.

481 Introduction to Food Technology (5) LISTON

Chemical and biological properties of foods; principles of processing, storage, distribution, and spoilage. Prerequisite, permission.

482 Food Analysis I (3) DOLLAR

Proximate analysis of foods by physical and chemical methods. Prerequisite, Biochemistry 483 or permission.

483 Food Analysis II (3) 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) DOLLAR, LISTON

Unprocessed foods, their composition, nutritional availability, associated microorganisms, storage, and distribution. Prerequisite, 481 or permission.

485 Principles of Food Processing II (5) DOLLAR, LISTON

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)

Biochemical, microbiological, physical, and chemical changes occurring in foods. Prerequisites, 483, 485 or permission.

487 Food Analysis III (3) DOLLAR, LISTON

Quality assessment of foods including spoilage methods, rancidity methods, organoleptic, and microbiological methods. Prerequisite, 483.

498 Undergraduate Thesis (2, max. 6) Prerequisite, permission.

FISHERIES

Courses for Graduates Only

501 On-the-Job Training (1-3, max. 3 for M.S., 9 for Ph.D.)

Guided on-the-job training in governmental or industrial fisheries organizations. Prerequisite, permission.

503 Systematic Ichthyology (5) WELANDER

Principles and procedures of ichthyological taxonomy demonstrated by current problems

and research. Prerequisites, 402 and permission.

505 Research Techniques in Shellfish Biology (5) SPARKS

A field and laboratory course dealing with research methods in the reproduction, growth, and mortality of oysters and clams.

507 Topics in Fish Ecology (1-5, max. 15)

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) 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) FIELDS

Prerequisite, 510 or concurrent registration in 510.

520 Graduate Seminar (2, max. 6)

Training in methods of searching fisheries literature.

530 Biological Problems in Water Pollution (3)

Biological and ecological changes in the aquatic environment resulting from domestic, industrial, radioactive, and agricultural wastes and methods for their evaluation. Prerequisite, permission.

556 Introduction to Quantitative Population Dynamics (5) 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) 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) 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.

604 Research (*, max. 3 for M.S., 10 for Ph.D.)

700 Thesis (*)

FOOD SCIENCE

Courses for Graduates Only

504 Principles of Technological Research in Fisheries and Food (3) LISTON

A lecture and laboratory course designed to familiarize graduate students with the methods used in technological research. Prerequisite, permission.

604 Problems in Food Science (*, max. 3 for M.S., 10 for Ph.D.)

700 Thesis (*)

COLLEGE OF FORESTRY

Courses for Undergraduates

101, 102, 103 Development of Forestry (1,1,1) SCHAEFFER

History of forestry and its present status in the United States. Orientation course required of all freshman forestry students; not open to others.

120 Introduction to Forest Ecology (5) SCOTT

An elementary study of the ecology of forest communities. Particular emphasis on field investigations of succession and development as related to different environments. (Offered Summer Quarter only at Pack Forest.)

140 Forest Surveying (5)

Plane surveying with special emphasis on forest topographic mapping, including establishment of ground control through the use of the compass, Abney level, transit, level, steel tape, trailer chain, and tape and pacing. Prerequisite, General Engineering 121. (Offered Summer Quarter only at Pack Forest.)

160 Elementary Forest Mensuration (5) TURNBULL

The analysis and interpretation of forestry data through the use of statistical methods; fundamentals of forest measurements. Prerequisite, Mathematics 105.

161 Field Problems in Forest Mensuration (5) TURNBULL

Field problems, including tree and timber stand measurement, site, tree form, and volume tables, timber cruising methods, log scaling, forest mapping, and growth investigations. Prerequisites, 160, General Engineering 101, 121, and Mathematics 156. (Offered Summer Quarter only at Pack Forest.)

**202, 203 Dendrology (3,3)**

BROCKMAN

Identification, classification, and distribution of the trees of North America. Prerequisite, Botany 114.

204 Dendrology (5)

BROCKMAN

Identification, classification, and distribution of trees of North America. Prerequisite, Botany 111.

206 Wood Technology (4)

ERICKSON, LENEY

The identification, uses, and basic physical and chemical properties of domestic and some foreign woods; natural moisture in wood; the effect of moisture changes on shrinking and swelling; calculations of moisture content, specific gravity, and dimensional change. Prerequisites, 202, Botany 112, 10 credits in chemistry, and Physics 101 and 107.

210 Elementary Forest Soils (3)

GESSEL

Rocks and minerals as parent materials for soils; relation of soils to geology and physiography; physical properties of soils. One Saturday field trip required.

240 General Logging (2)

PEARCE

Regional logging methods in the United States with emphasis on those used in the Pacific Northwest. Prerequisite, 202.

260 Forest Mensuration (5)

TURNBULL

Theory of log rules, volume tables, and yield tables. Measurement, computations, and analysis of tree and timber stand volume, structure, increment, and yield. Prerequisite, 161.

273 Major Forest Industries (4)

THOMAS

Fundamentals of processing and distributing the primary forest products; role of major forest industries in the economic structure of the Pacific Northwest.

301 Survey of Forestry (3)

BROCKMAN

History of the development of forestry, its aims and objectives; interrelationship between forestry and other phases of land use. For nonmajors.

307 Wood Structure (3)

LENEY

Microscopic study of the structural features of wood. Identification of wood and wood fibers by microscopic methods. Prerequisite or concurrently, 206, Botany 216.

310 General Forest Soils (5)

GESSEL

Study of chemical, biological, and morphological characteristics, and a laboratory study of physical properties, of forest soils. Consideration of soil properties important to tree

growth. Introduction to soil development and classification. Prerequisites, 210, Botany 216.

320 Elements of Silviculture (3)

SCOTT

The fundamentals of silvics and silviculture. Emphasis is placed on methods of controlling wood quality and quantity through silvicultural practice. For forest products students only. Prerequisites, 210, 260, Botany 216.

321 Silvics (3)

SCOTT, STETTLER

A study of forest ecology and the silvicultural characteristics of forest trees. Includes environmental factors, forest influences, the establishment, development, and general characteristics of trees and stands. Prerequisites, 120, 310, Botany 216.

322 Silvicultural Methods (3)

SCOTT

The theory and technique of applying silvical knowledge in controlling establishment, composition, and growth of forest stands. Includes reproduction methods, intermediate cuttings, and techniques for controlling cutting. Prerequisites, 260, 321.

350 Wildlife Management (3)

BROCKMAN

Interrelations between forests and wildlife; life histories and habits of animals involved. Prerequisites, junior standing and permission.

353 Range Management

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. (Offered alternate years; offered 1964-65.)

356 Forest Recreation (3)

BROCKMAN

Recreational needs, values, resources, and objectives; planning and development of outdoor recreational resources. Prerequisites, 101 or 301, junior standing, and permission.

370 Wood Preservation (3)

ERICKSON

Wood-destroying agencies; semicolor classification and manner of attack. Theory of preservation; the important preservatives; pressure and nonpressure treating processes. Fire-retardant treatments, coatings and impregnation. Prerequisite, 307.

371 Wood Preservation Laboratory (2)

ERICKSON

Evaluation of preservatives; analysis of preservatives; specifications for treated wood products; testing and inspection. Field trips to nearby commercial treating plants. Must be preceded or accompanied by 370.

372 Seasoning and Preservation (2)

LENEY

The elementary principles and practices of drying and treating wood with major emphasis

on methods of air seasoning and nonpressure treating of wood suitable for home use and small-scale operations. Prerequisite, 206.

380 Lumber Grading (2)

THOMAS

The principles of lumber grading and grade use with emphasis on softwood lumber grades. Hardwood and shingle grades included. Regular field trips. Prerequisites, 206, 273, 403 or 404.

401 Safety Practices in Forest Industries (2)

PEARCE

Accident costs and frequency rates; accident investigations; safety inspection; safety organization and program. Prerequisite, senior standing or permission.

403 Timber Physics (3)

BRYANT

The mechanical properties of wood; factors which affect its strength characteristics; introduction to graphic analysis of design problems; simple beam design. For forest management students only. Prerequisites, 160, 206, Mathematics 124, and Physics 101 and 107.

404 Timber Physics (5)

BRYANT

The mechanical properties of wood; factors which affect its strength characteristics; graphic analysis of design problems; beam design; timber testing. Prerequisites, 160, 206, Mathematics 124, and Physics 101 and 107.

406 Microtechnique (3)

LENEY

The technique of preparing, sectioning, staining, and mounting woody tissues and fibers for microscopic study. Prerequisite, 307 or permission.

407 Forest Economics (2)

DOWDLE

A survey of the field of forest economics. Application of economic principles to forestry; economics of forest production and stumpage appraisal techniques. For forest products majors. Prerequisite, Economics 211.

408 Forest Economics (5)

DOWDLE

Position of forests in the economic structure; cost of growing timber; valuation of land for forest production; stumpage appraisal techniques; problems of forest taxation. Prerequisite, Economics 211.

409 Forest Policy and Administration (3)

MARCKWORTH

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. Prerequisite, senior standing.

- 410 Advanced Forest Soils (3)**
GESSEL
A laboratory study of physical, chemical, and biological properties of forest soils. Prerequisites, 310 and permission.
- 423 Application of Silvicultural Methods (3)**
SCOTT
A study of the application of silvicultural methods to the important forest species, types, and regions of North America. Prerequisites, 202, 203, 322.
- 424 Advanced Silviculture (3)**
SCOTT
A detailed discussion of special problems or subjects in silviculture of interest to advanced students. Prerequisite, permission.
- 430 Advanced Forest Fire Control (3)**
SCHAEFFER
Presuppression; suppression; training methods; analysis of protection facilities; proper methods of slash disposal and hazard removal; fire behavior; organization for large fires.
- 435 Forest Entomology (4)**
HEIKKENEN
Characteristics, life histories, ecological relations, prevention and control of forest insects. Prerequisites, Zoology 204, Forestry 321.
- 436 Advanced Forest Entomology (4)**
HEIKKENEN
Host-insect interactions, approaches to forest insect problems, research technique, and pertinent forest entomological literature. Prerequisite, 435 or permission.
- 437 Forest Entomology Seminar (3)**
HEIKKENEN
Advance study of animal-plant interactions in the forest environment. Emphasis on individual search and interpretation of original research. Prerequisite, 435 or permission.
- 440 Construction (4)**
STENZEL
Design and construction of forest roads; earth-moving methods and costs, explosives, surfacing, drainage. Laboratory: design of timber bridges. Prerequisites, 140, 403 or 404.
- 441 Forest Engineering (5)**
STENZEL
Logging planning: road projection, selection of landings and settings, logging cost control. Land surveying, subdivision, platting, and boundaries. Prerequisites, 240, 322, 440.
- 442 Logging Engineering (5)**
PEARCE
Logging machinery and equipment: application problems, with emphasis on motor truck performance. Field trips to logging equipment factories. Prerequisite, 441.
- 446, 447, 448, 449 Logging Engineering Field Studies (3,5,5,3)**
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. Prerequisites, 442, Civil Engineering 310 and 415, or Forestry 465.
- 455 Forest Influences (4)**
GESSEL, SCOTT
A study of the effects of vegetation on climate, water and soil, with application to the conservation of water and soil and the control of floods. Fundamentals of watershed management are stressed. Prerequisite, permission.
- 460 Forest Management (5)**
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 Management (3)**
ROBERTSON
Survey of the field of forest management. A comprehensive course in the general principles of forest management. For forest products majors. Prerequisite, 407.
- 465 Forest Photo Interpretation (3)**
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. Prerequisites, 260 and permission.
- 466, 467, 468, 469 Senior Management Field Studies (5,5,4,2)**
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 Forest Products Industries (5)**
ERICKSON
Wood products other than lumber, plywood, and pulp. Derived and miscellaneous forest products. Economic and industrial aspects of forest products. Laboratory experiments and field trips. Prerequisite, 307.
- 471 Timber Design (3)**
BRYANT
Design of solid and laminated beams; design of trusses using timber connectors, bolts and other fastenings; column design; laminated arches. Prerequisite, 403 or 404.
- 472 Plywood, Lamination, and Glues (5)**
BRYANT
Techniques of manufacturing plywood and laminated wood; theory of adhesion, modern wood adhesives, gluing problems. Laboratory emphasizes student familiarization with glues and gluing techniques, individual research problems, visits to plywood and laminating operations. Prerequisites, 307 and 404.
- 476 Wood Pulp (6)**
LENEY, SARKANEN
The preparation of wood for pulp manufacture; production of mechanical and chemical pulp; practical problems in the operation of pulp and paper mills. Prerequisite, 307.
- 478 Advanced Wood Technology (5)**
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. Prerequisites, 370, 470, 472, 483.
- 481 Milling (5)**
THOMAS
The sawmilling process with emphasis on modern milling practice, sawmill layout, plant engineering, and mill management. Prerequisites, 206, 273, and 403 or 404.
- 482 Manufacturing Problems (5)**
THOMAS
Distribution and marketing of lumber, plywood, pulp, and other forest products; inter-regional and intra-industry competition; industry problems. Prerequisites, 470, 472, 481.
- 483 Theory and Practice of Kiln Drying (3)**
THOMAS
Wood-liquid relationships and hygrometry; application of gas laws. Problems in the design of dry kilns. Prerequisite, 206.
- 484 Forest Products Field Studies (2)**
THOMAS
Two-week field study of the forest products industry of the Northwest. Prerequisite, senior standing in forest products.
- 485 Forest Products Seminar (2)**
Reports by students and outside speakers on topics of current interest in forest products; discussion of special problems and field trips. Prerequisite, senior standing in forest products.
- 490, 491, 492 Undergraduate Studies (1-5,1-5,1-5)**
Preparation for work in fields for which there is not sufficient demand to warrant the or-



ganization of regular classes. Instructors are assigned according to the nature of the work. Prerequisite, permission.

495 Research Methods Seminar (3)

TURNBULL, BRYANT

Methods of approaching research problems; conventional statistical techniques which can be adapted to problems in forestry and forest products. Course is designed to improve the student's efficiency as a research worker. Prerequisite, senior or graduate standing.

Courses for Graduates Only

500 Graduate Seminar (1, max. 10)

MARCKWORTH

Required of graduate students. Prerequisite, permission.

511 Seminar in Forest Soils (2)

GESSEL

Prerequisites, 410 and permission.

512 Soil Morphology and Classification (3)

GESSEL

An advanced study of the principles of soil formation and classification; intensive coverage of these principles as applied to the survey and classification of forested lands; the factors of the environment that determine soil properties. Prerequisite, permission.

513 Methods of Forest Soil Survey (5)

GESSEL

A course of field studies to acquaint the student with forest soils of the Northwest and with soil classification and survey philosophies and procedures. Prerequisite, 512 and permission. (Offered alternate years; not offered 1964-65.)

521 Advanced Silvics (3-5)

SCOTT

A consideration of current literature and topics in forest tree ecology and physiology. Prerequisite, permission.

522 Advanced Silviculture (3)

SCOTT

A detailed study of the literature dealing with the more recent applications of silviculture in world forestry. Prerequisite, permission.

523 Forest Tree Seed (2)

STETTLER

The study of forest tree seed, including structure, development, production, collection, provenance, storage, germination, dormancy, and stimulation. Prerequisite, permission.

525 Research Methods in Forest Ecology (2)

GESSEL, SCOTT, TURNBULL

Research philosophies and procedures as applied to forest biological problems. Required

of all graduate students in forest management. Prerequisite, permission.

527 Forest Genetics (3)

STETTLER

Tree-improvement breeding theory as related to elementary population genetics, variation in plant populations, and natural and artificial selection. Prerequisite, permission.

541 Advanced Forest Engineering (5)

PEARCE

Logging organization and management; logging cost analysis and budgeting. Prerequisite, permission.

542 Advanced Logging Engineering (3)

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.

571 Advanced Wood Preservation (3)

ERICKSON

Permeability of wood; theory of penetration; treating plants, their equipment and design. Prerequisites, 370 and 371, permission.

572 Wood Chemistry and Analysis (3-5)

SARKANEN

Techniques for analyzing the chemical constituents of wood; the relationships between chemical properties and the structural properties and uses of various species of wood. Prerequisites, 307, 470, Chemistry 232, and permission.

573 Wood-Moisture Relations (2-3)

ERICKSON

Theories involved in relationships between wood and varying degrees of moisture content, conditions at fiber saturation point and between fiber saturation and zero moisture content. Prerequisites, 307, 404, and permission.

574 Wood-Resin Relations (3)

BRYANT

The technology of synthetic resins as wood adhesives, wood impregnants, binders, overlays, and surface coatings. Prerequisites, 472 and permission.

575 Forest Products Economics (3)

THOMAS

Economic considerations in planning for profitable and complete utilization of the forest resource under a variety of circumstances. Prerequisites, 482 and 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

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)

BROCKMAN

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)

BRYANT, ERICKSON, LENEY, THOMAS, SARKANEN

Prescribed Courses in Other Fields

Courses for Undergraduates

BOTANY

- 111 Elementary Botany (5)
- 112 The Plant Kingdom (5)
- 216 Physiology of Seed Plants (4)

- 361 Forest Pathology (5)

BUSINESS LAW

- 307 Business Law (3)

CHEMISTRY

- 101 General Chemistry (5)
- 102 General and Organic Chemistry (5)
- 151 General Chemistry Laboratory (2)

CIVIL ENGINEERING

- 310 Highway Location and Design (4)
- 415 Photogrammetry (3)

ECONOMICS

- 211 General Economics (3)

ENGLISH

- 101, 102, 103 Composition (3,3,3)

GENERAL ENGINEERING

- 101 Engineering Graphics (3)
- 121 Plane Surveying and Measurements (3)

MATHEMATICS

- 104 Plane Trigonometry (3)
- 105 College Algebra (5)
- 124 Calculus with Analytic Geometry (5)

PHYSICS

- 101, 102, 103 General Physics (4,4,4)
- 107, 108, 109 General Physics Laboratory (1,1,1)

ZOOLOGY

- 204 Forest 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. Conventional areas of elective

course work include courses from the following list (elective courses are not restricted to this list):

ACCOUNTING

- 210 Fundamentals of Accounting (3)
- 220 Fundamentals of Accounting (3)

ATMOSPHERIC SCIENCES

- 101 Survey of the Atmosphere (5)
- 322 Regional Climatology (5)

BOTANY

- 113 Elementary Plant Classification (5)
- 431, 432 Taxonomy (5,5)
- 471 Mineral Nutrition (5)

BUSINESS COMMUNICATIONS

- 301 Written Business Communications (3)

CHEMISTRY

- 170 Qualitative Analysis (3)
- 221 Quantitative Analysis (5)
- 231, 232 Organic Chemistry (3,3)
- 241, 242 Organic Chemistry Laboratory (2,2)

CIVIL ENGINEERING

- 214 Control Surveys (3)
 - 321 Roads and Pavements (3)
- #### ECONOMICS
- 340 Labor Economics (5)
 - 441 Union-Management Relations (5)

GEOGRAPHY

- 360 Principles of Cartography (5)
- 370 Conservation of Natural Resources (5)
- 444 Geography of Water Resources (3 or 5)

GEOLOGY

- 205 Physical Geology (5)
- 220 Mineralogy (5)
- 310 Geology for Engineers (4)

HISTORY

- 241 Survey of the History of the United States (5)
- 463 The Westward Movement (5)
- 464 History of Washington and the Pacific Northwest (5)

HUMANISTIC-SOCIAL STUDIES

(Logging Engineering majors only)

- 270 Engineering Report Writing (2)
- 302 Technical Writing (3)
- 331 Origins of Western Cultural Institutions (3)

HUMAN RELATIONS IN BUSINESS AND INDUSTRY

- 365 Human Behavior in Organizations (3)
- 460 Human Relations in Business and Industry (4)

MECHANICAL ENGINEERING

- 201 Metal Casting (1)
- 202 Welding (1)
- 203 Metal Machining (1)
- 410 Engineering Administration (3)
- 411 Engineering Economy (3)
- 415 Statistical Quality Control (3)
- 417 Methods Analysis (3)

MICROBIOLOGY

- 301 General Microbiology (5)

PERSONNEL AND INDUSTRIAL RELATIONS

- 310 Personnel Management (5)

POLITICAL SCIENCE

- 202 American Government and Politics (5)

SPEECH

- 220 Introduction to Public Speaking (5)
- 327 Extempore Speaking (3)

ZOOLOGY

- 444 Entomology (5)
- 464 Natural History of Birds (5)
- 465 Natural History of Mammals (5)



SCHOOL OF DENTISTRY

DENTAL SCIENCE AND LITERATURE

100 Orientation (1)

ANDERSON

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)

GILBERT

Physical and chemical properties of dental materials.

200 Dental History (1)

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.

N300, N301 Dental Medicine (0,0)

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)

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)

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)

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)

ANDERSON

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.

FIXED PARTIAL DENTURES

231, 232, 233 Fixed Partial Denture Technic (4,4,4)

WARNICK

Fixed partial denture fundamentals; construction of selected cases on technic models.

300, 301, 302 Fixed Partial Dentures (1,1,1)

VIGG

Lectures on various phases of typical crown and fixed partial denture construction.

346 Clinical Crowns and Fixed Partial Dentures (5)

MORRISON, STAFF

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)

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)

MORRISON, STAFF

Continuation and advancement of clinical experience, including clinical ceramics, with treatment of more difficult clinical cases under close supervision.

Courses for Graduates Only

561 Abutments and Distribution of Masticatory Stress (4)

MORRISON, STAFF

Tissue responses of bone and periodontal membrane to increased masticatory loads; physical principles involved in replacements in different locations in the mouth; considerations involved in length of span; retention form and resistance form; study of broken-stress design and fixed removable attachments; esthetic considerations of abutment preparation.

562 Advanced Dental Ceramics (3)

MORRISON, STAFF

Baked porcelain as a substitute for lost tooth structure. Physical properties of the material; pyrochemical reactions in firing. Indications and contraindications in restorative dentistry. Color in dental ceramics; esthetics a major consideration; use of strains. Veneer crowns and inlays—variant preparations of the teeth. Methods of impression taking, die formations, and construction of matrices. Manipulation of the various porcelains; the factors involved. Variations in technics of fabrication of restoration. Clinical considerations in respect to insertion and maintenance.

700 Thesis (*)

MORRISON, STAFF

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.

OPERATIVE DENTISTRY

131 Elementary Operative Dentistry Technic (4)

STIBBS

Fundamental principles of cavity preparation; training in digital skill.

132, 133, 134 Oral Anatomy (4,2,2)

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)

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)

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)

STIBBS

Clinical procedures in all phases of operative dentistry; varied clinical experience under close supervision.

400, 401, 402 Advanced Operative Dentistry (1,1,1)

DIEPENHEIM, ELLSPERMAN, SMITH

Lectures on refinements in technical procedures, treatment of atypical cases, and problems in diagnosis and treatment planning.

446 Advanced Clinical Operative Dentistry (7)

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)

CHRISTENSEN

A comprehensive review of restorative dental materials with emphasis on recent research.

561 Plastics As Restorative Materials (4)

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 Foil Restorations (4)

STIBBS

Tissue reactions to operative procedures; response of dental pulp to thermal change; age changes in dentinal wall and histology of dental pulp. Indications and contraindications for gold foil in restorative procedures. Physical properties of dentin, cohesive and non-cohesive pure gold foil, and platinum-centered foil. Rationale of manipulation of these materials. Modifications of basic cavity preparations for foil: Black, Ferrier, Woodbury, True, etc. Procedures for condensation and finishing.

563 Research Methodology in Operative Dentistry (2)

CHRISTENSEN

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)

CHRISTENSEN

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)

CHRISTENSEN

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)

CHRISTENSEN

A consideration of modern dental practice technics, auxiliary personnel, time and motion technics, ultra-high speed instruments, multiple restorations, and other factors.

590-591-592 Teaching Training (2-2-3)

STIBBS, CHRISTENSEN, OSTLUND

Supervised training in undergraduate teaching of operative dentistry procedures.

600 Research (*)

STAFF

An investigative program in one of the basic or clinical sciences under the direction 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.

ORAL DIAGNOSIS AND TREATMENT PLANNING**216, 217 Oral Roentgenology (1,1)**

JACOBSON

Physical, clinical, and interpretative aspects of dental X-ray procedures, with practical application in the completion of acceptable full-mouth surveys on patients.

300, 301 Oral Diagnosis and Treatment Planning (1,1)

DEGERING, JACOBSON

Fundamental procedures in oral diagnosis; preparation for advanced instruction.

346 Clinical Oral Diagnosis and Treatment Planning (1)

STAFF

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)

JACOBSON

Treatment planning of cases and familiarization with the clinical detection of oral pathological conditions. Advanced X-ray interpretation.

446 Advanced Clinical Oral Diagnosis and Treatment Planning (1)

STAFF

Advanced instruction in diagnosis and in the handling of patients. Students are in block assignment. Morning sessions are devoted to seminar discussion. During afternoon sessions, students perform roentgenographic surveys and complete 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.

ORAL PATHOLOGY**131 Oral Histology and Embryology (4)**

TAMARIN

Histology of enamel, dentin, dental pulp, cementum, periodontal membrane, alveolar bone, oral mucous membrane, maxillary sinus and temporomandibular articulation.

331 Oral Pathology (5)

SREEBNY, STAFF

The principles of pathologic processes as related to diseases of the mouth and adjacent structures.

Courses for Graduates Only**520 Seminar in Oral Pathology (1-3, max. 9)**

SREEBNY

Conferences, seminars, and round table discussions of advanced topics and recent literature in oral pathology. Prerequisite, permission.

531 Oral Pathology (5)

SREEBNY, STAFF

The purposes of this course are to train the student so that he may intelligently interpret manifestations of pathology as they occur in the oral cavity and to stimulate an intellectual curiosity regarding the basic pathological mechanisms responsible for these changes.

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.

ORAL SURGERY**200 Local Anesthesia (1)**

TOLAS

Introduction to methods of local anesthesia for dental and oral surgery. Review of the anatomy of the head and neck in relation to local anesthesia; review of the physical, chemical, and biological effects of local anesthesia; armamentarium; indications and contraindications for local anesthesia; injection technique; and the handling of post-anesthetic complications. Lectures and clinical demonstrations on oral surgery patients.

300, 301, 302 Exodontia (1,1,1)

HOOLEY, MOSS

General principles of oral surgery practice; history taking and the performance of the oral examination; principles of asepsis; armamentarium; surgical techniques for the extractions of complicated teeth, impactions, soft and hard tissue surgery; pre- and post-operative care of the patient; types, prevention, and control of hemorrhage; dental emergencies with the fundamentals of diagnosis, treatment, and prevention of shock; inflammation and surgical bacteriology; anatomy of the fascial spaces and planes of the head and neck with the progress of oral infection through the same, and the appropriate anti-infective therapy.

303 General Anesthesia (1)

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; pre-medication of the patient; armamentarium; complications and accidents; agents designed primarily for administration to children. Lectures and clinical demonstrations.

331 Oral Surgery Laboratory (1)

GEHRIG, STAFF

An introduction to the theoretical and technical aspects of exodontia and associated minor oral surgery is offered. A collation 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; cuff test; venipuncture; intramuscular injection of penicillin; oxygen administration; artificial respiration; and tracheotomy palpation are practiced during the course. TV demonstrations of each procedure are performed prior to the laboratory session.

346 Clinical Exodontia (2)

GEHRIG

Dental extractions and minor oral surgery under local anesthesia. The student is responsible for the history, oral examination, X-ray diagnosis, clinical diagnosis, treatment planning, treatment, and postoperative treatment, under supervision of the staff. He assists a senior student on the more difficult cases and manages the simpler cases under the close supervision of the oral surgery staff. Opportunity is given for practical application of the principles of sterilization of supplies and instruments as well as the administration of local anesthetics and antibiotic, sedative, and analgesic drugs.

400, 401, 402 Oral Surgery (1,1,1)

GEHRIG

Major oral surgery: including the diagnosis and treatment of fractures of the jaw; bone grafting; disturbances of the temporomandibular articulation; affections of the fifth and seventh nerve; differential diagnosis and treatment of benign and malignant oral tumors; diagnosis and treatment of cysts and major salivary gland pathology, developmental deformities of the maxilla and mandible such as, prognathia, retrognathia, apertognathia, and the rudiments of oral plastic procedures; and the legal aspects of oral surgery.

403, 404 Maxillofacial Surgery (1,1)

GEHRIG, MOSS

Neoplasms and oncologic surgery of the head and neck and the fundamentals of maxillofacial and plastic surgery as well as emergencies in dental practice.

446 Clinical Oral Surgery (2)

GEHRIG

Advanced application of the principles of exodontia and minor oral surgery; directly

supervised treatment of multiple extractions and preparation of the mouth for dentures; removal of unerupted or impacted teeth; removal of benign cysts and tumors of the maxilla and mandible; biopsies; management of oral infections.

Courses for Graduates Only

500, 501, 502 Oral Surgery Seminar (2,2,2)

GEHRIG, HOOLEY, MOSS, TOLAS

A continuous weekly seminar devoted to oral surgery theory and literature and practical case reviews.

530, 531, 532 Clinical Pathology Conference (1,1,1)

GEHRIG, HOOLEY, MOSS

A clinical pathology conference of clinic patients presented by graduate students.

540, 541, 542 Advanced Oral Surgery Clinic (3,3,3)

GEHRIG, HOOLEY, MOSS

The clinical diagnosis and treatment of oral surgical conditions.

550 Anatomical Approaches to Head and Neck Surgery (2)

GEHRIG, HOOLEY, MOSS, TOLAS

A study and laboratory dissection of the anatomical structures as they are found in major oral surgery procedures. Prerequisite, permission.

600 Research (*)

GEHRIG, MOSS

An investigative program in one of the basic or clinical sciences under the direction of the departmental faculty. Prerequisite, permission.

700 Thesis (*)

GEHRIG, MOSS

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.

ORTHODONTICS

300 Orthodontics (1)

MCNEILL

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)

MCNEILL, 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 ortho-

dontic 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 (4,5,5,5,6)

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.

PEDODONTICS

200, 201 Preventive Dentistry (1,1)

LAW, MOORE

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)

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)

LAW

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)

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)

HOFFMAN

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)

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 (*,*,*,*,*)

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)

STERN

A lecture series which surveys periodontics and links this field to dentistry in general.

231 Clinical Periodontics (1)

OGILVIE

A clinical and seminar experience in relating both the normal and the abnormal periodontium to dental practice.

300 Periodontics (2)

OGILVIE

A lecture 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.

301 Periodontics (1)

OGILVIE

A continuation of Periodontics 300.

346 Clinical Periodontics (3)

Treatment of periodontal disease. Emphasis upon diagnosis, treatment planning, and non-surgical treatment procedures.

400, 401 Periodontics (1,1)

OGILVIE

The surgical aspects of therapy in periodontics, their rationale, their selection, their application.

446 Advanced Clinical Periodontics (3)

More complex cases of periodontal disease. 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)

SCHLUGER

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)

SCHLUGER

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 departmental 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)

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)

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)

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)

The student is required to complete the endodontic treatment on an anterior, bicuspid, and molar tooth.

449 Advanced Clinical Endodontics (2)

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)

NATKIN

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)

NATKIN

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.

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)

NATKIN

A closely supervised experience in teaching clinical endodontics to the undergraduate dental student. Prerequisites, 546, 547, 548, 576, 577, 578.

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.

PROSTHODONTICS

131 Complete Denture Technic (8)

BOLENDER

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 (4,4)

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)

BOLENDER, WYKHUIS

A lecture course devoted to the diagnosis and treatment of the completely edentulous patient.

303, 304 Removable Partial Denture Prosthodontics (1,1)

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)

Diagnosis and treatment of completely edentulous and partially edentulous patients.

400, 401 Advanced Complete Denture Prosthodontics (1,1)

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)

BOLENDER

A lecture course devoted to the design and fabrication of complex removable partial dentures.

446 Advanced Clinical Prosthodontics (5)

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)

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)

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. Prerequisite, 560.

562 Removable Partial Dentures (4)

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. Prerequisite, 560.

563 Obturators and Speech Appliances (2)

BEDER

Theories, principles, technical, and clinical experience in the fabrication of prostheses for the patient presenting congenital or acquired defects of the palate and contiguous tissue. Active participation in affiliated hospital programs will be provided whenever available.

564 Definitive and Adjunctive Maxillofacial Appliances (2)

BEDER

Theories, principles, technical experience in the fabrication of somatoprostheses; 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. Active participation in affiliated hospital programs will be provided whenever available.

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.

CONJOINT COURSES IN DENTISTRY

N361 Clinical Orientation (0)

MERRILL

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)

NATKIN

A lecture course designed to acquaint 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, SREEBNY, NATKIN

Seminars on clinical pathologic phenomena with their basic causal factors discussed from interdisciplinary viewpoints.

DENTAL HYGIENE

300 Dental Procedures (3)

DECKER

Lectures and demonstrations in dental procedures, dental specialties; emphasis on the role of auxiliary personnel.

331 Dental Anatomy (4)

HODSON

Morphology of permanent and primary teeth; sketching and carving of essential units.

332 Dental Materials (2)

GILBERT

Survey of the physical and chemical properties of dental materials, with laboratory experience in their manipulation.

333 Oral Radiographic Technique (3)

STAFF

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)

TAMARIN

Development and microscopic anatomy of structures of the oral cavity.

335 Oral Prophylaxis (2)

RYAN

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)

RYAN

Clinical experience in the performance of oral prophylaxis, topical application of fluoride, and dental health instruction for patients.

401 Office Procedure and Ethics (2)

Dental office and clinic procedure; dental and dental hygiene ethics, professional interrelationships.

402 Community Dental Health (3)

FALES

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)

FALES

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)

TAMARIN

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)

BECHLEM

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)

FALES

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)

VORIS

Clinical procedures in all phases of dental hygiene; varied clinical experiences under close supervision.

448 Dental Hygiene Practice (4)

DECKER

Continued clinical procedure with expansion to include dental hygiene services to patients requiring special considerations.

449 Dental Hygiene Practice (4)

RYAN

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)

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)

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)

FALES, RYAN

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)

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 Elementary Anatomy and Physiology (2,5-5)

SKAHEN

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 of Physiology and Biophysics. For nursing and dental hygiene students.

Education 209 Educational Psychology (3)

SALYER

The psychological basis of education. Recent experimentation. Prerequisites, Psychology 100 and a course in child development.

Education 305 Introduction to Problems of Adolescence (5)

SALYER

A survey of the problems of adolescence with analysis and discussion of their educational and social complications.

Home Economics 319 Nutrition (4)

MONSON

Importance of food to the maintenance of health; nutritive values and human needs emphasized; ways of meeting human requirements at different cost levels. For nonmajors in home economics.

Microbiology 301 General Microbiology (5)

CHURCH

Microorganisms and their activities. For students of pharmacy, nursing, home economics, education, and others interested in a one-quarter survey course, with minimal training in chemistry. Prerequisite, two quarters of general chemistry.

Pathology 310 General Pathology (2)

STRUNK

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 and medical technology; others by permission.

Pedodontics 200 Preventive Dentistry (1)

LEWIS, 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)

RISING

Principles of pharmacy; mathematics of pharmacy; pharmacological and therapeutic action of drugs pertaining to dentistry.

Psychiatry 450 Principles of Personality Development (2)

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. Not open to students who have taken 267.



Psychiatry 451 Principles of Personality Development (2)

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.

Preventive Medicine 323 Introduction to Public Health Principles and Practices (3)

WILKIE

Public health organization and activities; introduction to health education. For public health majors and students of nursing and dental hygiene; others by permission.

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 Evolution of the Human Cranio-facial Complex (2)

Darwinism and the genetic basis for biological evolution. Principles of evolution. Palaeontological evidence of human evolution. Evolution of the cranio-facial complex. Evolution of the dentition. Malocclusion from the genetic and phylogenetic perspectives. Variability in the craniofacial complex and its interpretation in terms of evolution.

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, STAFF

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, STAFF

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 Fixed Partial Dentures.)

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 401, 402 Biochemistry (5,3)

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 401; 401 for 402; and permission.

Pediatrics 505 Physical Growth of the Well Child (2)

Weekly seminars. The correlation between growth and development and diseases in the child as pertaining to dental health. Prerequisite, permission.

Preventive Medicine 472 Applied Statistics in Health Sciences (3)

BENNETT

Prerequisite, permission.

Psychiatry 400 Human Personality Development and Behavior (1, max. 3)

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.

Psychiatry 430 Psychopathology (2)

RIPLEY

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.

Psychiatry 450 Principles of Personality Development (2)

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 Psychiatry 267.

For other graduate course offerings see individual departmental listings.

SCHOOL OF MEDICINE

ANESTHESIOLOGY

480 Clinical Clerkship (4)

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 (*)

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 (*)

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.

520 Anesthesiology Seminar (5)

BONICA

Anesthesiology conferences, lectures, and symposia on advanced anesthesiologic topics.

BIOCHEMISTRY

361 Biochemistry (3)

An introductory one-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. Prerequisite, Chemistry 102 or 232.

362 Biochemistry Laboratory (3)

Laboratory exercises and conferences. Certain experimental aspects of biochemistry of special interest to dental students are considered. For dental students. Prerequisite, 361, which may be taken concurrently.

363 Biochemistry Laboratory (3)

Laboratory exercises in general biochemistry for students in home economics, medical technology, and others by permission. Prerequisite, 361, which may be taken concurrently.

401, 402 Biochemistry (5,3)

Lectures and conferences in the first quarter cover the fundamentals of biochemistry. The second quarter emphasizes metabolism in man. Required for first-year medical students; open to a limited number of students with allied interests. Prerequisites, Chemistry 242 for 401; 401 for 402; and permission.

403 Biochemistry Laboratory

Required for first-year medical students; open to a limited number of students with allied interests. Prerequisites, 401 and 402, and permission.

481, 482, 483 Biochemistry (3,3,3)

Lectures and conferences cover the fundamentals of biochemistry with emphasis upon chemical structure, enzymatic reactions, intermediary metabolism, and biochemistry of physiological functions. Recommended for advanced undergraduate or graduate students of chemistry, biochemistry, and various biological sciences. Prerequisites, Chemistry 337 for 481; 481 or permission for 482; 482 or permission for 483; introductory physical chemistry is recommended.

484 Biochemistry Laboratory (3)

Laboratory projects and conferences. For students of biochemistry, chemistry, and various biological sciences. Prerequisites, 481 and 482; the latter course to be taken concurrently.

498 Undergraduate Thesis (*)

For senior medical students. Prerequisite, permission.

499 Undergraduate Research (*)

Investigative work on enzymes, proteins, lipides, nucleic acids, protein biosynthesis, intermediary metabolism, physical biochemistry, and related fields. Prerequisite, permission.

Courses for Graduates Only

520 Seminar (1-3, max. 9)

Prerequisite, permission.

562 Physical Biochemistry (2)

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 high molecular weight compounds and systems of biological interests are considered. Prerequisites, 483 and Chemistry 457 or permission. (Not offered in 1964-65.)

563, 564 Proteins (2,2)

NEURATH, WILCOX

Chemical composition, structure and biological function of peptides and proteins; methods of analysis and their interpretation; properties of protein solutions. Prerequisites, 483 or permission for 563; 563 for 564. (Not offered in 1964-65.)

565, 566 Enzymes and Enzyme Action (2,2)

FISCHER, DAVIE

Properties of enzymes and enzyme systems, enzyme kinetics, mechanism of enzyme action. Prerequisites, 483 and Chemistry 457, or permission for 565; 565 for 566.

568 Biochemistry of Lipides (2)

HANAHAH

The structure of metabolism of sterols, steroids, fatty acids, and the complex lipides will be treated on an advanced level. Prerequisite, 402 or 483 or permission. (Not offered in 1964-65.)

569 Biochemistry of Nucleic Acids (2)

GORDON

Chemistry and structure of nucleic acids, enzymes active on nucleic acids, and the biosynthesis and metabolism of the components of nucleic acids are considered. Current concepts of the replication of nucleic acids including the infectivity of viruses will be discussed. Prerequisite, 402 or 483, or permission.

570 Biochemistry of Higher Animals (2)

KREBS

An advanced treatment of topics related to metabolism in the intact animal: organ function, body pools, hormonal control, energy balance, nitrogen balance, and nutrition. Biochemical changes in certain diseases are discussed. Prerequisite, 402 or 483, or permission. (Not offered 1964-65.)

583 Advanced Biochemistry Laboratory (4)

Biochemical preparations and investigations of physical and chemical properties by special techniques, including spectrophotometry, polarimetry, ultracentrifuge, electrophoresis, isotope tracer applications, etc. Prerequisites, 484 and permission.

600 Research (*)

Limited to graduate students in the Department of Biochemistry and medical students who are post-sophomore fellows.

700 Thesis (*)

Graduate students in Department of Biochemistry only.



BIOLOGICAL STRUCTURE

301 General Anatomy (4)

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, 329 Gross Anatomy (6,4)

Lectures and dissection. The first quarter is devoted to a study of the entire human body except the head and neck areas, with emphasis on the thoracic and abdominal regions, and the second quarter to an intensive study of the head and neck areas. For dental students; others by permission.

330 Microscopic Anatomy (4)

Lecture and laboratory work in microscopic anatomy. For dental students; others by permission.

331 Neuroanatomy (2)

Lecture and laboratory work in neuroanatomy. For dental students; others by permission.

Conjoint 400 Human Anatomy and Physiology (9)

(See Conjoint Courses.)

An advanced course integrating anatomy, histology, physiology, and biochemistry of the human body. Permission. (Offered Autumn Quarter only.)

401-402-403 Gross Anatomy (8-4-4)

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)

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)

Essentials of microscopic, submicroscopic, and chemical anatomy. Required for first-year medical students. Prerequisite for nonmedical students, permission.

Conjoint 409 Basis of Neurology (3, 5, or 8)

(See Conjoint Courses.)

440 Special Topics in Dissection (1 or 2, max. 6)

BASSETT

Individual work in dissection and study of selected regions of the body. Prerequisite, permission.

444 History of the Basic Medical Sciences (2-3)

BODEMER

Growth of animal morphology from antiquity through the nineteenth century, emphasizing development of biological ideas, methodology, and other influences contributing to modern disciplines. 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)

ROOSEN-RUNGE

Comparative study of tissues in selected phyla of vertebrates and invertebrates. Prerequisite, 330, 405 or permission.

510 Cytochemistry (4)

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)

JENSEN

Theory of X-ray diffraction, with emphasis on applications to biological systems. Prerequisite, permission.

518 Developmental Neurology (2)

BODEMER

Detailed consideration of the problems of development, growth, and regeneration of the nervous system and its functions. (Offered Winter Quarter, 1965.) Prerequisite, Zoology 456 or equivalent.

521 Seminar in Molecular and Submicroscopic Anatomy (2)

LUFT

The molecular and micellar basis of bodily structure. Prerequisite, permission.

525 Brain Dissection (2)

EVERETT

A detailed consideration of the macroscopic anatomy of the human brain. Prerequisite, permission.

530 Biological Tracer Techniques (2)

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)

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)

BLANDAU

A detailed study of the embryology of the heart and great vessels during the first eight weeks of life. (Offered Winter Quarter, 1966.) Prerequisite, 404.

550 Biological Polarization Microscopy (4)

Theory, technique, and application of polarization microscopy in biological studies. Prerequisite, permission.

555 Mammalian Reproduction (3)

BLANDAU, ROOSEN-RUNGE

Fundamental processes of reproductive anatomy and physiology of laboratory animals. Prerequisite, permission.

557 Seminar (1, max. 9)

Prerequisite, permission.

Conjoint 585 Surgical Anatomy (1-3, max. 12)

(See Conjoint Courses.)

600 Research (*)

Prerequisite, permission.

700 Thesis (*)

CONJOINT COURSES

316, 317-318 Introductory Anatomy and Physiology (2, 5-5)

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.

400 Human Anatomy and Physiology (9)

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)

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 (4-9)**

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, Psychiatry, and Surgery. Required for second-year medical students.

454. Laboratory Procedures (2)

HOUGIE, SHERRIS, KAPLAN

Essentially a practical course which provides an opportunity for the student to become familiar with those laboratory tests he will be using constantly in subsequent duty. Special emphasis is given to the recognition of abnormal blood smears, urinalysis, and use of the electrolyte kit. Required for third-year medical students.

585 Surgical Anatomy (1-3, max. 12)

An intensive course of lectures and dissection devoted to one region of the body each quarter, i.e., thorax, abdomen, upper extremity, head, and neck. Offered by the Departments of Surgery and Biological Structure. Prerequisite, permission.

MEDICAL PRACTICE

401 History of Medicine (*)

HAVILAND

An introduction to the historical background of medicine including ethics and economics following orientation in the field; student and faculty participation in informal seminar-type presentation and discussion is emphasized. Open to all medical students.

411 First Aid (1)

CLAWSON

475 Externship in General Practice (*)

AGAARD

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)**

AGAARD

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.

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 (*)

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 (4-9)**

(See Conjoint Courses.)

**430 Basic Science Aspects and Introduction
to Clinical Endocrinology (*)**

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 (*)

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 (*)

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 (*)

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)

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.

480 Clinical Clerkships (12)

One fifth of the fourth-year class spends seven 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 (*)

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 (*)**

Elective work in cardiology clinics at University Hospital and King County Hospital. Interpretation of electrocardiograms, laboratory and exercise tests, cardiovascular hemodynamics. Rounds and conferences. Fourth-year medical students.

**483 Clinical Electrocardiography and
Cardiology (*)**

Elective work in clinical electrocardiography and cardiology, with participation in cardiology rounds and cardiology conferences in the laboratory. Veterans Hospital. Fourth-year medical students.

484 Clinical Hematology (*)

The outpatient and inpatient facilities at our teaching hospitals will be used.

485 Clinical Genetics (*)

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 (*)

Elective work including clinical study of selected patients and advanced work on the nervous system. Training in use of clinical and laboratory physiological techniques. Fourth-year medical students.

**487 Outpatient Clinic, King County
Hospital (*)**

Work-up of patients under supervision; discussion of these patients with attending physicians. Fourth-year medical students.

**488 Medical Externships, King County
Hospital (*)**

Work on medical ward under supervision of house staff and visiting physicians. Fourth-year medical student elective.

**489 Externship in Infectious Diseases,
King County Hospital (*)**

Students will act as clinical clerks on Ward 4 South, King County Hospital, and will engage in special projects in the bacteriological laboratory.

490 Outpatient Clinic, University Hospital (*)

Work in one or more of the group clinics, University Hospital. Fourth-year medical student elective.



491 Clinical Clerkship, University Hospital (*)

Work as clinical clerk on one of the medical wards. Fourth-year medical student elective.

492 Metabolic Clinic, University Hospital (*)

Elective work in the Metabolic Clinic under close supervision. Fourth-year medical students.

493 Problems in Fluid Balance and Kidney Disease (*)

Students will see complicated diagnostic problems in fluid and electrolyte balance on the renal service of the University Hospital. Fourth-year medical student elective.

494 Medical Externship, Madigan General Hospital (*)

Work-up of selected cases on wards and in clinics. Attend rounds and conferences. Fourth-year medical student elective. (*)

498 Undergraduate Thesis (*)

For medical students. Prerequisite, permission.

499 Undergraduate Research (*)

Case studies, with laboratory research. For medical students. Prerequisite, permission.

MICROBIOLOGY

201 Topics in Microbiology (4)

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. No prerequisites.

235 Microbiology for Students of Dentistry (7)

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)

NESTER, ROBERTS

Microorganisms and their activities. For students of pharmacy, dental hygiene, nursing, home economics, education, and others interested in a one-quarter survey course, with minimal training in chemistry. Prerequisite, two quarters of general chemistry.

320 Media Preparation (3 or 5)

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)

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 (4 or 6)

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, and permission.

430 Microbial Metabolism (3 or 5)

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)

EVANS, GROMAN, HENRY, 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 who have had previous work in bacteriology may by special permission be allowed to take 441- or -442 for 3 rather than 5 credits. 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, and permission.

443 Medical Mycology (2)

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, and permission.

444 Medical Parasitology (4)

GROMAN

Consideration of medically important parasites with emphasis on their biology in relation to the production and prevention of disease. Offered eight weeks of quarter. Required for

second-year medical students. Open to upper-division undergraduates and graduate students. Prerequisites, 441-442 or equivalent, and permission.

450 Topics in Immunology (5)

Prerequisites, Genetics 451, biochemistry (10 credits), or permission. (Offered alternate years; not offered 1964-65.)

Conjoint 454 Laboratory Procedures (2)

(See Conjoint Courses.)

498 Undergraduate Thesis (*)

For medical students. Prerequisite, permission.

499, 499H Undergraduate Research (*)

GROMAN

Specific problems in industrial, medical, and general microbiology. Prerequisites, senior standing and permission; permission for honors section.

Courses for Graduates Only

510 Physiology of Bacteria (3)

WHITELEY

Fundamentals of physiological and metabolic processes of bacteria with emphasis on the synthesis of cellular constituents, mechanisms, and energy-yielding processes. Prerequisite, permission. (Offered alternate years; not offered 1964-65.)

520 Seminar (1)

530 Comparative Morphology and Physiology of the Higher Bacteria (4)

ORDAL

Enrichment, isolation, and comparative morphology and physiology of selected bacteria with distinctive developmental cycles. Prerequisite, permission. (Offered alternate years; not offered 1964-65.)

540 Virology (3 or 4)

EVANS, GROMAN

Prerequisite, permission. (Offered alternate years; not offered 1964-65.)

550 Advanced Immunology (5)

WEISER

Prerequisites, 441- and permission. (Offered alternate years; offered 1964-65.)

600 Research (*)

700 Thesis (*)

OBSTETRICS AND GYNECOLOGY

Conjoint 426-427 Introduction to Physical Diagnosis (4-9)

(See Conjoint Courses.)

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.

476 Obstetric Externship (*)

Student to be assigned to one of two hospitals: Madigan Army Hospital or Providence Hospital. All terms, twelve days, full time.

479 Obstetric and Gynecological 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 (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.

PATHOLOGY

231 General Pathology (5) SREEBNY, ROSS

This course is open to dental students and to selected graduate students in the basic sciences. The objective is to cover in a more brief form the basic work covered in detail in 441-, 442-, and 443. The method of presentation is therefore the same as in those courses. A reasonable knowledge of gross and micro-

scopic 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. While the general tissue and systemic manifestations are considered by processes, the applications of these diseases to the mouth, teeth, and neck are particularly stressed. For dental students; graduate students by permission.

310 General Pathology (2) 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 (5) SMUCKLER, LAGUNOFF, HOUIGIE

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. (Offered Summer Quarter only.) Prerequisite, permission.

322- Medical Technology (6-) SMUCKLER

Clinical Chemistry I. Completion of three years prescribed curriculum.

-323- Medical Technology (-6-) SMUCKLER

Clinical Chemistry II. Prerequisite, permission.

-424- Medical Technology (-6-) SMUCKLER

Clinical Chemistry III, assigned projects. Prerequisite, permission.

-425 Medical Technology (-6) SMUCKLER

Internship I. Prerequisite, permission.

426 Medical Technology (16) SMUCKLER

Internship II. Prerequisite, permission.

430 Autopsy Participation and Review (*)

Course consists of medical student participation and review of autopsy cases. Autopsies will be done at one of the four hospitals: University Hospital, King County, Veterans Administration, and Children's Orthopedic. Elective open to second-year medical students.

431 Microscopic Autopsy Review (*)

The slides from interesting 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.

432 Cardiovascular Pathology Conference (*)

This course consists of two parts, a combined medical, surgical, and radiological conference on selected cardiovascular topics by members of the faculty or guest speakers, followed by laboratory review of gross and microscopic cardiovascular pathology. Elective open to first- and second-year medical students. Limited to two students.

433 Neuropathology Conferences (*) ALVORD

Clinicopathologic correlations of cases of neurological and neurosurgical interest. Permission.

441- General Pathology (6-)

The purpose of this course is to introduce the student to the basic concepts and the principal pathologic processes. This is achieved by the combination of lectures, laboratory, and demonstrations of human pathologic material and experimentally produced disease. In addition, participation in autopsies by small groups of students is part of the program. This and a demonstration of pathologic specimens in the gross is programmed primarily in the one afternoon session. For medical students; graduate students by permission. A suitable knowledge of anatomy, including histology, physiology, and biochemistry is required. Autopsy session is not required for graduate students. For second-year medical students; graduate students by permission.

-422-443 Systemic Pathology and Laboratory Procedures (-9-7)

A systematic survey is made of the pathological processes affecting each organ or organ system. Included in this survey is a review not only of pathologic anatomic changes but also of the derangements of the chemistry and physiology which underlie and are associated with specific diseases. Thus a coherent picture of systemic disease is presented and the usefulness of laboratory diagnostic procedures highlighted. Prerequisite, 441- or equivalent.

Conjoint 454 Laboratory Procedures (2) (See Conjoint Courses.)

470 Surgical Pathology (*)

Students participate in this course during the period in which they are taking the regular course work in surgery. The objective is to demonstrate fresh gross surgical material and to review microscopic sections from the more interesting material. For third-year medical students; graduate students by permission.

476 Clinical Pathological Conference (*) BENDITT

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 Autopsy Pathology (*) MOTTET

Advanced course in autopsy technique. Gross and histologic study of postmortem material.



Surgical pathology and clinical pathology. Attendance at and participation in clinicopathological conferences and other hospital activities: King County, Children's Orthopedic, Veterans Administration, and University Hospitals. Elective open to senior medical students.

483 Neuropathology (*)

ALVORD, SHAW

Gross and microscopic study of selected autopsied cases, conference discussions, review of study sets, and experimental project. Permission.

498 Undergraduate Thesis (*)

Prerequisite, permission. Elective for medical students.

499 Undergraduate Research (*)

Prerequisite, permission. Elective for medical students.

Courses for Graduates Only

500 Principles of Pathology (4 or 6)

The material covered is concerned primarily with the fundamental alterations in tissues and organs in disease processes and the results of these changes. This course is open to selected graduate students in the biological sciences by permission.

503 Enzymatic Histochemistry (2-3)

BENDITT, 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 Winter Quarters; offered Winter Quarter, 1965.)

504 Determinative Histochemistry (2-3)

LAGUNOFF

Principles and techniques of histochemical identification of proteins, polysaccharides, and lipids. Prerequisite, permission. Elective open to medical students and graduate students. (Offered alternate Winter Quarters; offered Winter Quarter, 1966.)

510 Anatomical Analysis of Disease (10, max. 30)

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, 441-442-443, 500 or permission.

520 Experimental Pathology Seminar (1-3, max. 10)

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)

The purpose of the course is to introduce the student to the fundamental problems in ex-

perimental pathology. Both animal experiments and material derived from human disease are utilized. Techniques applicable to particular problems are illustrated. The relationship of alterations and structure, chemistry, and function are emphasized. Such problems as cellular alterations in disease from the fine structure and molecular standpoint, immunology and its relationship to carcinogenesis, allergic encephalitis, mechanisms of inflammation, pathogenesis of arteriosclerosis and other similar problems are covered. Open only to graduate students, fellows, or trainees. Prerequisite, 231 or 441, and/or permission of chairman.

552 Clinical Pathology (2-5, max. 20)

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 Pediatric Pathology (*, max. 10)

Assignments according to need and background. By arrangement, for fellows and graduate students.

600 Research (*)

Selected problems arranged in accordance with the student's needs. Prerequisite, permission of chairman.

700 Thesis (*)

PEDIATRICS

404 Human Growth and Development (*)

DEISHER

An opportunity is provided to observe and closely follow an infant and his family throughout one or two years. The influence of constitutional and environmental factors on growth and development will be demonstrated in individual interviews and group discussions with members of the pediatric staff. Open to first- and second-year medical students.

Conjoint 426-427 Introduction to Physical Diagnosis (4-9)

(See Conjoint Courses.)

465 Clinical Clerkships (*, max. 16)

WEDGWOOD

An eight-week general pediatrics inpatient and outpatient clerkship. Students are divided between the pediatric facilities at the University, Children's Orthopedic, and King County hospitals and work under the supervision of members of the Department faculty. Required for third-year medical students.

470 Pediatric Infectious Diseases and Immunology (*)

WEDGWOOD

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 third- and fourth-year medical students. Prerequisite, permission.

471 Clinical Research in Pediatrics (*)

BAUM

Introduction to methods of clinical investigation through study of pediatric patients admitted to the Clinical Research Center. Open to one fourth-year medical student. Prerequisite, permission.

472 Pediatric Pulmonary Physiology and Neonatal Pediatrics (*)

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 fourth-year medical student. Prerequisite, permission.

473 Office Pediatrics (*)

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 fourth-year medical students. Prerequisite, permission.

480 Senior Pediatric Elective Clerkship (*)

Outpatient, inpatient, newborn, and emergency room experiences at the University, Children's Orthopedic, and King County hospitals. Participation in house staff teaching conferences. Clinical investigational projects, if desired. Open to six medical students. Prerequisite, permission.

481 Research in Child Growth and Development (*)

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 senior medical students. Prerequisite, permission.

482 Pediatric Endocrinology and Metabolic Disease (*)

KELLEY

Special research problems in pediatric endocrinology and teratology will be undertaken in the laboratory and/or clinic. The problem will depend on the student's interests. Open to two medical students. Prerequisite, permission.

483 Clinical Experience in Problems of Well Child Care (*)

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 senior medical students. Prerequisite, permission.

485 Clinical Problems in Mental Retardation (*)

DEISHER

Experience in multidisciplinary evaluation of the retarded child and study of the community management of this problem. Open to two senior medical students. Prerequisite, permission.

486 Pediatric Cardiology (*)

GUNTHEROTH, BAUM

Experience with diagnostic techniques, medical and surgical therapy of children with heart disease. Emphasis on physical diagnosis, electrocardiography and cardiac radiology. Open to two senior medical students. Prerequisite, permission.

487 Pediatric Neurology (*)

CHAPMAN

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. Prerequisite, permission.

488 Congenital Defects (*)

SHURTLEFF

An advanced course in pediatrics providing experience in the clinical diagnosis and management of structural and metabolic congenital defects. Prerequisite, permission.

489 Pediatric Outpatient Clinics (*)

WEDGWOOD

Elective clerkship includes diagnosis and management in the general medical and subspecialty pediatrics clinics of the University Hospital. Open to two medical students. Prerequisite, permission.

490 Adolescent Development (*)

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. Prerequisite, permission.

496 Concept of the Child (3)

TJOSSEM

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. (Formerly Conjoint 496.) Prerequisite, permission.

498 Undergraduate Thesis (*)

WEDGWOOD

For medical students. Prerequisite, permission.

499 Undergraduate Research (*)

WEDGWOOD

An opportunity to gain research experience through participation in various clinical or basic research programs in progress. Prerequisite, permission.

505 Physical Growth of the Well Child (2)

HAMMAR

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.

PHARMACOLOGY

234 General Pharmacology (4)

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.

301-302 General Pharmacology (4-5)

ELDER

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)

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 (*)

For medical students. Prerequisite, permission.

499 Undergraduate Research (*)

Participation in departmental research projects. For medical students. Prerequisite, permission.

Courses for Graduates Only

507 Journal Seminar (*, max. 6)

Presentation of comprehensive reports on recent medical and scientific literature in fields of current importance. Prerequisites, -443 and permission.

N508 Research Seminar (0)

Research progress reports and reports on results of completed research. Prerequisites, -443 and permission.

509 Survey of Pharmacological Techniques (3)

DILLE

Principles and specific laboratory techniques for the evaluation of drug effects on the basic physiological systems. Elective for second-year medical students. Prerequisites, 442-443 or 301-302 or 234 and permission.

511 Special Pharmacological Techniques (3)

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)

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.)

526 Autonomic Pharmacology (2)

ELDER

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.)

527 Biochemical Pharmacology (2)

HORITA

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.)

528 Central Nervous System Pharmacology (2)

SABAWALA

Concepts of the modification of the functions of the central nervous system by drugs. Open to medical students. Prerequisites, 442-443 or 301-302 or 234 and permission. (Offered alternate years; offered 1965.)

529 Psychopharmacology (2)

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 1966.)

530 Gastrointestinal Pharmacology (2)

MAGEE

A functional basis for the effects of drugs on mechanical and secretory processes within the gastrointestinal tract. Open to medical students. Prerequisites, 442-443 or 301-302 or 234 and permission. (Offered alternate years; offered 1966.)

531 Toxicology (2)

LOOMIS

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 1966.)

**600 Research (*)**

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 (*)

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)

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)

Staff of Departments of Medicine, Obstetrics and Gynecology, 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)

FABER

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, or 118, 118L.

342 Advanced Kinesiology (3)

LEHMANN

Study of joint motion and muscle function in relation to both the normal and abnormal state. Analysis is made of specific technics employed in the field of physical medicine and rehabilitation. Required for occupational therapy and physical therapy students, others by permission.

380 Occupational Therapy Theory I (2)

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)

RATHBUN, 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)

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)

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)

MCMILLAN

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.

444-445 Function of the Locomotor System (3- or 4-)(-3 or -4)

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, or 118, 118L.

444L-445L Anatomy Laboratory for Occupational Therapists (1-1)

LUCCI

Study of musculo-skeletal, peripheral-vascular, and peripheral-nervous systems from projected material. Concurrent with 444-445. Required for occupational therapy students, others by permission.

451 Anatomy Dissection for Physical Therapists (4)

JEBSEN, STAFF

Dissection of musculo-skeletal, peripheral-vascular, and peripheral-nervous systems. Required for physical therapy students, others by permission.

461 Massage (2)

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)

TROTTER

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)

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)

HUME

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)

HUME

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.

470-471-472 Therapeutic Exercise (3-3-2)

MCMILLAN

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)

RATHBUN, 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)

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)

MORSE, 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)

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)

HUME, SHEVLIN

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)

LUCCI, SHEVLIN

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)

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)

MC MILLAN

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)

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)

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)

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)

MC MILLAN

Twelve to fifteen weeks with 600 minimum working hours. Clinical application of physical therapy techniques under supervision in affiliated hospitals. Required for physical therapy students.

496 Electromyography and Electrodiagnosis (*)

Elective work in clinical electromyography and other electrodiagnostic methods with lecture-demonstrations involving selected cases in the laboratories. Prerequisite, permission.

498 Undergraduate Thesis (*)

Prerequisite, permission.

499 Undergraduate Research (*)

(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.

520 Seminar (1-5)

Conferences, seminars, discussions of advanced physical medicine and rehabilitation topics. Prerequisite, permission.

PHYSIOLOGY AND BIOPHYSICS

Conjoint 316, 317-318 Introductory Anatomy and Physiology (2, 5-5)

(See Conjoint Courses.)

360 General Human Physiology (5)

Lecture, laboratory, and laboratory conference instruction in the basic principles and basic laboratory techniques of physiology. For students of pharmacy. Prerequisites, Zoology 112, Chemistry 239, Physics 102 and 108, Microbiology 301.

370 Human Physiology (7)

Lectures, laboratories, demonstrations, and small group conferences in human physiology stressing applications to dentistry. For dental students. Graduate students and others by permission.

Conjoint 400 Human Anatomy and Physiology (9)

(See Conjoint Courses.)

401-402 Advanced Human Physiology (7-7)

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.

Conjoint 409 Basis of Neurology (3, 5, or 8)

(See Conjoint Courses.)

411 Introductory Biophysics (4)

BROWN, WOODBURY, YOUNG

A general discussion of physical concepts in physiology including membrane phenomena, control systems, and energy exchange. Prerequisite, B.S. in physical science or permission.

416 Biophysics (5)

WOODBURY, YOUNG

Study of bioelectric phenomena in mathematical and physical terms; volume conductors, simple circuit theory, membrane and electrode potentials, and elementary servomechanism theory. For students with biological background. Prerequisite, permission.

418 Biological Instrumentation (4)

BROWN

Introduction to analysis of biological instrumentation system, transient response, frequency response of simple systems, noise, feedback and control systems, digital operations. Premedical and medical students; others by permission.

419 Biological Instrumentation Laboratory (2)

BROWN

Laboratory to illustrate and extend material presented in 418. Premedical and medical students; others by permission.

424 Introductory Membrane Potentials (3)

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.

**491 Medical Physics (2)**

BROWN, YOUNG

Review of physical principles applicable to medicine. Elective for medical students; graduate students by permission.

492 Selected Topics in Physiology and Biophysics (2)

Seminars or research in collaboration with a faculty member on topics selected by individual arrangement. Elective for medical students; graduate students by permission.

**494 Neurological Study Unit (2)
Physiology, Neuroanatomy, Neurology,
Neuropathology, Neurosurgery,
and Psychiatry**

Faculty and student discussion of neurological topics illustrated with clinical cases or demonstrations. Elective for medical students; graduate students by permission.

498 Undergraduate Thesis (*)

For medical students. Prerequisite, permission.

499 Undergraduate Research (*)

For medical students. Prerequisite, permission.

Courses for Graduates Only**515-516-517 Physiological Proseminar (7-7-7)**

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)

Selected topics in physiology. Prerequisite, permission.

521 Biophysics Seminar (2-5)

YOUNG

Selected topics in biophysics. Prerequisite, permission.

522 Biophysics of External Respiration (2-5)

YOUNG

Viscous and elastic properties of chest-lung system; flow of gases in tubes. Generalized alveolar air equations. Principle of infrared absorption and emission type of rapid gas analyzers. Prerequisite, permission.

523 Heat Transfer and Temperature Regulation (2-5)

YOUNG

Prerequisite, B.S. in physical science and permission.

524 Advanced Membrane Potentials (3)

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 (2-5, 2-5, 2-5)

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 System (2-5)

YOUNG

Theories of nonlinear mechanics and their applications to physiological control systems. Prerequisite, B.S. in physical science or permission.

529 Motoneuron Physiology (4)

TOWE, WOODBURY

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)

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.

532-533 Principles of Physiological Instrumentation (4-4)

YOUNG

Pulse generator; A.C. and D.C. high-gain amplifier circuits; oscilloscopes and oscillographs; recording of pressure, volume, and flow in liquids and gases; calorimetry and pyrometry; continuous gas analysis. Prerequisite, permission.

534 Applied Physiological Instrumentation (2-5)

Study and use of research instruments applicable to the nervous system (stimulators, amplifiers, and oscilloscopes), the cardiovascular system (cinelfluorograph, electro- and stetho-cardiograph, oximeter, strain gauge manometers, etc.), and respiratory and metabolic activity (flow meters, minute volume integrator, infrared and paramagnetic gas analyzers, cardiostachometer, thermocouples, gradient calorimeter). Prerequisites, 532 and permission.

535 Operative Techniques in Neurophysiology (2-5)

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)

SMITH, TOWE

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)

GLICKSTEIN

Consideration of the literature relating to brain mechanisms of learning.

550 Cortical Potentials (4)

TOWE

Properties of continuous and evoked potentials and their interactions. Relationship of cortical unit activity to cortical potentials. Prerequisites, 515, 519, and permission.

600 Research (*)

Prerequisite, permission.

700 Thesis (*)

Prerequisite, permission.

PREVENTIVE MEDICINE**323 Introduction to Public Health Principles and Practices (3)**

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)

KIRK, DOEGE

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)

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)

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. Prerequisite, 323 or 461 or permission, or graduate standing.

424 Public Health Programs (3)

MERRITT

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 or permission, or graduate standing.

425 Introduction to Preventive Medicine (1)

GRAYSTON, STAFF

Lectures on principal communicable diseases of man, with emphasis on methods for their control. Required for second-year medical students.

440 Water and Waste Sanitation (4)

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. Prerequisite, 422 or permission.

441 Milk and Food Sanitation (4)

HATLEN

Advanced study of the sanitary control of the production, processing, and distribution of milk and food. Prerequisite, 422 or permission.

442 Vector Control and General Sanitation (3)

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. Prerequisite, 422 or permission.

450 Measurement and Control of Air Pollution (2)

BREYSSSE

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. For preventive medicine majors; others by permission.

453 Industrial Hygiene Techniques (3)

BREYSSSE

Field and industrial laboratory testing procedures for chemical and physical hazards as employed by industrial health workers. Prerequisite, permission.

460J Field Training in Health Education (5)

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. (Offered Summer Quarter only.)

461 School and Community Health Programs (5)

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.

470 Introduction to Biometry (3)

BENNETT

Statistical methods used in the compilation, interpretation, and presentation of vital data. Prerequisite, permission.

472 Applied Statistics in Health Sciences (3)

BENNETT

Application of statistical techniques to biological and medical research; design and interpretation of experiments. Prerequisite, permission.

475 Clerkships and Seminar (4)

GRAYSTON, STAFF

A half-term of case-oriented study of the management of complex health problems, emphasizing the utilization of community health agencies in the care of patients. Required for fourth-year medical students.

476 Sample Survey Techniques (3-5)

BENNETT

Methods appropriate for conducting and analyzing results of sample surveys. Prerequisite, permission. (Offered when demand is sufficient.)

477 Statistical Methods in Biological Assay (3)

BENNETT

Methods appropriate to estimation of the dose-effect relationship; biological standardization; microbiological assay; design of experiments. Prerequisite, permission. (Offered when demand is sufficient.)

478 Practice of Epidemiology (3)

Participation in the work of the Division of Acute Communicable Disease Control of the Seattle-King County Department of Public Health, including field investigations of important or unusual disease outbreaks. Senior medical student elective.

480 Public Health Problems (*, max. 6)

Special assignments in the field of public health. Prerequisite, permission.

482 Field Practice in Public Health (2-6)

An assignment to a local health department for supervised application of public health practices. Prerequisite, permission.

483 Field Practice in Public Health (6)

An assignment to a local health department for practice in program planning. Prerequisite, permission.

484 Field Practice in Public Health (3)

An assignment to a local health department for training in the utilization of community resources. Prerequisite, permission.

490 Public Health Administration (3)

RAVENHOLT

Public health administration, including philosophy, legal aspects, program and fiscal planning, personnel management and public relations. Prerequisite, 420, 422, 424, or permission.

492 Problems in International Health (2)

GRAYSTON

Conference and discussion based on a survey of international health organizations and the services offered by regions and countries. Prerequisite, permission.

498 Undergraduate Thesis (*)

For medical students. Prerequisite, permission.

499 Undergraduate Research (*)

Prerequisite, permission.

Courses for Graduates Only**506 Mammalian Cell Culture as a Tool for Virus Research (*, max. 3)**

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. (Offered Summer Quarter only.)

510 Preventive and Community Medicine (4)

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)

ALEXANDER

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)

RAVENHOLT

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)

Selected topics in epidemiology. Prerequisites, M.D., or Ph.D. in medical science and permission.

530, 531 Medical Biometry I, II (3,3)

FERRIN

The application of mathematical and statistical techniques to the problems of advanced medical and epidemiological research. Prerequisites, M.D., or Ph.D. in medical science and permission.

535-536-537 Stochastic Models (3-3-3)

FERRIN

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)**

MARTIN

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 (*)

Selected problems arranged in accordance with the student's needs. Prerequisite, permission.

700 Thesis (*)

Prerequisite, permission.

PSYCHIATRY**267 Introduction to Mental Hygiene (2)**

DAVIES

A survey of the development of personality and a consideration of minor emotional problems in children and adults. For nonmedical students. Not open to students who have taken 450 or 451.

400 Human Personality Development and Behavior (1, max. 3)

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.

Conjoint 426-427 Introduction to Physical Diagnosis (4-9)

(See Conjoint Courses.)

430 Psychopathology (2)

BAKKER, BROWNSBERGER, CHRIST, HAMPSON, RIPLEY

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.

440 Physiology of Emotions (*)

HOLMES

Seminar based on discussion of selected reading of original articles from psychophysiological and psychosociologic literature. Designed to orient and interest students for participation in current or future research projects. Elective for first- and second-year medical students only. Prerequisite, permission.

441 Individual Psychological Testing and Measurement (*)

Instruction in the administration and interpretation of the Rorschach, Thematic Apperception, and Wechsler-Bellevue Test results with patients in psychiatric wards or in outpatient clinics. Elective for second-year medical students only. Prerequisite, permission.

442 Culture and Illness (*)

LANGNESS, LINSKY

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 for first-year and second-year medical students only. Prerequisite, permission.

443 Seminar in Theories of Personality (*)

HAMPSON

A consideration of major contemporary theories of personality and their relevance to psychiatry. Elective for first- and second-year medical students only. Prerequisite, permission.

450 Principles of Personality Development (2)

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. An interview with a child is required for credit. Prerequisite, senior or graduate standing.

451 Principles of Personality Development (2)

HEILBRUNN

Continuation of 450. Consideration will be given to the physiologic, psychologic, and cultural factors from maturity through old age. For nonmedical students. Not open to students who have taken 267. Prerequisite, 450 or permission.

452 Clinical Psychiatry (2 or 3)

SCHWARTZ

Discussion of clinical psychiatry considering causation, prevention, treatment, and rehabilitation. Not open to students who have taken 457 or 557. For nonmedical students. Quiz section required for Occupational Therapy students; optional for other students. Prerequisite, 267 or 451 or permission.

465 Clinical Clerkships (*, max. 8)

Four weeks of closely supervised experience on a psychiatric inpatient service. The student 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 (*)

Three or six weeks of work at a state psychiatric hospital where the student has an opportunity to learn from firsthand experience and active participation the methods used in caring for seriously ill patients. Elective for fourth-year medical students only. Prerequisite, permission.

480 Clinical Diagnosis and Treatment (6)

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 (*)

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 for fourth-year medical students only. Prerequisite, permission.

491 Seminars and Conferences in Psychiatry (*)

RIPLEY

Special seminars and conferences on a variety of topics can be arranged to accommodate the particular interests of students. Opportunity will be afforded to gain experience in the theory of the interview and the doctor-patient relationship. Elective for medical students only. Prerequisite, permission.

492 Behavioral Science Study Unit (*)

HOLMES

A variety of topics will be presented under the sponsorship of the Department of Psychiatry, with participation of faculty members from the Division of Neurosurgery and the Departments of Pediatrics, Pharmacology, Physiology and Biophysics, Psychology, and Sociology. When practicable, selected patients will illustrate topics presented. Elective for medical students only. Prerequisite, permission.

498 Undergraduate Thesis (*)

Supervised library, clinical, or experimental work. Elective for medical students only. Prerequisite, permission.

499 Undergraduate Research (*, max. 15)

Special projects in various aspects of clinical and laboratory psychiatry, including work in psychoses, psychoneuroses, psychosomatic disorders, child psychiatry, geriatrics, social psychiatry, and psychological testing can be arranged with the instructor. Elective for medical students only. Prerequisite, permission.

Courses for Graduates Only**553 Psychodynamics and Psychopathology (2)**

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 or 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 1964-65.)

559 Child Psychiatry (2)

KAUFMAN

Series of discussions and lectures dealing with psychopathology of children. For nonmedical students. Prerequisite, 267 or 451 or permission.

565 Biological Foundations of Psychiatry (2)

HEILBRUNN

Anatomical and physiological factors involved in various forms of psychopathology. For nonmedical students. Prerequisite, permission.

RADIOLOGY

Conjoint 426-427 Introduction to Physical Diagnosis (4-9)

(See Conjoint Courses.)

465 Diagnostic Radiology (*, max. 2)

FIGLEY, LOOP, PHILLIPS

A series of lectures for medical students describing in general principle and some detail the applications of radiological methods to clinical diagnostic problems. Prerequisite, third-year medical students.

475 Therapeutic Radiology (1)

PARKER, PURCELL

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.

480 Experimental Radiation Dosimetry (3)

BALTZO

Radiological instrumentation, standards, and techniques pertinent to measurement and control of human exposure to ionizing radiation in X-ray and isotope applications. Prerequisite, Physics 473 or Chemistry 395 or permission.

485 Radiation Dosimetry (4)

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.

493 Special Problems in Radiological Health (2 or 4, max. 8)

BALTZO

Observation and participation in research and clinical use of radiation emitters. Prerequisite, permission.

494 Clerkship: Diagnostic Radiology (*)

FIGLEY, LEIGHTON, PHILLIPS

Observation, instruction, and supervised participation in clinical fluoroscopy, radiography, film interpretation, and X-ray conferences. Prerequisites, senior standing and permission.

495 Clerkship: Therapeutic Radiology (*)

PARKER, PURCELL

Observation, instruction, and supervised participation in clinical radiation therapy including clinical examination, treatment planning and administration, and conferences. Prerequisites, senior standing and permission.

498 Undergraduate Thesis (*)

The student may write a thesis in either therapeutic or diagnostic phases of radiology. Prerequisite, permission.

501-502 Biological Effects of Ionizing Radiation (2-2)

JACKSON

Effects of ionizing radiation at the molecular, cellular, organ and organism levels with emphasis on mammalian systems. Required for radiological science students. (Formerly 481, 482.) Prerequisite, permission.

501L-502L Laboratory in Radiation Biology (1-1)

JACKSON

Laboratory study of the biological effects of ionizing radiation. Required for Radiological Science students. (Formerly 481L, 482L.) Prerequisite, permission.

510 Special Topics in Radiation Biology (2)

CHRISTENSEN

A detailed study of current research of special significance to the development of radiation biology.

520 Seminar (2)

604 Research (*, max. 12)

The following Radiology courses are offered at the Center for Graduate Study at Richland, Washington.

R400 Radiobiology (3)

BAIR

This course requires only a minimum background in chemistry and does not presume any prior study of biology. Chemical, biological, and genetic effects of irradiation on unicellular and multicellular organisms, tolerance and dosage limits, effect of internal emitters, radiological ecology. Prerequisites, degree in science or engineering, Physics R323, or permission.

R485 Radiation Dosimetry (4)

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.

SURGERY

Conjoint 426-427 Introduction to Physical Diagnosis (4-9)

(See Conjoint Courses.)

428 Neurosurgery Research Seminar (1)

CHATRIAN, DEVITO, FOLTZ, KELLY,
MORLOCK, WARD, WHITE

Presentation and discussion of research topics by staff and students. Elective for second-, third-, fourth-year medical students and graduate students. Prerequisite, permission Division and Department.

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 also be included. Seminars will be conducted weekly in each of the surgical specialty areas. Required for third-year medical students.

475 Preceptorship in Orthopedics (*)

ANDERSON, GLOYD

Student will follow a preceptor in all his work to better understand the pathophysiology and management of problems of the musculoskeletal system. Elective for medical students. Prerequisite, permission Division and Department.

476 Pediatric Orthopedic Clerkship (*)

Students will be assigned to the orthopedic service at Children's Orthopedic Hospital and Medical Center where they will have the opportunity to study problems of the musculoskeletal system in patients on an inpatient and outpatient basis. The student becomes an integral part of the service and assists in patient care; attends rounds, seminars, and correlative anatomy conferences. Elective for medical students. Prerequisite, permission Division and Department.

477 Electroencephalography Laboratory (*)

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.

**478 Neurosurgery Research (*)**

CHATRIAN, DEVITO, FOLTZ, KELLY,
MORLOCK, WARD, WHITE

Investigation of special problems as an intimate member of the research team in the neurosurgical laboratory. Research to lead to a thesis if desired. Elective for medical students. Prerequisite, permission Division and Department.

479 Clinical Neurosurgery (*)

FOLTZ, KELLY, WARD, WHITE

Student serves clinical clerkship as active extern on neurosurgery ward at University Hospital or affiliated hospital. Elective for medical students. Prerequisite, permission Division and Department.

480 Surgery Clerkship-Selective Elective: Neurosurgery, Orthopedics, Urology (*)

Time is divided between the inpatient and outpatient services of two of these divisional specialties; affords student 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.

481 Surgical Externship in Ophthalmology and Otolaryngology (*)

PASSMORE, AND LINEBACK, MADIGAN;
CAIN, U.S.P.H. HOSPITAL

At Madigan Hospital, individual externship training in outpatient department of ophthalmology and otolaryngology; the student attends hospital conferences and meetings. At U.S.P.H. Hospital, externship in otolaryngology in outpatient clinic (visits average 600 per month); the student utilizes own diagnostic abilities, performs or assists instructor in all phases of patient work-ups and care; attends ward rounds and conferences. Elective for medical students. Prerequisite, permission Division and Department.

482 Externship in General Surgery (*)

BAKER, SAVAGE, SPEIR

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 Division and Department.

483 Urology Research (*)

ANSELL

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 Division and Department.

484 Clinical Urology (*)

ANSELL

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 in responsibility for the care of patients on this service. Elective for medical students. Prerequisite, permission Division and Department.

485 Cardiovascular Surgery (*)

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 Division and Department.

486 Plastic Surgery Clerkship and Preceptorship (*)

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 Division and Department.

487 Animal Surgery (*)

STEVENSON

Participating students perform as a surgical team approximately six complete representative procedures in animal laboratory under standard operating room conditions, utilizing standard operating room techniques. Special conference precedes each session. Elective for medical students. Prerequisite, permission.

498 Undergraduate Thesis (*)

Offered to those students who have engaged in summer research in any division of 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 from the Division and Department.

499 Undergraduate Research (*)**Courses for Graduates Only****520 General Surgery Seminar (5)**

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.

521 Orthopedic Research Seminar (*)

AKESON, ANDERSON, CLAWSON

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 (*)

CLAWSON

Seminar in current topics of orthopedic interest. Prerequisite, senior medical student or graduate student.

525 Seminar in Plastic and Maxillofacial Surgery (*)

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 Division and Department.

529 Neurosurgery Seminar (1)

CHATRIAN, DEVITO, FOLTZ, KELLY,
MORLOCK, WARD, WHITE

A weekly seminar centered around advanced clinical topics in neurosurgery with discussion by staff and students. Elective for senior medical students and graduate students. Prerequisite, permission Division and Department.

Conjoint 585 Surgical Anatomy (1-3, max. 12)
(See Conjoint Courses.)**590 Surgical Experimental Techniques (5)**

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.

598 Seminar in Urology (*)

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.

600 Research (*)**700 Thesis (*)****SCHOOL OF NURSING****Courses for Undergraduates****102 Introduction to Professional Nursing (2)**
GRAY

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. Lectures, discussion, observations, and field visits. Open to any student in the University.

227 Nursing Fundamentals (2)

BRANDT, COLIN, HAY

Concepts of health which influence health practices. Nursing activities concerned with maintenance of health, selection of medical aid, and initial hospitalization. Two hours laboratory, weekly.

228 Nursing Fundamentals (2)

BRANDT, BRUNO, COLIN, HAY

Effects of illness on individuals. Selected nursing measures to meet patients' needs, including

technical, communication, observation skills. Natural and social science principles applied. Three hours clinical laboratory, weekly.

229 Nursing Fundamentals (3)

BRANDT, COLIN, HAY

The role of the nurse in meeting selected therapeutic needs of patients. Prerequisite, 228. Six hours of clinical laboratory per week.

250 Introduction to Psychiatry and Psychiatric Nursing (5)

BUCKLES, RISLEY

Concepts and principles used in planning nursing care of mentally ill patients. Therapies and rehabilitation measures.

251 Selected Psychiatric Nursing Practice (5)

BUCKLES, CASHAR

Application of fundamental principles in planning and caring for the mentally ill patient. Fifteen hours clinical experience in community psychiatric facilities. Concurrent with 250. For affiliate students only.

252 Introduction to Nursing Care and Treatment of Tuberculosis (2)

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. Lectures, discussions, and demonstration. Seven hours per week for three weeks.

253 Selected Tuberculosis Nursing Practice (2)

Emphasis on planning comprehensive nursing care of the chronically ill, including the alcoholic, by utilization of paramedical services. Problem-solving approach stressed. Hospital practice, ward discussions, clinic, and conferences. Twenty-two hours of laboratory experience per week for three weeks. Concurrent with 252. For affiliate students only.

260 Scientific Principles Basic to Nursing (2)

BRUNO

Rationale for determining nursing actions based on study of pathological changes.

298 Introduction to Normal Growth and Development (2)

BARNARD

Basic concepts and principles related to the nursing care of children from infancy through the preschool period. Classroom observation of children at different age levels, parent interviews, case studies, lecture and discussion. Concurrent with 368.

299 Introduction to Normal Growth and Development (2)

BARNARD

Basic concepts and principles related to the nursing care of children from school age through adolescence. Schoolroom observations, child interviews, lecture and discussion. Concurrent with 370.

315 Nursing for Physical Therapists (3)

HAY

Selected nursing activities and techniques for students in the physical therapy program.

361 Survey of Trends in Contemporary Nursing (2)

Emphasis on current problems. For registered nurses only.

365 Therapeutics and Nursing Care (2)

SCHUMANN

The nurse's responsibilities in the use of selected therapeutic agents, treatment, and diagnostic tests. For registered nurses only.

366 Special Problems in Nursing Care (2)

FATKA

Emphasis on mental aspects. Concurrent with 419. For registered nurses only.

367 Nursing Principles in Mother and Child Care (4)

KLEMER, STEWART

An introduction to major concepts in family-centered care of mothers and infants; scientific and nursing principles in the care of women before, during, and after childbirth, and in infant care during the newborn period.

368 Nursing Practice in Mother and Child Care (5)

CLAYPOOL, KLEMER, STEWART

The application of scientific and nursing principles to the care of women, before, during, and after childbirth, and to the care of the newborn infant. Fifteen hours experience per week in prenatal clinics, obstetricians' offices, and hospitals. Concurrent with 367.

369 Nursing Principles in Mother and Child Care (4)

KLEMER, STEWART

Continuation of 367, with emphasis on meeting the health needs of children from birth through adolescence. Includes health supervision, and common illnesses and disabilities of children.

370 Nursing Practice in Mother and Child Care (5)

CLAYPOOL, KLEMER, STEWART

Continuation of 368, with emphasis on the health supervision of the well child and the care of children with common illnesses and disabilities. Fifteen hours experience per week in clinics, hospitals, and pediatricians' offices. Concurrent with 369.

371 Principles of Medical-Surgical Nursing (4)

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)

BOOZER, HASTIE, GUICHON, SCHUMANN

Application of scientific and nursing principles to the care of adult patients with selected

medical-surgical conditions. Fifteen hours experience per week in hospital wards and operating room. Concurrent with 371.

373 Principles of Medical-Surgical Nursing (4)

BOOZER, BRUNO

Discussion of selected medical-surgical conditions and related nursing care. Identification of principles from nursing and the basic sciences.

374 Medical-Surgical Nursing Practice (5)

BOOZER, HASTIE, GUICHON, SCHUMANN

Fifteen hours clinical experience per week in hospital wards and operating room. Identification of common elements and significant differences in care of medical-surgical patients with specialized nursing problems. Concurrent with 373.

407 Principles of Ward Management and Bedside Teaching (3)

Problems of ward administration, with emphasis on the supervisory and teaching functions of the team leader, and on the provision of patient teaching. Human relations in the ward situation are stressed. Concurrent with 422.

409 Professional Problems in Nursing (2)

COLIN, GRAY

Responsibilities of the professional nurse to the community. Study of professional organizations, opportunities in various fields of nursing, legislation, accreditation, and professional literature. Concurrent with 422.

412 Scientific Principles in Nursing Care (3)

BRANDT, MANSFIELD

An undergraduate seminar devoted to a critical analysis of nursing situations, with emphasis on the identification and utilization of the inherent social and natural science principles. (In Registered Nurse Baccalaureate Program, concurrent with 415-416.)

413 Principles of Psychiatric Nursing (5)

JARROTT, SCHULTZ

Concepts and principles of psychiatric-mental health nursing used in planning care of mentally ill patients. Psychiatric therapies and rehabilitation measures.

414 Psychiatric Nursing Practice (5)

BECKWITH, SCHULTZ

Applications of psychiatric-mental health principles and skills in the care of selected psychiatric patients. Fifteen hours clinical experience in community psychiatric facilities. Concurrent with 413.

415 Community Health Nursing Principles (3)

COBB, MARTIN

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)

BERG, COBB, FISHER, MARTIN, SPARROW

Application of public health nursing principles and skills in family and community health situations. Problem-solving and interpersonal relationship skills emphasized. Concurrent with 415.

417 Principles of Teaching Nursing and Health (3)

NITE

Introduction to learning principles and processes as related to nursing and health. Prerequisites, Psychology 106 and Education 209 or equivalent. For registered nurses only.

418 Supervision in Nursing (3)

LITTLE

Principles of supervision as they apply to nursing in hospitals and health services. The importance of interpersonal relations in supervision. For registered nurses only.

419 Contemporary Nursing in the Hospital (3)

NITE

Weekly conferences, and four hours of weekly clinical experience in nursing in hospitals. Fundamental problems in nursing care. Prerequisite, 365. Concurrent with 366. For registered nurses only.

421 Selected Problems in Clinical Nursing (4)

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 team leader.

422 Senior Nursing Practice (6)

PATRICK, ROSE

Experience dealing with 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 experience. Concurrent with 421.

425 Current Literature in Nursing (2)

BURKE

Analysis of current literature and research findings related to a selected clinical area of interest.

429 Nursing Functions in Gerontology (2)

SCHULTZ

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)

Supervised individual research on a specific nursing problem. Open to qualified majors in the senior year. Prerequisite, permission of instructor. May substitute for 412. Concurrent with 416.

Courses for Graduates

430 Advanced Nursing Field Work (3)

FATKA, GIBLIN, NEHREN, ROSE, SPARROW

Identification and analysis of complex nursing problems, rationale for nursing therapies used, and evaluation of results. Guided experience with selected patients in clinical specialty. Weekly seminar.

431 Advanced Nursing Field Work (2)

FATKA, ROSE, SPARROW

Continuation of Nursing 430. Selected experiences in areas of major clinical interest. Weekly seminar. Prerequisite, 430.

435 Practice Supervision in Nursing (3)

SPARROW

Identification and analysis of administrative problems related to providing and evaluating optimum nursing care for groups of patients. Guided experience in selected clinical situations. Weekly seminar. Prerequisites, 454, experience in field.

436 Practice Teaching in Nursing (3)

COBB, FATKA, GIBLIN, MURRAY

Identification and utilization of optimum learning situations for basic student's clinical experience. Evaluation of progress. Guided experience in selected teaching situations. Weekly seminar. Prerequisite, 462.

454 Administration in Nursing (2)

Philosophy, purpose, and elements of administration. Explores communication in administration, administrative behavior, administration of change, personnel, and material. Prerequisite, 418.

455 Administration of Schools of Nursing (3)

Application of principles: over-all administrative functions as they relate to organization, student and faculty personnel, curriculum facilities, finance, records, and reports in schools of nursing. Prerequisite, 454. (Not offered 1964-65.)

456 Nursing Service Administration (3)

Application of fundamentals of administration and organization to hospital nursing service. Planning for personnel, equipment, physical facilities. Budget control. Interdepartmental relationships. Prerequisite 454.

462 Teaching in Schools of Nursing (3)

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. Prerequisites, 417, Education 309.

463 Personnel Guidance in Nursing (3)

NEHREN

Development of concepts and principles of interpersonal relations in personnel guidance.

464 The Nurse in Mental Health (3)

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)

Planning, developing, and evaluating in-service programs in various institutions and agencies, seen as a part of continuing education of all nursing personnel. (Offered Summer Quarter 1965.)

467 Evaluation of Performance in Nursing (3)

TJELTA

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.

471NJ Advanced Directed Teaching: School Nursing (4)

COBB

Directed school nursing practice in public schools, including health education and health services. Offered jointly with the College of Education.

481 The Nurse in School Vision Programs (2)

Nurse's role and responsibilities. Relationship of vision programs to community health services. Lecture, discussions, and demonstrations. (Not offered 1964-65.)

485 School Health Problems (3)

Analysis of and planning for programs based on developmental needs of the school-age child. Field observation and participation in school health programs. (Not offered 1964-65.)

486 Occupational Health Programs, Nursing Implications (3)

Philosophy, scope, types of programs; functions of health personnel; interpersonal and community relationships, environmental and preventive health aspects. Emphasis on role of the nurse. (Not offered 1964-65.)

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)

NEHREN

Evaluation of selected theoretical concepts relating to dynamics operating in groups; analysis of process and development of skills to increase group productivity.

504 Seminar in Occupational Health Nursing (2)

Intensive analysis of selected problems. (Not offered 1964-65.)

505 Seminar in Administration of Schools of Nursing (3)

GRAY

Application of principles of administration to schools of nursing. Case method with discussion and analysis of situations presented. Prerequisite, 454 or equivalent (Offered Summer Quarter 1965.)

506 Seminar in Nursing Service Administration (3)

Over-all planning for the nursing department with study of administrative problems, policy making, control, and other administrative practices. Prerequisite, 456.

507 Seminar in Nursing Problems in Mental Health (2)

NEHREN

Psychiatric concepts in the nurse's therapeutic role in the family milieu. Prerequisite, 508 (Offered Summer Quarter 1965.)

508 Seminar in Advanced Psychiatric Nursing (2)

Development of a philosophy of psychiatric nursing through comparative analysis of psychiatric theoretical formulations; implications for role expectations in therapeutic settings. Concurrent with 430.

509 Seminar in School Nursing (3)

The application of public health nursing concepts, principles, and research findings in the analysis and solution of school nursing problems. (Not offered 1964-65.)

510 Curriculum Development in Nursing Education (5)

TJELTA

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)

FATKA, 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)

Analysis of specific role relationships in treatment of the emotionally ill; emerging roles implied by trends in mental health programs. Prerequisite, 508. (Offered Summer Quarter 1965.)

513 Field Experience in Mental Health Nursing (3)

NEHREN

Analysis of interpersonal relationships in the family milieu; application of psychiatric con-

cepts in developing the therapeutic nursing relationships. Concurrent with 507. (Offered Summer Quarter 1965.)

516 Seminar in Child Psychiatric Nursing (5)

CRITCHLEY

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. Clinical laboratory hours per week, minimum of 12.

517 Seminar in Child Psychiatric Nursing (5)

CRITCHLEY

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.

518 Seminar in Child Psychiatric Nursing (5)

CRITCHLEY

Continuation of N517 with major emphasis upon synthesis of a body of child psychiatric nursing knowledge. Minimum of 16 laboratory hours. (Offered Summer Quarter 1965.)

519 Seminar in Child Psychiatric Nursing (5)

CRITCHLEY

Planning and implementing therapeutic group relationships with disturbed and defective children in a children's treatment center. Minimum of 12 laboratory hours. (Offered Summer Quarter 1965.)

520 Methods of Research in Nursing (3)

HOFFMAN

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)

HOFFMAN

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)

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)

Analysis of significant problems in care of mentally retarded children and their families, through consideration of the complex biophysical, psychological, and sociocultural factors involved. (Not offered 1964-65.)

540 Seminar in Medical-Surgical Nursing (3)

GIBLIN

Exploration of influences of physical and emotional factors on pathophysiology underlying selected manifestations of physical illness. Implications for nursing diagnosis and nursing therapy.

542 Seminar in Cardiovascular Nursing (3)

Exploration of influence of physiological and psychological factors on pathophysiology underlying selected cardiovascular conditions. Implications for nursing management. Prerequisites, 430 (medical-surgical), 464. (Not offered 1964-65.)

543 Seminar in Nursing in Gerontology (3)

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. (Offered Summer Quarter 1965.)

550 Advanced Public Health Nursing (3)

COBB

Derivation of public health nursing concepts and principles. The solution of current and complex community health problems.

558 Seminar in Advanced Public Health Nursing (3)

Application of concepts, principles, and research findings in analysis and solution of current and complex community health problems. (Offered Summer Quarter 1965.)

570 Seminar in Clinical Research in Nursing (3)

Philosophy, problems of design; use of criterion measures in terms of patient care. (Offered Summer Quarter 1965.)

600 Research (*)

700 Thesis (*)

COLLEGE OF PHARMACY PHARMACEUTICAL CHEMISTRY

Courses for Undergraduates

237, 238, 239 Organic Pharmaceutical Chemistry (3,3,3)

HUITRIC

The chemistry of the carbon compounds. Prerequisite, Chemistry 170.

248, 249 Organic Pharmaceutical Chemistry Laboratory (3,3)

HUITRIC

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)**

MCCARTHY

Use of scientific literature, preparation of abstracts, and assignments in selected pharmaceutical topics.

325 Quantitative Pharmaceutical Analysis (5)

KRUPSKI

Principles of volumetric analysis with special emphasis on medicinal compounds. Prerequisite, Chemistry 170.

326 Quantitative Pharmaceutical Analysis (5)

KRUPSKI

Principles of gravimetric and colorimetric analysis applied to medicinal compounds. Prerequisite, 325.

327 Quantitative Pharmaceutical Analysis (3)

MCCARTHY

Physicochemical methods used in pharmaceutical analysis. Prerequisite, 326.

395, 396 Pharmaceutical Chemistry (3,3)

FISCHER

The chemistry of pharmaceuticals and their constituents with respect to the physical and chemical methods used in standardization. Prerequisite, 326.

430 Inorganic Medicinal Products (3)

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 Organic Medicinal Products (3,3,3)

FISCHER, KRUPSKI

Nomenclature, classification, synthesis, properties, structure, and activity of medicinal products. Prerequisite, 239.

480 Advanced Medicinal Chemistry Laboratory (3)

HUITRIC

Synthesis of important medicinal products. Prerequisite, permission. (Offered alternate years; offered 1964-65.)

497 Toxicology (3)

FISCHER

A study of poisons, their action, and the treatment of conditions produced by them. Prerequisite, 239.

499 Undergraduate Research (*, max. 6)

FISCHER, HUITRIC, KRUPSKI, MCCARTHY

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)**

KRUPSKI

Chromatography, gas chromatography, ion exchange, and the use of various instruments

for scientific investigations and vitamin determinations. (Offered every third year; offered 1964-65.)

520 Seminar (1, max. 5)

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)

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 483, or permission. (Offered alternate years; offered 1965-66.)

531, 532, 533 Plant Chemistry (3,3,3)

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 1965-66.)

600 Research (*)

FISCHER, HUITRIC, KRUPSKI, MCCARTHY

700 Thesis (*)**PHARMACOLOGY****Courses for Undergraduates****312, 313, 314, 315 General Pharmacology (4,4,4,3)**

BRADY, TYLER

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 361.

405 Advanced Pharmacology (3)

TYLER

A laboratory course covering advanced techniques in pharmacology.

406 Medicinal Plants (2)

TYLER

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)

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, 315, and Physiology and Biophysics 360 or equivalent.

412 Immunological Agents (2)

BRADY

Production, quality, and use of serum, vaccine, virus, and allergenic products currently employed in the prevention and treatment of disease. Prerequisite, 315.

499 Undergraduate Research (*, max. 6)

BRADY, TYLER

Research problems in pharmacology. Prerequisite, cumulative grade-point average of 2.50 and permission.

Courses for Graduates Only**520 Seminar (1, max. 5)**

Graduate students must attend seminars and make one formal presentation per year while in residence; 1 credit per year is allowed.

581 Topics in Pharmacology (1, max. 2)

TYLER

Discussions and readings of topics of current interest in the field of pharmacology. Subject matter changes from year to year. Prerequisite, reading knowledge of German.

600 Research (*)

BRADY, TYLER

700 Thesis (*)**PHARMACY AND PHARMACY ADMINISTRATION****Courses for Undergraduates****204 Orientation and History (2 or 3)**

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)

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)

HAMMARLUND

A study of pharmaceutical dosage forms including processes, physical principles and metrology involved in their preparation. Prerequisites, Physics 102 and 108, Microbiology 301, and Pharmaceutical Chemistry 239.

352 Pharmacy and Therapeutics (3)

Principles of pharmacy; mathematics of pharmacy; pharmacological and therapeutic action of drugs. For nonmajors.

407, 408, 409 Pharmacy in Dispensing Practice (4,3,3)

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.

410 Clinical Dispensing Pharmacy (1)

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.

411 Dispensing Formulation (2)

HALL

Problems in the design and preparation of pharmaceuticals in dispensing practice. Prerequisites, 333 and permission.

420 Manufacturing Pharmacy (3)

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)

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)

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)

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)

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)

HALL, HAMMARLUND, PLEIN, RISING

Pharmaceutical research problems. Prerequisites, cumulative grade-point average of 2.50 and permission.

Courses for Graduates Only

520 Seminar (1, max. 5)

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)

PLEIN

The technology of parenteral preparations, ophthalmic solutions and ointments, and specific problems in formulation of sterile pharmaceuticals. (Offered alternate years; offered 1965-66.) Prerequisite, permission.

570 Hospital Pharmacy Administration (5)

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 1965-66.) Prerequisite, permission.

580 Advanced Manufacturing Pharmacy (5)

PLEIN

A study of the methods of manufacture of pharmaceutical preparations on a semi-commercial scale. (Offered alternate years; offered 1964-65.) Prerequisite, Chemistry 457, or taken concurrently, and permission.

600 Research (*)

HALL, HAMMARLUND, PLEIN, RISING

700 Thesis (*)

SCHOOL OF LIBRARIANSHIP

440 Libraries and Society (3)

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)

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)

BEVIS, TURNER

Basic principles of book selection applicable to library work. A prerequisite to graduate courses in librarianship.

443 Organization of Library Materials: Theory and Practice (3)

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)

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 (3)

WHEELER

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)

WHEELER

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)

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)

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)

BEVIS

Development of the written and printed book, growth of the book trade, and aspects of rare book collecting as it affects libraries.

500 Libraries, Librarians, and Society (2)

LIEBERMAN

Objectives and principal fields of library services. Major trends and problems.

501 Libraries, Librarians, and Society (2)

BEVIS

Continuation of 500. Prerequisite, 500.

502 Library Organization and Administration (3)

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)**

BEVIS, LIEBERMAN

Four weeks of professionally supervised field work in various types of libraries.

510 Evaluation of Library Materials (4)

BEVIS, TURNER

Sources of information about books; criteria of evaluation for selection; evaluation of general reference materials; procedures of reader's services.

511 Library Materials in the Humanities and Social Sciences (3)

BEVIS, TURNER

Survey and evaluation of library resources in these fields. Included are reference tools, bibliographies, landmark books, and contemporary literature, with reference to the needs of different kinds of readers. Prerequisite, 510.

512 Library Materials in Science and Technology (3)

BEVIS

Continuation of 511. Prerequisite, 510.

513 Government Publications (2)

Government publications of the United States and foreign countries, their acquisition, organization, and use.

514 The Library and Audio-Visual Materials (3)

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.

530 Organization of Library Materials: Theory and Principles (4)

PETERSON

The organization of library materials for use: principles of cataloging, classification, and subject analysis; study of the Dewey Decimal and Library of Congress schemes of classification.

531 Organization of Library Materials: Comparative Methods (4)

PETERSON

Cataloging practices and methods employed to meet varying needs. Prerequisite, 530.

532 Organization of Library Materials: Advanced Problems (2)

PETERSON

Cataloging of special materials; maps, music, microfilm, and rare books; special classification schemes. Prerequisite, 531.

540 Advanced Legal Bibliography (2)

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)

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)

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)

WHEELER

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)

WHEELER

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 (3)

WHEELER

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.

599 Methods of Research in Librarianship (2)

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.

GRADUATE SCHOOL OF PUBLIC AFFAIRS

PUBLIC ADMINISTRATION

501, 502, 503 The Administrative Process (3,3,3)

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)

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. Prerequisite, permission.

521, 522, 523 Public Management (3,3,3)

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. Prerequisite, permission.

541, 542, 543 Social Theory and the Public Policy Process (3,3,3)

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.

600 Research (*, max. 15)

PUBLIC POLICY

500 General Seminar (*, max. 15)**528 Seminar in National Security Policy Formation (3)**

DENNY

The principal elements of national security. Constitutional, historical, theoretical, and administrative analysis of United States foreign and defense policy formation and execution. (Offered by Department of Political Science.) Prerequisite, permission.

532 Seminar in National Security Policy and Administration (3)

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.

600 Research (*)

POLITICAL SCIENCE

562, 563, 564 Public Law (3,3,3)

COLE

General legal concepts applicable to the conduct of governmental activities.

580, 581, 582 Seminar in Metropolitan and Urban Planning Problems (3,3,3)

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.

ECONOMICS

435 Natural Resource Utilization and Public Policy (5)

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)

TIEBOUT

553 Economic Analysis and Government Programs (3)

TIEBOUT

Application of economic analysis to public enterprises and programs. Prerequisite, Economics 451.

SCHOOL OF SOCIAL WORK

Courses for Undergraduates

391 Supervised Study (2-6, max. 6)

Specialized academic and field study in an agency of a selected social welfare problem. 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, permission.

400 Field of Social Welfare (5)

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)

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.

CHILD CARE

301 Child Care: Social Development (2)

Understanding of human growth and development in its continuum and developmental phases as related to the social development of children and youth. Prerequisite, permission.

302 Child Care: Care and Treatment Through Group Living (2)

Identification and analysis of roles and responsibilities of child-care staff in working with groups of children and youth. Prerequisite, permission.

303 Child Care: Group Dynamics in Program Development (2)

Introduction and assessment of relevancy of play and leisure-time activities associated with child-care function. Prerequisite, permission.

304 Child Care: Supervision of Child-Care Personnel (2)

Introduction to roles and processes of supervision of personnel in residential child-care and treatment programs. Prerequisite, permission.

305 Child Care: Care and Treatment of Pathological Group Situations (2)

Study of a range of pathological group situations in the context of group living within institutional settings and application of such knowledge in dealing with these situations. Prerequisite, permission.

REFRESHER COURSES

461 Current Concepts of Social Work Practice: Social Work Methods (2)

A review of the basic principles and concepts underlying professional practice of social work methods. Also, a review of recent professional literature and clinical materials.

462 Current Concepts of Social Work Practice: Human Growth and Behavior (2)

A review of knowledge pertaining to concepts of development and behavior as related to social behavior and social work practice.

463 Current Concepts of Social Work Practice: The Social Services (2)

A review and analysis of organization and structure of social welfare services and programs.

Courses for Graduates Only

502, 503, 504 Social Welfare Organization (2,2,2)

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.

509 Readings in Social Work (*)

Prerequisite, permission.

510 Social Case Work (2)

ABRAHAMSON, 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 Case Work (2)

ABRAHAMSON, MUNDT, REISS

Continuation of generic casework theory, with emphasis on diagnosis and casework treatment. Prerequisite, 510.

512 Social Case Work (2)

ABRAHAMSON, 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)

Prerequisite, permission.

520 Seminar (*, max. 6)

Prerequisite, permission.

521 Social Group Work (2)

CITRIN, DE NOON, MAIER

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)

CITRIN

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.

523 Social Group Work (2)

CITRIN

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.

524 Advanced Social Group Work (2)

CITRIN

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.

525 Advanced Social Group Work (2)

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.

**526 Advanced Social Group Work (2)**

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.

530 Advanced Social Case Work (2)

ABRAHAMSON, HUNT, 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, permission.

531 Advanced Social Case Work (2)

ABRAHAMSON, HUNT, 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 Case Work (2)

ABRAHAMSON, HUNT, 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 Case Work (2,2)

ABRAHAMSON, HUNT, REISS

Generic and differential factors in understanding and utilizing various administrative settings in social casework practice. Study of developments and trends in social casework practice. Prerequisite, permission.

535 Advanced Field Instruction

(4-8, max. 12)

C. MACDONALD

Prerequisite, 515.

550, 551, 552 Human Growth and Behavior (2,2,2)

EYMBERTS, 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.

556 Social Aspects of Illness and Disability (2)

EYMBERTS, R. MACDONALD

Physical growth and change of the individual as correlated with factors of emotional and social development; consideration of specific medical problems. Prerequisite, permission.

557 Social Work with Sick, Disabled, or Handicapped Persons

R. MACDONALD

Illness, disability, and handicapping conditions are viewed as engendering forms of behavior which depart from usual age and sex role expectations and thus are perceived by the public as forms of social deviancy. Individual, group and community stereotypes, attitudes and reactions to such deviancy are analyzed.

Identification is made of social work services appropriate to prevention and amelioration of stress associated with such deviancy. Specific emphasis is placed upon ways in which illness, etc., pose additional social-emotional problems according to the state of development in which the onset of illness occurs.

570 Administration of Social Agencies (2)

PARSONS

Problems of administration that confront the administrator and his staff in any public or private agency; relations with board and staff; problems of finance and budget making, office management. Emphasis on dynamic principles of the administrative process. Prerequisite, permission.

572 Social Community Organization (2)

STAFF

Problems of adjusting social welfare needs and resources; understanding the social forces of the community; methods used by public and private agencies to organize to meet social welfare needs; interpretation of agency programs to the community; the place of boards and committees. Prerequisite, permission.

580 Social Work and Public Policy (2)

PARSONS

Care of needy under poor laws, emergency relief and modern public assistance programs; characteristics of state assistance plans; administration of work relief; federal grants-in-aid; adult probation and parole; vocational rehabilitation services. Prerequisite, permission.

586 Statistics in Social Work (2)

NORTHWOOD

Elementary statistical method applied to social welfare problems; sources for continuing statistical reports; interpretation and use of statistics in welfare administration. Prerequisite, permission.

587 Law and Social Welfare (2)

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)

GRISWOLD, 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 Seminar in 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. Includes development of research design, collection of data, tabulation and analysis, and report writing. Prerequisite, 590 or its equivalent.

700 Thesis (*)

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.

702 Degree Final (6)

Limited to students completing a nonthesis degree program.

Affiliated Departments**PSYCHIATRY****452 Clinical Psychiatry (2 or 3)**

SCHWARTZ

553 Psychodynamics and Psychopathology (2)

HEILBRUNN

559 Child Psychiatry (2)

KAUFMAN

PSYCHOLOGY**599 Readings in Psychology (*)**

STROTHER

SOCIOLOGY**472 Juvenile Delinquency (5)**

HAYNER, SCHRAG

473 Corrections (5)

HAYNER, SCHRAG

474 Probation and Parole (3)

HAYNER

571 Correctional Communities (3)

HAYNER

572 Analysis of Criminal Careers (3)

HAYNER

573 Crime Prevention (3)

HAYNER

574 Seminar in Methods of Criminological Research (3)

SCHRAG

INTERDISCIPLINARY GRADUATE DEGREE PROGRAMS

GEOPHYSICS

Geophysics 403J Introduction to Geophysics (The Atmosphere) (5)

The atmosphere in its relation to the environment, gravity, geomagnetism, composition, transfer processes, motions, clouds, signal phenomena. Prerequisites, Mathematics 324, Physics 371, or permission.

Geophysics 404J Introduction to Geophysics (The Ocean) (5)

Composition and character of sea water; physical, chemical and geological properties and processes; dynamics; waves. Prerequisites, Mathematics 324, Physics 371, Chemistry 170, or permission.

Geophysics 405J Introduction to Geophysics (The Earth) (5)

Solid material in space, internal structure of the earth, sources of forces and stresses, the crust, tectonic cycles, time scale and dating, correlation of rock types and structural setting. Prerequisites, Mathematics 324, Physics 371, Chemistry 170, or permission.

NUCLEAR ENGINEERING

For a description of courses in Nuclear Engineering, see *College of Engineering* section.

RADIOLOGICAL SCIENCES

For a description of the curriculum in Radiological Sciences, see *Interdisciplinary Graduate Degree Programs* section.

RESERVE OFFICER TRAINING CORPS

MILITARY SCIENCE

Courses for Undergraduates

101, 102, 103 Military Science I: Basic (1,1,1)

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 of warfare.

201, 202, 203 Military Science II: Basic (2,2,2)

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, techniques 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, strategical, and social patterns found in the present-day Army.

301, 302, 303 Military Science III: Advanced (3,3,3)

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. One academic substitute is required during the year.

360 Military Science III: Advanced Summer Camp (3)

Six weeks training at an Army installation. 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. (Offered Summer Quarter only.)

401, 402, 403 Military Science IV: Advanced (2,2,3)

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.

NAVAL SCIENCE

Courses for Undergraduates

111 Naval Orientation (3)

General introduction to the Navy; its organization, discipline, and methods of operation.

112 Concepts of Sea Power (3)

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)

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)

Introduction to naval weapons and weapons systems; weapon and ordnance installations; the theory of fire control.

212 Naval Weapons Laboratory (1)

Practical work on naval weapons and weapons systems. (Prerequisite, one course in psychology or human relations.)

213 Guided Missiles and Nuclear Weapons (3)

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)

Terrestrial navigation including dead reckoning, piloting, and electronic navigational developments; celestial navigation, emphasizing celestial theory.

312 Navigation and Naval Operations (3)

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)

Employment of naval forces, naval tactics, operation plans and orders; employment of detection equipment; meteorology.

411 Naval Engineering (3)

Principles of ship propulsion, marine steam power plants, auxiliary systems, elements of ship stability and damage control.

**412 Naval Engineering and Leadership (3)**

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)

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)**

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)

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)

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 (3)

Introduction to the development of amphibious warfare; detailed study of the amphibious campaigns of World War II; resumé of the Korean conflict.

422 Amphibious Warfare and Leadership (3)

A study of the detailed planning for an amphibious operation including Marine Corps staff organization, command relationship and task organization. Introduction to naval leadership including the Uniform Code of Military Justice.

In the Spring Quarter of the senior year, Marine Corps Option Students take 413.

SUPPLY CORPS OPTION STUDENTS**331 Organization and Logistics, Navy Accounting, and Finance (3)**

Introduction to Supply Corps; Navy Bureau system; supply demand control point concepts; naval finance, appropriation, and cost accounting.

332 Advanced Navy Accounting and Basic Supply Afloat (3)

Navy accounting, balance sheet reconciliation; reports and returns; organization and administration of supply afloat; afloat requirements determination and stock control.

333 Advanced Supply Afloat (3)

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)

Operating procedure, records, reports, and returns for ship's store afloat; operating procedures, records, reports, and returns for clothing and small stores afloat.

432 Ship's Store Afloat; Clothing and Small Stores and Leadership (3)

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.

AIR SCIENCE**Courses for Undergraduates****121, 122, 123 Air Science I—Basic (1,1,1)**

Foundations of Aerospace Power: An introductory examination of the factors of aerospace power, major ideological conflicts, requirements for military forces in being, responsi-

bilities of citizenship, development and traditions of the military profession, role and attributes of the professional officer in American democracy, organization of the armed forces as factors in the preservation of national security, and the United States Air Force as a major factor in the security of the free world. One classroom hour and one hour of Leadership Laboratory per week.

211, 212, 213 Air Science II—Basic (1,1,1)

World Military Systems: A comparative study of world military forces to include Free World land and naval forces. Free World air forces, Communist military systems, and trends in the development and employment of military power. One classroom hour and one hour of Leadership Laboratory per week.

321, 322, 323 Air Science III—Advanced (3,3,3)

Growth and Development of Aerospace Power: A survey course about the nature of war; development of airpower in the United States; mission and organization of the Defense Department; Air Force concepts, doctrine, and employment; astronautics and space operations; and the future development of aerospace power. Includes the United States space programs, vehicles, systems, and problems in space exploration. Three classroom hours, one hour of supervised research, and one hour of Leadership Laboratory per week.

304 Air Science III—Advanced (3)

Summer Training Unit: Four weeks training at an Air Force base; familiarization with the duties and problems encountered by the Air Force junior officer.

491, 492, 493 Air Science IV—Advanced (3,3,3)

Global Relations: An intensive study of global relations of special concern to the Air Force officer, with emphasis on international relations, geography, and military application of weather and aerial navigation, and briefing for commissioned service. Four classroom hours and one hour of Leadership Laboratory per week.

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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 either render a decision on the appeal 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 records of students held by the University of Washington, regardless of origin, are the property of the University and may be used by the University in any manner deemed appropriate. Student records will be treated in a responsible manner and with due regard to the personal nature of the information they contain. However, the student should understand that the student records and information based upon student records may be disclosed to others when, in the judgment of the University, such disclosure serves the best interests of the student, the University, or the community.

The University of Washington reserves the right not to release a student's record, or any information based upon the record, when the student has failed to discharge any obligation, financial or otherwise, to the University.

DEFINITIONS OF GENERAL UNIVERSITY TERMS

College

The University is made up of eight colleges, each of which offers a four-year 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.*, 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 graduate students (those who have already obtained a bachelor's degree) taking 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. A typical example is the Division of General Studies.

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.

Academic

All subjects offered at the University are classified as academic regardless of their content or method of presentation.

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 needs of the student.

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 fre-

quently 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 aspects 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 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 Army, Air Force, and Navy ROTC courses. For general purposes, the following apply. (See *Selective Service* in this section.)

- 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 registered in 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

An entering student on probation is a student with a record of unsatisfactory scholarship in previous high school or college work whose petition for admission on a trial basis has been granted by the Board of Admissions. Probationary status continues until he achieves the satisfactory academic record required or he is dropped for failure to achieve such a record. (See *Removal from Academic Probation* in this section.)

Other Students

See *Scholastic Standards Required for Graduation* in this section.

Special

A special student is a legal resident of the state of Washington who is twenty-one years of age or over, who is not a high school graduate, and who has been admitted to the University by the Board of Admissions.

Transient

Transient students are admitted to the *Summer Quarter only*. In order to register for Autumn, Winter, or Spring Quarters, they are required to file full credentials and be admitted through regular admission procedures. They may be:

1. Teachers and administrators, working for a degree from some other college or university, who desire to register for *undergraduate* courses during the Summer Quarter or who do not desire to file the complete credentials required for regular admission to the Graduate School or do not qualify for admission as a Visiting Graduate Student.
2. Students currently in attendance during the regular school year at another college or university who wish to attend the University of Washington during the Summer Quarter only. These students are required to present preliminary transcripts showing good scholarship in April or May preceding the Summer Quarter which they wish to attend.

Admission to the Summer Quarter with transient standing does not assure admission for the academic year. Students entering directly from high school are not eligible for transient standing, but must file credentials and obtain regular standing. *Transient students are not admitted to graduate classes (those numbered 500 or above).*

Visiting Graduate Student

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 advanced degree may be admitted as a Visiting Graduate Student. (See *Graduate Education* section.)

Auditors

With the consent of the dean and instructor concerned and upon payment of the auditor's fee, a mature person may enroll in any quarter as an auditor in any number of nonlaboratory courses or the lecture parts of any number of laboratory courses. An application must be filed with the Office of Admissions.

No person who audits a course may take an examination in it or obtain credit therefor except by taking the course later as a regular student and satisfying all 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 in some college of the University.

Auditors are not eligible for participation in student activities.

ADMISSION

Correspondence regarding requirements for admission to and graduation from any college or school of the University should be addressed to the Director of Admissions. Graduate students should refer to Admission statements in the *Graduate Education* section.

Terms Used in Admissions and Evaluation of Credentials

In the following rules concerning admission:

A *2.00 grade point* is equivalent to a C average on the standard grading system used in the state of Washington. Students from schools in other states will find their scholarship averages adjusted to the Washington four-point system. The maximum allowance toward University entrance for junior high school study is 4 units.

To count as a unit, a subject must be taught five times a week, in periods of not less than forty-five minutes, for a high school year of thirty-six weeks.



Accredited high schools in Washington are those accredited by the State Department of Public Instruction; in Alaska, by the Northwest Association of Secondary and Higher Schools; in other states, by the state university of the state or by a regional accrediting association.

Accredited colleges and universities are those accredited by the regional accrediting association of the area in which they are located. (Transfer of credit from institutions accredited for less than four years will not be accepted in excess of the accreditation of the school concerned.)

Admission to Resident Program

Regulations pertaining to admission to the University are administered by the Board of Admissions, an administrative board appointed by the President. First preference is given to qualified residents of Washington and all sons and daughters of University of Washington alumni.

Graduates From Unaccredited High Schools

A graduate from an unaccredited high school in Washington, if he has the recommendation of his principal, may petition the Board of Admissions for permission to enter. Before granting such permission, the Board may require the student to pass certain examinations.

Non-High School Graduates

In general, the Board of Admissions considers that College Entrance Board Examinations may be used to supplement unaccredited or incomplete preparatory study but may not be used as the sole basis to supply entrance credits. Applications of this kind must be reviewed by the Board of Admissions.

Information regarding College Entrance Board Examinations may be obtained by writing to the Educational Testing Service, P.O. Box 592, Princeton, New Jersey, or Box 27896, Los Feliz Station, Los Angeles, California.

Special Students

With the consent of the Board of Admissions, a legal resident of the state of Washington who is twenty-one years of age or over, may be admitted to the University as a special student. Official records of all previous school work, if available, shall accompany the application.

A special student so admitted may take such regular courses as the dean of the college may determine. A special student may not participate in student activities, nor shall he be eligible for any degree, but by fulfilling the requirements for admission to the college or department in which he is enrolled, he may become a regular student.

See definition of a regular student.

Allowance of 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.

Credit may be granted for work done in Armed Forces training schools upon the terms and subject to the limitations set forth in the regulation governing acceptance of Armed Forces training schools credit. (See below.)

No credit will be granted to a student for courses taken in another college while the student is in residence at the University, unless written permission to register for such courses is obtained by the student from the University department giving such instruction in the subject, from his major department, and from the dean of his college. The prescribed written permission is effective only if obtained before registration. Nothing in this rule makes mandatory the granting of any credit by the University.

Other Types of Admission to Advanced Standing

Armed Forces Training Schools Credits

The University reserves the right to accept or reject Armed Forces training schools credits. It shall be the policy of the University to accept, without validating examinations, such Armed Forces training schools credits as may be determined to be acceptable upon application to the Director of Admissions.

The maximum number of credits obtainable by acceptance of Armed Forces training schools credits shall be 30.

All acceptable Armed Forces training schools credits shall be counted as extension credits and shall be included in the 90 extension credit maximum allowed toward the bachelor's degree.

Within a given field of study, no student shall receive Armed Forces training schools credits in subject matter more elementary than that for which he has previously received credit.

If a student repeats a course taken at an Armed Forces training schools which was accepted for credit at the University of Washington, the University of Washington credit shall be honored and the Armed Forces training schools credit shall be canceled.

Work of Unknown Standing (Credit by Examination)

For work done in institutions whose standings are unknown, or for work done with private teachers, credit shall be granted only upon examination. (See *Examination and Tests* in this section.)

Unaccredited Schools Offering Specialized Instruction (Certification Examination)

Credits from unaccredited schools offering specialized instruction shall be accepted only after certification by the departmental examiner, the executive officer of the department, and the dean of the college or school concerned. The fee for such certification shall be \$5.00. A student seeking such certification shall make application on forms available at the Admissions Office.

Application forms for examinations may be obtained at 106 Administration Building.

All applications for, and questions about entitlement should be addressed to a Veterans Administration Regional Office.

Credit for Armed Forces Training Courses

The American Council on Education has provided colleges and universities of the United States with recommended credit values for Armed Forces training courses offered on college campuses as well as at Army, Navy, and Air Force camps, posts, and stations. In accordance with these recommendations, a maximum of 30 quarter credits is allowed for such study, if equivalent to degree courses at standard universities, and such credits are applied, if possible, on University requirements. They are not, however, readily applicable to the requirements of the curricula of the College of Engineering, of premedicine, or elsewhere.

Credits earned in *approved* extension departments of accredited universities through the United States Armed Forces Institute will be applied as far as possible on University requirements. (See *Extension Credits and Correspondence Study* in this section.)

The Admissions Office of the University should be consulted for exact evaluations of such credits.

Correspondence Study

Correspondence study courses are open to all who can pursue the work with profit to themselves regardless of previous academic accomplishment. Veterans wishing to avail themselves of these courses under Public Law 550 may obtain information as to regulations and procedure upon request to the Division of Correspondence Study. See section concerning registering for correspondence study while registered for work in residence; section for the amount of correspondence study work allowed to be used for a bachelor's degree; and the current *Correspondence Study Bulletin* for further details. Credits by correspondence are not applicable to an advance degree in the Graduate School.

REGISTRATION FOR WORK IN RESIDENCE

Registration of students is the joint responsibility of the faculty and the administrative staff. The rules concerning registration which follow are faculty rules. Counseling students, assisting them in the selection of courses, and enforcing faculty rules are the responsibilities of the academic deans and their advisory staffs. The collection of fees which has been set by state law and/or by the Regents is the responsibility of the Comptroller. (For fees, see *Appendix A*.) Enforcement of faculty rules and the actual mechanics of registration is the responsibility of the Registrar. Registration is officially completed in the Sections Office, 101 Administration



Building (engineers go to 208 Guggenheim Hall), after fees have been paid to the Comptroller. Students are assigned to sections in courses approved by their academic advisers at the Sections Office.

Quarterly Announcement of Registration Period Dates

Registration dates are announced through the calendars in the bulletins, posters placed on campus bulletin boards and "Official Notices" in the *Daily*. Each student is held responsible for watching "Official Notices" in the *Daily* and the bulletin boards for detailed quarterly instructions for completing registration. (See also the *Academic Calendar* in this Catalog.)

Registration Required

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.

There will be no exceptions to the rules and procedures established for course registration. (See *Methods of Registration* in this section.) They apply to both full-time and part-time students and will be enforced by the Registrar's Office without referral.

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.

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 Schools of Dentistry, Law, or Medicine, and those initially granted Unclassified-5 status in another academic area.
2. Students on scholastic probation who are prohibited from participating in Advance Registration by their academic deans, and who present an adviser-approved waiver of the \$15.00 service charge 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 for the ensuing quarter.
4. Graduate students registering *in absentia*, with the approval of the Dean of the Graduate School.
5. Students who withdraw *on or after* the first day of the quarter, but *before* the close of Advance Registration.

An eligible student leaves his approved Official Program of Studies at Sections, 101 Administration Building, within the specified dates. His schedule assignments are made in his absence. Programs are scheduled by class in the order in which they are received. 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 Statement. His enrollment is completed when he pays his fees by mail by a stated deadline and turns in all Information Cards as directed.

Students who withdraw after the first three days of the Autumn, Winter, or Spring Quarter will be eligible to to participate in *Advance Registration* for the following quarter, if they so desire.

A service fee 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). Students must apply by the application deadline. A registration appointment is required, on which date the student must pay his fees and take his approved Official Program of Studies to Sections, 101 Administration

Building (engineers go to 208 Guggenheim Hall) where he is given his class assignments and his enrollment is completed. (See *Registration Appointments* and *Registration Permits* in this section.)

Advising for *In-Person Registration* takes place after *Advance Registration* is closed.

Credits Allowed Per Quarter

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 military, naval, or air science courses.

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 Extension Services.

No resident student may take an extension course without the consent of the dean. This permission, on forms furnished for the purpose, shall be filed with the Division of Extension Services or the Division of Correspondence Study, whichever is appropriate to the request.

Concurrent Registrations at Other Collegiate Institutions

A student must obtain the specified signatures on duplicate petition forms which may be procured at 109 Administration Building or at the advisory office. One copy of the completed form with the required signatures must be left at the Admissions Office, 105 Administration Building, immediately and prior to registration at the other institution.

Registration Appointments and Registration Permits

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 or she reports for registration. Application for Admission at all levels, with complete credentials, must be received by the established deadline.

Former students may obtain an Application for Registration Appointment by writing or telephoning the Registrar's Office by the established application dead-

line appearing on campus bulletin boards and as indicated in this Catalog. (See *Academic Calendar*.) A service fee 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. *Although students in the Schools of Medicine, Dentistry, and Law are not required to have Registration Appointments, they must file an application for a Registration Permit by the deadline for applying for a Registration Appointment.*

Late Registration Appointments and Registration Permits

Students granted Registration Appointments and Registration Permits after the established application deadline will be subject to a service fee of \$15.00.

Class Time Schedules

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 (engineers go to 208 Guggenheim). *Time Schedules* are also available for inspection in each adviser's office.

Special Approvals Required (Permission Signatures)

Before being enrolled at 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 after they have obtained that of the departmental adviser.
3. Students registering for one or more courses in education must show "final approval" of the College of Education, obtained at 221 Miller Hall. This approval must be written on the student's Official Program of Studies form.
4. All private music lessons (applied music courses) must be approved by the School of Music and an authorization and special fee card issued by the School of Music must be presented at Sections.



5. All librarianship courses, except course 100, must be approved in writing on the student's Official Program of Studies form at the School of Librarianship, 111 Library.

6. Students registering for any course for which *instructor's permission* is specified in the *Time Schedule* should bring written approval on their Program of Studies form.

7. All former students who have not been in residence for a period of one year must report for a medical examination as instructed at the time they receive their Fee Cards at the Permit Window in the lobby of the Administration Building.

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 permit card issued by the Department of Mathematics to the student will be the authority for Sections to register a student in either of these courses. (See *Mathematics Qualifying and Exemption Tests*.)

Change of Registration

Changes of registration involving "adds" and "drops," or changes for the convenience of the University, will be accepted by Sections only during the Change of Registration period at the beginning of each quarter. (See *Academic Calendar* in this Catalog.)

Students finding errors on their schedules should be referred to Sections for adjustment without having to wait for the change of registration 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 registration 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 of Studies 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 registration period.

No change of registration 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 Fee

A service fee of \$5.00 will be assessed for each change of registration, or change of section, or withdrawal from a course, or any number of changes of registration 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 fee concerning section changes, additions, and/or withdrawals rests with the dean of the school or college or his authorized representative.

Change of Registration Procedure During the First Week of Instruction

For Adding or Dropping a Course

1. Consult your adviser and secure signed Change of Registration card.
2. Get course approval signatures for added courses where necessary.
3. Present signed Change card to Window 2, Administration Building Lobby, to receive a Change of Registration Appointment.
4. Go to Sections (101 Administration Building) on day and time of appointment. Engineers go to 208 Guggenheim.

Withdrawals

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.

Withdrawal from a course is voluntary severance by a student of his connection with a course.

Procedure for Withdrawal from the University

Nonmilitary Withdrawal

1. The student will obtain Request for Withdrawal From the University forms from his adviser.

2. Veterans 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 obtain approval of the Veterans Division.

3. The student will report to the Office of the Dean of Students for terminal interview.

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 and the Office of the Dean of Students have approved the withdrawal by signing the Withdrawal blanks.

5. The ROTC student presents his Withdrawal blank 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 and the Office of the Dean of Students have approved the withdrawal by signing the Withdrawal blanks.

6. The student then turns in all copies of the Withdrawal blank at the Information Window in the lobby of the Administration Building 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 blank is mailed to the parent if the student is an unmarried minor.

Military Withdrawal

1. Upon presentation of orders to report for active duty with the Armed Forces, a student in residence who withdraws from the University at a time consistent with such orders shall be granted certain credits for work completed in any course during the quarter of withdrawal with a grade of C or better. Granting of such credits shall be subject to the following conditions:

a. If the student withdraws at a date prior to completion of the first third of the general class schedule for a quarter, he shall receive no credit.

b. If the student has met all requirements stated in the first sentence of paragraph 1, and withdraws at a date subsequent to completion of the first third, but prior to completion of two-thirds, of the general class schedule for a quarter, he shall receive one-half unspecified credit without letter grade.

c. If the student has met all requirements stated in the first sentence of paragraph 1, and withdraws at a date subsequent to completion of the first two-thirds of the general class schedule for a quarter, he shall receive full specified credit without letter grade. If the student withdraws during the last five class days of the general class schedule for a quarter, he may be given a letter grade at the discretion of his instructor.

d. Unspecified credit granted under b above may later be converted to credit and grade in a specific course by credit examination, whereupon the unspecified credit shall be canceled. A letter grade for full credit granted under paragraph c above may later be earned by advanced credit examination.

2. The provisions of paragraph 1 shall apply to Summer Quarter courses, provided (a) that the student has registered for both halves of a summer course, and (b) that approval of the department head concerned is obtained. All other provisions in these rules shall govern equally the summer session and the regular quarters.

3. Dates marking completion, under paragraph 1, of one-third and two-thirds of the class schedule for a quarter shall be set in advance by the Registrar with the approval of the Senate Executive Committee, and published. These dates shall control administration of paragraph 1.

4. Upon presentation of orders to report for active duty with the Armed Forces, a student in residence who withdraws from the University at a time consistent with such orders shall, under certain circumstances, be granted a bachelor's degree. Awarding of this degree shall be subject to the following conditions. If the student withdraws at any time during the quarter in which his course of study would normally have completed his requirements for the bachelor's degree, he shall be granted that degree, provided (a) that at the beginning of his quarter of withdrawal he has attained all cumulative grade-point averages which would be required for his graduation; (b) that the awarding of his degree has been approved by his major professor, department head, and dean; and (c) that his grade for the com-



pleted portion of his quarter of withdrawal, in each course necessary for graduation, is C or better. This third proviso may be waived if the student's withdrawal occurs so soon after the beginning of his final quarter that computation of a grade is impossible.

5. Should the foregoing provisions run counter to standards imposed upon a professional college or school by national or regional accrediting or licensing agencies, the application of these rules to such college or school shall be subject to approval or limited approval by the dean or director thereof.

6. When relevant, the foregoing provisions shall apply to students in evening classes, and in such cases refunding of fees shall be proportionate to the credit allowed.

7. The foregoing provisions shall not apply to students in home study courses, except that upon approval of the department executive officer such students who withdraw to join the Armed Forces shall be allowed the difference between the fee paid for the course and the cost incurred to the date of withdrawal.

Students requesting a Military Withdrawal must present official orders to active duty at the Information Window in the Administration Building. There they will be given the necessary forms and advised on procedure. *Students desiring a military withdrawal are expected to attend classes and withdraw no more than seven calendar days before their report date.*

Military Withdrawals apply only to calls to active duty for extended or indefinite periods of time. They *do not* apply in the cases of members of the National Guard or Reserve components who are called to active duty for periods of short duration to meet yearly active duty requirements or other short-term situations.

Procedure for Withdrawal from 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 grade-point average. A fee of \$5.00 shall be imposed for each official withdrawal from a course.

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 Registration Request form obtained at the advisory office. He should present the card at Sections and pay the \$5.00 fee when so instructed. It is wise to confer with the instructor before dropping a course.

Students making a formal withdrawal within the first fifteen calendar days of the quarter shall be given a W.

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 Registration 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 fee 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.

Penalty for Not Withdrawing Officially

Students ceasing to attend a class without a formal withdrawal any time during the quarter shall be given a grade of EW, which is to be interpreted as an E in computing grade-point average.

Change of College

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 entitlement to educational benefits. Consult Veterans Division.

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 executive officers 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.

In other colleges no special forms are used. To change a major the student is expected to confer with his adviser.

GRADING SYSTEM

General

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
W—Official Withdrawal during the first fifteen calendar days of a quarter	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 reregistering 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 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 *never* are 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.

Grades of W and PW

Students making an official withdrawal during the first fifteen calendar days of a quarter shall be given a W. 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.

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. 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 shortly after the beginning 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.

Computation of Grade-Point Averages

Grade-point (GP) averages for low scholarship 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. 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 210	5	A (4) =	20
GEOGRAPHY 115	2	B (3) =	6
TOTAL CREDITS ATTEMPTED (TCA)			15
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	6
GEOLOGY 101	5*	B	0
SPEECH 210	5	B	15
PHYS. EDUC. 114	[1]†	I	1
TOTAL REGISTERED HOURS (TCA)			13
GRADE-POINT AVERAGE =			$8 \div 13 = 1.61$

* The 5 registered hours in Geology 101 for which no credit was received are included.

† The 1 registered hour in Phys. Educ. 114 in which an Incomplete was received is not included.



Examinations and Tests

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 a credit examination in a course in which he has been registered at any time either as an auditor or as a student.

All credits secured by examination shall be counted as extension credits and shall be included in the 90 extension-credit maximum allowed toward the bachelor's degree. 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 the student's native language.

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 executive officer 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 fee 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 in a test on a 3-, 4-, or 5-credit course, and a minimum of two 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.

**SCHOLASTIC STANDARDS
REQUIRED FOR GRADUATION**

All-University Requirements

To be eligible for the bachelor's degree:

1. A student (except as provided in paragraph 2) must earn a minimum cumulative grade-point average of

2.00 for all work done at the University of Washington. Students offering transfer credit from other institutions must present a combined cumulative average of 2.00.

College Requirements

Colleges, schools, and departments are privileged to require higher scholastic achievement for graduation than the University minimum of 2.00. All students should consult the appropriate section of this Catalog related to the degree curriculum they are following.

MAINTAINING SATISFACTORY SCHOLARSHIP

The following scholarship rules will apply:

Academic Probation

Any undergraduate student who has completed three or more quarters in the University and whose cumulative grade-point average is below 2.00 shall be placed on academic probation. Any undergraduate student who has completed not more than two quarters at the University shall be placed on probation when his cumulative grade-point average is below 1.80. The dean of the school or college in which the student is enrolled shall notify the student as soon as possible that he is on probation. Such action will be noted permanently on the student's official academic record.

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 the Faculty Committee on Intercollegiate Athletics and the Faculty Committee on Student Welfare, respectively.

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 dean of the school or college in which he is enrolled.

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.

Grades

Grade-point averages are calculated on the basis of all grades received in courses which carry academic credit, including courses repeated. Grades received in repeated courses do not cancel or replace any other grades. Only University of Washington residence credits will be used in these computations. Please refer to explanation of symbols on the back of your quarterly grade report.

GRADUATION 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.

Choice of Requirements

If not more than ten years have elapsed since the date of a student's entry into the school or college in which he is to graduate, he may choose to graduate under the requirements set out in the catalog most recently



prior to the date of his entry, or that published most recently prior to his anticipated date of graduation; provided, that when, in the opinion of the faculty of the school or college or a departmental executive officer or a dean acting for such faculty, substantial changes have been made in the curriculum since the student's entry, the student's choice shall be subject to the approval of the appropriate faculty, executive officer, 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. Nothing in this section shall be construed to apply to the requirements for teaching certificates. Requirements for teaching certificates shall be those currently prescribed by the College of Education at the time the certificate is to be granted.

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.

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 in this University's extension or correspondence courses.

Students in other colleges of the University who wish to receive simultaneously a degree from the College of Arts and Sciences or the College of Business Administration must receive approval from the Dean of the College 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.

A minimum of 60 credits in upper-division courses, exclusive of those earned in Army, Air Force, or Navy ROTC courses, shall be an all-University requirement for graduation. 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 enter the University of Washington in the Autumn Quarter, 1958, and thereafter.

This rule does not prohibit the acceptance of the transfer credit, if appropriate, but it does prohibit counting such credit as a part of the required 60 upper-division credits.

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 the 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. University credits earned by removing a deficiency shall not be used to satisfy group requirements. In the case of foreign languages: (1) 10 quarter credits are considered the equivalent of 2 units (four semesters) of high school credit; (2) one-half of the University credit normally granted may be received for a college course which duplicates not more than half of a high school course; and (3) the admission requirement is satisfied when the student completes the last course normally required of students who take, at the University, all courses required to remove a foreign language deficiency.

Extension and Correspondence Study Credits

No more than 90 extension credits and/or correspondence study credits may be counted toward the bachelor's degree. No more than 45 credits gained in extension courses offered by other institutions may be counted toward the bachelor's degree. No more than 10 extension credits granted by the University, and none granted by other institutions, may be counted in the 45 credits of the senior year. (See *Credit by Examination* and *Armed Forces Training Schools Credits* in this section.)

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 fifteen 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 and no credits gained by advanced 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 members of the Supervisory Committee from the major department, must be deposited in the Graduate School Office at least two weeks before the degree is to be conferred. Instructions for the preparation of theses 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 must be filed with the supervising professor and/or with the office of the major department. Each student is advised to retain a personal copy of the thesis for his own use.

Financial Obligations

In determining the fitness of a candidate for a degree, his attitude toward his financial obligations to the University shall be taken into consideration. Diplomas are not released until all indebtedness to the University with the exception of outstanding notes has been cleared.

Applications for Bachelor's Degrees

During the first quarter of his senior year, a student shall file with the Registrar a written application for his degree. Each application shall be filed in the Reg-

istrar'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, 109 Administration Building, 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. 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, 109 Administration Building, 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 resubmit 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, 109 Administration Building, 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 so 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 requirement 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 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, whichever 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 Education* 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

Students admitted to freshman standing in the University in the Autumn Quarter, 1954, and thereafter, if not otherwise exempt, shall complete three quarters of physical education activity courses. Students who present acceptable credits for physical education activity courses taken in other colleges may be exempted from all or part of the requirements.

All students shall complete the physical education courses required in the number of quarters of University residence immediately following admission to the University that corresponds to the number of such required courses. No student may register for more than one physical education activity course in a single quarter, provided, however, that during the Summer Quarter a student may register for not more than one such course in each of the two halves of the Summer Quarter.

Physical education activity credits are required in addition to the basic 180 credits which are required for graduation. (See *Graduation Requirements—Bachelor's Degree* in this section.)

Activity Courses

Students who enter the University as freshmen are required to complete one physical education activity course each quarter for the first three quarters of residence.

In fulfilling the foregoing requirement, *all* students must pass a swimming test or satisfactorily complete one quarter of swimming. In fulfilling the three-quarter requirement, no activity course may be repeated for credit.

Men students may use credits earned in freshman or varsity sports to satisfy the activity course requirement.

Women students, in fulfilling the three-quarter requirement, may take a maximum of two credits in any of the following: (1) swim area; (2) dance area; (3) tennis and badminton; (4) any other specific individual, dual, or team activity.

Transfer students who present acceptable credit for physical education activity courses taken in other colleges may be exempted from all or part of the physical education requirement, the amount of exemption depending on the number of quarters for which credit is transferred.

The following students shall be exempt from the requirement of activity courses:

1. 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.
2. Students who enter as sophomores, juniors, or seniors.
3. Special students.
4. Students registered for 6 credits or less.

The physical education activity requirement will also be waived for students who, because of physical condition, are exempted by the Graduation Committee upon the recommendation of the dean of the college concerned. Such action will be taken only when the dean has received a joint recommendation for exemption from the University Health Officer and the Executive Officer of the Department of Physical Education for Men or for Women, whichever is appropriate. All other students who are reported by the University Health Officer as unfit to join regular classes will be assigned by the Executive Officer of the Health Department of Physical Education for Men or for Women to special programs adapted to their needs.

Veterans' Exemption

Veterans who have had one year or more of military service on active duty are granted a complete exemption from the activity requirement. This exemption does not grant credit. In order to qualify for this exemption, a veteran must present his or her service record at 109 Administration Building.

Teaching Certificates

Requirements for teaching certificates shall be those currently 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 are obtained at 207 Miller Hall.

Standard Certificates

PETITIONS

All fifth-year students working toward 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 221 Miller Hall each quarter to obtain approval on all courses before proceeding to Sections to complete registration.

Veterans and Children of Deceased Veterans

Veterans and children of deceased veterans are welcome at the University of Washington under the applicable federal laws established for their education in institutions of higher learning. For complete information, students should consult the Veterans Division Office on campus.

The Korean Veterans Bill (Public Law 550) expires January 31, 1965. All benefits under P.L. 550 terminate on that date.

Under certain conditions, veterans of World Wars I or II who are not eligible for Veterans Administration benefits are fully or partially exempt from tuition 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 of work earned at the University of Washington which bear the official seal of the University and the signature of the Registrar are known as transcripts.

Students may order copies of their 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.) *Transcripts are not issued to any student whose record has been attached for a financial delinquency or by order of the Dean of Students.*

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 fee of \$1.00, payable in advance, is charged for each transcript. Typewritten title transcripts for all records of students entering the University prior to Autumn Quarter, 1929, are \$2.00 for each original copy.

Grade Sheets

Quarterly grade reports are known as grade sheets. Copies may be ordered for 50 cents each, payable in advance, at the Transcript Department of the Registrar's Office, 109 Administration Building. (See *Grade Reports* in this section.)

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.

STUDENT CONDUCT AND DISCIPLINE

Student Conduct

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, regulation, or procedures shall render students subject to penalties, which may include dismissal from the University.

The provisions of this and the following sections do not apply to disciplinary matters arising solely out of scholarship.

Discipline

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 below.

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, and he is authorized to take such steps as are necessary to preserve order and to maintain the effective cooperation of the class in fulfilling the objectives of the course.

Interpretations, Procedures, and Records

The procedures set forth below shall be interpreted and administered in such a way as to assure the student charged with a breach of conduct of a fair hearing. Formalities are not required in initial disciplinary proceedings, but, in the case of reviews and rehearings, more formal procedures are desirable. Conduct disciplinary proceedings are not to be construed as adversary proceedings or judicial trials.

PROCEDURES AND RECORDS IN INITIAL DISCIPLINARY PROCEEDINGS:

The officer, committee, faculty member, or student organization responsible for maintaining discipline (hereinafter called disciplinary authority) shall be guided by the following principles:

1. The student involved shall be informed by the disciplinary authority, orally or in writing, of the charge against him at the earliest reasonable time.
2. The student shall be given an opportunity to be heard by the disciplinary authority and to present evidence, testimonial or documentary, in his own behalf.
3. Every effort shall be made by the disciplinary authority to bring the matter to a speedy conclusion.
4. All documentary or other physical evidence produced or considered shall be preserved by the disciplinary authority for at least five years after the student involved leaves the University.
5. Oral testimony need not be recorded; but if a record is made, in whole or in any part, it shall be preserved by the disciplinary authority for at least five years after the student involved leaves the University.
6. The disciplinary authority shall not, in the usual case, notify the student of his decision.
7. Within five days after the disciplinary authority has completed the hearing, he shall file with the person indicated in paragraph 8: (a) a report, in triplicate, setting forth his conclusions and his reasons in support thereof; and (b) any documentary or physical evidence and any records of testimonial evidence which he has in his possession.
8. In all instances of disciplinary action by a faculty member, the report shall be filed with the executive officer of the department in which the course is offered. The executive officer shall notify his dean. The dean shall notify the dean of any other school or college in



which the student may be enrolled. Either dean may initiate such additional disciplinary action as the circumstances warrant.

In all instances of disciplinary action by officers, faculty committees, or student organizations, the report shall be filed with the dean to whom they are responsible, or, if a Senate or Presidential Committee, with the President.

9. The officer with whom the report is filed, within five days thereafter, shall notify the student, in writing, and, if possible, orally, of the action taken and of his right to request a review. The written notification shall point out that the request for review must be in writing and must be filed with the officer sending the notice not more than twenty days from the day upon which the oral notice was given or the written notice would be received in the normal course of events.

10. In the case of an unmarried student, under twenty-one years of age, who is expelled, suspended, or placed on disciplinary probation, the officer who notifies the student of the action taken shall also send notice of the action taken in writing to the parents or guardian of the student.

Review

In all cases where disciplinary action is taken, the student involved shall be advised that he has the right to request one review of the case, such review to be accorded by the next immediate superior of the officer or agency taking the action, except as hereinafter provided (see next paragraph). Such requests for review must be made in writing within the twenty-day period provided above. Action taken by faculty members or school or college disciplinary committees shall be subject to review by the dean of the school or college in which the case arose. Actions of the Dean of Men and/or the Dean of Women shall be subject to review by the Dean of Students. Actions taken by the dean of a school or college or the Dean of Students shall be subject to review by the President of the University. Actions of an agency to which responsibility for taking disciplinary action has been delegated shall be subject to review by the officer who has made the delegation. (See *Delegation* in column opposite.)

In cases involving expulsion or suspension, the record of the case shall be forwarded to the President of the University for review before the decision is announced. In these cases, the President, after reviewing the record, should indicate (1) his approval of the action, or (2) his

suggestions as to additional steps which should be taken on the matter. No further review will be provided in such cases.

Rules governing procedures on review shall be established by:

1. The school or college concerned, for review of actions taken by faculty members or school or college disciplinary committees.
2. The Dean of Students, for review of actions taken by the Dean of Men or Dean of Women.
3. The President, for review of actions taken by the dean of a school or college or the Dean of Students.
4. The officer who made the delegation, for actions taken by agencies to which the responsibility for taking disciplinary action has been delegated.

Maintenance of Records

Records of all disciplinary cases shall be kept by the school, college, or office concerned.

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.

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.

Delegation

Responsibility for taking disciplinary action may in certain cases be delegated by the Dean of Students or by the dean of a school or college to a committee of the University Faculty, to a committee of the faculty of the school or college concerned, to student organizations, or to a student-faculty committee, subject to such terms and conditions, not in conflict with this section, as may be necessary to assure a sound disciplinary program.

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:
 - a. The faculty Committee on Student Welfare for non-athletic activities; or
 - b. The faculty Committee on Intercollegiate Athletics for intercollegiate athletic events.

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.

Approval forms to be used for teaching staff members may be obtained at 107 Administration Building.

Students wishing a tutor should apply to the department concerned or to the Placement Office, Chelan Hall C, for names of advanced students qualified to tutor in particular subjects.

STUDENT ACTIVITIES

Eligibility Rules

The primary concern of all students should be with scholarship and academic achievement. The University recognizes, however, the desirability of properly supervised and socially acceptable out-of-class activities and encourages organizations of students for living, social, recreation, and cultural purposes. Participation in these activities and organizations should be limited to the point where they will contribute to, and not interfere with, the academic progress of individual students and the primary instructional program of the University. In order to participate in any student activity or to seek election to any student office classified as a major activity, a student shall comply with the rules and regulations governing the activity. For students who wish to participate in intercollegiate athletics, these shall be the rules and regulations established by the Intercollegiate Athletics Committee; for students who wish to participate in student affairs, these shall be the rules and regulations established by the Dean of Students with the advice and assistance of the Committee on Student Welfare.

Major Activity

To be eligible to participate in any major activity a student shall:

1. Have earned a grade-point average of 2.00 (or, in the School of Law, a numerical average of 68) in his last quarter of college attendance and over his entire college record.
2. Not have been declared ineligible by the dean of his college on the grounds that participation in the activity is detrimental to his scholarship.



3. Not have been declared ineligible for disciplinary reasons.

4. Be enrolled for a minimum of 10 academic credits exclusive of credits in extension classes, in correspondence study, in basic ROTC courses, and in physical education activity.

5. Have complied with any additional requirements of the particular activity.

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.

Further information on nonathletic activity eligibility is available at the ASUW Activities Bureau, 208 Student Union Building.

Intercollegiate Athletics

No student shall represent the University of Washington in any athletic contest unless he meets the requirements of the Pacific Coast Conference 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 hours the quarter of participation.

2. Have five times as many passing hours as failing hours (*i.e.*, 5 hours of "E" would require 25 good hours to offset).

3. Progress toward graduation—must have earned 39 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, 228 Edmundson Pavilion.

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 Publications Committee of the Board of Control.

The *Daily* is published Tuesday through Friday mornings and is distributed on campus without charge. It is operated as a laboratory for third-year journalism majors.

The *Tyee*, University yearbook, is prepared by students who have volunteered their services.

Top editorial and managerial positions on all student publications carry nominal salary allowances.

USE OF CAMPUS AND BUILDINGS

General Policy

Except in the case of the Men's Athletic Pavilion, which is under the general direction of the Associated Students, it is the policy of the University to permit use of its auditoriums and classroom buildings only by such organizations as shall give evidence of educational or cultural returns to the University and its students by the uses to which the halls and buildings are put while under lease.

Meetings, Assemblies, and Speakers

The buildings and campus of the University shall be primarily devoted to education; they may also be used for cultural and recreational purposes incidental to the work of the University.

The University buildings and grounds shall not be available for commercial or other outside uses except that assembly halls may be used for graduation exer-

cises and other special assemblages of the public schools by arrangement with the President's Office.

Meetings of student organizations upon the campus may be permitted for educational, cultural, and recreational purposes connected with the work of the colleges or departments of the University.

All student groups desiring to make use of the facilities of the campus for meeting places shall apply to the ASUW Activities Office Program Secretary, 205 Student Union Building, in accordance with the Code for Student Organizations. Application shall be made at the beginning of each school year except that such student groups organized during the school year shall make application before arranging for any meeting on the campus.

Arrangements and programs for public meetings (1) held under the sponsorship of a college or department of the University, or (2) for outside speakers or artists recommended by the Committee on Public Lectures and Concerts, shall be approved by the President. The President shall advise the executive officer of the sponsoring department or the chairman of the committee if he questions such a request. The executive officer or the committee chairman may then call for a conference with the President to seek agreement before the President makes his decision.

Special lectures for students should be held in the afternoon in order not to disrupt regular morning classes, and any necessary arrangements for rooms shall be made through the Registrar's Office.

Only all-University functions for which classes are generally dismissed may be designated as assemblies.

Use of University Facilities by Off-Campus Organizations

Under the regulations governing the use of University facilities which provide that campus and buildings may be used only for educational purposes or for cultural and recreational activities that are noncommercial in character and are considered incidental to the primary work and mission of the University, it is the policy of the University to limit its use to:

1. Cultural, educational, and recreational activities of the faculty, staff, and student body.

2. Short courses, conferences, seminars, or similar events (conducted either in the public service or for the advancement of professional interests) when arranged by, or with, the sponsorship of the University or its departments.

3. Programs or events of a cultural or professional nature brought to the campus at the request of University units and presented with their active sponsorship and active participation.

4. Programs sponsored by the public schools or state or federal agencies or other activities of widespread public service conducted with the permission of the University administration.

University buildings and facilities will not be used for social or amusement purposes on Sundays. Public lectures, forums, concerts, or other meetings of a cultural and educational nature, sponsored by an academic department or by the Faculty Committee on Public Lectures and Concerts, may be held on Sunday subject to existing University regulations. University-recognized organizations may use University facilities for meetings of their own members on Sundays, subject to existing regulations for such meetings, but such meetings may not be primarily for social or amusement purposes.

University theaters will be limited to University use.

A committee consisting of the Vice President, the Comptroller, the Chairman of the Faculty Committee on Public Lectures and Concerts, the Manager of the Office of Lectures and Concerts, and the Director of University Relations will review and act on all requests for the use of University facilities where off-campus organizations are involved.

Making Room Reservations

Campus colleges and departments may make reservations directly with the Room Assignments Secretary (Ext. 3-1080).

Student groups desiring room reservations should apply to the ASUW Activities Office, 205 Student Union Building (Ext. 3-2911). 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.



Reservations for the use of University facilities which are requested by an off-campus organization either directly or through an academic department are considered to be tentative until approved by the University Auditorium Committee.

Cancellation of Reservations

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 in the University. When two dates are given, the second, in parentheses, is the date of the promotion to present academic rank. Members of the Graduate School faculty are designated by an asterisk.

College of Architecture and Urban Planning

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

ALDEN, RICHARD S., 1961 (1963), *Assistant Professor of Architecture*; B.Arch., 1957, Washington; M.Arch., 1960, Yale

CASASCO, JUAN A. A., 1964, *Visiting Lecturer in Urban Planning*; M.A.Arch., 1947, Buenos Aires; M.C.P., 1961, Harvard

CHERVENAK, ROBERT A., 1959, *Assistant Professor of Architecture*; B.Arch., 1951, Washington

CURTIS, JACOB W., 1963, *Assistant Professor of Architecture*; B.Arch., 1952, Washington

DIETZ, ROBERT HENRY,* 1947 (1958), *Professor of Architecture*; Dean, College of Architecture and Urban Planning; B.Arch., 1941, Washington; M.Arch., 1944, Massachusetts Institute of Technology

DOERNACH, RUDOLF W., 1964, *Visiting Lecturer in Architecture*; B.Arch., 1955, Washington

FITZMAURICE, GERALD F., 1964, *Visiting Lecturer in Architecture*; B.S., 1949, Seattle

GREY, ARTHUR L., JR., 1963, *Visiting Professor*; A.B., 1943, San Jose State; Ph.D., 1954, California

HAAG, RICHARD,* 1958 (1960), *Associate Professor of Landscape Architecture*; B.S. in L.A., 1950, California; M.S. in L.A., 1952, Harvard

HARTMAN, GEORGE A., 1962, *Lecturer in Architecture*; B.A.Math., 1951, Hastings College; M.F.A. in Arch., 1955, Princeton

HERRMAN, ARTHUR PHILIP, 1923 (1937), *Professor of Architecture*; B.A. in Arch., 1921, Carnegie Institute of Technology; F.A.I.A.

JACOBSON, PHILLIP L., 1963, *Assistant Professor of Architecture*; B.Arch.E., 1952, Washington State; 1952-53, Liverpool

JENSEN, ALFRED, 1930 (1956), *Professor Emeritus of Architectural Engineering*; B.S. in C.E., 1925, M.S. in C.E., 1932, Washington

JOHNSTON, NORMAN J.,* 1960 (1961), *Associate Professor of Architecture and Urban Planning*; Assistant to the Dean; B.A., 1942, Washington; B.Arch., 1949, Oregon; M.C.P., 1959, Pennsylvania

KÖLB, KEITH ROBERT,* 1952 (1960), *Associate Professor of Architecture*; B.Arch., 1947, Washington; M.Arch., 1950, Harvard

KOSKI, ROBERT, 1958, *Extension Lecturer*; B.B.A., 1951, M.Urban Plan., 1957, Washington

LEONIDAS, THOMAS A., 1960, *Lecturer in Architecture*; B.S. in E.E., 1949, British Columbia

LOVETT, WENDELL HARPER,* 1948 (1960), *Associate Professor of Architecture*; B.Arch., 1947, Washington; M.Arch., 1948, Massachusetts Institute of Technology

MITHUN, OMER LLOYD, 1947 (1960), *Associate Professor of Architecture*; B.Arch., 1942, Minnesota

NELSEN, IBSEN A., 1958 (1963), *Associate Professor of Architecture*; B.Arch., 1951, Oregon

NORTON, THOMAS J.,* 1961, *Assistant Professor of Urban Planning*; B.A. in Far Eastern, 1949, Washington; M.Urban Plan., 1960, Washington

OTT, STEFAN, 1964, *Lecturer in Urban Planning*; B.Arch., 1957, Royal Academy of Fine Arts, Copenhagen

PATTON, ROBERT J., 1963, *Lecturer in Architecture*; B.Arch., 1958, Washington

POMEROY, GERALD, 1964, *Visiting Lecturer in Architecture*; B.Arch., 1954, Washington

RADCLIFFE, DONALD GREGG, 1947 (1962), *Associate Professor of Architectural Engineering*; B.S. in C.E., 1932; M.S. in C.E., 1934, Illinois

REICHERT, ROBERT J., 1963, *Acting Assistant Professor of Architecture*; B.Arch., 1947, Minnesota; M.Arch., 1951, Harvard

ROHRER, JOHN ABRAM, 1948 (1959), *Associate Professor of Architecture*; B.Arch., 1937, Washington

SAKUMA, DONALD K., 1963, *Assistant Professor of Landscape Architecture*; B.S., 1957, California; M. of L.A., 1959, Harvard

SASANOFF, ROBERT, 1963, *Assistant Professor in Architecture*; B.Arch., 1963, California

SHOMLER, ROBERT P., 1963, *Visiting Lecturer in Architecture*; B.Arch., 1959, Washington

SPROULE, JOHN ROBERT, 1948 (1960), *Associate Professor of Architecture*; B.Arch., 1934, Washington

STEINBRUECK, VICTOR,* 1946 (1960), *Professor of Architecture*; Acting Chairman, Department of Architecture; B.Arch., 1935, Washington; F.A.I.A.

STERN, RICHARD MORRIS, 1955, *Lecturer in Architecture*; B.S. in C.E., 1935, North Dakota

STREISSGUTH, DANIEL MICHENER, 1955 (1961), *Associate Professor of Architecture*; B.Arch., 1948, Washington; M.Arch., 1949, Massachusetts Institute of Technology

TANG, T. KENNETH, 1959 (1960), *Assistant Professor of Architectural Engineering*; B.S. in C.E., 1950, Washington

THIEL, PHILIP, 1961 (1963), Associate Professor of Architecture; B.S. in N.A., 1943, Webb Institute of Naval Architecture; M.S. in N.A., 1948, Michigan; B.Arch., 1952, Massachusetts Institute of Technology

TIMPE, CARL LOUIS, 1957, Lecturer in Architecture

TORRENCE, GERARD RUTGERS,* 1954 (1961), Associate Professor of Architectural Engineering; B.S. in C.E., 1949, Washington; M.S. in S.E., 1950, Massachusetts Institute of Technology

VAREY, GORDON B., 1963, Lecturer in Architecture; B.Arch., 1954, Washington

WHERRETTE, WILLIAM CARNES, 1948 (1960), Associate Professor of Architecture; B.Arch., 1948, Carnegie Institute of Technology; M. Urban Plan., 1959, Washington

WILKINSON, NATHAN, JR., 1963, Lecturer in Architecture; B.S. in Arch., 1935, Illinois

WILLIAMS, GERALD A., 1963, Lecturer in Architecture; B.Arch., 1956, Washington; M.F.A. in Arch., 1962, Pennsylvania

WINKEL, GARY H., 1960 (1964), Visiting Lecturer in Architecture; B.A. in Psych., 1960, California; M.S. in Psych., 1963, Washington

WOLFE, MYER RICHARD,* 1949 (1958), Professor of Urban Planning; Chairman, Department of Urban Planning; B.S., 1940, New Hampshire; M.Regional Planning, 1947, Cornell

WRIGHT, DAVID H., 1963, Lecturer in Architecture; B.Arch., 1957, Washington

College of Arts and Sciences

American Studies

There is no separate faculty for courses in American Studies; courses are taught by faculty from other departments in the College of Arts and Sciences.

Anthropology

CARO, ISABEL SKLOW, 1960 (1961), Assistant Professor of Anthropology; A.B., 1939, M.A., 1950, Chicago

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

FOGELSON, RAYMOND D.* 1962, Assistant Professor of Anthropology; B.A., 1955, Wesleyan; M.A., 1958, Ph.D., 1962, Pennsylvania

GARFIELD, VIOLA EDMUNDSON,* 1937 (1955), Associate Professor of Anthropology; B.A., 1928, M.A., 1931, Washington; Ph.D., 1939, Columbia

GREENGO, ROBERT E.* 1957 (1962), Associate Professor of Anthropology; A.B., 1948, M.A., 1951, California; Ph.D., 1957, Harvard

GUNTHER, ERNA,* 1923 (1941), Professor of Anthropology; A.B., 1919, Barnard; A.M., 1920, Ph.D., 1928, Columbia

HARPER, EDWARD B.* 1962 (1963), Associate Professor of Anthropology; B.A., 1951, Reed; Ph.D., 1958, Cornell

JACOBS, MELVILLE,* 1928 (1952), Professor of Anthropology; A.B., 1922, City College of New York; A.M., 1923, Ph.D., 1931, Columbia

KOLLNHOFFER, LUYSE, 1962, Visiting Assistant Professor of Anthropology; Visiting Assistant Curator of Ethnology, Thomas Burke Memorial Washington State Museum; B.A., 1955, Vienna; Ph.D., 1960, Institut für Völkerkunde

KRIEGER, ALEX D., 1960 (1961), Research Professor of Anthropology; B.A., 1936, California; M.A., 1939, Oregon; D.Sc., 1954, Universidad Nacional de Mexico

LI, FANG-KUEI,* 1949 (1950), Professor of Chinese Linguistics and of Anthropology; A.B., 1926, Michigan; A.M., 1927, Ph.D., 1928, Chicago

OTTENBERG, SIMON,* 1955 (1961), Associate Professor of Anthropology; B.A., 1948, Wisconsin; Ph.D., 1957, Northwestern

POPPE, NICHOLAS N.* 1949 (1950), Professor of Slavic and Altaic Studies and Anthropology and Linguistics; M.A., 1923, Petrograd; Ph.D., 1934, Petersburg

RAY, VERNE FREDERICK,* 1933 (1947), Professor of Anthropology; B.A., 1931, M.A., 1933, Washington; Ph.D., 1937, Yale

READ, KENNETH EYRE,* 1957 (1958), Associate Professor of Anthropology; Chairman, Department of Anthropology; B.A., 1939, M.A., 1945, Sydney; Ph.D., 1948, London

ROBERTS, DEREK F. (1964), Professor of Physical Anthropology; B.A., 1948, Cambridge; M.A., 1951, Ph.D., 1953, Oxford

ROYS, RALPH L., 1959, Research Professor of Anthropology; Ph.B., 1900, Michigan; Hon. L.H.D., 1936, Whitman

SPIRO, MELFORD E.* 1957, Professor of Anthropology; B.A., 1941, Minnesota; Ph.D., 1950, Northwestern

VALENTINE, CHARLES ABERNETHY III,* 1961, Assistant Professor of Anthropology; B.A., 1951, M.A., 1953, Ph.D., 1958, Pennsylvania

WATSON, JAMES BENNETT,* 1955, Professor of Anthropology; A.B., 1941, A.M., 1945, Ph.D., 1948, Chicago

School of Art

ALPS, GLEN EARL,* 1945 (1962), Professor of Art; B.A., 1940, Colorado State College of Education; M.F.A., 1947, Washington

ANDERSON, FREDERICK NEIL,* 1945 (1959), Associate Professor of Art; B.A., 1943, Washington; M.F.A., 1954, Minnesota

BENSON, EDNA GRACE, 1927 (1954), Associate Professor Emeritus of Commercial Art; B.A., 1909, M.A., 1923, Columbia

BONIFAS, PAUL AMI, 1946 (1959), Associate Professor Emeritus of Art; 1913, School of Fine Arts; 1914, Swiss School of Ceramics (Renens); 1918, University-Laboratory of Geology (Geneva)

BRAZEAU, WENDELL PHILLIPS,* 1945 (1963), Professor of Art; B.F.A., 1933, M.F.A., 1947, Washington

CAPLAN, IRWIN S., 1958, Lecturer in Art; B.A., 1941, Washington

CURTIS, ELIZABETH LONG, 1930 (1960), Assistant Professor Emeritus of Art; B.F.A., 1929, M.F.A., 1933, Washington

DAILEY, MICHAEL D., 1963, Instructor in Art; B.A., 1960, M.F.A., 1963, State University of Iowa

DEL GIUDICE, FRANK, 1948, Lecturer in Art; Pratt Institute

DUNTHORNE, STEPHEN, 1961, Lecturer in Art; B.A., 1949, M.F.A., 1950, Washington

DU PEN, EVERETT GEORGE,* 1945 (1960), Professor of Art; B.F.A., 1937, Yale

ERICKSON, JOHN WILBUR,* 1956 (1960), Associate Professor of Art; B.S., 1941, B.F.A., 1947, M.F.A., 1951, Illinois

FOOTE, HOPE LUCILLE,* 1923 (1948), Professor of Art; A.B., 1920, Iowa State Teachers College; M.A., 1923, Columbia

FULLER, STEVEN D.* 1946 (1958), Associate Professor of Art; B.A., 1939, M.F.A., 1948, Washington

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

HAFERMEHL, C. LOUIS,* 1957 (1960), Associate Professor of Art; B.F.A., 1940, Bethany College (Kansas); M.F.A., 1955, Cranbrook Academy of Art (Michigan)

HILL, RAYMOND LEROY, 1927 (1961), Professor Emeritus of Art; Graduate, 1913, Rhode Island School of Design

HIXSON, WILLIAM JOHN,* 1950 (1958), Associate Professor of Art; B.A., 1948, M.F.A., 1950, Oregon

JOHNSON, PAULINE,* 1941 (1958), Professor of Art; B.A., 1929, Washington; M.A., 1936, Columbia

JONES, ROBERT C.* 1960 (1962), Assistant Professor of Art; B.F.A., 1953, M.S., 1959, Rhode Island School of Design

MASON, ALDEN C.* 1946 (1957), Associate Professor of Art; B.A., 1942, M.F.A., 1947, Washington

MERRILL, DAVID O., 1963, Assistant Professor of Art; A.B., 1955, Harvard; M.A., 1960, Yale

MOSELEY, SPENCER ALTEMONT,* 1948 (1959), Associate Professor of Art; B.A., 1948, M.F.A., 1951, Washington

MYERS, HAROLD W.* 1960 (1962), Assistant Professor of Art; A.B., 1952, San Jose State College; M.F.A., 1959, Mills College

PATTERSON, AMBROSE MCCARTHY, 1919 (1947), Professor Emeritus of Painting; Consultant in Painting; National School of Art (Melbourne); Jullens, Colorossi, Delacuse, Whistler, Simon, and Lhote Schools of Art (Paris)

PATTERSON, VIOLA HANSEN,* 1947 (1958), Associate Professor of Art; B.A., 1921, B.S. in L.S., B.F.A., 1925, M.F.A., 1947, Washington

PENINGTON, RUTH ESTHER,* 1928 (1951), Professor of Art; B.F.A., 1927, M.F.A., 1929, Washington

PIZZUTO, EUGENE C.* 1957 (1960), Assistant Professor of Art; B.S., 1950, Wisconsin; M.F.A., 1951, Cranbrook Academy of Art (Michigan)

PROCTOR, RICHARD M.* 1962, Instructor in Art; B.A., 1958, M.A., 1962, Michigan State



RAND, THEODORE L., 1954, *Lecturer in Art; Cornish School of Allied Arts*

REED, TRUMAN GERVAIS, 1951 (1955), *Lecturer in Art; Assistant Director, Henry Art Gallery; B.A., 1949, Yale*

ROGERS, MILLARD BUXTON, 1952 (1961), *Acting Associate Professor of Art; B.F.A., 1937, M.F.A., 1940, School of the Art Institute of Chicago; M.A., 1940, Chicago*

SMITH, CHARLES WALLACE,* 1948 (1959), *Associate Professor of Art; Pratt Institute; M.F.A., 1956, Cranbrook Academy of Art (Michigan)*

SPAFFORD, MICHAEL C., 1963, *Instructor in Art; A.A., 1955, Riverside City College; B.A., 1959, Pomona; M.A., 1960, Harvard*

SPEIER, ROBERT W.* 1962 (1963), *Assistant Professor of Art; B.A., 1949, Amherst; B.F.A., 1955, M.F.A., 1958, Yale*

SPERRY, ROBERT,* 1954 (1960), *Associate Professor of Art; B.A., 1950, Saskatchewan; B.F.A., 1954, School of the Art Institute of Chicago; M.F.A., 1955, Washington*

TSUTAKAWA, GEORGE,* 1946 (1957), *Professor of Art; B.A., 1937, M.F.A., 1950, Washington*

WELMAN, VALENTINE S.* 1954 (1962), *Associate Professor of Art; B.F.A., 1952, Denver; M.F.A., 1954, Colorado*

Astronomy

JACOBSEN, THEODOR S., 1928 (1952), *Professor of Astronomy; B.A., 1922, Stanford; Ph.D., 1926, California*

Atmospheric Sciences

BADGLEY, FRANKLIN ILSLEY,* 1950 (1959), *Associate Professor of Atmospheric Sciences; B.S., 1935, Chicago; M.S., 1948, Ph.D., 1951, New York*

BUETTNER, KONRAD J. K.* 1953 (1957), *Professor of Atmospheric Sciences; B.S., 1922, Gymnasium (Pforte, Germany); Dr.phil., 1926, Goettingen; Dr.phil.habil., 1934, Kiel (Germany)*

BUSINGER, JOOST A.* 1958 (1961), *Associate Professor of Atmospheric Sciences; B.S. (Candidaatsexamen), 1947, M.Sc. (Doctoraal-examen), 1950, Ph.D., 1954, Utrecht*

CHURCH, PHIL EDWARDS,* 1935 (1948), *Professor of Atmospheric Sciences; Chairman, Department of Atmospheric Sciences; B.S., 1923, Chicago; M.A., 1932, Ph.D., 1937, Clark*

FLEAGLE, ROBERT GUTHRIE,* 1948 (1956), *Professor of Atmospheric Sciences; A.B., 1940, Johns Hopkins; M.S., 1944, Ph.D., 1949, New York*

HOBBS, PETER VICTOR,* 1963, *Assistant Professor of Atmospheric Sciences; B.Sc. (Honors), 1960, Ph.D., 1963, London*

REED, RICHARD JOHN,* 1954 (1963), *Professor of Atmospheric Sciences; B.S., 1945, California Institute of Technology; Sc.D., 1949, Massachusetts Institute of Technology*

Biochemistry

The faculty in biochemistry is listed under the Division of Health Sciences, School of Medicine.

Biology

There is no separate faculty for biology courses; they are taught by faculty from the Departments of Botany, Genetics, and Zoology.

Botany

BLASER, HENRY WESTON,* 1946 (1948), *Associate Professor of Botany; B.S., 1931, A.M., 1933, Temple; Ph.D., 1940, Cornell*

CLELAND, ROBERT ERSKINE, 1964, *Associate Professor of Botany; A.B., 1953, Oberlin; Ph.D., 1957, California Institute of Technology*

HITCHCOCK, CHARLES LEE,* 1937 (1944), *Professor of Botany; A.B., 1927, Pomona; A.M., 1929, Claremont; Ph.D., 1931, Washington University*

KRUCKEBERG, ARTHUR RICE,* 1950 (1960), *Associate Professor of Botany; B.A., 1941, Occidental; Ph.D., 1950, California*

MEEUSE, BASTIAAN JACOB DIRK,* 1952 (1960), *Professor of Botany; B.Sc., 1936, Doctoraal-examen, 1939, Leiden (Holland); Doctor, 1943, Delft (Holland)*

MUHLICK, CLARENCE VICTOR, 1948 (1952), *Lecturer in Botany; B.S., 1933, Montana*

STUNTZ, DANIEL ELLIOT,* 1940 (1958), *Professor of Botany; B.S., 1935, Washington; Ph.D., 1940, Yale*

WALKER, RICHARD BATTSON,* 1948 (1960), *Professor of Botany; Chairman, Department of Botany; B.S., 1938, Illinois; Ph.D., 1948, California*

WHISLER, HOWARD CLINTON,* 1963, *Assistant Professor of Botany; B.S., 1954, Ph.D., 1960, California*

Chemistry

ANDERSON, ARTHUR G., JR.* 1946 (1957), *Professor of Chemistry; A.B., 1940, Illinois; M.S., 1942, Ph.D., 1944, Michigan*

CADY, GEORGE HAMILTON,* 1938 (1947), *Professor of Chemistry; Chairman, Department of Chemistry; Director, Bagley Hall Laboratories; A.B., 1927, A.M., 1928, Kansas; Ph.D., 1930, California*

CHILTON, WILLIAM SCOTT,* 1963, *Assistant Professor of Chemistry; B.S., 1955, Duke; Ph.D., 1963, Illinois*

CRITTENDEN, ALDEN LARUE,* 1947 (1960), *Associate Professor of Chemistry; B.S., 1942, Ph.D., 1946, Illinois*

DAUBEN, HYP JOSEPH, JR.* 1945 (1961), *Professor of Chemistry; B.A., 1937, M.S., 1937, Ohio State; A.M., 1941, Ph.D., 1941, Harvard*

DAVIDSON, ERNEST ROY,* 1962, *Assistant Professor of Chemistry; B.S., 1958, Rose Polytechnic Institute; Ph.D., 1961, Indiana*

EGGERS, DAVID FRANK, JR.* 1950 (1956), *Professor of Chemistry; B.S., 1943, Illinois; Ph.D., 1950, Minnesota*

FAIRHALL, ARTHUR W.* 1954 (1963), *Professor of Chemistry; B.Sc., 1946, Queen's (Ontario); Ph.D., 1952, Massachusetts Institute of Technology*

GREGORY, NORMAN WAYNE,* 1946 (1957), *Professor of Chemistry; B.S., 1940, M.S., 1941, Washington; Ph.D., 1943, Ohio State*

HALSEY, GEORGE DAWSON, JR.* 1951 (1958), *Professor of Chemistry; B.S., 1943, South Carolina; Ph.D., 1948, Princeton*

LINGAFELTER, EDWARD CLAY, JR.* 1939 (1952), *Professor of Chemistry; Associate Dean, Graduate School; B.S., 1935, Ph.D., 1939, California*

POCKER, YESHAYAU,* 1961, *Professor of Chemistry; M.Sc., 1949, Hebrew University (Jerusalem); Ph.D., 1953, D.Sc., 1960, University College (London)*

RABINOVITCH, BENTON SEYMOUR,* 1948 (1957), *Professor of Chemistry; B.Sc., 1939, Ph.D., 1942, McGill*

RITTER, DAVID MOORE,* 1944 (1959), *Professor of Chemistry; S.B., 1933, Ph.D., 1937, Chicago*

ROBINSON, REX JULIAN,* 1929 (1945), *Professor of Chemistry; B.A., 1925, DePauw; M.A., 1927, Ph.D., 1929, Wisconsin*

SCHUBERT, WOLFGANG MANFRED,* 1947 (1958), *Professor of Chemistry; B.S., 1941, Illinois; Ph.D., 1947, Minnesota*

SIVERTZ, VICTORIAN,* 1926 (1949), *Associate Professor of Chemistry; Executive Secretary, Department of Chemistry; B.S., 1922, Washington; M.S., 1924, West Virginia; Ph.D., 1926, McGill*

SLUTSKY, LEON JUDAH,* 1961, *Assistant Professor of Chemistry; A.B., 1953, Cornell; Ph.D., 1959, Massachusetts Institute of Technology*

STOUT, GEORGE H.* 1957 (1963), *Associate Professor of Chemistry; B.S., 1953, M.A., 1954, Ph.D., 1956, Harvard*

TARTAR, HERMAN VANCE, 1918 (1952), *Professor Emeritus of Chemistry; B.S., 1902, Oregon Agricultural College; Ph.D., 1920, Chicago*

VANDENBOSCH, ROBERT, 1963, *Associate Professor of Chemistry; A.B., 1954, Calvin College; Ph.D., 1957, California*

VINCOW, GERSHON,* 1961, *Assistant Professor of Chemistry; A.B., 1956, M.A., 1957, Ph.D., 1959, Columbia*

WARE, FRANK EDWARD, 1960, *Lecturer in Chemistry; B.S., 1921, Montana State; M.S., 1924, Iowa; Ph.D., 1930, Iowa State*

Classics

DENSMORE, HARVEY BRUCE, 1907 (1952), *Professor Emeritus of Classics; Research Consultant; A.B., 1903, Oregon; A.B., 1907, Oxford*

EDMONSON, COLIN NEIL, 1960, *Acting Assistant Professor of Classics; B.A., 1950, Arizona; M.A., 1955, California (Berkeley)*

FREDRICKSMEYER, ERNEST ADOLPH,* 1961, *Assistant Professor of Classics; B.A., 1952, Lakeland College; M.A., 1953, Ph.D., 1958, Wisconsin*

GRUMMEL, WILLIAM CHARLES,* 1950 (1955), *Associate Professor of Classics; A.B., 1937, St. Louis; A.M., 1940, Washington University; Ph.D., 1949, New York*

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- BOSTETTER, EDWARD EVERETT,* 1940 (1959), *Professor of English*; A.B., 1935, Franklin and Marshall; M.A., 1937, Ph.D., 1938, Princeton
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- JONES, FRANK WILLIAM,* 1955, *Associate Professor of English*; *Chairman, Comparative Literature*; B.A., 1934, Manitoba; Ph.D., 1941, Wisconsin; B.A., M.A., 1955, Oxford
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WYLIE, TURRELL VERL,* 1958 (1959), *Assistant Professor of Tibetan Language and Civilization; B.A., 1952, Ph.D., 1958, Washington*

YEN, ISABELLA YIYUN,* 1960 (1961), *Associate Professor of Chinese Language; B.A., 1938, National Peking University; A.M., 1951, Michigan; Ph.D., 1956, Cornell*

Division of General Studies

LUTEY, WILLIAM GLEN, 1934 (1949), *Assistant Professor of Liberal Arts; Director of General Studies; B.A., 1930, M.A., 1931, Washington*

Genetics

DOERMANN, AUGUST H., 1964, *Professor of Genetics; A.B., 1940, Wabash College; M.A., 1941, Illinois; Ph.D., 1946, Stanford*

DOUGLAS, HOWARD CLARK,* 1941 (1958), *Professor of Microbiology and of Genetics; A.B., 1936, Ph.D., 1949, California*

GALLANT, JONATHAN A.* 1961; *Assistant Professor of Genetics; B.S., 1957, Haverford; Ph.D., 1961, Johns Hopkins*

GARTLER, STANLEY M.,* 1957 (1961), *Associate Professor of Medicine and of Genetics; B.S., 1948; Ph.D., 1952, California*

HALL, BENJAMIN D.* 1963, *Associate Professor of Genetics; A.B., 1954, Kansas; A.M., 1956, Ph.D., 1958, Harvard*

HAWTHORNE, DONALD C., 1958 (1960), *Research Assistant Professor of Genetics; B.S., 1950, M.S., 1953, Ph.D., 1955, Washington*

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MOTULSKY, ARNO G.* 1953 (1961), *Professor of Medicine and of Genetics; B.S., 1945, M.D., 1947, Illinois*

NESTER, EUGENE W., 1962 (1963), *Assistant Professor of Microbiology and of Genetics; B.S., 1952, Cornell; Ph.D., 1959, Western Reserve*

ROMAN, HERSCHEL L.* 1942 (1952), *Professor of Genetics; Chairman, Department of Genetics; A.B., 1936, Ph.D., 1942, Missouri*

SANDLER, LAURENCE MARVIN,* 1962, *Associate Professor of Genetics; B.S., 1952, Cornell; M.A., 1954, Ph.D., 1956, Missouri*

STADLER, DAVID ROSS,* 1956 (1962), *Associate Professor of Genetics; A.B., 1948, Missouri; M.A., 1950, Ph.D., 1952, Princeton*

STETTNER, REINHARD F., 1963, *Assistant Professor of Forestry and of Genetics; Degree of Forestry, 1955, Federal Institute of Technology (Zurich); Ph.D., 1963, California*

Geography

EARLE, FRANCES MERRIT,* 1931 (1941), *Associate Professor of Geography; B.A., 1918, Winthrop College; M.S., 1926, Columbia; Ph.D., 1929, George Washington*

HEATH, WILLIS ROBERTSON,* 1957 (1959), *Assistant Professor of Geography; B.A., 1954, M.A., 1956, Ph.D., 1958, Washington*

HUDSON, GEORGE DONALD,* 1951, *Professor of Geography; Ph.B., 1925, A.M., 1926, Ph.D., 1934, Chicago*

JACKSON, W. A. DOUGLAS,* 1955 (1960), *Professor of Far Eastern and Slavic Languages and Literature; Assistant Director, Far Eastern and Russian Institute; B.A., 1946, M.A., 1949, Toronto; Ph.D., 1953, Maryland*

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MARTIN, HOWARD HANNA, 1930 (1962), *Professor Emeritus of Geography; B.S., 1922, Pennsylvania; A.M., 1923, Ph.D., 1929, George Washington; Sc.D. (Hon.), 1937, Monmouth*

MARTS, MARION ERNEST,* 1946 (1961), *Professor of Geography; Vice Provost; B.A., 1937, M.A., 1944, Washington; Ph.D., 1950, Northwestern*

MORRILL, RICHARD LELAND,* 1960, *Assistant Professor of Geography; B.A., 1955, Dartmouth; M.A., 1957, Ph.D., 1959, Washington*

MURPHEY, W. RHOADS III,* 1952 (1962), *Professor of Geography; A.B., 1941, A.M., 1942, A.M., 1948, Ph.D., 1950, Harvard*

SHERMAN, JOHN CLINTON,* 1942 (1954), *Professor of Geography; Chairman, Department of Geography; A.B., 1937, Michigan; M.A., 1943, Clark; Ph.D., 1947, Washington*

THOMAS, MORGAN DAVID,* 1959 (1960), *Associate Professor of Geography; B.A., 1951, Ph.D., 1954, Queen's (Belfast)*

TIEBOUT, CHARLES MILLS,* 1962, *Professor of Finance and Economics; Professor of Geography; B.A., 1950, Wesleyan; M.A., 1951, Ph.D., 1957, Michigan*

ULLMAN, EDWARD LOUIS,* 1951, *Professor of Geography; Associate Dean, Graduate School; S.B., 1934, Chicago; A.M., 1935, Harvard; Ph.D., 1942, Chicago*

Geology

BARKSDALE, JULIAN DEVREAU,* 1936 (1949), *Professor of Geology; B.A., 1930, Stanford; Ph.D., 1936, Yale*

BENNINGTON, KENNETH O., 1963, *Research Associate Professor of Geophysics; B.S., 1947, Montana State; B.A., 1949, Montana; M.S., 1951, Washington State; Ph.D., 1960, Chicago*

COOMBS, HOWARD ABBOTT,* 1934 (1949), *Professor of Geology; Chairman, Department of Geology; B.S., 1929, M.S., 1932, Ph.D., 1935, Washington*

CZAMANSKE, GERALD KENT, 1962, *Assistant Professor of Geology; A.B., 1953, B.S., 1955, Chicago; Ph.D., 1961, Stanford*

FULLER, RICHARD, *Research Professor of Geology; B.S., 1924, Ph.D., 1930, Washington*

GOODSPEED, GEORGE EDWARD, 1919 (1957), *Professor Emeritus of Geology; B.S. in Min.E., 1910, Massachusetts Institute of Technology*

MALLORY, V. STANDISH,* 1952 (1962), *Professor of Geology; A.B., 1943, Oberlin; M.A., 1948, Ph.D., 1952, California*

McKEE, BATES,* 1958 (1964), *Associate Professor of Geology; B.S., 1955, Yale; Ph.D., 1958, Stanford*

MISCH, PETER HANS,* 1947 (1950), *Professor of Geology; D.Sc., 1932, Goettingen (Germany)*

PORTER, STEPHEN CUMMINGS,* 1962, *Assistant Professor of Geology; B.S., 1955, M.S., 1958, Ph.D., 1962, Yale*

SINCLAIR, ALASTAIR JAMES, 1962, *Assistant Professor of Geology; B.S., 1957, M.S., 1958, Toronto; Ph.D., 1964, British Columbia*

VANCE, JOSEPH ALAN,* 1957, *Assistant Professor of Geology; B.S., 1951, Ph.D., 1957, Washington*

WHEELER, HARRY EUGENE,* 1948 (1951), *Professor of Geology; B.S., 1930, Oregon; A.M., 1932, Ph.D., 1935, Stanford*

Germanic Languages and Literature

AMMERLAHN, HELLMUT, 1963, *Instructor in German; M.A., 1960, Vermont*

ANKELE, FELICE, 1927 (1952), *Assistant Professor Emeritus of German*; B.A., 1925, M.A., 1926, Ph.D., 1936, Washington

BAUMGAERTEL, GERHARD,* 1962, *Associate Professor of Germanic Literature*; M.A., 1953, Brown; Ph.D., 1954, Tubingen (Germany)

BUCK, GEORGE CRAWFORD,* 1950 (1962), *Associate Professor of Germanic Literature*; B.A., 1942, Amherst; M.A., 1948, Ph.D., 1954, Yale

COTTRELL, ALAN P., 1962, *Instructor in German*; B.Sc., 1956, Ohio State; M.A., 1958, Wisconsin; Ph.D., 1963, Ohio State

EGERT, EUGENE, 1964, *Instructor in German*; B.Sc., 1958, M.A., 1961, British Columbia

HERTLING, GUNTER, 1961 (1964), *Assistant Professor of Germanic Literature*; B.A., 1954, M.A., 1957, Ph.D., 1963, California (Berkeley)

HRUBY, ANTONIN,* 1961 (1964), *Associate Professor of Germanic Literature*; Ph.D., 1946, Prague

IMMERWAHR, RAYMOND,* 1960, *Professor of Germanic Literature*; A.B., 1934, Swarthmore; M.A., 1935, Northwestern; Ph.D., 1941, California (Berkeley)

MEYER, HERMAN C. H.,* 1934 (1942), *Associate Professor of Germanic Languages*; Executive Secretary, Department of Germanic Languages and Literature; B.A., 1924, Capital; Ph.D., 1936, Chicago

RABURA, HORST, 1963, *Instructor in German*; B.A., 1957, Seattle

REED, CARROLL EDWARD,* 1946 (1959), *Professor of Germanic Languages and of Linguistics*; B.A., 1936, M.A., 1937, Washington; Ph.D., 1941, Brown

REY, WILLIAM HENRY,* 1950 (1959), *Professor of Germanic Literature*; Chairman, Department of Germanic Languages and Literature; Ph.D., 1937, Frankfurt

SAUERLANDER, ANNEMARIE M.,* 1947 (1949), *Associate Professor of Germanic Literature*; B.A., 1928, M.A., 1930, Buffalo; Ph.D., 1936, Cornell

SHERWIN, ELSA W., 1962, *Lecturer in German*; Ph.D., 1933, Berlin

SIEBENMANN, OTTO R., 1964, *Instructor in German*; B.A., 1955, Toronto

WESNER, ELENORA M., 1924 (1950), *Assistant Professor Emeritus of German*; B.Ped., 1909, Colorado State Normal School; A.B., 1915, Chicago; M.A., 1923, Northwestern

WILKIE, RICHARD FRANCIS, JR.,* 1937 (1962), *Associate Professor of Germanic Literature*; B.A., 1934, M.A., 1936, Washington; Ph.D., 1953, California

History

ALDEN, DAURIL,* 1959 (1960), *Assistant Professor of History*; A.B., 1950, M.A., 1952, Ph.D., 1959, California

BADIAN, ERNST, 1962, *Professor of History*; A.B., 1945, M.A., 1946, Victoria (New Zealand); B.A., 1950, M.A., 1954, D.Phil., 1956, Oxford

BESTOR, ARTHUR,* 1962, *Professor of History*; Ph.B., 1930, Ph.D., 1938, Yale; M.A., 1956, Oxford; LL.D., 1959, Lincoln (Pennsylvania)

BRIDGMAN, JON MARSHALL,* 1961, *Assistant Professor of History*; B.A., 1951, Ph.D., 1960, Stanford

BURKE, ROBERT EUGENE,* 1957 (1960), *Associate Professor of History*; Chairman, Department of History; A.B., 1946, Chico State; M.A., 1947, Ph.D., 1950, California

BUTOW, ROBERT J. C.,* 1960, *Associate Professor of History*; A.B., 1947, A.M., 1948, Ph.D., 1953, Stanford

CARSTENSEN, VERNON, 1964, *Professor of History*; B.A., 1928, Iowa State; M.A., 1932, Ph.D., 1936, State University of Iowa

COHEN, SIDNEY LEON,* 1963, *Assistant Professor of History*; B.A., 1957, Rutgers; M.A., 1959, Ph.D., 1962, Yale

COSTIGAN, GIOVANNI,* 1934 (1948), *Professor of History*; B.A., 1926, B.Litt., 1930, M.A., 1930, Oxford; M.A., 1928, Ph.D., 1930, Wisconsin

DOBIE, EDITH, 1926 (1957), *Professor Emeritus of History*; B.A., 1914, Syracuse; A.M., 1938, Columbia; Ph.D., 1942, Johns Hopkins

EMERSON, DONALD EUGENE,* 1946 (1953), *Associate Professor of History*; A.B., 1937, Johns Hopkins; M.A., 1938, Columbia; Ph.D., 1942, Johns Hopkins

FERRILL, ARTHUR L., 1964, *Assistant Professor of History*; B.A., 1960, Wichita; M.A., 1961, Ph.D., 1964, Illinois

GRIFFITHS, GORDON,* 1959 (1961), *Associate Professor of History*; A.B., 1936, Ph.D., 1942, California; B.A., 1939, M.A., 1946, Oxford

HANKINS, THOMAS L., 1964, *Assistant Professor of History*; B.A., 1956, Yale; M.A.T., 1958, Harvard; Ph.D., 1964, Cornell

HOLT, W. STULL,* 1940, *Professor of History*; A.B., 1920, Cornell; Ph.D., 1926, Johns Hopkins

KAMINSKY, HOWARD,* 1957 (1962), *Associate Professor of History*; M.A., 1949, Ph.D., 1952, Chicago

KAPOOR, SATISH C., 1962, *Lecturer in History*; B.S., 1946, Punjab University (Lahore); M.A., 1950, St. Stephens College (Delhi); Ph.D., 1954, Sorbonne

KATZ, SOLOMON,* 1936 (1950), *Professor of History*; Dean, College of Arts and Sciences; A.B., 1930, Ph.D., 1933, Cornell

KEEP, JOHN L. H., *Visiting Associate Professor of History for 1964-65*; B.A., 1950, Ph.D., 1954, London

LEVY, ERNST, 1937 (1952), *Professor Emeritus of History, Law, and Political Science*; J.D., 1906, Berlin; LL.D. (Hon.), 1949, Frankfurt; Ph.D. (Hon.), 1949, Heidelberg

LEVY, FRED JACOB,* 1960 (1961), *Assistant Professor of History*; A.B., 1954, A.M., 1956, Ph.D., 1960, Harvard

LYTLE, SCOTT HARRISON,* 1949 (1957), *Associate Professor of History*; A.B., 1940, Princeton; Ph.D., 1948, Cornell

PRESSLY, THOMAS J.,* 1949 (1957), *Professor of History*; A.B., 1940, A.M., 1941, Ph.D., 1950, Harvard

RICHARDSON, ELMO R., *Visiting Assistant Professor of History for 1964-65*; A.B., 1952, Illinois; M.A., 1952, Illinois; Ph.D., 1958, California

SAVELLE, MAX,* 1947, *Professor of History*; A.B., 1924, M.A., 1926, Ph.D., 1932, Columbia

SPELLMAN, JOHN W., 1964, *Assistant Professor of History*; B.A., 1956, Northeastern; Ph.D., 1960, London

SUGAR, PETER FRIGYES,* 1959 (1963), *Associate Professor of History*; A.B., 1954, City College of New York; A.M., 1956, Ph.D., 1959, Princeton

SZEFTEL, MARC,* 1961, *Professor of History*; Matur, 1919, Stan. Staszic Gymnasium (Poland); Magister of Laws, 1925, University of Warsaw; Docteur en droit, 1934, Lic.Slav. Phil.Hist., 1939, Université Libre de Bruxelles

THOMSON, S. HARRISON, *Visiting Professor of History for 1964-65*; A.B., 1923, Princeton; D.Phil., 1925, Charles University (Prague); B.Litt., 1926, D.Litt., 1942, Oxford

TREADGOLD, DONALD WARREN,* 1949 (1959), *Professor of History*; B.A., 1943, Oregon; M.A., 1947, Harvard; D.Phil., 1950, Oxford

VORZIMMER, PETER J.,* 1964, *Assistant Professor of History*; B.A., 1958, California; Diploma Hist.Sci., 1959, Ph.D., 1963, Cambridge

WILLIAMS, JOHN A.,* 1963, *Assistant Professor of History*; B.A., 1957, Wisconsin; M.A., 1959, California; Ph.D., 1963, Wisconsin

Home Economics

BROCKWAY, DORIS J.,* 1951, *Associate Professor of Home Economics*; B.A., 1926, Washington State; M.A., 1939, Washington

CRUM, JEANNETTE, 1956, *Instructor in Home Economics*; B.S., 1930, M.S., 1932, Washington

DENNY, GRACE GOLDENA, 1913 (1950), *Professor Emeritus of Home Economics*; B.A., 1907, Nebraska; M.A., 1919, Columbia

DRESSLAR, MARTHA ESTELLA, 1918 (1955), *Associate Professor Emeritus of Home Economics*; A.B., 1913, Southern California; B.S., 1917, Washington; M.S., 1918, Columbia

GRANBERG, GRACE GRINDALL, 1960, *Instructor in Home Economics*; B.S. in H.Ec., 1934, M.S. in H.Ec., 1960, Washington

HALL, FLORENCE TURNBULL,* 1952, *Assistant Professor of Home Economics*; B.S., 1943, Manitoba; M.S., 1945, Minnesota

HENDERSON, DOROTHY I., 1959 (1960) *Assistant Professor of Home Economics*; B.S. in H.Ec., 1944, Georgia State College for Women; M.S., 1951, Tennessee

JOHNSON, MARY LOUISE,* 1945 (1957), *Professor of Home Economics*; Director, School of Home Economics; B.A., 1940, Hardin-Simmons; M.S., 1942, Wisconsin; D.Sc., 1954, Harvard

KLEMER, RICHARD H., 1962, *Visiting Assistant Professor of Home Economics*; B.A., 1939, Pittsburgh; Ph.D., 1953, Florida State



LOWENBERG, MIRIAM E., 1963, *Visiting Professor of Home Economics*; Ph.B., 1918, Chicago; M.S., 1929, Iowa State; Ph.D., 1943, State University of Iowa

MCADAMS, LAURA ELIZABETH,* 1941 (1951), *Associate Professor of Home Economics*; B.S., 1923, M.S., 1932, Kansas State College

MONSEN, ELAINE R., 1963, *Acting Assistant Professor of Home Economics*; B.A., 1956, Utah; M.S., 1959, Ph.D., 1961, California

MURDOCH, MARGARET BARR, 1959, *Instructor in Home Economics*; B.S., 1935, Carnegie Institute of Technology; M.A., 1958, Teachers College, Columbia

NIELSEN, MABEL MULLIKIN,* 1957, *Assistant Professor of Home Economics*; B.S., 1935, Idaho; M.S., 1941, Iowa State College

PAYNE, BLANCHE,* 1927 (1942), *Professor of Home Economics*; B.S., 1916, Kansas State Teachers College; M.A., 1924, Columbia

ROWNTREE, JENNIE IRENE, 1925 (1956), *Professor Emeritus of Home Economics*; B.S., 1918, Wisconsin; M.S., 1925, Chicago; Ph.D., 1929, Iowa

SANDSTROM, ALICE W., 1957, *Instructor in Home Economics*; B.S., 1934, Washington

SHIGAYA, MABEL KYO, 1953 (1960), *Instructor in Home Economics*; B.A., 1951, M.A. in H.Ec., 1960, Washington

SMITH, DOROTHY JEAN, 1960, *Instructor in Home Economics*; B.S., 1941, M.A. in H.Ec., 1961, Washington

TERRELL, MARGARET ELMA,* 1928 (1944), *Professor of Home Economics*; B.A., 1923, Penn College (Iowa); M.A., 1927, Chicago

Linguistics

ABERNATHY, ROBERT HARWOOD,* 1960 (1962), *Associate Professor of Slavic Linguistics*; B.A., 1945, Arizona; M.A., 1946, Ph.D., 1951, Harvard

JACOBS, MELVILLE,* 1928 (1952), *Professor of Anthropology and of Linguistics*; A.B., 1922, City College of New York; A.M., 1923, Ph.D., 1931, Columbia

JACOBSEN, WILLIAM H., JR., 1961, *Acting Assistant Professor of Linguistics*; Director, English for Foreign Students; A.B., 1953, Harvard

LI, FAN-KUEI,* 1949 (1950), *Professor of Chinese Linguistics and of Anthropology*; A.B., 1926, Michigan; A.M., 1927, Ph.D., 1928, Chicago

POPPE, NICHOLAS N.,* 1949 (1951), *Professor of Slavic and Altaic Studies*; Anthropology and of Linguistics; M.A., 1923, Petrograd; Ph.D., 1934, Petersburg

REED, CARROLL EDWARD, 1946 (1959), *Professor of Germanic Languages and of Linguistics*; B.A., 1936, M.A., 1937, Washington; Ph.D., 1941, Brown

SAPORTA, SOL,* 1960 (1961), *Associate Professor of Romance Linguistics*; Chairman, Department of Linguistics; B.A., 1944, Brooklyn; M.A., 1952, Ph.D., 1955, Illinois

SZEMERENYI, OSWALD J.L. (1964), *Visiting Professor of Linguistics*; Ph.D., 1936, Budapest

THOMPSON, LAURENCE C., JR.,* 1957 (1962), *Associate Professor of Far Eastern and Slavic Languages and Literature and of Linguistics*; A.B., 1949, Middlebury; M.A., 1950, Ph.D., 1954, Yale

WYATT, WILLIAM FRANK, JR.,* 1960, *Assistant Professor of Classics and of Linguistics*; B.A., 1953, Bowdoin; M.A., 1957, Ph.D., 1962, Harvard

Mathematics

ALLEENDOERFER, CARL BARNETT,* 1951, *Professor of Mathematics*; B.S., 1932, Haverford; B.A., 1934, M.A., 1939, Oxford; Ph.D., 1937, Princeton

ARSOVE, MAYNARD GOODWIN,* 1951 (1961), *Professor of Mathematics*; B.S., 1943, Lehigh; Sc.M., 1948, Ph.D., 1950, Brown

AVANN, SHERWIN PARKER,* 1946 (1962), *Associate Professor of Mathematics*; B.S., 1938, Washington; M.S., 1940, Ph.D., 1942, California Institute of Technology

BALLANTINE, JOHN PERRY,* 1926 (1937), *Professor of Mathematics*; A.B., 1918, Harvard; Ph.D., 1923, Chicago

BEAUMONT, ROSS ALLEN,* 1940 (1954), *Professor of Mathematics*; A.B., 1936, M.S., 1937, Michigan; Ph.D., 1940, Illinois

BIRNBAUM, ZYGMUNT WILLIAM,* 1939 (1950), *Professor of Mathematics*; Director, Laboratory of Statistical Research; LL.M., 1925, Ph.D., 1929, John Casimir (Lwow, Poland)

BLUMENTHAL, ROBERT McCALLUM,* 1956 (1961), *Associate Professor of Mathematics*; B.A., 1952, Oberlin; Ph.D., 1956, Cornell

BROWNELL, FRANCIS HERBERT III,* 1950 (1961), *Professor of Mathematics*; B.A., 1943, M.S., 1947, Yale; Ph.D., 1949, Princeton

CANTOR, DAVID GEOFFREY,* 1962, *Assistant Professor of Mathematics*; B.S., 1956, California Institute of Technology; Ph.D., 1960, California (Los Angeles)

CHAPMAN, DOUGLAS GEORGE,* 1949 (1957), *Professor of Mathematics*; B.A., 1938, Saskatchewan; M.A., 1940, Ph.D., 1949, California

CORSON, HARRY HERBERT,* 1958 (1962), *Associate Professor of Mathematics*; A.B., 1952, Vanderbilt; M.A., 1954, Ph.D., 1957, Duke

CRAMLET, CLYDE MYRON,* 1920 (1948), *Professor of Mathematics*; B.S., 1916, Walla Walla College; M.S., 1920, Ph.D., 1926, Washington

DEKKER, DAVID BLISS,* 1948 (1959), *Associate Professor of Mathematics*; Director, Research Computer Laboratory; A.B., 1941, California; M.S., 1943, Illinois Institute of Technology; Ph.D., 1948, California

DEMARR, RALPH ELGIN,* 1962, *Assistant Professor of Mathematics*; B.S., 1952, Idaho; M.A., 1954, Washington State; Ph.D., 1961, Illinois

DUBISCH, ROY,* 1961, *Professor of Mathematics*; B.S., 1938, M.S., 1940, Ph.D., 1943, Chicago

ELLIS, HOMER G.,* 1962, *Assistant Professor of Mathematics*; B.A., 1955, M.A., 1958, Ph.D., 1961, Texas

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GANEA, THEODOR,* 1963, *Professor of Mathematics*; Master, 1949, Bucharest; Doctor, 1962, Paris

GANGOLLI, RAMESH ANAND,* 1962, *Assistant Professor of Mathematics*; B.A., 1954, Elphinstone College (Bombay); B.A., 1957, Cambridge; Ph.D., 1961, Massachusetts Institute of Technology

GETOOR, RONALD KAY,* 1956 (1960), *Associate Professor of Mathematics*; A.B., 1950, M.S., 1951, Ph.D., 1954, Michigan

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HACKMAN, MORTON MATHEW, 1963, *Assistant Professor of Mathematics*; A.B., 1958, Harvard; S.M., 1960, Chicago; Ph.D., 1963, Massachusetts Institute of Technology

HALLER, MARY ELIZABETH,* 1931 (1949), *Associate Professor of Mathematics*; B.A., 1924, M.S., 1931, Ph.D., 1934, Washington

HEWITT, EDWIN,* 1948 (1954), *Professor of Mathematics*; A.B., 1940, M.A., 1941, Ph.D., 1942, Harvard

HOBBY, CHARLES RAY,* 1961, *Assistant Professor of Mathematics*; B.A., 1953, California; M.S., 1957, Houston; Ph.D., 1960, California Institute of Technology

HOSAY, NORMAN, 1964, *Instructor in Mathematics*; B.S., 1956, Wayne State; M.S., 1958, Ph.D., 1963, Wisconsin

HUFFORD, GEORGE ALLEN,* 1958, *Assistant Professor of Mathematics*; B.A., 1953, California Institute of Technology; M.S., 1948, Washington; M.A., 1952, Ph.D., 1953, Princeton

HUNGERFORD, THOMAS W., 1963, *Instructor in Mathematics*; A.B., 1958, Holy Cross College; M.S., 1960, Ph.D., 1963, Chicago

ISELL, JOHN ROLFE,* 1957 (1962), *Professor of Mathematics*; B.S., 1951, Chicago; Ph.D., 1954, Princeton

JANS, JAMES P.,* 1957 (1960), *Associate Professor of Mathematics*; A.B., 1949, M.A., 1950, Ph.D., 1955, Michigan

JERBERT, ARTHUR RUDOLPH, 1921 (1937), *Professor Emeritus of Mathematics*; Consultant; B.S., 1916, M.S., 1923, Ph.D., 1928, Washington

JOHNSON, HAROLD H.,* 1961, *Assistant Professor of Mathematics*; B.A., 1951, San Jose State; M.A., 1956, Ph.D., 1957, California

KINGSTON, JOHN MAURICE,* 1940 (1959), *Associate Professor of Mathematics*; Executive Secretary, Department of Mathematics; B.A., 1935, Western Ontario; M.A., 1936, Ph.D., 1939, Toronto

KLEE, VICTOR L.,* 1953 (1957), *Professor of Mathematics*; B.A., 1945, Pomona; Ph.D., 1949, Virginia

LORTZ, MARJORIE M., 1964, *Lecturer in Mathematics*; B.S., 1963, Washington

LUMER, GUNTER,* 1961, Assistant Professor of Mathematics; B.S., 1948, State College of Montevideo; E.E., 1951, Montevideo; Ph.D., 1959, Chicago

McFARLAN, LEE HORACE,* 1927 (1946), Professor of Mathematics; B.S., 1917, Kansas State Teachers College; A.M., 1921, Ph.D., 1924, Missouri

MICHAEL, ERNEST ARTHUR,* 1953 (1960), Professor of Mathematics; B.A., 1947, Cornell; M.A., 1948, Harvard; Ph.D., 1951, Chicago

MOREL, ANNE C.,* 1960 (1961), Associate Professor of Mathematics; B.A., 1941, California (Los Angeles); Ph.D., 1953, California

NAMIOKA, ISAAC,* 1963, Associate Professor of Mathematics; B.A., 1951, Ottawa College; M.A., 1953, University of Kansas; Ph.D., 1956, California

NEWMAN, DAVID STANLEY,* 1961 (1962), Assistant Professor of Mathematics; B.S., 1956, New Mexico; Ph.D., 1961, Cornell

NUNKE, RONALD JOHN,* 1958 (1963), Associate Professor of Mathematics; B.S., 1950, M.S., 1951, Ph.D., 1955, Chicago

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PHELPS, ROBERT RALPH,* 1962 (1963), Associate Professor of Mathematics; B.A., 1954, California (Los Angeles); Ph.D., 1958, Washington

PIERCE, RICHARD SCOTT,* 1955 (1960), Professor of Mathematics; Chairman, Department of Mathematics; B.S., 1950, Ph.D., 1952, California Institute of Technology

PYKE, RONALD,* 1960 (1962), Associate Professor of Mathematics; B.A., 1953, McMaster; M.S., 1955, Ph.D., 1956, Washington

RICHARDSON, ROGER WOLCOTT, JR.,* 1960 (1963), Associate Professor of Mathematics; B.S., 1951, Louisiana State; Ph.D., 1958, Michigan

RITCHIE, ROBERT WELLS,* 1962, Assistant Professor of Mathematics; B.A., 1957, Reed; M.A., 1959, Ph.D., 1961, Princeton

SCHWARTZMAN, SOL,* 1963, Assistant Professor of Mathematics; B.A., 1948, Brooklyn; M.A., 1949, Ph.D., 1953, Yale

SEGAL, JACK,* 1960 (1961), Assistant Professor of Mathematics; B.S., 1955, M.S., 1957, Miami; Ph.D., 1960, Georgia

SELFRIDGE, JOHN LEWIS,* 1960 (1961), Associate Professor of Mathematics; B.S., 1951, Washington; Ph.D., 1958, California (Los Angeles)

TATE, ROBERT FLEMMING,* 1953 (1961), Associate Professor of Mathematics; A.B., 1944, California; M.A., 1949, North Carolina; Ph.D., 1952, California

TROY, ALAN,* 1962, Assistant Professor of Mathematics; B.A., 1950, B.S., 1952, Chicago; M.S., 1956, Ph.D., 1961, Illinois

WINGER, ROY MARTIN, 1918 (1956), Professor Emeritus of Mathematics; A.B., 1906, Baker; Ph.D., 1912, Johns Hopkins

WOLL, JOHN WILLIAM, JR.,* 1961, Assistant Professor of Mathematics; B.S., 1952, Haverford; Ph.D., 1956, Princeton

WOOLF, WILLIAM B.,* 1959 (1960), Assistant Professor of Mathematics; B.A., 1953, Pomona; M.A., 1955, Claremont; Ph.D., 1959, Michigan

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ZUCKERMAN, HELEN C., 1952 (1960), Lecturer in Mathematics; B.S., 1930, M.S., 1935, Washington

ZUCKERMAN, HERBERT SAMUEL,* 1939 (1952), Professor of Mathematics; B.S., 1932, California Institute of Technology; M.S., 1934, Chicago; Ph.D., 1936, California

Microbiology

The faculty in microbiology is listed under the Division of Health Sciences, School of Medicine.

Music

BABB, WARREN,* 1955, Assistant Professor of Music; B.A., 1938, M.A., 1939, Harvard

BEALE, JAMES MACARTHUR, JR.,* 1948 (1958), Associate Professor of Music; B.A., 1945, Harvard; B.Mus., 1946, M.Mus., 1947, Yale

BERGSMA, WILLIAM,* 1963, Professor of Music; Director, School of Music; B.A., 1942, M.M., 1943, Eastman School of Music, Rochester

BOSTWICK, IRENE NEILSON, 1930 (1957), Associate Professor of Music; B.M., 1922, M.A., 1950, Washington

BRIDGES, THOMAS WHITNEY, 1963, Instructor in Music; B.A., 1952, Hamilton; M.A., 1959, California

CHAPPLE, STANLEY,* 1958, Professor of Music; Director, Symphony and Opera; D.Mus. (Hon.), 1947, Colby College

CLARKE, HENRY LELAND,* 1958 (1959), Associate Professor of Music; A.B., 1928, A.M., 1929, Ph.D., 1947, Harvard

COLE, WILLIAM D., 1957 (1961), Assistant Professor of Music; B.S., 1946, Illinois; M.A., 1954, Washington

EICHENBERGER, RODNEY BRYCE, 1963, Lecturer; B.A., 1952, St. Olaf College; M.A., 1958, Denver

EICHINGER, WALTER A., 1936 (1954), Associate Professor of Music; B.Mus., 1932, M.Mus., 1933, Northwestern

FERRIN, RICHARD ROYCE, 1959 (1961), Assistant Professor of Music; B.Mus., 1950, M.Mus., 1951, Eastman School of Music, Rochester

GARFIAS, ROBERT ADOLPH, 1962, Acting Assistant Professor of Music; B.A., 1956, San Francisco State College; M.A., 1958, California (Los Angeles)

GEISSMAR, ELSE JOHANNA-MARIE, 1947 (1961), Associate Professor of Music; L.R.A.M., 1937, Royal Academy (London); M.Mus., 1944, Michigan

HARRIS, EDISON DAVIS,* 1947, Associate Professor of Music; B.S., 1942, New York

HEFFERNAN, CHARLES W.,* 1962, Assistant Professor of Music; Mus.B., 1958, M.M., 1959, Ph.D., 1962, Michigan

HEINITZ, EVA MARIA,* 1948 (1956), Associate Professor of Music; Studied at State Academy of Music (Berlin)

HOKANSON, RANDOLPH, 1949 (1960), Associate Professor of Music; Studied with Dame Myra Hess, Howard Ferguson (London)

IRVINE, DEMAR BUEL,* 1937 (1960), Professor of Music; B.A., 1929, M.A., 1931, California; Ph.D., 1937, Harvard

JACOBSON, BERTHE PONCY,* 1937 (1948), Professor of Music; Diplomas, 1915, Conservatory of Music (Geneva); Diplomas, 1917, Schola Cantorum (Paris); Diplomas, 1921, Dalcroze School (Geneva)

KECHLEY, GERALD, 1947 (1961), Associate Professor of Music; B.A., 1946, M.A., 1950, Washington

KIRCHNER, GEORGE CASINO, 1919 (1959), Associate Professor Emeritus of Music; Graduate, 1911, Leipzig

KOSTER, RÈ, 1962, Associate Professor of Music; Studied with Jean Reder and Marya Freund (Paris); Conti Varesi and Malatesta (Milan)

McKAY, GEORGE FREDERICK,* 1927 (1943), Professor of Music; B.Mus., 1923, Rochester

MOLDENHAUER, HANS, 1961, Lecturer in Music; B.A., 1945, Whitworth; Dr. Mus. (Hon.), 1945, Boguslawski College of Music (Chicago); D.F.A., 1951, Chicago Musical College (Roosevelt University)

MOORE, JOHN TERENCE, 1948, Assistant Professor of Music; B.Mus., 1940, M.Mus., 1941, Illinois

MUNRO, KATHLEEN, 1929 (1962), Professor Emeritus of Music; B.M., 1924, Washington; M.A., 1929, Columbia; Ph.D., 1937, Washington

NORMANN, THEODORE FREDERICK,* 1940 (1958), Professor of Music; B.A., 1925, Macalaster College; M.A., 1928, Columbia

ROSINBUM, RALPH RAMBO,* 1948 (1963), Associate Professor of Music; B.A., 1947, M.A., 1948, Washington

SOKOL, VILEM MARK, 1948 (1958), Associate Professor of Music; Mus.B., 1938, Oberlin Conservatory; Grad.Cert., 1939, Conservatory of Music (Prague)

TERRY, MIRIAM,* 1930 (1950), Associate Professor of Music; B.M., 1926, M.A., 1948, Washington

TUFTS, PAUL DEWITT, 1958 (1963), Instructor in Music; Undergraduate Adviser; B.A., 1949, M.A., 1951, Washington

VERRALL, JOHN WEEDON,* 1948 (1959), Professor of Music; B.Mus., 1929, Minneapolis College of Music; Cert. of Mus., 1932, Liszt Conservatory (Budapest); B.A., 1934, Minnesota

WELKE, WALTER CARL, 1929 (1943), Associate Professor of Music; B.M., 1927, Michigan

WERNER, AUGUST HANSEN, 1931 (1932), Professor Emeritus of Music; B.S., 1913, College of Agriculture (Stend, Norway); Graduate, 1924, Master School of Music (New York)

WOODCOCK, EDITH,* 1930 (1945), Associate Professor of Music; B.M., 1925, Rochester; M.M., 1936, Washington



ZETLIN, EMANUEL ROMAN,* 1947, *Professor of Music*; B.A., 1916, *Imperial Conservatory (Petrograd)*; *Dr.Mus. (Hon.)*, 1936, *Washington College of Music (Washington, D.C.)*

Oceanography

ANDERSON, GEORGE CAMERON, 1958, *Research Assistant Professor of Oceanography*; B.A., 1947, M.A., 1949, *British Columbia*; Ph.D., 1954, *Washington*

BANSE, KARL,* 1960 (1963), *Associate Professor of Oceanography*; Ph.D., 1955, *Kiel*

BARNES, CLIFFORD ADRIAN,* 1947 (1955), *Professor of Oceanography*; B.S., 1930, Ph.D., 1936, *Washington*

COACHMAN, LAWRENCE KEYES, 1962, *Assistant Professor of Oceanography*; A.B., 1948, *Dartmouth*; M.F., 1951, *Yale*; Ph.D., 1962, *Washington*

CREAGER, JOE SCOTT,* 1958 (1962), *Associate Professor of Oceanography*; B.S., 1951, *Colorado College*; M.S., 1953, Ph.D., 1958, *Texas A&M*

DAWSON, WILLIAM A., 1960, *Research Instructor in Oceanography*; B.A., 1949, *Swarthmore College*; M.A., 1960, *Harvard*

ENBYSK, BETTY JOYCE, 1960 (1963), *Research Assistant Professor of Oceanography*; B.S., 1949, M.S., 1954, *Washington State*; Ph.D., 1960, *Washington*

ENGLISH, THOMAS SAUNDERS,* 1958, *Assistant Professor of Oceanography*; B.S., 1950, M.S., 1951, *Iowa State*; Ph.D., 1961, *Washington*

FLEMING, RICHARD HOWELL,* 1951, *Professor of Oceanography*; *Chairman, Department of Oceanography*; B.A., 1929, M.A., 1931, *British Columbia*; Ph.D., 1935, *California*

GROSS, MEREDITH GRANT, JR.* 1961, *Assistant Professor of Oceanography*; A.B., 1954, *Princeton*; M.S., 1959, Ph.D., 1961, *California Institute of Technology*

HENRY, DORA PRIAULX, 1960, *Research Associate Professor of Oceanography*; A.B., 1925, M.A., 1926, Ph.D., 1931, *California (Berkeley)*

LING, HSIN-YI, 1963, *Research Instructor in Oceanography*; B.S., 1953, *National Taiwan University*; M.S., 1958, *Tohoku University*; Ph.D., 1963, *Washington University*

McMANUS, DEAN ALVIS, 1959 (1963), *Research Assistant Professor of Oceanography*; B.S., 1954, *Southern Methodist University*; M.S., 1956, Ph.D., 1959, *Kansas*

MURPHY, STANLEY REED, 1960, *Lecturer in Oceanography*; *Senior Physicist, Applied Physics Laboratory*; B.S., 1948, *Fresno State College*; Ph.D., 1959, *Washington*

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RATTRAY, MAURICE, JR.* 1950 (1962), *Professor of Oceanography*; B.S., 1944, M.S., 1947, Ph.D., 1951, *California Institute of Technology*

RICHARDS, FRANCIS ASBURY,* 1959, *Associate Professor of Oceanography*; B.S., 1939, *Illinois*; M.S., 1942, *Nevada*; Ph.D., 1950, *Washington*

SANDS, WALTER CASPER, 1962 (1963), *Lecturer in Oceanography*; B.S., 1937, *Washington*; B.S., 1949, *USN Postgraduate School, Annapolis*; M.S., 1959, *California (Los Angeles)*

WHETTEN, JOHN T., 1963, *Research Instructor in Oceanography*; A.B., 1957, *Princeton*; M.A., 1959, *California (Berkeley)*; Ph.D., 1962, *Princeton*

Philosophy

BOLER, JOHN FRANCIS,* 1960, *Assistant Professor of Philosophy*; A.B., 1950, *Creighton*; M.A., 1952, *St. Louis University*; Ph.D., 1960, *Harvard*

DIETRICHSON, PAUL,* 1955 (1961), *Associate Professor of Philosophy*; A.B., 1947, *Georgia*; Ph.D., 1955, *Yale*

KEYT, DAVID,* 1957 (1960), *Assistant Professor of Philosophy*; A.B., 1951, *Kenyon College*; M.A., 1953, Ph.D., 1955, *Cornell*

MELDEN, ABRAHAM IRVING,* 1946 (1956), *Professor of Philosophy*; A.B., 1931, *California (Los Angeles)*; A.M., 1932, *Brown*; Ph.D., 1938, *California*

MISH'ALANI, JAMES KARAM,* 1963, *Assistant Professor of Philosophy*; A.B., 1956, *American University of Beirut*; M.A., 1958, Ph.D., 1961, *Brown*

MOULTON, JOHN RUSSELL, 1961, *Instructor in Philosophy*; B.A., 1950, *Dartmouth*

RADER, MELVIN MILLER,* 1930 (1948), *Professor of Philosophy*; A.B., 1925, M.A., 1927, Ph.D., 1929, *Washington*

RICHMAN, ROBERT JUNE,* 1961, *Associate Professor of Philosophy*; *Chairman, Department of Philosophy*; A.M., 1950, Ph.D., 1953, *Harvard*

SMULLYAN, ARTHUR,* 1946 (1956), *Professor of Philosophy*; A.B., 1937, *City College of New York*; M.A., 1940, Ph.D., 1941, *Harvard*

STERN, LAURENT,* 1961, *Assistant Professor of Philosophy*; Ph.D., 1952, *Zurich*

Physical Education for Men

BUCKLEY, ROBERT WILLIAM, 1942 (1960), *Assistant Professor of Physical Education*; B.A., 1950, *Washington*

CUTLER, RUSSELL KELSEY,* 1946 (1948), *Chairman, Department of Physical Education for Men*; B.Ed., 1930, *California (Los Angeles)*; M.S., 1934, *Oregon*; D.Ed., 1958, *Stanford*

DUCKWORTH, WILBUR M., 1963, *Lecturer in Physical Education*; *Head Basketball Coach*; B.A., 1951, *Tulsa*; M.S., 1956, *Oklahoma State*

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KUNDE, NORMAN FRÉDERICK,* 1931 (1949), *Associate Professor of Physical Education*; B.S., 1928; M.S., 1932, *Washington*; D.Ed., 1946, *New York*

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MILLS, CASWELL ALBERT,* 1942 (1961), *Associate Professor of Physical Education*; B.A., 1935, *North Dakota State Teachers College*; M.A., 1943, Ph.D., 1959, *Washington*

OWENS, JAMES, 1957, *Lecturer in Physical Education*; *Head Football Coach*; *Director of Athletics*; B.S., 1950, *Oklahoma*

PARISEAU, JOHN J., 1962 (1963), *Instructor in Physical Education*; B.S., 1960, M.S., 1962, *Washington*

PEEK, CLIFFORD L.,* 1938 (1962), *Associate Professor of Physical Education*; B.S., 1929, *Washington*; M.A., 1931, *Columbia*

PETERSON, ROBERT A., 1958, *Lecturer in Physical Education*; *Athletic Trainer*

REEVES, GEORGE SPENCER,* 1935 (1948), *Associate Professor of Physical Education*; B.S., 1933, *Oregon State*; M.S., 1937, *Oregon*; M.P.H., 1951, *California*

SCHWARZKOPF, ROBERT J., 1962 (1963), *Instructor in Physical Education*; B.S., 1961, *Minnesota*; M.S., 1962, *Washington*

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STEVENS, LEONARD WOODBURY,* 1937 (1961), *Associate Professor of Physical Education*; B.S., 1933, M.S., 1941, *Washington*

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TORNEY, JOHN ALFRED, JR.* 1930 (1948), *Associate Professor of Physical Education*; B.S., 1938, *Washington*; M.A., 1930, *Columbia*

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Physical and Health Education for Women

BROER, MARION RUTH,* 1947 (1960), *Professor of Physical Education*; B.S., 1933, M.S., 1936, *Wisconsin*; Ph.D., 1954, *New York*

CARR, NORMA JUNE, 1962, *Instructor in Physical Education*; B.S., 1953, *California (Los Angeles)*; M.S., 1962, *Washington*

CULVER, ELIZABETH JEAN, 1958 (1963), *Research Assistant Professor of Physical Education*; B.S., 1955, *Skidmore College (New York)*; M.S., 1958, *Washington*

FOX, KATHARINE SHIRLEY,* 1945 (1948), *Assistant Professor of Physical Education*; B.S., 1938, *Washington*; M.S., 1943, *Oregon*; Ph.D., 1955, *Iowa*

GAINES, MARY JOSEPHINE, 1961, *Acting Assistant Professor of Physical Education*; B.S., 1949, *California (Los Angeles)*; M.A., 1952, *New York University*

GARLAND, IRIS, 1961, *Instructor in Physical Education*; B.S., 1957, *Illinois*; M.S., 1960, *California*

HORNE, DORTHALEE BELLE, 1944, *Assistant Professor of Physical Education*; B.S., 1930, *Missouri*; M.S., 1939, *Oregon*

- KIDWELL, M. KATHRO,* 1939 (1950), *Associate Professor of Physical Education*; B.S., 1927, Nebraska; M.S., 1928, Wisconsin; Ed.D., 1954, Columbia
- MACLEAN, DOROTHY G., 1936 (1943), *Assistant Professor of Physical Education*; B.S., 1933, Oregon; M.S., 1938, Washington
- RULIFSON, LEONE HELMICH, 1926 (1943), *Associate Professor of Physical Education*; B.S., 1922, M.A., 1936, Washington
- WILSON, RUTH MARIAN,* 1936 (1945), *Associate Professor of Physical Education*; Chairman, Department of Physical Education for Women; B.S., 1931, Utah; M.S., 1936, Wisconsin
- Physics**
- BAKER, MARSHALL,* 1962, *Associate Professor of Physics*; B.A., 1953, Harvard College; Ph.D., 1958, Harvard
- BLAIR, JOHN SANBORN,* 1952 (1961), *Professor of Physics*; B.S., 1943, Yale; M.S., 1949, Ph.D., 1951, Illinois
- BODANSKY, DAVID,* 1954 (1958), *Associate Professor of Physics*; B.S., 1943, M.A., 1948, Ph.D., 1950, Harvard
- BRAKEL, HENRY LOUIS, 1905 (1947), *Professor Emeritus of Physics*; Major Adviser; B.A., 1902, Olivet College; M.A., 1905, Washington; Ph.D., 1912, Cornell
- CLARK, KENNETH COURTRIGHT,* 1948 (1960), *Professor of Physics*; B.A., 1940, Texas; M.A., 1941, Ph.D., 1947, Harvard
- COOK, VICTOR, 1963, *Assistant Professor of Physics*; A.B., 1956, Ph.D., 1962, California
- DASH, JAY GREGORY,* 1960 (1963), *Professor of Physics*; B.S., 1944, City College of New York; M.A., Ph.D., 1951, Columbia
- DAVIS, HOWARD FRED,* 1961, *Assistant Professor of Physics*; S.B., S.M., 1954, Massachusetts Institute of Technology; Ph.D., 1960, Rochester
- DEHMELT, HANS GEORG,* 1955 (1961), *Professor of Physics*; B.S., 1946, M.S., 1949, Ph.D., 1950, Goettingen
- FAIRHALL, ARTHUR WILLIAM,* 1954 (1958), *Associate Professor of Physics*; B.Sc., 1946, Queens (Ontario); Ph.D., 1952, Massachusetts Institute of Technology
- FARWELL, GEORGE WELLS,* 1948 (1959), *Professor of Physics*; Associate Dean of the Graduate School; B.S., 1941, Harvard; Ph.D., 1948, Chicago
- GEBALLE, RONALD,* 1946 (1959), *Professor of Physics*; Chairman, Department of Physics; B.S., 1938, M.S., 1940, Ph.D., 1943, California
- GERHART, JAMES BASIL,* 1956 (1961), *Associate Professor of Physics*; B.S., 1950, California Institute of Technology; M.A., 1952, Ph.D., 1954, Princeton
- HALPERN, ISAAC,* 1953 (1960), *Professor of Physics*; B.S., 1943, City College of New York; Ph.D., 1948, Massachusetts Institute of Technology
- HENDERSON, JOSEPH EDMONDS,* 1929 (1942), *Professor of Physics*; Director, Applied Physics Laboratory; B.S., 1922, College of Wooster; Ph.D., 1928, Yale
- HENLEY, ERNEST M.,* 1954 (1961), *Professor of Physics*; B.E.E., 1944, City College of New York; Ph.D., 1951, California
- HIGGS, PAUL McCLELLAN,* 1926 (1959), *Associate Professor of Physics*; B.S., 1919, Washington
- JACOBSON, BORIS ABBOTT,* 1948 (1959), *Professor of Physics*; A.B., 1938, A.M., 1939, Columbia; Ph.D., 1947, Chicago
- KENWORTHY, RAY WILLIAM,* 1929 (1950), *Associate Professor of Physics*; B.A., 1924, M.S., 1925, Iowa; Ph.D., 1938, Washington
- KIM, YOUNG BAE,* 1955 (1962), *Associate Professor of Physics*; B.S., 1950, Washington; Ph.D., 1954, Princeton
- LORD, JERE JOHNS,* 1952 (1962), *Professor of Physics*; A.B., 1943, Reed; M.A., 1948, Ph.D., 1950, Chicago
- MASEK, GEORGE EDWARD,* 1957 (1961), *Associate Professor of Physics*; B.S., 1950, M.S., 1951, Ph.D., 1955, Stanford
- MCCORMICK, WILLIAM DEVLIN, 1963, *Assistant Professor of Physics*; B.S., 1953, California Institute of Technology; Ph.D., 1959, Duke
- McDERMOTT, MARK N.,* 1962, *Assistant Professor of Physics*; B.S., 1953, Whitman; Ph.D., 1959, Columbia
- NEDDERMEYER, SETH HENRY,* 1946 (1952), *Professor of Physics*; B.A., 1929, Stanford; Ph.D., 1935, California Institute of Technology
- PUFF, ROBERT DAVID,* 1962, *Assistant Professor of Physics*; B.S., 1954, Washington University; Ph.D., 1960, Harvard
- SANDERMAN, LLEWELLYN ARTHUR,* 1928 (1952), *Associate Professor of Physics*; Executive Secretary, Department of Physics; B.S., 1923, Linfield College; M.S., 1931, Ph.D., 1943, Washington
- SCARF, FREDERICK LEONARD, 1956 (1961), *Associate Professor of Physics*; A.B., 1951, Temple; Ph.D., 1955, Massachusetts Institute of Technology
- SCHMIDT, FRED HENRY,* 1947 (1956), *Professor of Physics*; B.S.E., 1937, Michigan; M.A., 1940, Buffalo; Ph.D., 1945, California
- SILSBEE, HENRY BRIGGS, 1958, *Acting Associate Professor of Physics*; B.S., 1943, M.A., 1948, Ph.D., 1951, Harvard
- STREIB, JOHN FREDERICK, JR.,* 1947 (1960), *Associate Professor of Physics*; B.S., 1936, Ph.D., 1942, California Institute of Technology
- UEHLING, EDWIN ALBRECHT,* 1936 (1947), *Professor of Physics*; B.A., 1925, Wisconsin; M.A., 1930, Ph.D., 1932, Michigan
- UTTERBACK, CLINTON LOUIS, 1918 (1955), *Professor Emeritus of Physics*; B.S., 1908, Purdue; M.S., 1918, Washington; Ph.D., 1926, Wisconsin
- WILETS, LAWRENCE,* 1958 (1962), *Professor of Physics*; B.S., 1948, Wisconsin; M.A., 1950, Ph.D., 1952, Princeton
- WILLIAMS, ROBERT WALTER,* 1959 (1960), *Professor of Physics*; A.B., 1941, Stanford; M.A., 1943, Princeton; Ph.D., 1948, Massachusetts Institute of Technology
- Political Science**
- BONE, HUGH ALVIN,* 1948, *Professor of Political Science*; Chairman, Department of Political Science; B.A., 1931, North Central College; M.A., 1935, Wisconsin; Ph.D., 1937, Northwestern
- CASSINELLI, CHARLES WILLIAM,* 1960 (1963), *Associate Professor of Political Science*; A.B., 1948, M.A., 1950, California; Ph.D., 1953, Harvard
- COLE, KENNETH C.,* 1924 (1936), B.Litt. in Law, 1924, Oxford; Ph.D., 1930, Harvard
- DANELSKI, DAVID JOSEPH,* 1961, *Assistant Professor of Political Science* (on leave); LL.B., 1953, DePaul (Chicago); B.A., 1955, Seattle; M.A., 1957, Ph.D., 1961, Chicago
- GOTTFRIED, ALEX,* 1950 (1961), *Associate Professor of Political Science*; B.Ed., 1941, Chicago Teachers College; A.M., 1948, Ph.D., 1952, Chicago
- HARBOLD, WILLIAM H.,* 1949 (1962), *Associate Professor of Political Science*; A.B., 1947, Pennsylvania State; M.A., 1949, Ph.D., 1953, Harvard
- HITCHNER, DELL GILLETTE,* 1947 (1951), *Associate Professor of Political Science*; B.A., 1936, Wichita; M.A., 1937, Missouri; Ph.D., 1940, Wisconsin
- KESSEL, JOHN HOWARD,* 1961, *Assistant Professor of Political Science*; B.A., 1950, Ohio; Ph.D., 1958, Columbia
- KROLL, MORTON,* 1958 (1962), *Associate Professor of Political Science*; Director, Division of Correspondence Study; B.A., 1946, Ph.D., 1952, California (Los Angeles)
- MANDER, LINDEN ALFRED,* 1928 (1937), *Professor of Political Science*; B.A., 1917, M.A., 1920, Adelaide (Australia)
- RESHETAR, JOHN STEPHEN, JR.,* 1957 (1962), *Professor of Political Science*; B.A., 1945, Williams; M.A., 1946, Ph.D., 1950, Harvard
- RILEY, WALTER LEE, 1946 (1951), *Assistant Professor of Political Science*; Assistant Dean, College of Arts and Sciences; B.A., 1933, Adams State College; M.A., 1935, Stanford; Ph.D., 1957, Washington
- ROHN, PETER HANS,* 1962, *Assistant Professor of Political Science*; B.A., 1952, Vienna; M.A., 1953, Washington; C.H.E.S., 1954, D.H.E.S., 1955, Saar; Ph.D., 1958, Washington
- SHIPMAN, GEORGE ANDERSON,* 1946, *Professor of Political Science*; Director, Institute of Public Affairs; B.A., 1925, M.A., 1926, Wesleyan (Conn.); Ph.D., 1931, Cornell
- SMITH, ROGER,* 1964, *Assistant Professor of Political Science*; B.A., 1954, Pennsylvania State; M.A., 1955, Ph.D., 1958, Cornell
- WARREN, ROBERT,* 1960 (1964), *Assistant Professor of Political Science*; B.A., 1954, M.A., 1957, Ph.D., 1965, California (Los Angeles)
- WEBSTER, DONALD HOPKINS,* 1939 (1948), *Professor of Political Science*; Director, Bureau of Governmental Research and Services; B.A., 1929, LL.B., 1931, Ph.D., 1933, Washington



Psychology

- ALLEN, KATHERINE EILEEN, 1959, *Lecturer and Head Teacher in the Laboratory Pre-School*; B.S., 1963, Washington
- BAER, DONALD MERLE,* 1957 (1961), *Associate Professor of Psychology*; A.B., 1950, Ph.D., 1957, Chicago
- BIJOU, SIDNEY WILLIAM,* 1948 (1951), *Professor of Psychology*; *Director, Developmental Psychology Laboratory*; B.S., 1933, Florida; M.A., 1936, Columbia; Ph.D., 1941, Iowa
- BIRNBRAUER, JAY SPENCER,* 1960 (1962), *Assistant Professor of Psychology*; B.S., 1954, College of William and Mary; Ph.D., 1962, Indiana
- CULBERT, SIDNEY SPENCE,* 1947 (1961), *Associate Professor of Psychology*; B.A., 1943, Ph.D., 1950, Washington
- EDWARDS, ALLEN L.,* 1944 (1948), *Professor of Psychology*; B.A., 1937, Central College (Chicago); M.A., 1938, Ohio State; Ph.D., 1940, Northwestern
- ESPER, ERWIN ALLEN, 1927 (1960), *Professor Emeritus of Psychology*; B.A., 1917, M.A., 1920, Ph.D., 1923, Ohio State
- EVANS, ELEANOR, 1944 (1946), *Assistant Professor of Psychology*; B.S., 1934, Illinois; M.E., 1940, Winnetka Teachers College
- FIELDS, PAUL ELDON,* 1955, *Professor of Psychology*; A.B., 1926, A.M., 1927, Ohio Wesleyan; Ph.D., 1930, Ohio State
- FORRIN, BERT,* 1961, *Assistant Professor of Psychology*; B.A., 1952, Toronto; M.A., 1953, Ph.D., 1958, Michigan
- GALANTER, EUGENE HARRISON,* 1962, *Professor of Psychology*; A.B., 1950, Swarthmore; A.M., 1951, Ph.D., 1953, Pennsylvania
- GLICKSTEIN, MITCHELL,* 1961, *Assistant Professor of Psychology and Physiology and Biophysics*; B.A., 1951, Ph.D., 1958, Chicago
- GUILD, ROBERT EARL, 1960, *Lecturer in Psychology*; *Research Associate Professor, School of Dentistry*; B.S., 1948, Willamette; M.S., 1953, Ph.D., 1955, Washington
- HARRIS, FLORENCE R., 1950 (1951), *Lecturer in the Laboratory Pre-School*; *Director, Laboratory Pre-School*; B.A., 1931, M.A., in Education, 1958, Washington
- HEATHERS, LOUISE BUSSARD,* 1945 (1962), *Associate Professor of Psychology*; *Senior Clinical Psychologist in the Counseling Center*; B.A., 1933, Washington; Ph.D., 1940, Yale
- HERMANS, THOMAS GERALD, 1929 (1962), *Assistant Professor Emeritus of Psychology*; *Consultant in Psychology*; B.S., 1923, M.A., 1927, Washington
- HODGSON, THOMAS FRANCIS, 1961, *Lecturer in Psychology*; *Associate Dean of Students*; B.A., 1949, British Columbia; M.A., 1952, Ph.D., 1958, Washington
- HOPKINS, BILLY LEE,* 1962, *Assistant Professor of Psychology*; A.B., 1957, Emory; Ph.D., 1962, Indiana
- HORST, A. PAUL,* 1947, *Professor of Psychology*; A.B., 1927, California; Ph.D., 1931, Chicago

HORTON, GEORGE PLANT,* 1934 (1946), *Associate Professor of Psychology*; B.S., 1926, M.A., 1930, Ph.D., 1932, Princeton

JOHNSTON, MARGARET SAYWARD, 1960, *Lecturer and Head Teacher in the Laboratory Pre-School*; B.S., 1964, Washington

LOCKARD, ROBERT BRUCE,* 1962, *Assistant Professor of Psychology*; B.A., 1955, California (Santa Barbara); M.S., 1961, Ph.D., 1962, Wisconsin

LOUCKS, ROGER BROWN,* 1936 (1948), *Professor of Psychology*; B.S. in C.E., 1927, Ph.D., 1930, Minnesota

LUNNEBORG, CLIFFORD EARL, JR.,* 1962, *Assistant Professor of Psychology*; *Director of Bureau of Testing*; B.S., 1954, M.S., 1957, Ph.D., 1959, Washington

McKEEVER, BENJAMIN BUTLER,* 1949, *Associate Professor of Psychology*; A.B., 1930, M.A., 1931, Harvard; Ph.D., 1940, Iowa

SARASON, IRWIN GERALD,* 1956 (1959), *Associate Professor of Psychology*; B.A., 1951, Rutgers; M.A., 1953, Iowa; Ph.D., 1955, Indiana

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STROTHER, CHARLES RIDDELL,* 1947, *Professor of Psychology*; *Professor of Clinical Psychology in the School of Medicine*; *Director, Pilot School*; B.A., 1929, M.A., 1932, Washington; Ph.D., 1935, Iowa

TJOSSEM, THEODORE DAVID, 1960, *Lecturer in Psychology*; *Assistant Professor of Psychiatry (Psychology)*; B.A., 1940, Drake; M.A., 1941, Iowa; Ph.D., 1959, Washington

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WOODBURNE, LLOYD STUART,* 1950, *Professor of Psychology*; A.B., 1929, M.A., 193, Ph.D., 1932, Michigan

Romance Languages and Literature

ALBORG, JUAN LUIS, 1961, *Visiting Associate Professor of Romance Languages and Literature*; B.A., 1936, Institute "Luis Vives"; M.A., 1940, University of Valencia; Ph.D., 1960, University of Madrid

ALCALA, HUGO R., 1958 (1961), *Professor of Romance Languages and Literature*; *Bachelor*, 1936, LL.D., 1943, Asunción (Paraguay); M.F.L., 1950, Washington State; Ph.D., 1953, Wisconsin

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AYLLON, CANDIDO, 1956 (1957), *Assistant Professor of Spanish*; B.A., 1951, Brooklyn College; M.A., 1952, Ph.D., 1956, Wisconsin

BACIU, STEFAN, 1962, *Visiting Lecturer of Portuguese Language and Literature*; Lic. Droit, 1941, Bucharest

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Scandinavian Languages and Literature

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Zoology

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ILLG, PAUL LOUIS,* 1952 (1959), *Professor of Zoology*; A.B., 1936, M.A., 1941, California; Ph.D., 1952, George Washington

KINCAID, TREVOR, 1899 (1947), *Professor Emeritus of Zoology*; *Research Consultant*; B.S., 1899, Washington; D.Sc., 1940, College of Puget Sound

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BROSKY, JOHN JOSEPH,* 1961, *Assistant Professor of Accounting*; B.S., 1956, B.S., 1957, M.B.A., 1958, Lehigh; Ph.D., 1961, Texas

CHIU, JOHN S.Y.,* 1960 (1963), *Associate Professor of Statistics*; B.A., 1952, National Taiwan University; M.S., 1955, Kentucky; Ph.D., 1960, Illinois

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General Business

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- HAMACK, FRANK H.,* 1921 (1942), *Lecturer in Accounting*; LL.B., 1916, Georgetown
- HAY, JOHN L., 1956, *Part-time Lecturer in Business Law*; B.A., 1951, LL.B., 1953, Washington; admitted to practice in Washington
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- LESSINGER, JACK, 1964, *Associate Professor of General Business*; B.S., 1943, Ph.D., 1956, California (Berkeley)
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- SCOTT, ROBERT H.,* 1961 (1963), *Associate Professor of Business Fluctuations*; A.B., 1949, M.A., 1950, Kansas; M.A., 1956, Ph.D., 1961, Harvard
- SEYFRIED, WARREN R.,* 1956 (1958), *Associate Professor of General Business*; B.S., (M.E.), 1943, Vanderbilt; M.B.A., 1954, D.B.A., 1956, Indiana
- SIMPSON, ROBERT H., 1957, *Part-time Lecturer in Accounting*; B.A., 1925, Pennsylvania State; C.P.A., State of Michigan (Washington, Illinois, California, Texas)
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- WALTON, SCOTT D.,* 1962, *Associate Professor of General Business*; B.S., 1947, Minnesota; M.B.A., 1949, Harvard; Ph.D., 1953, Iowa State
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- WHEATLEY, JOHN J., 1960 (1962), *Associate Professor of Marketing*; S.B., 1947, Harvard; M.B.A., 1954, Ph.D., 1959, Buffalo
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- BARNOWE, THEODORE J.,* 1947 (1955), *Professor of Human Relations and Administration*; B.A., 1939, Morningside College (Iowa); M.A., 1940, Ph.D., 1946, Washington
- BROWN, EDWARD G.,* 1948 (1949), *Professor of Business Policy*; A.B., 1929, Washington; M.B.A., 1932, Harvard
- FENN, MARGARET P.,* 1953 (1963), *Assistant Professor of Human Relations*; B.S., 1942, LaCrosse State Teachers; M.B.A., 1950, D.B.A., 1963, Washington
- FISCHER, HENRY C., 1961, *Acting Assistant Professor of Production*; B.S., 1950, Michigan; M.B.A., 1958, Detroit
- FRENCH, WENDELL L.,* 1958 (1962), *Professor of Personnel and Industrial Relations*; B.A., 1948, M.P.S., 1949, Colorado; D.Ed., 1956, Harvard
- GRIMSHAW, AUSTIN,* 1949, *Professor of Policy and Administration*; Dean, College of Business Administration; S.B. in C.E., 1927, M.B.A., 1934, D.C.S., 1938, Harvard
- HENNING, DALE A.,* 1955 (1962), *Professor of Policy and Administration, and Production*; B.S., 1948, M.B.A., 1949, Pennsylvania; Ph.D., 1954, Illinois
- JOHNSON, RICHARD A.,* 1955 (1959), *Associate Professor of Policy and Administration, and Production*; B.B.A., 1949, M.B.A., 1952, Minnesota; D.B.A., 1958, Washington
- KAST, FREMONT E.,* 1951 (1961), *Professor of Policy and Administration, and Production*; A.B., 1946, San Jose State; M.B.A., 1949, Stanford; D.B.A., 1956, Washington
- KNOWLES, HENRY P., JR.,* 1957 (1962), *Associate Professor of Policy and Administration*; B.S., 1935, U.S. Naval Academy; M.B.A., 1947, Harvard; Ph.D., 1961, Stanford
- KNUDSON, HARRY R., JR.,* 1958 (1961), *Associate Professor of Personnel and Human Relations*; B.S., 1952, M.B.A., 1953, Indiana; D.B.A., 1958, Harvard
- LEBRETON, PRESTON P.,* 1960, *Professor of Business Policy*; Chairman, Department of Policy, Personnel Relations, and Production; B.S., 1947, M.B.A., 1949, Louisiana State; Ph.D., 1953, Illinois
- MEIER, ROBERT C.,* 1957 (1962), *Associate Professor of Production*; B.S., 1952, Indiana; M.A., 1955, Ph.D., 1951, Minnesota
- NEWELL, WILLIAM T.,* 1960 (1963), *Associate Professor of Production*; B.S., 1952, Colorado; M.B.A., 1955, Denver; Ph.D., 1962, Texas
- ROSENZWEIG, JIM,* 1956 (1963), *Professor of Policy and Administration, and Operations Research*; B.A., 1951, M.B.A., 1954, Washington; Ph.D., 1956, Illinois
- SAXBERG, BORJE O.,* 1957 (1960), *Associate Professor of Policy and Administration, and Production*; B.Econ., 1950, Swedish University College of Commerce (Finland); B.S., 1952, Oregon State; M.S., 1953, Ph.D., 1958, Illinois



SCHNECK, RODNEY E., 1963, *Acting Part-time Instructor in Personnel*; B.S., B.A., 1959, M.B.A., 1961, Denver

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

SUTERMEISTER, ROBERT A.,* 1949 (1952), *Professor of Personnel and Human Relations*; A.B., 1934, Harvard; M.A., 1942, Washington

WOODWORTH, ROBERT T., 1961 (1963), *Acting Assistant Professor of Personnel and Industrial Relations*; B.S., 1952, Indiana; M.B.A., 1956, Northwestern

College of Education

BAILEY, ATHOL ROMAYNE,* 1949 (1955), *Associate Professor of Industrial Education*; B.S., 1931, Kansas State Teachers College; M.A., 1936, Ed.D., 1949, Missouri

BATIE, HARRIETT VIRGINIA, 1941 (1954), *Assistant Professor Emeritus of Education*; B.S., 1935, Hastings College; M.A., 1945, Ph.D., 1953, Washington

BOLTON, DALE LEROY,* 1962, *Assistant Professor of Educational Administration*; B.S., 1950, Oklahoma State; M.S., 1953, Oklahoma State; Ph.D., 1958, Wisconsin

BOROUGHES, HOMER, JR.,* 1948 (1956), *Associate Professor of Education*; Director, *Student Teaching*; B.A., 1939, Western Washington College of Education; M.A., 1947, Ph.D., 1949, Washington

BRAMMER, LAWRENCE M.,* 1964, *Associate Professor of Education*; B.S., 1943, St. Cloud State College, M.A., 1948, Ph.D., 1950, Stanford

BRIGGS, JAMES ROBERT,* 1947 (1955), *Associate Professor of Education*; A.B., 1935, M.A., 1950, Washington; Ed.D., 1954, Stanford

COLE, THOMAS RAYMOND, 1930 (1951), *Professor Emeritus of Education*; Consultant in *School Service*; Ph.B., 1902, M.A., 1903, LL.D. (Hon.), 1931, Upper Iowa

CORBALLY, JOHN EDWARD,* 1927 (1942), *Professor of Education*; Associate Dean, *College of Education*; Acting Director, *Bureau of School Service and Research*; B.A., 1918, Whitworth College; M.A., 1925, Ph.D., 1929, Washington

DRAPER, EDGAR MARIAN,* 1925 (1936), *Professor of Curriculum*; Director of *In-Service Teacher Training*; B.A., 1916, M.A., 1925, Ph.D., 1926, Washington

DVORAK, AUGUST,* 1923 (1964), *Professor Emeritus of Education*; B.A., 1920, Ph.D., 1923, Minnesota

FEA, HENRY ROBERT,* 1954 (1959), *Associate Professor of Education*; B.A., 1942, B.Ed., 1947, M.Ed., 1948, Saskatchewan; Ph.D., 1950, California

FOSTER, CLIFFORD DONALD,* 1959 (1962), *Associate Professor of Education*; B.S., 1947, Northeast Missouri State Teachers College; M.A., 1952, Ph.D., 1957, Washington

FREEHILL, MAURICE FRANCIS,* 1962, *Professor of Educational Psychology*; B.Ed., 1946, Alberta; M.A., 1947, Ed.D., 1948, Stanford

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

HAYDEN, ALICE HAZEL,* 1942 (1952), *Professor of Education*; Ph.C., 1928, B.S., M.S., 1929, Oregon State, Ph.D., 1932 Purdue

HUNT, JACOB TATE,* 1964, *Professor of Education*, B.A., 1938, Maryville College, M.S., 1941, Tennessee; Ph.D., 1950, California

JAROLIMEK, JOHN,* 1962, *Associate Professor of Elementary Education*; B.S., 1943, Wisconsin State College; M.A., 1949, Ph.D., 1955, Minnesota

JESSUP, JOHN HUNNICUTT,* 1926 (1927), *Associate Professor of Educational Sociology*; A.B., 1920, Earlham College; M.A., 1924, Iowa

KITTELL, JACK EDWARD,* 1964, *Associate Professor of Education*; A.A., 1937, Coffeyville Junior College; B.A., 1941, Denver; M.Ed., 1952, Central Washington State College; Ph.D., 1956, Washington State

LEE, GORDON CANFIELD,* 1961, *Professor of Education and Dean of the College of Education*; A.B., 1937, California; M.A., 1938, Ph.D., 1948, Columbia

MACDONALD, CECILIA,* 1949 (1957), *Associate Professor of Elementary Education*; B.A., 1946, Central Washington College of Education; M.Ed., 1952, Washington

MADSEN, DAVID LAWRENCE,* 1962, *Assistant Professor of Higher Education*; Ph.B., 1951, North Dakota; M.A., 1954, Ph.D., 1961, Chicago

MATTSON, DALE EDWARD,* 1963, *Assistant Professor of Education*; B.A., 1959, Colorado College; M.A., 1961, Ph.D., 1963, Illinois

OLSTAD, ROGER GALE, 1964, *Assistant Professor of Education*; B.S., 1955, M.A., 1959, Ph.D., 1963, Minnesota

POWERS, FRANCIS FOUNTAIN,* 1928 (1940), *Professor of Education*; Director, *Office of Educational Research*; B.A., 1923, Washington; M.A., 1927, Oregon; Ph.D., 1928, Washington

SALYER, RUFUS COLEMAN, JR.,* 1953 (1962), *Associate Professor of Education*; B.A., 1930, Seattle Pacific; M.A., 1931, Ph.D., 1955, Washington

SEBESTA, SAM LEATON,* 1963, *Assistant Professor of Education*; B.S., 1953, M.A., 1960, Northwestern; Ed.D., 1963, Stanford

STEVENS, EDWIN BICKNELL, 1936 (1947), *Professor Emeritus of Education*; A.B., 1896, Tufts; A.M., 1899, Harvard

STRAYER, GEORGE DRAYTON, JR.,* 1949, *Professor of Educational Administration*; B.S., 1927, Princeton; M.A., 1928, Ph.D., 1934, Columbia

TOSTBERG, ROBERT EUGENE,* 1962, *Assistant Professor of History of Education*; B.A., 1956, Oregon; M.A., 1958, Ph.D., 1960, Wisconsin

VOPNI, SYLVIA FREDA,* 1952 (1961), *Associate Professor of Education*; B.A., 1931, M.A., 1938, Ph.D., 1955, Washington

College of Engineering

Aeronautics and Astronautics

AHLSTROM, HARLOW G.,* 1962, *Assistant 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

BAGNALL, LESLIE M., 1963, *Instructor in Aeronautics and Astronautics*; B.S., 1951, Michigan; M.S., 1957, Southern Methodist

BOLLARD, RICHARD JOHN H.,* 1961, *Professor of Aeronautics and Astronautics*; Chairman, *Department of Aeronautics and Astronautics*; B.E. in C.E., 1948, M.E. in *Struct.E.*, 1949, New Zealand; Ph.D., 1954, Purdue

DILL, ELLIS HAROLD,* 1956 (1959), *Associate Professor of Aeronautics and Astronautics*; B.S. in C.E., 1954, M.S. in C.E., Ph.D. in C.E., 1956, California

EASTMAN, FRED SCOVILLE,* 1927 (1943), *Professor of Aeronautics and Astronautics*; B.S. in E.E., 1925, Washington; M.S., 1929, Massachusetts Institute of Technology

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

FYFE, IAN MILLAR,* 1959, *Associate Professor of Aeronautics and Astronautics*; A.R.T.C. in M.E., 1950, The Royal College of Science and Technology, (Scotland); M.M.E. in M.E., 1954, Delaware; Ph.D. in *Engineering Mechanics*, 1958, Stanford

GANZER, VICTOR MARTIN,* 1947 (1953), *Professor of Aeronautics and Astronautics*; B.A. in Math, 1933, Augustana (Illinois); B.S. in A.E., 1941, Washington

JOPPA, ROBERT GLENN,* 1945 (1957), *Associate Professor of Aeronautics and Astronautics*; B.S. in A.E., 1945, M.S. in A.E., 1951, Washington; M.A., 1962, Princeton

KEVORKIAN, JIRAIR K., 1964, *Assistant Professor of Aeronautics and Astronautics*; B.S. in A.E., 1955, M.S. in A.E., 1956, Georgia Institute of Technology; Ph.D. in *Aeronautics and Mathematics*, 1961, California Institute of Technology

KLAIMON, JEROLD H., 1964, *Visiting Lecturer of Aeronautics and Astronautics*; B.S., 1955, Colorado; M.S., 1957, Southern California; Ph.D., 1962, Minnesota

MARTIN, HAROLD CLIFFORD,* 1948 (1952), *Professor of Aeronautics and Astronautics*; B.S. in M.E., 1934, M.S., 1937, New York; Ph.D., 1950, California Institute of Technology

MIELE, ANGELO, 1962, *Visiting Professor of Aeronautics and Astronautics*, Dr.C.E., 1944, Dr.A.E., 1946, Rome

NARK, THEODORE C., JR., 1964, *Visiting Lecturer of Aeronautics and Astronautics*; B.S. in A.E., 1954, Texas A&M; M.S. in M.E., 1958, California; Ph.D. in A.E., 1962, Ohio State

O'BRIEN, TIMOTHY FREDERICK,* 1956 (1958), Associate Professor of Aeronautics and Astronautics; B.S. in A.E., 1947, M.S. in A.E., 1951, D.Sc. in A.A., 1963, Massachusetts Institute of Technology

PARMETER, R. REID, 1963, Assistant Professor of Aeronautics and Astronautics; B.S. in Physics, 1958, M.S. in A.E., 1959, Ph.D. in A.E., 1963, California Institute of Technology

RAE, WILLIAM HOWARD, JR., 1956 (1959), Assistant Professor of Aeronautics and Astronautics; B.S. in A.E., 1953, M.S. in A.E., 1959, Washington

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STREET, ROBERT ELLIOTT,* 1948 (1955), Professor of Aeronautics and Astronautics; B.S. in Physics, 1933, Rensselaer Polytechnic Institute; A.M., 1934, Ph.D. 1939, Harvard

Chemical Engineering

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BERG, JOHN CALVIN, 1964, Assistant Professor of Chemical Engineering; B.S., 1960, Carnegie Institute of Technology; Ph.D., 1964, California

DAVID, MORTON MORRIS,* 1953 (1962), Professor of Chemical Engineering; B.S. 1942, Colorado; D.Eng., 1950, Yale

GARLID, KERMIT L.,* 1960, Assistant Professor of Chemical Engineering; B.S., 1950, River Falls State College (Wisconsin); B.Ch.E., 1956, Ph.D., 1961, Minnesota

HEIDEGER, WILLIAM JOSEPH,* 1957, Assistant Professor of Chemical Engineering; B.S., 1954, Carnegie Institute of Technology; M.S.E., 1955, Ph.D., 1959, Princeton

JOHANSON, LENNART NOBEL,* 1951 (1962), Professor of Chemical Engineering; B.S., 1942, Utah; M.S., 1943, Ph.D., 1948, Wisconsin

MOULTON, RALPH WELLS,* 1941 (1950), Professor of Chemical Engineering; Chairman, Department of Chemical Engineering; B.S., 1932, M.S., 1934, Ph.D., 1938, Washington

MCCARTHY, JOSEPH LePAGE,* 1941 (1952), Professor of Chemical Engineering; Dean, Graduate School; B.S., 1934, Washington; M.S., 1936, Idaho; Ph.D., 1938, McGill

SARKANEN, KYOSTI VILHO,* 1961, Associate Professor of Wood Chemistry, College of Forestry; Lecturer in Chemical Engineering; Associate Director of the Institute of Forest Products; B.Sc., 1947, Helsinki; M.Sc., 1952, Ph.D., 1956, State University College of Forestry (New York)

SATHER, NORMAN FREDRICK,* 1962, Assistant Professor of Chemical Engineering; B.S., 1958, Illinois; Ph.D., 1962, Minnesota

SLEICHER, CHARLES ALBERT, JR.,* 1960 (1961), Associate Professor of Chemical Engineering; Sc.B., 1944, Brown; S.M., 1949, Massachusetts Institute of Technology; Ph.D., 1955, Michigan

Civil Engineering

BOGAN, RICHARD HERBERT,* 1954 (1957), Associate Professor of Civil Engineering; B.S. in C.E., 1949, Washington; S.M., 1952; Sc.D., 1954, Massachusetts Institute of Technology

CAMPBELL, THOMAS HERBERT,* 1945 (1955), Professor of Civil Engineering; B.S. in C.E., 1934, Washington; M.S. in C.E., 1938, Massachusetts Institute of Technology

CARLSON, DALE ARVID,* 1955 (1961), Associate Professor of Civil Engineering; B.S. in C.E., 1950, M.S. in C.E., 1951, Washington; Ph.D., 1960, Wisconsin

CHENOWETH, HARRY HOLT,* 1946 (1957), Associate Professor of Civil Engineering; B.S. in C.E., 1937, M.S. in C.E., 1957, Washington

CHITTENDEN, HIRAM MARTIN, 1923 (1949), Associate Professor of Civil Engineering; B.S. in C.E., 1920, C.E., 1935, Washington

CHRISTMAN, RUSSELL FABRIQUE (1962), Research Assistant Professor of Sanitary Chemistry; B.S. (Chemistry), 1958, M.S. (Chemistry), 1960, Ph.D. (Chemistry), 1962, Florida

CLANTON, JACK REED,* 1947 (1958), Professor of Civil Engineering; B.S. in C.E., 1936, Missouri School of Mines; M.S. in C.E., 1939, Pittsburgh

COLCORD, JOSIAH EDWARD, JR.,* 1949 (1957), Associate Professor of Civil Engineering; B.S., 1947, Maine, M.S. in C.E., 1949, Minnesota

EKSE, MARTIN INGVALD,* 1948 (1957), Professor of Civil Engineering; B.S., 1932, South Dakota State; M.S., 1948, Wisconsin

FARQUHARSON, FREDERICK BURT, 1925 (1963), Professor Emeritus of Civil Engineering; B.S. in M.E., 1923, M.E., 1927, Washington

HARRIS, CHARLES WILLIAM, 1906 (1915), Professor Emeritus of Hydraulic Engineering; Research Consultant, B.S. in C.E., 1903, Washington; C.E., 1905, Cornell

HARTZ, BILLY J.,* 1955 (1957), Associate Professor of Civil Engineering; B.S. in C.E., 1952, M.S. in C.E., 1954, Ph.D., 1955, California

HENNES, ROBERT GRAHAM,* 1934 (1947), Professor of Civil Engineering; B.S. in C.E., 1927, Notre Dame; M.S., 1928, Massachusetts Institute of Technology

HORWOOD, EDGAR MILLER,* 1946 (1962), Professor of Civil Engineering; B.S. in M.E., 1942, Georgia Institute of Technology; M.S. in Regional Planning, 1951, Washington; Ph.D., 1959, Pennsylvania

KENT, JOSEPH CHAN,* 1952 (1961), Associate Professor of Civil Engineering; B.S. in C.E., 1945, British Columbia; M.S. in C.E., 1948, Stanford; Ph.D., 1952, California

MEESE, RICHARD HUNT, 1946 (1955), Associate Professor of Civil Engineering; B.S. in C.E., 1939, Washington; S.M., 1941, Harvard

MILLER, ALFRED LAWRENCE,* 1923 (1937), Professor of Mechanics and Structures; B.S. in C.E., 1920, C.E., 1926, Washington

MILLER, WILLIAM MACKAY, 1951 (1959), Associate Professor of Civil Engineering; B.S. in C.E., 1951, M.S. in C.E., 1952, Washington

MITTET, HOLGER PEDER,* 1946 (1955), Associate Professor of Civil Engineering; B.S. in C.E., 1937, Washington; M.S. in C.E., 1938, Massachusetts Institute of Technology

MORITZ, HAROLD KENNEDY,* 1928 (1949), Professor of Hydraulics; B.S. in M.E., 1921, Massachusetts Institute of Technology

NECE, RONALD ELLIOTT,* 1959 (1961), Associate Professor of Civil Engineering; B.S. in C.E., 1949, Washington; M.S. in C.E., 1951, Lehigh; Sc.D., 1958, Massachusetts Institute of Technology

NORRIS, CHARLES HEAD,* (1962), Professor of Civil Engineering; Chairman, Department of Civil Engineering; B.S. in C.E., 1931, Washington; S.M. in C.E., 1932, Sc.D. in Structural Engineering, 1942, Massachusetts Institute of Technology

OGLESBY, RAY THURMOND, 1962, Research Assistant Professor of Sanitary Biology; B.S. (Biology), 1953, Richmond, Virginia; M.A. (Marine Biology), 1955, College of William and Mary; Ph.D. (Sanitary Biology), 1962, North Carolina

RHODES, FRED HAROLD, JR.,* 1927 (1951), Professor of Civil Engineering; B.S. in C.E., 1926, B.S. in M.E., 1926, C.E., 1935, Washington

RICHEY, EUGENE PORTER,* 1954 (1956), Associate Professor of Civil Engineering; B.S. in C.E., 1941, Alaska; M.S. (Meteorology), 1947, M.S. in C.E., 1948, California Institute of Technology; Ph.D., 1955, Stanford

ROSSANO, AUGUST THOMAS, JR., 1962, Research Professor of Sanitary Engineering; S.B., 1938, Massachusetts Institute of Technology; S.M., 1941, Sc.D., 1954, Harvard

SAWHILL, ROY BOND,* 1956 (1960), Associate Professor of Civil Engineering; B.S. in C.E., 1950, Washington; M.E., 1952, California

SERGEV, SERGIUS IVAN,* 1923 (1946), Professor of Engineering Mechanics; B.S. in M.E., 1923, M.E., 1931, Washington

SHERIF, MEHMET ABDUL-KADIR, 1963, Instructor of Civil Engineering; Brevet, 1953, Aleppo College (Syria); B.S., 1953, Robert College (Istanbul); M.S., 1961, Arizona State College; M.A., 1962, Princeton

STRAUSSER, HOWARD SAMUEL, JR.,* 1955 (1957), Associate Professor of Civil Engineering; B.S. in C.E., 1942, Virginia Military Institute; M.S.E., 1950, Johns Hopkins

SYLVESTER, ROBERT OHRUM,* 1947 (1957), Professor of Sanitary Engineering; B.S. in C.E., 1936, Washington; S.M., 1941, Harvard

TYLER, RICHARD GAINES, 1929 (1954), Professor Emeritus of Sanitary Engineering; C.E., 1908, Texas; B.S. in C.E., 1910, Massachusetts Institute of Technology

VAN HORN, ROBERT BOWMAN, 1925 (1962), Professor Emeritus of Civil Engineering; B.S. in C.E., 1916, C.E., 1926, Washington

VASARHELYI, DESI D.,* 1949 (1961), Professor of Civil Engineering; B.A., 1928, Ref. Collegium Kolozsvar (Rumania); Dipl.Ingr., 1932, Dr.Ingr., 1944, Technical University (Budapest)



WESSMAN, HAROLD EVERETT,* 1948, Professor of Civil Engineering; Dean of the College of Engineering; B.S., 1924, M.S., 1925, C.E., 1929, Ph.D., 1936, Illinois

WILSON, BAYNARD SPENCE, 1962 (1964), Associate Professor of Engineering Mechanics; B.S. in C.E., 1953, M.S. in C.E., 1955, Ph.D. in C.E., 1957, California

Electrical Engineering

AGGARWAL, RAJINDER PAL, 1960, Acting Instructor in Electrical Engineering; B.S., 1952, Delhi; M.S. in E.E., 1958, Minnesota

ALBRECHT, ROBERT WILLIAM,* 1961, Assistant Professor of Electrical Engineering; B.S. in E.E., 1957, Purdue; M.S. in N.E., 1958, Ph.D., 1961, Michigan

ALEXANDRO, FRANK JOHN JR., 1964, Assistant Professor of Electrical Engineering; B.E.E., 1956, M.E.E., 1959, D.Sc., 1964, New York University

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

BERNARD, GARY DALE, 1960, Acting Instructor in Electrical Engineering; B.S. in E.E., 1959, M.S. in E.E., 1960, Washington

BIGGS, ALBERT WAYNE, 1963, Research Instructor in Electrical Engineering; B.S. in E.E., 1947, Missouri; M.B.A., 1949, Stanford

BJORKSTAM, JOHN LUDWIG,* 1955 (1960), Associate Professor of Electrical Engineering; B.S. in E.E., 1949, M.S. in E.E., 1952, Ph.D., 1958, Washington

CLARK, ROBERT NEWHALL,* 1957 (1959), Associate Professor of Electrical Engineering; B.S. in E.E., 1950, M.S. in E.E., 1951, Michigan

COCHRAN, LYALL BAKER,* 1934 (1952), Professor of Electrical Engineering; B.S. in E.E., 1923, E.E., 1936, Washington

COOLEY, WILLIAM WARD, 1958, Acting Instructor in Electrical Engineering; B.S. in E.E., 1954, Washington

CREEDON, WILLIAM EDWARD, 1960, Lecturer in Electrical Engineering; B.S. in E.E., 1929, Massachusetts Institute of Technology; M.S. in M.E., 1938, California

DEARHOLT, DONALD WILLIAM, 1960, Acting Instructor in Electrical Engineering; B.S. in E.E., 1958, M.S. in E.E., 1960, New Mexico

EASTMAN, AUSTIN VITRUVIUS,* 1924 (1942), Professor of Electrical Engineering; Chairman, Department of Electrical Engineering; B.S. in E.E., 1922, M.S. in E.E., 1929, Washington

GOLDE, HELLMUT,* 1959, Assistant Professor of Electrical Engineering; Dip.-Ing., 1953, Technische Hochschule (Germany); M.S., 1955, Ph.D., 1959, Stanford

GUILFORD, EDWARD CHARLES,* 1959 (1961), Associate Professor of Electrical Engineering; B.A., 1942, M.A., 1950, Utah; Ph.D., 1959, California

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HARRISON, ARTHUR ELLIOT,* 1948 (1952), Professor of Electrical Engineering; B.S. in E.E., 1936, California; M.S., 1937, Ph.D., 1940, California Institute of Technology

HILL, WILLIAM RYLAND, JR.,* 1941 (1953), Professor of Electrical Engineering; Associate Dean, College of Engineering; B.S. in E.E., 1934, Washington; M.S. in E.E., 1938, E.E., 1941, California

HOARD, GEORGE LISLE, 1920 (1941), Professor of Electrical Engineering; B.S. in E.E., 1917, M.S. in E.E., 1926, Washington

HOLDEN, ALISTAIR DAVID CRAIG, 1958, Acting Instructor in Electrical Engineering; B.S., 1955, Glasgow; M.S., 1958, Yale

HSU, CHIH-CHI,* 1958 (1962), Associate Professor of Electrical Engineering; B.S. in E.E., 1945, Chiao-Tung University; M.S. in E.E., 1949, Michigan; Ph.D., 1951, Ohio State

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JOHNSON, DAVID LAURENCE,* 1955 (1961), Professor of Electrical Engineering; B.S. in E.E., 1948, Idaho; Ph.D., 1955, Purdue

KOZDROWICKI, EDWARD WALTER, 1960, Acting Instructor in Electrical Engineering; B.S. in E.E., 1959, M.S. in E.E., 1960, Oklahoma

LEWIS, LAUREL JONES,* 1946 (1954), Professor of Electrical Engineering; A.B., 1933, E.E., 1935, Ph.D., 1947, Stanford

LINDSAY, ROBERT ERNEST,* 1962, Assistant Professor of Electrical Engineering; B.S., 1957, M.S., 1958, Engineer, 1960, Ph.D., 1962, Stanford

LOEW, EDGAR ALLAN, 1909 (1948), Professor Emeritus of Electrical Engineering; Dean Emeritus, College of Engineering; B.S. in E.E., 1906, E.E., 1922, Wisconsin

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McSPADDEN, WILLIAM ROBERT, 1962, Acting Instructor in Electrical Engineering; B.S., 1956, M.S., 1959, Arizona

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ROBBINS, FLOYD DAVID, 1946 (1957), Associate Professor of Electrical Engineering; B.S. in E.E., 1925, E.E., 1949, Washington

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SWARM, HOWARD MYRON,* 1947 (1955), Professor of Electrical Engineering; B.S. in E.E., 1940, M.S. in E.E., 1950, Washington; Ph.D., 1960, Stanford

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General Engineering

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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

BOEHMER, HERBERT, 1937 (1961), Professor of General Engineering; Dipl. Engr., M.E., 1928, German Technical University, Brunswick; M.S. in A.E., 1933, Washington

BONOW, WALTER B., 1956 (1958), Assistant Professor of General Engineering; B.S., 1948, Antioch College

BROWN, ROBERT Q., 1919 (1963), Professor Emeritus of General Engineering; B.S. in E.E., 1916, Washington

CHALK, WILLIAM S., 1961, Assistant Professor of General Engineering; B.S. in M.E., 1950, M.S. in M.E., 1961, Washington

COLLINS, JAMES D., 1958, Assistant Professor of General Engineering; B.S. in M.E., 1938, Michigan State; M.S. in I.E., 1958, Purdue

DOUGLASS, CLARENCE E., 1939 (1961), Professor of General Engineering; B.S., 1927, Washington State

DOUTHWAITE, GEOFFREY K., 1961, Instructor in General Engineering; B.S. in E.E., 1952, M.S. in E.E., 1963, Washington

DUNN, WALTER L., 1954 (1960), Associate Professor of General Engineering; B.S. in C.E., 1949, Montana State; M.P.H., 1953, California

HAMMER, VERNON B., 1947 (1962), Professor of General Engineering; Chairman, Department of General Engineering; B.S. in C.E., 1940, Washington; M.S. in S.E., 1941, Harvard

HOAG, ALBERT L., 1946 (1957), Associate Professor of General Engineering; B.S.F., 1941, B.S. in C.E., 1952, Washington

JACOBSEN, PHILIP A., 1927 (1939), Assistant Professor of General Engineering; B.S. in Engr., 1926, Washington

KONICHEK, DORLAND H., 1954 (1960), Associate Professor of General Engineering; B.S. in C.E., 1930, North Dakota State

MACARTNEY, THOMAS W., 1946 (1957), Associate Professor of General Engineering; B.S. in C.E., 1939, B.S. in Com.E., 1946, M.S. in C.E., 1956, Washington

MC CREADY, ROY A., 1958, Instructor in General Engineering; B.S. in Min., 1939, Montana School of Mines

MCNEESE, DONALD C., 1946 (1956), Associate Professor of General Engineering; B.S. in C.E., 1940, C.E., 1951, Wyoming

MESSER, ROWLAND E., 1946 (1957), Associate Professor of General Engineering; B.S. in M.E., 1935, Washington

NELSON, GEORGE A., 1957, Assistant Professor of General Engineering; B.S. in C.E., 1925, Minnesota

PYE, WILLIAM V., 1961, Instructor in General Engineering; B.S. in C.E., 1958, M.S. in C.E., 1961, Washington

ROWLANDS, THOMAS M., 1928 (1963), Professor Emeritus of General Engineering; B.S. in Nav. Arch. and Marine Engrg., 1926, Massachusetts Institute of Technology

SEABLOOM, ROBERT W., 1954 (1961), Associate Professor of General Engineering; B.S. in C.E., 1950, M.S. in C.E., 1956, Washington

SEED, RICHARD W., 1951, Lecturer in General Engineering; B.S. in M.E., 1944, California Institute of Technology; LL.B., 1949, George Washington

THOMPSON, WELLS, 1958 (1960), Assistant Professor of General Engineering; B.S., 1928, U.S. Naval Academy; M.S., 1938, California

WARNER, FRANK M., 1913 (1954), Professor Emeritus of General Engineering; B.S. in M.E., 1907, Wisconsin

WILCOX, ELGIN R., 1921 (1962), Professor Emeritus of General Engineering; B.S., 1915, Met.E., 1919, Washington

WOLFF, MARTIN, 1963, Instructor in General Engineering; B.S. in M.E., 1960, M.S. in M.E., 1961, California Institute of Technology

Humanistic-Social Studies

BOTTING, DAVID CHARLES, JR., 1955 (1961), Associate Professor of Humanistic-Social Studies; B.A., 1940, M.A., 1947, Washington; Ph.D., 1950, Chicago

CHAPMAN, STUART WEBSTER, 1947 (1954), Professor of Humanistic-Social Studies; Chairman, Department of Humanistic-Social Studies; A.B., 1927, Boston; Ph.D., 1939, Yale

ELLIOTT, EUGENE CLINTON, 1953 (1959), Associate Professor of Humanistic-Social Studies; Special Assistant to the President; B.A., 1936, M.A., 1941, Washington; Doctor, 1952, University of Paris (Sorbonne)

HIGBEE, JAY ANDERS, 1952 (1956), Assistant Professor of Humanistic-Social Studies; B.A., 1941, Iowa; M.A., 1949, Washington; D.S.S., 1955, Syracuse

HUNNER, WESLEY LOUIS, 1957, Assistant Professor of Humanistic-Social Studies; B.A., 1935, M.A., 1938, Ph.D., 1950, Washington

LEAHY, JACK THOMAS, 1959 (1963), Assistant Professor of Humanistic-Social Studies; B.A., 1954, M.A., 1957, Washington

MISE, RAYMOND WINFIELD, 1961, Instructor in Humanistic-Social Studies; B.A., 1957, Washington

RUSTAD, JOHN RONALD, 1948 (1955), Assistant Professor of Humanistic-Social Studies; B.A., 1948, M.A., 1949, Washington

SKEELS, DELL ROY, 1946 (1963), Professor of Humanistic-Social Studies; B.A., 1941, M.A., 1942, Idaho; Ph.D., 1949, Washington

SOUTHER, JAMES WALTER, 1948 (1957), Associate Professor of Humanistic-Social Studies; Director, University Placement Services; B.A., 1947, M.A., 1948, Washington

TRIMBLE, LOUIS PRESTON, 1956 (1959), Assistant Professor of Humanistic-Social Studies; B.A., 1950, Ed.M., 1953, Eastern Washington

WHITE, MYRON LESTER, 1947 (1959), Assistant Professor of Humanistic Social Studies, B.A., 1943, Ph.D., 1958, Washington

Mechanical Engineering

ANDERSON, JAY W., 1956 (1961), Assistant Professor of Mechanical Engineering; B.S. in M.E., 1955, M.S. in M.E., 1961, Washington

BALISE, PETER LOUIS, JR.,* 1950 (1961), Professor of Mechanical Engineering; S.B., 1948, S.M., 1950, Massachusetts Institute of Technology

BROWNE, OSCAR MORRISON, JR., 1959 (1961), Assistant Professor of Mechanical Engineering; B.S., 1930, U.S. Naval Academy; M.S. in Naval Construction, 1935, Massachusetts Institute of Technology

CHILDS, MORRIS ELSMERE,* 1954 (1961), Professor of Mechanical Engineering; B.S. in M.E., 1944, Oklahoma; M.S. in M.E., 1947, Ph.D., 1956, Illinois

COSTELLO, CHARLES PIERCE, JR.,* 1958 (1961), Associate Professor of Mechanical Engineering; B.S. in M.E., 1954, Washington; M.S. in M.E., 1955, Ph.D. in M.E., 1958, Stanford

CRAIN, RICHARD WILLSON, SR.,* 1936 (1953), Associate Professor of Mechanical Engineering; B.S. in E.E., 1930, B.S. in M.E., 1932, Colorado State; M.S. in M.E., 1946, Washington

DAY, EMMETT ELBERT,* 1947 (1954), Professor of Mechanical Engineering; B.A., 1936, East Texas State Teachers College; B.S., 1945, M.S., 1946, Massachusetts Institute of Technology

DEPEW, CREIGHTON ARTHUR,* 1960, Assistant Professor of Mechanical Engineering; B.S. in M.E., 1956, M.S. in M.E., 1957, Ph.D., 1960, California

DRUI, ALBERT BURNELL, 1960, Assistant Professor of Mechanical Engineering; B.S. in I.E., 1949, M.S. in I.E., 1957, Washington University (St. Louis)

EMERY, ASHLEY FRANCIS,* 1961, Assistant Professor of Mechanical Engineering; B.S., 1956, M.S., 1958, Ph.D., 1961, California

FIREY, JOSEPH CARL,* 1954 (1961), Professor of Mechanical Engineering; B.S. in M.E., 1940, Washington; M.S. in M.E., 1941, Wisconsin

FORD, PAUL WILLIAM, 1957 (1959), Assistant Professor of Mechanical Engineering; B.Ind.E., 1956, General Motors Institute; M.S. in M.E., 1959, Washington

GALLE, KURT ROBERT,* 1960, Acting 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

GUIDON, MICHAEL III,* 1946 (1956), Associate Professor of Mechanical Engineering; B.S. in M.E., 1942, Lehigh; M.S. in M.E., 1952, Washington

HOLT, RICHARD EDWIN, 1954 (1962), Associate Professor of Mechanical Engineering; B.S. in M.E., 1947, M.S. in Met.E., 1957, Washington

KIELING, WILLIAM CLAYTON, 1956 (1959), Assistant Professor of Mechanical Engineering; B.S. in M.E., 1950, M.S. in M.E., 1959, Washington

KIPPENHAN, CHARLES JACOB,* 1963, Professor of Mechanical Engineering; Chairman, Department of Mechanical Engineering; B.S. in M.E., 1940, M.S. in M.E., 1946, Ph.D., 1948, Iowa

KOBAYASHI, ALBERT SATOSHI,* 1958 (1961), Associate Professor of Mechanical Engineering; B.S., 1947, Tokyo; M.S. in M.E., 1952, Washington; Ph.D., 1958, Illinois Institute of Technology

MCFERON, DEAN EARL,* 1958, Professor of Mechanical Engineering; Associate Dean, College of Engineering; Director, Engineering Research; B.S. in M.E., 1945, M.S. in M.E., 1948, Colorado; Ph.D., 1956, Illinois

MCINTYRE, HARRY JOHN, 1919 (1958), Professor Emeritus of Mechanical Engineering; B.S. in M.E., 1915, M.B.A., 1923, Washington

MCMINN, BRYAN TOWNE,* 1920 (1939), Professor of Mechanical Engineering; B.S. in M.E., 1918, Oregon State; M.S. in M.E., 1926, M.E., 1931, Washington

MILLS, BLAKE DAVID, JR.,* 1946 (1947), Professor of Mechanical Engineering; B.S. in M.E., B.S. in E.E., 1934, M.E., 1947, Washington, M.S. in M.E., 1935, Massachusetts Institute of Technology

MORRISON, JAMES BRYAN,* 1946 (1961), Professor of Mechanical Engineering; B.S. in M.E., 1943, Virginia Polytechnic Institute; M.S. in M.E., 1954, Washington

NORDQUIST, WILLIAM BERTIL,* 1947 (1955), Associate Professor of Mechanical Engineering; B.M.E., 1941, Rensselaer Polytechnic Institute; M.S., 1946, Massachusetts Institute of Technology

OWENS, BERL WINFIELD, 1948 (1956), Associate Professor of Mechanical Engineering; B.Aero.E., 1944, Minnesota; M.S. in M.E., 1953, Washington

SCHALLER, GILBERT SIMON,* 1922 (1937), Professor of Mechanical Engineering; B.S. in M.E., 1916, Illinois; M.B.A., 1925, Washington



SHERRER, ROBERT EUGENE,* 1960, Associate Professor of Mechanical Engineering; B.S. in M.E., 1948, Kansas; M.S. in E.M., 1953, Ph.D., 1958, Wisconsin

TAGGART, RAYMOND,* 1962, Associate Professor of Mechanical Engineering; B.S., 1948, London; Ph.D., 1956, Queens (Belfast)

WAIBLER, PAUL JOHN,* 1954 (1961), Professor of Mechanical Engineering; B.S. in M.E., 1943, Kansas State; M.S. in M.E., 1944, Yale; Ph.D., 1958, Illinois

Mineral Engineering

ANDERSON, DONALD LORRAINE,* 1947 (1957), Associate Professor of Mining Engineering; B.S., 1938, St. Francis Xavier; B.Sc. in Min.E., 1941, Illinois

ARCHBOLD, THOMAS FRANK,* 1961, Assistant Professor of Metallurgical Engineering; B.S. Met.E., 1955, M.S., 1957, Ph.D., 1961, Purdue

BAUER, WOLF, 1954, Lecturer in Ceramic Engineering; B.S. in Cer.E., 1935, Washington

BRIEN, FREDERICK BLYTH,* 1954 (1963), Professor of Mineral Engineering; B.S. in Min.E., 1950, Alberta; M.S. in Min.E., 1951, Columbia

CAMPBELL, ROBERT JOHN, JR.,* 1955, Assistant Professor of Ceramic Engineering; B.S., Ch.E., 1939, Oregon State; M.S. in Cer.E., 1954, Washington

DANIELS, JOSEPH, 1911 (1954), Professor Emeritus of Mining and Metallurgical Engineering; S.B., 1905, Massachusetts Institute of Technology; M.S., 1908, E.M., 1933, Lehigh

FLANAGAN, WILLIAM FRANCIS,* 1959, Assistant Professor of Metallurgical Engineering; B.S. in Physics, 1951, M.S., 1953, Sc.D., 1959, Massachusetts Institute of Technology

MUELLER, JAMES IRVING,* 1949 (1955), Professor of Ceramic Engineering; B.Cer.E., 1939, Ohio State; Ph.D., 1949, Missouri

PIFER, DRURY AUGUSTUS,* 1945 (1948), Professor of Mining Engineering; Director, School of Mineral Engineering; B.S. in Min.E., 1930, M.S. in Min.E., 1931, Washington

POLONIS, DOUGLAS HUGH,* 1955 (1962), Professor of Metallurgical Engineering; B.A.Sc., 1951, British Columbia; M.A.Sc., 1953, Toronto; Ph.D., 1955, British Columbia

ROBERTS, MILNOR, 1901 (1947), Professor Emeritus of Mining Engineering; B.A., 1899, Stanford

SHEVLIN, THOMAS S.,* 1961, Associate Professor of Ceramic Engineering; B.Cer.E., 1942, M.S., 1947, Ph.D., 1954, Ohio State

TOOP, GERALD W., 1963, Assistant Professor of Metallurgical Engineering; B.A.Sc., 1957, M.A.Sc., 1960, British Columbia; Ph.D., 1963, Imperial College of Science and Technology (London)

Nuclear Engineering

ALBRECHT, ROBERT WILLIAM,* 1961, Assistant Professor of Electrical Engineering; B.S. in E.E., 1957, Purdue; Ph.D., 1960, California

BABB, ALBERT LESLIE,* 1952 (1960), Professor of Chemical Engineering; Director, Nuclear Reactor Laboratories; Chairman, Nuclear Engineering Group; B.A.Sc., 1948, British Columbia; M.S., 1949, Ph.D., 1951, Illinois

BOGAN, RICHARD HERBERT,* 1954 (1957), Associate Professor of Civil Engineering; B.S. in C.E., 1949, Washington; S.M., 1952, Sc.D., 1954, Massachusetts Institute of Technology

CHILDS, MORRIS ELSMERE,* 1954 (1961), Professor of Mechanical Engineering; B.S. in M.E., 1944, Oklahoma; M.S., in M.E., 1947, Ph.D., 1956, Illinois

COSTELLO, CHARLES PIERCE, JR.,* 1958 (1961), Associate Professor of Mechanical Engineering; B.S. in M.E., 1954, Washington; M.S. in M.E., 1955, Ph.D., 1958, Stanford

DEPEW, CREIGHTON ARTHUR,* 1960, Assistant Professor of Mechanical Engineering; B.S., 1956, M.S., 1957, Ph.D., 1960, California

FIREY, JOSEPH CARL,* 1954 (1960), Professor of Mechanical Engineering; B.S. in M.E., 1940, Washington; M.S. in M.E., 1941, Wisconsin

GARLID, KERMIT L.,* 1960, Assistant Professor of Chemical Engineering; B.S., 1950, River Falls State (Wisconsin); B.Ch.E., 1956, Ph.D., 1961, Minnesota

McFERON, DEAN EARL,* 1958, Professor of Mechanical Engineering; Associate Dean, College of Engineering; Director, Office of Engineering Research; B.S. in M.E., 1943, M.S. in M.E., 1948, Colorado; Ph.D., 1956, Illinois

MOULTON, RALPH WELLS,* 1941 (1950), Professor of Chemical Engineering; Chairman, Department of Chemical Engineering; B.S. in Ch.E., 1932, M.S. in Ch.E., 1934, Ph.D., 1938, Washington

POLONIS, DOUGLAS HUGH,* 1955 (1962), Professor of Metallurgical Engineering; B.A.Sc., 1951, British Columbia; M.A.Sc., 1953, Toronto; Ph.D., 1955, British Columbia

WAIBLER, PAUL JOHN,* 1954 (1961), Professor of Mechanical Engineering; B.S. in M.E., 1943, Kansas State; M.S. in M.E., 1944, Yale; Ph.D., 1958, Illinois

WILSON, WILLIAM E., JR., 1959, Senior Nuclear Engineer; B.S., 1954, M.S.E., 1959, Washington

Reserve Officers Training Program

Air Science

BABINEC, ALBERT S., Lt. Col., USAF, 1963, Professor of Air Science; B.A., 1957, Ohio State

BEDNAREK, NORBERT H., Lt., USN, 1963, Assistant Professor of Naval Science; B.S., 1959, U.S. Naval Academy

BUTLER, ELWYN H., Specialist Fifth Class, 1963, Instructor of Military Science

CAMACHO, FRANK F., JR., Staff Sergeant, 1961, Instructor in Military Science

CRAIG, DONALD W., FTGL, USN, 1963, Instructor in Naval Science

DALY, RAYMOND R., GySgt, USMC, 1962, Instructor in Naval Science

DEEGAN, ROBERT F., QMC, USN, 1963, Instructor in Naval Science

DYER, KENNETH L., JR., Major, USAF, 1962, Assistant Professor of Air Science; B.A., 1947, Kansas; M.A., 1962, Hawaii

FISCHER, FRANK O., Colonel, 1963, Professor of Military Science; B.S., 1959, Maryland

GRAY, DUANE L., Staff Sergeant, USAF, 1963, Instructor in Air Science

HEINLEIN, WILLARD H., Major, 1961, Assistant Professor of Military Science; B.A., 1951, Denver

HIATT, WILLIS G., Staff Sergeant, 1964, Instructor in Military Science

HUDSON, MATTHEW, Captain, USAF, 1962, Assistant Professor of Air Science; B.A., 1953, Pittsburgh

KENDRICK, JAMES O., JR., Major, 1961, Assistant Professor of Military Science; B.S., 1960, Maryland

LADD, MERTIN, JR., SKCS, USN, 1963, Instructor in Naval Science

LOGAN, LADDIE B., Captain, 1962, Assistant Professor of Military Science; B.S., 1957, Arkansas State College

McHENRY, JIM N., Master Sergeant, USAF, 1960, Instructor in Air Science

MILLS, WILLIAM S. III, Cdr, USNR, 1961, Associate Professor of Naval Science; B.A., 1942, Vanderbilt

PARKER, DARRELL R., Technical Sergeant, USAF, 1962, Instructor in Air Science

POOL, RAYMOND W., YNC, USN, 1963, Instructor in Naval Science

RILEY, WILLIAM E., Major, USMC, 1963, Assistant Professor of Naval Science; B.S., 1952, College of St. Thomas

SCHELLING, ROBERT A., Captain, USN, 1963, Professor of Naval Science; B.S., 1938, U.S. Naval Academy; M.S., 1949, U.S. Naval Post Graduate School

SCOTT, LINDLE M., Technical Sergeant, USAF, 1958, Instructor in Air Science

SHARP, STANLEY E., Lt., USN, 1962, Assistant Professor of Naval Science; B.S., 1958, U.S. Naval Academy

SHIRLEY, VERNON D., Lt., USN, 1962, Assistant Professor of Naval Science; B.A., 1956, Eastern New Mexico

SMITH, BOBBY E., Lt., USN, 1962, Assistant Professor of Naval Science; B.A., 1956, Rice Institute

SOLINSKY, HAROLD, Captain, 1962, Assistant Professor of Military Science; B.S., 1956, Idaho

VICE, GEORGE E., Technical Sergeant, USAF, 1962, Instructor in Air Science

WAISS, TERRILL E., Captain, USAF, 1962, Assistant Professor of Air Science; B.A., 1954, Washington

WRIGHT, WALTER F., Lt., USN, 1962, Assistant Professor of Naval Science; B.S., 1955, Nebraska

YARBERRY, ROBERT L., *Staff Sergeant*, 1960, *Instructor in Military Science*

Military Science

BUTLER, ELWYN H., *Specialist Fifth Class*, 1963, *Instructor in Military Science*

CAMACHO, FRANK F., JR., *Staff Sergeant*, 1961, *Instructor in Military Science*

FISCHER, FRANK O., *Colonel*, 1963, *Professor of Military Science*; B.S. in *Mil.Sci.*, 1959, *Maryland*

HEINLEIN, WILLARD H., *Major*, 1961, *Assistant Professor of Military Science*; B.A., 1951, *Denver*

HIATT, WILLIS G., *Staff Sergeant*, 1964, *Instructor of Military Science*

KENDRICK, JAMES O., JR., *Major*, 1961, *Assistant Professor of Military Science*; B.S., 1960, *Maryland*

LOGAN, LADDIE B., *Captain*, 1962, *Assistant Professor of Military Science*; B.S., 1957, *Arkansas State*

SOLINSKY, HAROLD, *Captain*, 1962, *Assistant Professor of Military Science*; B.S., 1956, *Idaho*

YARBERRY, ROBERT L., *Staff Sergeant*, 1960, *Instructor in Military Science*

Naval Science

BEDNAREK, NORBERT H., *Lt.*, USN, 1963, *Assistant Professor of Naval Science*; B.S., 1959, *U.S. Naval Academy*

CRAIG, DONALD W., *FTG1*, USN, 1963, *Instructor in Naval Science*

DALY, RAYMOND R., *GySgt.*, USMC, 1962, *Instructor in Naval Science*

DEEGAN, ROBERT F., *QMC*, USN, 1963, *Instructor in Naval Science*

LADD, MERTIN, JR., *SKCS*, USN, 1963, *Instructor in Naval Science*

POOL, RAYMOND W., *YNC*, 1963, *Instructor in Naval Science*

RILEY, WILLIAM E., *Major*, USMC, 1963, *Assistant Professor of Naval Science*; B.S., 1952, *College of St. Thomas*

SCHELLING, ROBERT A., *Captain*, USN, 1963, *Professor of Naval Science*, B.S., 1938, *U.S. Naval Academy*; M.S., 1949, *U.S. Naval Post Graduate School*

SHARP, STANLEY E., *Lt.*, USN, 1962, *Assistant Professor of Naval Science*; B.S., 1958, *U.S. Naval Academy*

SHIRLEY, VERNON D., *Lt.*, USN, 1962, *Assistant Professor of Naval Science*; B.A., 1956, *Eastern New Mexico*

SMITH, BOBBY E., *Lt.*, USN, 1962, *Assistant Professor of Naval Science*; B.A., 1956, *Rice Institute*

WRIGHT, WALTER F., *Lt.*, USN, 1962, *Assistant Professor of Naval Science*; B.S., 1955, *Nebraska*

College of Fisheries

BELL, MILO CARSNER, 1953 (1963), *Professor of Fisheries*; B.S., 1930, *Washington*

BEVAN, DONALD EDWARD,* (1964), *Assistant Professor of Fisheries*; B.S., 1948, Ph.D., 1959, *Washington*

BURGNER, ROBERT LOUIS,* (1964), *Assistant Professor of Fisheries*; B.S., 1942, Ph.D., 1958, *Washington*

DELACEY, ALLAN CLARK,* 1946 (1958), *Professor of Fisheries*; B.S., 1932, M.S., 1933, Ph.D., 1941, *Washington*

DOLLAR, ALEXANDER MELVILLE,* 1949 (1962), *Associate Professor of Fisheries*; B.S., 1948, M.S., 1949, *California*; Ph.D., 1958, *Reading*

DONALDSON, LAUREN RUSSELL,* 1935 (1948), *Professor of Fisheries*; *Director, Laboratory of Radiation Biology*; A.B., 1926, *Intermountain Union College (Montana)*; M.S., 1931, Ph.D., 1939, *Washington*

ELLIS, JAMES, *Fisheries Biologist III*; B.S., 1942, *Washington*

FIELDS, PAUL ELDON,* 1953 (1955), *Professor of Comparative Psychology*; A.B., 1926, A.M., 1927, *Ohio Wesleyan*; Ph.D., 1930, *Ohio State*

KATZ, MAX, 1960 (1962), *Acting Associate Professor*; B.S., 1939, M.S., 1942, Ph.D., 1949, *Washington*

LISTON, JOHN,* 1957 (1964), *Professor of Fisheries*; B.S., 1952, *Edinburgh*; Ph.D., 1955, *Aberdeen*

LYNCH, JAMES ERIC, 1931 (1958), *Professor Emeritus of Fisheries*; B.A., 1917, M.A., 1921, *Nebraska*; Ph.D., 1929, *California*

McPHAIL, JOHN DONALD,* 1963, *Assistant Professor of Fisheries*; B.A., 1957, M.Sc., 1959, *British Columbia*; Ph.D., 1963, *McGill*

MATCHES, JACK, 1964, *Senior Microbiologist*; B.S., 1957, M.S., 1958, *Oregon State*, Ph.D., 1963, *Iowa State*

MATHISEN, OLE ALFRED,* (1964), *Assistant Professor of Fisheries*; *Cand.Real.*, 1945, *Oslo*; Ph.D., 1955, *Washington*

PAULIK, GERALD JOHN,* 1961 (1963), *Assistant Professor of Fisheries*; B.S., 1953, Ph.D., 1959, *Washington*

ROYCE, WILLIAM FRANCIS,* 1958, *Professor of Fisheries*; *Director, Fisheries Research Institute*; B.S., 1937, Ph.D., 1943, *Cornell University*

SEYMOUR, ALLYN HENRY,* 1963, *Professor of Fisheries*; *Associate Director, Laboratory of Radiation Biology*; B.S., 1937, Ph.D., 1956, *Washington*

SPARKS, ALBERT KIRK,* 1958 (1963), *Professor of Fisheries*; B.S., 1947, M.S., 1949, Ph.D., 1957, *Texas A&M*

TAUB, FRIEDA, *Research Assistant Professor of Fisheries*; B.A., 1955, M.S., 1957, Ph.D., 1959, *Rutgers*

THOMPSON, WILLIAM FRANCIS, 1930 (1958), *Professor Emeritus of Fisheries*; B.A., 1911, Ph.D., 1930, *Stanford*

VAN CLEVE, RICHARD,* 1948 (1958), *Professor of Fisheries*; *Dean, College of Fisheries*; B.S., 1927, Ph.D., 1936, *Washington*

WELANDER, ARTHUR DONOVAN,* 1937 (1958), *Professor of Fisheries*; *Professor in Laboratory of Radiation Biology*; B.S., 1934, M.S., 1940, Ph.D., 1946, *Washington*

College of Forestry

BETHEL, JAMES S.,* 1962, *Professor of Forestry*; *Associate Dean, Graduate School*; B.S.F., 1937, *Washington*; M.F. 1939, D.F., 1947, *Duke*

BROCKMAN, C. FRANK,* 1946 (1957), *Professor of Forestry*; B.S., 1924, *Colorado State*; M.S., 1931, *Washington*

BRYANT, BENJAMIN SMYTH,* 1949 (1959), *Associate Professor of Forest Products*; *Director, Institute of Forest Products*; B.S.F., 1947, M.S.F., 1948, *Washington*; D.F., 1951, *Yale*

DOWDLE, BARNEY,* 1962, *Assistant Professor of Forest Economics*; B.S.F., 1957, *Washington*; M.F., 1958, Ph.D., 1962, *Yale*

ERICKSON, HARVEY D.,* 1947 (1959), *Professor of Forest Products*; B.S., 1933, B.S., 1934, M.S., 1936, Ph.D., 1937, *Minnesota*

GESSEL, STANLEY PAUL,* 1948 (1961), *Professor of Forest Soils*; B.S., 1939, *Utah State Agricultural College*; Ph.D., 1950, *California*

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*

HEIKKENEN, HERMAN JOHN, 1962, *Assistant Professor of Forest Entomology*; B.S.F., 1953, M.F., 1957, Ph.D., 1963, *Michigan*

HUPMAN, CARL BRANTNER, JR., 1956, *Resident Manager, Charles Lathrop Pack Demonstration Forest*; B.S.F., 1939, *Washington*; M.F., 1946, *Yale*

LENEY, LAWRENCE,* 1960 (1962), *Associate Professor of Forest Products*; B.S., 1942, M.S., 1948, Ph.D., 1960, *New York State University*

MARCKWORTH, GORDON DEXTER,* 1939, *Professor of Forest Management*; *Dean, College of Forestry*; B.S.F., 1916, *Ohio State*; M.F., 1917, *Yale*

MULLIGAN, BRIAN O., 1946, *Director, Arboretum*; N.D.H., 1933, *England*

PEARCE, JOHN KENNETH,* 1934 (1943), *Professor of Logging Engineering*; B.S.F., 1921, *Washington*

ROBERTSON, JAMES CAMPBELL,* 1945 (1956), *Professor of Forest Management*; B.S.F., 1927, *Washington*; M.S.F., 1933, *California*; D.F., 1947, *Duke*

SARKANEN, KYOSTI V.,* 1961, *Associate Professor of Wood Chemistry*; *Associate Director, Institute of Forest Products*; B.Sc., *Helsinki*; M.Sc., 1952, Ph.D., 1956, *New York State*

SCHAEFFER, WALTER HOWARD,* 1952 (1960), *Professor of Forestry*; B.S.F., 1936, *Washington*; M.S.F., 1937, *Yale*; Ph.D., 1952, *Washington*

SCHMITZ, HENRY, 1952 (1958), *President Emeritus*; B.S.F., 1915, M.S., 1916, *Washington*; Ph.D., 1919, *Washington University*

SCOTT, DAVID ROBERT M.,* 1955 (1960), *Associate Professor of Silviculture*; B.A., 1942, *Virginia*; M.F., 1947, Ph.D., 1950, *Yale*



SMITH, BERNICE F., 1955, *Librarian*; B.A., 1936, B.A. in L.S., 1937, Washington

STENZEL, GEORGE,* 1949 (1962), *Professor of Logging Engineering*; B.S., 1938, New Hampshire; M.F., 1939, Yale

STETTLER, REINHARD FRIEDERICH, 1963, *Assistant Professor of Forest Genetics*; dipl.Forst., 1955, Zurich; Ph.D., 1963, California

THOMAS, DAVID PHILLIP,* 1950 (1959), *Associate Professor of Forest Products*; B.S.F., 1941, M.F., 1948, Washington

TURNBULL, KENNETH JAMES, 1958, *Instructor in Forestry*; B.Sc., 1951, Edinburgh; M.F., 1958, Ph.D., 1963, Washington

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ASPINWALL, NEVIN, *Research Assistant*; B.S., 1962, Washington

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BEVAN, DONALD E., *Research Associate Professor*; B.S., 1948, Ph.D., 1959, Washington

BURGNER, ROBERT L., *Research Associate Professor and Assistant Director*; B.S., 1942, Ph.D., 1958, Washington

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School of Medicine

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Biochemistry

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KAPLAN, ALEX,* 1960, *Associate Professor of Biochemistry*; *Head, Clinical Chemistry Laboratory*; A.B., 1932, California (Los Angeles); Ph.D., 1936, California

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LINDBERG, MARJORIE C., 1963, *Research Assistant Professor of Biochemistry*; B.A., 1950, Clark; M.S., 1952, Rutgers; Ph.D., 1962, Radcliffe

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Biological Structure

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BODEMER, CHARLES W.,* 1956 (1963), *Associate Professor of Biological Structure*; *Assistant Dean, School of Medicine*; B.A., 1951, Pomona; M.A., 1952, Claremont Graduate School; Ph.D., 1956, Cornell

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ODLAND, GEORGE F., 1955 (1962), *Associate Professor of Biological Structure and Medicine*; M.D., 1946, Harvard

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SKAHEN, JULIA G.,* 1946 (1961), *Associate Professor of Biological Structure and Physiology and Biophysics*; B.A., 1926, M.S., 1928, Washington; Ph.D., 1940, Chicago

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Microbiology

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Pathology

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HOUGIE, CECIL,* 1960, Associate Professor of Pathology; M.R.C.S. (England); L.R.C.P., 1945; M.B., B.S., 1946, London

LAGUNOFF, DAVID, 1960 (1962), Assistant Professor of Pathology; M.D., 1957, Chicago

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SHAW, CHENG-MEI, 1960 (1964), Assistant Professor of Pathology; M.D., 1950, National Taiwan University

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VRACKO, RUDOLF, 1963, Instructor in Pathology; M.D., 1955, Munich

WATTS, RUTH M., 1957 (1961), Research Instructor in Pathology; B.S., 1921, Washington; M.S., 1925, Yale; Ph.D., 1930, Chicago

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Pharmacology

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ELDER, JOHN T.* 1957 (1963), Assistant Professor of Pharmacology; B.S., 1953, M.S., 1955, Massachusetts College of Pharmacy; Ph.D., 1959, Washington

HOLLIDAY, AUDREY R.* 1957 (1959), Assistant Professor of Pharmacology; B.A., 1945, Oregon; M.S., 1949, Ph.D., 1957, Washington

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MAGEE, DONAL F.* 1951 (1962), Professor of Pharmacology; B.A., 1944, M.A., B.M., B.Ch., 1948, Oxford; Ph.D., 1952, Illinois

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Physiology and Biophysics

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- KENNEDY, THELMA T.,* 1958 (1961), *Assistant Professor of Physiology and Biophysics*; Ph.B., B.S., 1947, M.S., 1949, Ph.D., 1955, Chicago
- KOCH, ALAN R., 1947 (1961), *Research Assistant Professor of Physiology and Biophysics*; B.S., 1951, Michigan; Ph.D., 1955, Columbia
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- MASORO, EDWARD J., 1962, *Research Professor of Physiology and Biophysics and Regional Primate Research Center*; B.A., 1947, Ph.D., 1950, California (Berkeley)
- MORSE, RUSSELL W., 1964, *Research Instructor in Physiology and Biophysics*; B.S., 1957, Montana State College; Ph.D., 1964, Washington
- PATTON, HARRY D.,* 1947 (1956), *Professor of Physiology and Biophysics and Administrative Officer*; B.A., 1939, Arkansas; Ph.D., 1943, M.D., 1946, Yale
- RUCH, THEODORE C.,* 1946 (1961), *Professor of Physiology and Biophysics*; Chairman, Department of Physiology and Biophysics; Director, Regional Primate Research Center; B.A., 1927, Oregon; M.A., 1928, Stanford; B.A., 1930, B.Sc., Oxon., 1932; Ph.D., 1933, Yale
- RUSHMER, ROBERT F.,* 1947 (1956), *Professor of Physiology and Biophysics*; B.S., 1936, Chicago; M.D., 1939, Rush Medical College
- SCHER, ALLEN M.,* 1950 (1962), *Professor of Physiology and Biophysics*; B.A., 1942, Ph.D., 1951, Yale
- SKAHEN, JULIA G.,* 1946 (1961), *Associate Professor of Physiology and Biophysics and Biological Structure*; B.S., 1926, M.S., 1928, Washington; Ph.D., 1940, Chicago
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- STEGALL, H. FRED, 1964, *Research Instructor in Physiology & Biophysics*; B.S., 1956, St. Edwards University; M.S., 1959, M.D., 1961, Texas
- STEVENS, CHARLES F.,* 1963, *Assistant Professor of Physiology and Biophysics*; B.A., 1956, Harvard; M.D., 1960, Yale; Ph.D., 1964, Rockefeller Institute
- TOWE, ARNOLD L.,* 1953 (1962), *Associate Professor of Physiology and Biophysics*; B.A., 1948, Pacific Lutheran College; Ph.D., 1953, Washington
- VAN CITTERS, ROBERT L.,* 1962, *Assistant Professor of Physiology and Biophysics*; Robert L. King Chair of Cardiovascular Research; A.B., 1949, M.D., 1953, Kansas
- WIEDERHIELM, CURT A. R.,* 1961, *Assistant Professor of Physiology and Biophysics*; Karolinska Institutet, 1947; Ph.D., 1961, Washington
- WOODBURY, J. WALTER,* 1950 (1962), *Professor of Physiology and Biophysics*; B.S., 1943, M.S., 1947, Ph.D., 1950, Utah
- YOUNG, ALLAN C.,* 1949 (1960), *Professor of Physiology and Biophysics*; B.A., 1930, M.A., 1932, British Columbia; Ph.D., 1934, Toronto
- Preventive Medicine**
- ALEXANDER, E. RUSSELL,* 1961, *Assistant Professor of Preventive Medicine and Pediatrics*; Ph.B., 1948, S.B., 1950, M.D., 1953, Chicago
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- BOATMAN, EDWIN S., 1961 (1964), *Research Instructor in Preventive Medicine*; B.S., 1950, B.S., 1952, British Post-Graduate Medical School; M.S., 1961, Washington
- BOVEE, HARLEY H., 1964, *Research Assistant Professor of Preventive Medicine*; B.S., 1948, M.A., 1954, Ph.D., 1959, Washington
- BREYSSE, PETER A., 1957, *Research Instructor in Preventive Medicine*; B.S., 1952, Idaho; M.S., 1954, Washington State; M.P.H., 1957, Pittsburgh
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- FISH, JOHN O., 1960 (1962), *Part-time Instructor in Preventive Medicine*; Manager, Sanitation Division, Physical Plant Department; B.S., 1949, Washington; M.P.H., 1959, Michigan
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- JENKIN, HOWARD M., 1961, *Research Assistant Professor of Preventive Medicine*; B.S., 1949, Wisconsin; Ph.D., 1960, Chicago
- KENNY, GEORGE E.,* 1961 (1963), *Assistant Professor of Preventive Medicine*; B.S., 1952, Fordham; M.S., 1957, North Dakota; Ph.D., 1961, Minnesota
- KIRK, RUTH P., 1962, *Research Instructor in Preventive Medicine*; B.A., 1946, Oberlin; B.S., 1958, Washington; M.S., 1961, North Carolina State; Ph.D., 1962, North Carolina
- MARTIN, HARRY B.,* 1961, *Associate Professor of Preventive Medicine*; Director, Environmental Health Division; B.A., 1943, Washington; M.D., 1949, Johns Hopkins
- MERRITT, JAMES E., 1961 (1962), *Instructor in Preventive Medicine*; B.A., 1949, M.S.W., 1951, Washington
- MILLS, CASWELL A., 1954 (1960), *Part-time Assistant Professor of Preventive Medicine*; Associate Professor of Men's Physical Education; B.A., 1935, Minot State Teachers College; M.A., 1943, Ph.D., 1959, Washington
- PENG, JUI-YUN, 1963, *Visiting Assistant Professor of Preventive Medicine*; M.D., 1944, Medical College, Taipei Imperial University; D.P.H., 1956, London School of Hygiene and Tropical Medicine
- PERRIN, EDWARD B.,* 1962, *Assistant Professor of Preventive Medicine*; B.A., 1953, Middlebury (Vermont); M.A., 1956, Columbia; Ph.D., 1960, Stanford
- RAVENHOLT, REIMERT T.,* 1963, *Associate Professor of Preventive Medicine*; B.S., 1948, M.B., 1951, M.D., 1952, Minnesota; M.P.H., 1956, California
- REEVES, SPENCER G., 1950, *Part-time Associate Professor of Preventive Medicine*; Associate Professor of Men's Physical Education; B.S., 1933, M.S., 1937, Oregon; M.P.H., 1951, California
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- Clinical Medical Sciences**
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- ALLEN, GERALD D., 1962, *Instructor in Anesthesiology*; M.B., B.S., 1948, Durham; F.F.A.R.C.S., 1959, London
- BONICA, JOHN J., 1960, *Professor of Anesthesiology*; Chairman, Department of Anesthesiology; B.S., 1938, New York; M.D., 1942, Marquette
- BOWES, JOHN B., 1964, *Instructor in Anesthesiology*; M.B., 1949, B.S., 1955, St. Thomas
- CRAWFORD, EDWARD W., 1962, *Instructor in Anesthesiology*; B.S., 1948, Michigan; M.D.C.M., 1952, McGill
- DEVENY, LYDIA J., 1963, *Instructor in Anesthesiology*; A.A., 1953, M.D., 1958, Philippines
- FINLEY, THEODORE N.,* 1961, *Associate Professor of Anesthesiology, Physiology, and Biophysics*; B.S., 1950, Washington; M.D., 1954, Johns Hopkins
- FREUND, FELIX G., 1963, *Instructor in Anesthesiology*; B.A., 1935, Colegio Nacional (San Isidro); M.D., 1948, Universidad Nacional de Buenos Aires Medical School
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Medicine

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GOODNER, CHARLES J., 1962, *Assistant Professor of Medicine*; B.A., 1951, Reed; M.D., 1955, Utah

HEALEY, LOUIS A., JR., 1963, *Instructor in Medicine*; B.S., 1950, Fordham; M.D., 1954, Columbia

HECHT, FREDERICK, 1952, *Instructor in Medicine*; B.A., 1952, Dartmouth; M.D., 1960, Rochester

HOGNESS, JOHN R., 1951 (1960), *Associate Professor of Medicine*; Associate Dean, School of Medicine; B.S., 1943, M.D., 1946, Chicago

HUFF, JOHN W., 1963, *Assistant Professor of Medicine*; B.A., 1950, Centre College; M.D., 1954, Louisville

JOHNSON, WILLARD P., 1959 (1964), *Instructor in Medicine*; B.A., 1948, California; M.D., 1953, Texas

KIRBY, WILLIAM M. M., 1949 (1963), *Professor of Medicine*; Acting Chairman, Department of Medicine; B.S., 1936, Trinity; M.D., 1950, Cornell

KLEBANOFF, SEYMOUR J., 1962, *Associate Professor of Medicine*; M.D., 1951, Toronto

MARSAGLIA, GEORGE, 1960, *Lecturer in Medicine*; B.A., 1946, Colorado; M.A., 1947, Ph.D., 1950, Ohio

MORGAN, THOMAS E., JR., 1962 (1964), *Assistant Professor of Medicine*; B.S., 1950; M.D., 1954, Duke

MOTULSKY, ARNO G.,* 1953 (1961), *Professor of Medicine and Genetics*; B.S., 1945, M.D., 1947, Illinois

NELP, WIL B., 1962, *Assistant Professor of Medicine and Radiology*; B.A., 1951, Franklin; M.D., 1955, Johns Hopkins

ODLAND, GEORGE F., 1957 (1962), *Associate Professor of Medicine and Biological Structure*; M.D., 1946, Harvard

PARKER, FRANK, 1960 (1962), *Assistant Professor of Medicine*; B.S., 1954, M.D., 1958, Washington

PAULSEN, C. ALVIN, 1958 (1963), *Associate Professor of Medicine*; B.A., 1947, M.D., 1952, Oregon

PETERSDORF, ROBERT G., 1959 (1962), *Professor of Medicine*; B.A., 1948, Brown; M.D., 1952, Yale

RICH, CLAYTON, 1960 (1962), *Associate Professor of Medicine*; M.D., 1948, Cornell

ROBERTS, C. EVANS, 1963 (1964), *Assistant Professor of Medicine and Microbiology*; B.A., 1953, Haverford; M.D., 1957, Columbia

ROWELL, LORING B., 1962 (1963), *Research Assistant Professor of Medicine*; B.S., 1953, Springfield; Ph.D., 1962, Minnesota

RUBIN, CYRUS E., 1954 (1962), *Professor of Medicine*; A.B., 1943, Brooklyn; M.D., 1945, Harvard

SANDLER, HAROLD, 1963, *Instructor in Medicine*; B.S., 1951, M.D., 1955, Cincinnati

SCRIBNER, BELING H., 1951 (1962), *Professor of Medicine*; A.B., 1941, California; M.D., 1945, Stanford; M.S., 1951, Minnesota

STEINMÜLLER, DAVID, 1961, *Research Instructor in Medicine*; B.A., 1956, Swarthmore; Ph.D., 1961, Pennsylvania

SWANSON, PHILLIP D., 1964, *Assistant Professor of Medicine*; B.S., 1954, Yale; M.D., 1958, Johns Hopkins

THOMAS, E. DONNALL, 1963, *Professor of Medicine*; M.D., 1946, Harvard

TURCK, MARVIN, 1960 (1964), *Assistant Professor of Medicine*; B.S., 1955, M.D., 1959, Illinois

TURINESE, ANDREA, 1964, *Assistant Professor of Medicine*; M.D., 1952, Padova (Italy)

VAN ARSDEL, PAUL P., JR., 1953 (1962), *Associate Professor of Medicine*; B.S., 1947, Yale; M.D., 1951, Columbia

VOLWILER, WADE, 1949 (1959), *Professor of Medicine*; A.B., 1939, Oberlin; M.D., 1943, Harvard

WAYS, PETER O., 1961 (1963), *Assistant Professor of Medicine*; A.B., 1949, Harvard; M.D., 1953, Columbia

WERGEDAL, JON E., 1962, *Research Instructor in Medicine*; B.A., 1958, St. Olaf; M.S., 1960, Ph.D., 1962, Wisconsin

WILLIAMS, ROBERT H., 1948, *Professor of Medicine*; A.B., 1929, Washington and Lee; M.D., 1934, Johns Hopkins

WOOD, FRANCIS C., JR., 1960 (1963), *Assistant Professor of Medicine*; Assistant Director, Clinical Research Center; A.B., 1950, Princeton; M.D., 1954, Harvard

Obstetrics and Gynecology

CONRAD, JOHN T., 1962, *Assistant Professor of Obstetrics and Gynecology*; B.A., 1951, Washington Square College; M.S., 1955, Graduate School, Ph.D., 1961, New York

CONRAD, SUZANNE H., 1962, *Research Assistant Professor of Obstetrics and Gynecology*; B.A., 1951, Skidmore; M.D., 1956, New York

DEALVAREZ, RUSSELL R., 1948, *Professor of Obstetrics and Gynecology*; B.S., 1931, M.D., 1935, M.S., 1940, Michigan

FIGGE, DAVID C., 1956, *Associate Professor of Obstetrics and Gynecology*; B.S., 1949, M.D., 1950, Northwestern

HERRMANN, WALTER, 1961, *Professor of Obstetrics and Gynecology*; B.Med.Sci., 1945, M.D., 1949, Geneva

HUNTER, CHARLES A., JR., 1961, *Professor of Obstetrics and Gynecology*; Chairman, Department of Obstetrics and Gynecology; A.B., 1944, M.D., 1946, Kansas



JOHNSON, WAYNE L., 1962, *Assistant Professor of Obstetrics and Gynecology*; B.S., 1950, Roanoke; M.D., 1954, Virginia

LINDBERG, MARJORIE C., 1962, *Research Assistant Professor of Obstetrics and Gynecology and Biochemistry*; B.A., 1950, Clark; M.S., 1952, Rutgers; Ph.D., 1962, Radcliffe

SPACKMAN, DARREL H., 1962, *Research Assistant Professor of Obstetrics and Gynecology and Biochemistry*; B.A., 1950, M.A., 1952, Ph.D., 1954, Utah

SPADONI, LEON R., 1963, *Instructor in Obstetrics and Gynecology*; B. S., 1953, M.D., 1957, Washington

UELAND, KENT, 1963, *Instructor in Obstetrics and Gynecology*; B.A., 1953, Carleton; B.S., M.D., 1957, Illinois

Pediatrics

ALDRICH, ROBERT A., 1956 (on leave), *Professor of Pediatrics*; B.A., 1939, Amherst; M.B., 1943, M.D., 1944, Northwestern

ALEXANDER, E. RUSSELL, 1961, *Assistant Professor of Pediatrics and Preventive Medicine*; Ph.B., 1948, S.B., 1950, M.D., 1953, Chicago

ALLEYNE, DELORES G., 1962, *Part-time Instructor in Pediatrics*; B.A., 1953, M.D., 1957, Louisville

BARNARD, KATHRYN E., 1964, *Assistant Professor of Nursing*; B.S. in Nurs., 1960, Nebraska; M.S., 1962, C.A.G.S., 1963, Boston University

BAUM, DAVID, 1961, *Associate Professor of Pediatrics*; A.B., 1951, Dartmouth; M.D., 1955, Cornell

BERGMAN, ABRAHAM B., 1964, *Assistant Professor of Pediatrics*; B.A., 1954, Reed; M.D., 1958, Western Reserve

CAMPBELL, MARY M., 1960, *Instructor in Pediatrics and Psychiatry (Psychologist)*; B.A., 1930, M.Sc., 1957, Ph.D., 1959, Manitoba

CHAPMAN, JOHN T., 1961, *Part-time Instructor in Pediatrics and Neurology*; M.D., 1955, George Washington

COWGER, MARILYN L., 1960 (1962), *Associate Professor of Pediatrics*; B.A., 1953, Omaha; M.D., 1956, Nebraska

DAVIS, STARKEY D., 1964, *Instructor in Pediatrics*; M.D., 1957, Baylor

DECKER, LINDA, 1964, *Instructor in Dental Hygiene*

DEISHER, ROBERT W., 1949 (1962), *Professor of Pediatrics*; Director, Child Health Center and Director of Clinic for Child Study; A.B., 1941, Knox College (Illinois); M.D., 1944, Washington University

DUNCANSON, NEIL, 1959 (1963), *Instructor in Pediatrics*; B.A., 1954, Washington; M.D., 1958, Northwestern

FERRIER, PIERRE, 1964, *Assistant Professor of Pediatrics*; M.D., 1952, Geneva

GUNTHEROTH, WARREN G., 1958 (1962), *Associate Professor of Pediatrics*; M.D., 1952, Harvard

HAMMAR, SHERREL L., 1958 (1962), *Instructor in Pediatrics*; B.A., 1953, College of Idaho; M.D., 1957, Washington

HECHT, FREDERICK, 1964, *Instructor in Pediatrics and Medicine*; M.D., 1960, Rochester

HICKMAN, ROBERT O., 1959 (1962), *Part-time Instructor in Pediatrics*; B.A., 1951, Utah; M.D., 1957, Maryland

IGO, ROBERT P., 1958 (1961), *Assistant Professor of Pediatrics*; B.S., 1950, M.D., 1952, Utah

KELLEY, VINCENT C., 1958, *Professor of Pediatrics*; B.A., 1934, M.S., 1935, North Dakota; B.S. (Education), 1936, Ph.D., 1942, B.S. (Medicine), 1944, M.S., 1945, M.D., 1946, Minnesota

LABBE, ROBERT F., 1957 (1960), *Research Associate Professor of Pediatrics*; B.S., 1947, Portland; M.S., 1949, Ph.D., 1951, Oregon State

LIMBECK, GEORGE, 1964, *Instructor in Pediatrics*; M.D., 1956, Washington

LOWENBERG, MIRIAM E., 1964, *Visiting Professor in Pediatrics and Home Economics*; Ph.B., 1918, Chicago; M.S., 1929, Ph.D., State University of Iowa, 1943

MACKLER, BRUCE, 1957 (1961), *Professor of Pediatrics*; B.S., 1939, M.D., 1943, Temple

MAHONEY, CHARLES P., 1959 (1962), *Assistant Professor of Pediatrics*; B.S., 1951, Denver University; M.D., 1955, Colorado

MCNELLIS, ELLEN, 1959, *Part-time Instructor in Pediatrics*; M.B., Ch.B., 1938, D.P.H., 1940, Glasgow

MORGAN, BEVERLY C., 1962, *Part-time Instructor in Pediatrics*; M.D., 1955, Duke

OLIVER, THOMAS K., 1963, *Associate Professor of Pediatrics*; M.D., 1949, Harvard

ORIGENES, MAURICIO L., 1958 (1960), *Research Instructor in Pediatrics*; A.A., 1949, M.D., 1954, Catholic University (Philippines)

PRATHER, ELIZABETH, 1964, *Speech Pathologist*

PYTKOWICZ, ANN, 1963 (1964), *Instructor in Pediatrics and Psychiatry*; B.S., 1954, Oregon; M.A., 1959, California; Ph.D., 1964, Washington

RAMSEY, OTIS E., 1961 (1963), *Instructor in Pediatrics and Psychiatry (Psychology)*; B.A., 1950, Southern California; M. S., 1954, Ph.D., 1962, Washington

ROBERTSON, WILLIAM O., 1963, *Associate Professor of Pediatrics and Medicine*; Medical Director, University Hospital; Assistant Dean, School of Medicine; B.A., 1946, M.D., 1949, Rochester

SHEPARD, THOMAS H., 1955 (1962), *Associate Professor of Pediatrics*; B.A., 1945, Amherst; M.D., 1948, Rochester

SHURTLIFF, DAVID B., 1960 (1962), *Assistant Professor of Pediatrics*; M.D., 1955, Tufts

SMITH, ELIZABETH KNAPP, 1958; *Research Associate Professor of Pediatrics*; B.S., 1938, Florida State; M.S., 1939, Michigan; Ph.D., 1943, Iowa

SOBEL, RAYMOND, 1960, *Associate Professor of Pediatrics and Psychiatry*; M.D., 1955, Tufts

STONE, E. FRANKLIN, JR., 1963, *Instructor in Pediatrics*; B.A., 1950, Brown; M.D., 1954, Jefferson Medical College

TJOSSEM, THEODORE D., 1951 (1960), *Assistant Professor of Pediatrics and Psychiatry (Psychologist)*; B.A., 1940, Drake; M.A. 1941, Iowa; Ph.D., 1960, Washington

WALLACE, JOHN G., 1964, *Instructor in Pediatrics and Psychiatry*; M.D., 1955, Western Ontario

WEDGWOOD, RALPH J., 1962 (1963); *Professor of Pediatrics*; Chairman, Department of Pediatrics; M.D., 1947, Harvard

WILLIAMS, CHRISTOPHER P., 1959 (1962); *Instructor in Pediatrics*; B.A., 1953, Oregon; M.D., 1958, Oregon

Physical Medicine and Rehabilitation

FABER, JAN JOB, 1963, *Instructor in Physical Medicine and Rehabilitation*; M.D., 1960, Amsterdam; Ph.D., 1963, Western Ontario

FORDYCE, WILBERT E., 1959, *Assistant Professor of Clinical Psychology*; B.S., 1948; M.S., 1951; Ph.D., 1953, Washington

HONET, JOSEPH, 1964, *Assistant Professor of Physical Medicine and Rehabilitation*; B.A., 1948, Denver; M.S., 1950, Chicago; M.D., 1958, Washington

HUME, FRANCES B., 1961, *Instructor in Occupational Therapy*; B.A., 1954, Mount Holyoke; Certificate in Occupational Therapy, 1956, Columbia

JEBSEN, ROBERT H., 1963, *Assistant Professor of Physical Medicine and Rehabilitation*; B.A., 1953, Brooklyn College; M.D., 1956, New York State University Medical College; M.S., 1960, Ohio State

KUNCE, JOSEPH T., 1963, *Instructor in Physical Medicine and Rehabilitation*; A.B., 1950, M.A., 1956, Washington University; Ph.D., 1959, Missouri

LEHMANN, JUSTUS F., 1957, *Professor of Physical Medicine and Rehabilitation*; Chairman, Department of Physical Medicine and Rehabilitation; M.D., 1945, Johann Wolfgang Goethe Universitat

LUCCI, JENNIE A., 1963, *Instructor in Occupational Therapy*; B.S. with Certificate in Occupational Therapy, 1953, Western Michigan; M.A., 1957, Southern California

McMILLAN, JO A., 1958 (1963), *Assistant Professor of Physical Therapy*; Head, Division of Physical Therapy; B.S., 1953, North Texas State College; Certificate, Physical Therapy, 1955, Mayo Clinic

RATHBUN, LOIS A., 1962, *Instructor in Physical Therapy*; B.S., 1955, Idaho; Certificate in Physical Therapy, 1957, Mayo Clinic

SHEVLIN, M. GERALDINE, 1959, *Instructor in Occupational Therapy*; Head, Division of Occupational Therapy; B.S. in O.T., 1954, Ohio State; M.A., 1959, Columbia

SILVERMAN, DONALD RAY, 1964, *Instructor in Physical Medicine and Rehabilitation*; A.B., 1953, M.D., 1957, Nebraska

STOLOV, WALTER C., 1960, *Assistant Professor of Physical Medicine and Rehabilitation*; B.S., 1948, City College of New York; M.A., 1951, M.D., 1956, Minnesota

SYMINGTON, DAVID C., 1962, *Instructor in Physical Medicine and Rehabilitation*; M.D., 1951, Glasgow

TREMAIN, KATHERINE J., 1964, *Instructor in Physical Medicine and Rehabilitation*; M.D., 1957, Albany Medical College

TROTTER, MARTHA JANE, 1963, *Instructor in Physical Therapy*; B.A., 1957, East Tennessee State; *Physical Therapy Certificate*, 1954, Duke

Psychiatry

BAKKER, CORNELIS B., 1960 (1963), *Assistant Professor of Psychiatry*; M.D., 1952, Utrecht (Netherlands)

BROWNSBERGER, CARL N., 1962, *Instructor in Psychiatry*; B.A., 1951, Yale; M.D., 1955, Harvard

CAMPBELL, MARY M., 1962, *Instructor in Psychiatry and Pediatrics (Psychologist)*; B.A., 1930, Manitoba; M.S., 1957, Ph.D., 1959, Washington

CARR, JOHN E., 1963, *Instructor in Psychiatry (Psychologist)*; A.B., 1956, Earlham (Indiana); M.A., 1958, Ph.D., 1963, Syracuse

CHRIST, ADOLPH E., 1962, *Instructor in Psychiatry*; A.B., 1951, M.D., 1954, California

HAMPSON, JOHN L., 1960, *Associate Professor of Psychiatry*; A.B., 1943, Allegheny; M.D., 1946, Johns Hopkins

HOLMES, THOMAS H. III, 1949 (1958), *Professor of Psychiatry*; A.B., 1939, North Carolina; M.D., 1943, Cornell

JACKSON, JOAN K., 1951 (1961), *Research Associate Professor of Psychiatry (Sociologist)*; *Lecturer in Sociology*; B.A., 1945, M.A., 1947, McGill; Ph.D., 1955, Washington

JACOBS, LAURENCE P., 1964, *Instructor in Psychiatry*; B.A., 1954, Harvard; M.D., 1959, New York State

JOHNSON, MERLIN H., 1955 (1960), *Assistant Professor of Psychiatry*, B.A., 1944, M.D., 1947, Iowa

LANGNESS, LEWIS L., 1962 (1963), *Research Instructor in Psychiatry (Anthropologist)*; B.S., 1956, Idaho; M.A., 1959, Washington

MASUDA, MINORU, 1956 (1960), *Research Assistant Professor of Psychiatry (Physiologist)*; B.S., 1936, M.S., 1938, Ph.D., 1956, Washington

PRESTON, CAROLINE E., 1949 (1960), *Assistant Professor of Psychiatry (Psychologist)*; B.A., 1940, M.A., 1941, Colorado

PYTKOWICZ, ANN R., 1963 (1964), *Instructor in Psychiatry and Pediatrics (Psychologist)*; B.S., 1954, Oregon State; M.A., 1959, California; Ph.D., 1964, Washington

RABKIN, LESLIE Y., 1962, *Instructor in Psychiatry (Psychologist)*; A.B., 1956, Columbia; Ph.D., 1963, Rochester

RAMSEY, OTIS E., Jr., 1956 (1963), *Instructor in Psychiatry and Pediatrics (Psychologist)*; B.A., 1950, Southern California; M.S., 1954, Ph.D., 1962, Washington

RIPLEY, HERBERT S., 1949, *Professor of Psychiatry*; *Chairman, Department of Psychiatry*; A.B., 1929, Michigan; M.D., 1933, Harvard

SOBEL, RAYMOND, 1960, *Associate Professor of Pediatrics and Psychiatry*; *Head, Division of Child Psychiatry*; A.B., 1937, Harvard; M.D., 1941, New York

SPOERL, OTTO H., 1964, *Instructor in Psychiatry*; M.D., 1957, Erlangen (Germany)

STROTHER, CHARLES R., 1949, *Professor of Psychiatry and Psychology (Psychologist)*; B.A., 1929, M.A., 1932, Washington; Ph.D., 1935, Iowa

TOWNES, BRENDA D., 1961, *Instructor in Psychiatry (Psychologist)*; A.B., 1957, Antioch; M.A., 1958, Mills

WAGNER, NATHANIEL N., 1962, *Assistant Professor of Psychiatry (Psychologist)*; *Lecturer in Psychology*; B.A., 1951, Long Island; M.A., 1952, Teachers College, Columbia; Ph.D., 1956, Columbia

WALLACE, JOHN G., 1964, *Instructor in Psychiatry and Pediatrics*; M.D., 1955, Western Ontario

WIMBERGER, HERBERT C., 1961, *Assistant Professor of Psychiatry*; M.D., 1953, University of Vienna Medical School

Radiology

BALTZO, RALPH M., 1955, *Associate Professor of Radiology*; B.A., 1950, Washington; M.A., 1963

BILL, KAZUKO, 1963, *Instructor in Radiology*; B.S., 1942, Washington; M.D., 1948, Women's Medical College of Pennsylvania

CHRISTENSEN, GERALD M., 1964, *Instructor in Radiology*; B.S., 1951, Utah; Ph.D., 1958, Emory University

FIGLEY, MELVIN M.,* 1958, *Professor of Radiology*; *Chairman, Department of Radiology*; M.D., 1944, Harvard

GRAHAM, C. BENJAMIN, 1963, *Instructor in Radiology*; B.A., 1954, Illinois; M.D., 1958, Washington

HARMS, G. LESTER, 1964, *Instructor in Radiology*; B.S., 1952, Bethel College; M.D., 1956, Kansas

JACKSON, KENNETH L.,* 1963, *Assistant Professor of Radiology*; A.B., 1949, Ph.D., 1954, California (Berkeley)

LEIGHTON, ROBERT S., 1955 (1962), *Assistant Professor of Radiology*; B.A., 1953, M.D., 1938, Minnesota

LOOP, JOHN W., 1959, *Assistant Professor of Radiology*; B.S., 1948, Wyoming; M.D., 1952, Harvard

McKAY, THOMAS F., 1963, *Instructor in Radiology*; B.S., 1950, M.D., 1953, Washington

NELP, WIL B., 1962, *Assistant Professor of Radiology and Medicine*; B.A., 1951, Franklin; M.D., 1952, Harvard

PARKER, ROBERT G., 1956 (1959), *Associate Professor of Radiology*; B.S., 1945, M.D., 1958, Wisconsin

PATERSON, DONALD E., 1964, *Assistant Professor of Radiology*; B.S., 1941, M.B., 1955, Liverpool

PHILLIPS, LEON A., *Assistant Professor of Radiology*; B.S., 1948, Washington; M.D., 1952, Yale

PURCELL, THEODORE R., 1963, *Instructor in Radiology*; A.B., 1950, California (Berkeley); B.S., 1953, California (San Francisco); M.D., 1959, George Washington

STACY, GILBERT S., 1964, *Instructor in Radiology*; B.A., 1953, M.A., 1955, Arkansas; M.D., 1960, Washington University

WOOTTON, PETER, 1959 (1964), *Assistant Professor of Radiology*; Hon.B.Sc., Birmingham (England)

Surgery

AKESON, WAYNE H.,* 1961, *Assistant Professor of Surgery (Orthopedics)*; M.D., 1953, Chicago

ANSELL, JULIAN S.,* 1959 (1961), *Associate Professor of Surgery*; *Head, Division of Urology*; B.A., 1947, Bowdoin; M.D., 1951, Tufts; Ph.D., 1959, Minnesota

BELL, JOHN W.,* 1959 (1960), *Associate Professor of Surgery*; B.S., 1942, Washington; M.D., 1945, Northwestern

BLACK, RICHARD G., 1964, *Research Instructor in Surgery (Neurosurgery)*, B.A.Sc., 1954, M.D., 1960, M.A., 1964, Toronto

BROCKENBROUGH, EDWIN C., 1961 (1964), *Assistant Professor of Surgery*; B.S., 1952, William and Mary; M.D., 1956, Johns Hopkins

CANTRELL, JAMES R.,* 1960, *Professor of Surgery*; A.B., 1944, M.D., 1946, Johns Hopkins

CHATRIAN, GIAN E.,* 1959, *Associate Professor of Medicine (Neurology) and Surgery (Neurosurgery)*; *Director, EEG Program*; M.D., 1951, Naples

CLAWSON, D. KAY,* 1958 (1961), *Associate Professor of Surgery*; *Head, Division of Orthopedics*; M.D., 1952, Harvard

COBB, BENJAMIN, 1960 (1964), *Instructor in Surgery (Urology)*; B.A., 1953, College of the Pacific; M.D., 1957, California (Los Angeles)

DILLARD, DAVID H.,* 1953 (1963), *Associate Professor of Surgery*; A.B., 1946, Whitman; M.D., 1950, Johns Hopkins

DEVITO, JUNE L., 1963, *Research Instructor in Surgery (Neurosurgery)*; B.A., 1947, M.A., 1949, British Columbia; Ph.D., 1954, Washington

DEVITO, ROBERT V.,* 1956 (1962), *Assistant Professor of Surgery*; *Head, Division of Plastic and Maxillofacial Surgery*; B.A., 1949, British Columbia; M.D., 1953, Washington

FLETCHER, T. LLOYD, 1948 (1955), *Research Associate Professor of Surgery*; A.B., 1937, M.A., 1938, Clark (Massachusetts); Ph.D., 1949, Wisconsin

FOLTZ, ELDON L.,* 1950 (1958), *Professor of Surgery (Neurosurgery)*; B.S., 1941, Michigan State; M.D., 1943, Michigan

FRY, LOUIS R.,* 1962, *Instructor in Surgery (Orthopedics)*; B.A., 1951, Denison University; M.D., 1955, Temple

GORDON, LAWRENCE H.,* 1962, *Assistant Professor of Surgery (Orthopedic)*; B.A., 1951, M.D., 1955, Stanford

HARKINS, HENRY NELSON,* 1947, *Professor of Surgery*; *Chairman, Department of Surgery*; B.S., 1925, M.S., 1926, Ph.D., 1928, Chicago; M.D., 1931, Rush Medical College



JESSEPH, JOHN E.,* 1955 (1961), *Assistant Professor of Surgery*; A.B., 1949, Whitman; M.D., 1953, M.S., 1956, Washington

KELLY, WILLIAM A.* 1959, *Assistant Professor of Surgery (Neurosurgery)*; M.D., 1954, Cincinnati

LOCKARD, JOAN S., 1964, *Research Instructor in Surgery (Neurosurgery)*; A.B., 1958, M.S., 1961, San Diego State; Ph.D., 1963, Wisconsin

MERENDINO, K. ALVIN,* 1948 (1955), *Professor of Surgery*; B.A., 1936, Ohio; M.D., 1940, Yale; Ph.D., 1946, Minnesota

MORLOCK, NOEL L., 1963, *Research Instructor in Surgery (Neurosurgery)*; M.D., 1960, Washington

NAMKUNG, MOSES, 1954 (1964), *Research Instructor in Surgery*; B.S., 1949, Seoul College (Korea)

NYHUS, LLOYD M.,* 1952 (1959), *Professor of Surgery*; B.A., 1945, Pacific Lutheran College; M.D., 1947, Alabama

PAN, HSI-LUNG, 1954 (1955), *Research Instructor in Surgery*; B.S., 1946, Fukien Christian (China); M.S., 1950, College of Puget Sound; M.S., 1953, Washington

RADKE, HUBERT M., 1958 (1963), *Instructor in Surgery*; M.D., 1954, Texas

STEVENSON, JOHN K.,* 1954 (1959), *Associate Professor of Surgery*; M.D., 1949, Rochester

STRANDNESS, DONALD E., JR.,* 1955 (1963), *Assistant Professor of Surgery*; B.A., 1950, Pacific Lutheran College; M.D., 1954, Washington

TAYLOR, THOMAS K. F., 1964, *Instructor in Surgery (Orthopedics)*; M.B., B.S., 1955, Sydney

WARD, ARTHUR A., JR.,* 1948 (1955), *Professor of Surgery*; Head, Division of Neurosurgery; B.S., 1938, M.D., 1942, Yale

WHITE, LOWELL E., JR.,* 1954 (1960), *Associate Professor of Surgery (Neurosurgery)*; B.S., 1951, M.D., 1953, Washington

WINTERSCHIED, LOREN C.,* 1957 (1962), *Assistant Professor of Surgery*; B.A., 1948, Willamette; Ph.D., 1953, M.D., 1954, Pennsylvania

School of Dentistry

Dental Hygiene

FALES, MARTHA H., 1959, *Assistant Professor of Dental Hygiene*; Director, Department of Dental Hygiene; R.D.S., 1935, A.D.Ed., 1943, Michigan

HASTINGS, MARY ANNE, 1962, *Instructor in Dental Hygiene*; B.S., 1962, Indiana

KOCHER, LINDA M., 1961, *Instructor in Dental Hygiene*; B.S., R.D.H., 1958, Washington

RYAN, MARY MARGARET, 1962, *Instructor in Dental Hygiene*; B.S., 1956, Washington

VORIS, JOAN S., 1960, *Instructor in Dental Hygiene*; B.S., R.D.H., 1959, Washington

WELLS, NORMA J., 1960, *Instructor in Dental Hygiene*; B.S., R.D.H., 1958, Washington

WYKES, BERNICE E., 1963, *Instructor in Dental Hygiene*; B.S., R.D.H., 1949, Ed.M., 1962, Massachusetts

Dental Science and Literature

ANDERSON, BERTON EMMETT,* 1948, *Professor of Dental Science and Literature*; D.M.D., 1925, Oregon

Fixed Partial Dentures

MORRISON, KENNETH N.,* 1948, *Associate Professor of Fixed Partial Dentures*; Chairman, Fixed Partial Dentures; D.D.S., 1943, Toronto; M.S., 1952, Washington

VIGG, JOHN, 1959, *Assistant Professor of Fixed Partial Dentures*; D.D.S., 1956, Washington

WARNICK, MYRON E., 1956, *Assistant Professor of Fixed Partial Dentures*; D.D.S., 1955, Alberta

YUODELIS, RALPH A., 1963, *Instructor in Fixed Partial Dentures*; D.D.S., 1955, Alberta

Department of Operative Dentistry

CHRISTENSEN, GORDON J., *Assistant Professor of Operative Dentistry*; D.D.S., 1960, Southern California; M.S.D., 1963, Washington

DIEPENHEIM, JAN, *Associate Professor of Operative Dentistry*; D.D.S., 1956, Alberta

HABERMAN, JAMES D., 1960, *Instructor in Operative Dentistry*; B.A., 1952, Central Washington College of Education; D.D.S., 1960, Washington

HODSON, JEAN E., 1952, *Assistant Professor of Operative Dentistry (Ceramics and Oral Anatomy)*; B.D., 1952, M.S., 1958, Washington

MERRILL, O. MONTE, 1962, *Instructor in Operative Dentistry*; D.D.S., 1961, Washington

SCHROETER, CHARLES, 1950, *Assistant Professor of Oral Anatomy*; Fortbildungsinstitut des Verbandes der Dentisten im Deutschen, Relche (Berlin)

STIBBS, GERALD D.,* 1948, *Professor of Operative Dentistry and Fixed Partial Dentures*; Chairman, Department of Operative Dentistry; Director of the Dental Operatory; B.S., D.M.D., 1931, Oregon

WELK, DONALD A., 1962, *Instructor in Operative Dentistry*; B.S., 1959, Seattle Pacific College; D.D.S., 1962, Washington

Oral Diagnosis

BUSEMAN, RALPH H., 1957, *Instructor in Oral Diagnosis*; B.S., 1953, D.D.S., 1957, Washington

DEGERING, CHARLES IRVIN, 1950, *Assistant Professor of Oral Diagnosis and Treatment Planning*; B.A., 1942, Walla Walla College; D.D.S., 1950, Washington

JACOBSON, F. LLOYD,* 1950, *Associate Professor of Oral Diagnosis and Treatment Planning*; Chairman, Department of Oral Diagnosis and Treatment Planning; D.M.D., 1934, Oregon

Oral Pathology

KELLER, PATRICIA J.,* 1963, *Associate Professor of Oral Pathology*; B.S., 1945, Detroit; Ph.D., 1963, Washington University

ROSS, RUSSELL, 1962, *Assistant Professor of Oral Pathology and Pathology*; A.B., 1951, D.D., 1955, Columbia; Ph.D., 1962, Washington

SREEBNY, LEO M.,* 1957, *Professor of Oral Pathology*; Chairman, Department of Oral Pathology; A.B., 1942, D.D.S., 1945, M.S., 1950, Ph.D., 1954, Illinois

TAMARIN, ARNOLD, 1962, *Assistant Professor of Oral Pathology*; B.S., 1949, D.D.S., 1951, Illinois; M.A., 1961, Washington

Oral Surgery

GEHRIG, JOHN D.,* 1954, *Associate Professor of Oral Surgery*; Chairman, Department of Oral Surgery; D.D.S., 1946, M.S.D., 1951, Minnesota

HOOLEY, JAMES R., 1963, *Instructor in Oral Surgery*; D.D.S., 1957, St. Louis University

Orthodontics

MOORE, ALTON WALLACE,* 1948, *Professor of Orthodontics*; Chairman, Department of Orthodontics; D.D.S., 1941, California; M.S., 1948, Illinois

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Pedodontics

LAW, DAVID BARCLAY,* 1947, *Associate Professor of Pedodontics*; Chairman, Department of Pedodontics; B.S.D., D.D.S., 1938, M.S., 1941, Northwestern

LEWIS, THOMPSON M., 1955, *Assistant Professor of Pedodontics*; D.D.S., 1950, Northwestern; M.S.D., 1955, Washington

Periodontics and Endodontics

BECHLEM, DONALD NIELSEN, 1959, *Instructor in Periodontics and Endodontics*; D.D.S., 1943, Northwestern; M.S.D., 1959, Washington

DRENNAN, GEORGE ALEXANDER, 1962, *Instructor in Periodontics and Endodontics*; L.D.S., 1946, D.D.S., 1946, Toronto; M.S.D., 1962, Washington

EASLEY, JAMES R., 1963, *Instructor in Periodontics and Endodontics*; D.D.S., 1958, Michigan; M.S.D., 1963, Washington

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KARREN, KEITH, 1962, *Instructor in Periodontics and Endodontics*; D.D.S., 1956, M.S.D., 1964, Washington

NATKIN, EUGENE, 1962, *Instructor in Periodontics and Endodontics*; A.B., 1953, Columbia; D.D.S., 1957, New York; M.S.D., 1962, Washington

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SCHLUGER, SAUL,* 1958, Professor of Periodontics; D.D.S., 1931, Louisville

STERN, IRVING B.,* 1959, Associate Professor of Periodontics and Endodontics; B.S., 1941, City College of New York; D.D.S., 1946, New York; Certif., 1956, Columbia

Prosthodontics

BEDER, OSCAR EDWARD,* 1952, Professor of Prosthodontics; B.S., 1936, Rutgers; D.D.S., 1941, Columbia

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WYKHUIS, WALTER A.,* 1956, Associate Professor of Prosthodontics; B.A., 1932, Calvin College; D.D.S., 1936, Chicago College of Dental Surgery

School of Nursing

ANDERSON, EUGENIA ELAINE, 1961, Assistant Professor of Medical-Surgical Nursing; B.S.N., 1949, Colorado; M.N., 1958, Washington

BAKER, JOAN M., 1956 (1961), Instructor in Medical-Surgical Nursing; B.S.N., 1955, Washington; M.S., 1959, Rutgers

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BATEY, MARJORIE,* 1956 (1958), Assistant Professor of Psychiatric Nursing; Diploma, 1947, Sacred Heart Hospital School of Nursing, Washington; B.S., 1953, Washington; M.S., 1956, Colorado

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BOOZER, MARY,* 1956, Assistant Professor of Medical-Surgical Nursing; B.S., 1947, Colorado; M.N., 1955, Washington

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BRECKENRIDGE, FLORA, 1953, Instructor in Medical-Surgical Nursing; Diploma, 1941, Evanston Hospital School of Nursing; B.S., 1952, Western Reserve

BRUNO, PAULINE,* 1958 (1959), Assistant Professor of Medical-Surgical Nursing; Diploma, 1945, St. Vincent Hospital School of Nursing, Massachusetts; B.S., 1952, M.S.N., 1954, Catholic University

BUCKLES, JOAN V., 1963, Instructor in Psychiatric Nursing; Diploma, 1943, Lincoln General Hospital, Nebraska; B.A., 1960, Hastings College, Nebraska; M.N., 1963, Washington

BURKE, A. EVELYN,* 1943 (1953), Associate Professor of Public Health Nursing; B.S., 1930, Akron Municipal; Diploma, 1930, M.A., 1941, Western Reserve; C.P.H.N., 1943, Washington

BURTON, MARY G., 1964, Research Instructor in Nursing; Diploma, 1942, St. Elizabeth Hospital School of Nursing, Washington, D.C.; B.S.N., 1951, M.N., 1962, Washington

BYERLY, ELIZABETH LEE, 1962, Acting Instructor in Maternal-Child Nursing; Diploma, 1947, Michael Reese Hospital School of Nursing, Illinois; B.S.N., 1955, Iowa State; M.N., 1958, Washington

CARNEVALI, DORIS, 1962, Research Instructor in Medical-Surgical Nursing; B.S.N., 1947; M.N., 1961, Washington

CASHAR, LEAH, 1952 (1959), Instructor in Psychiatric Nursing; Diploma, 1945, St. Joseph's Hospital School of Nursing, Kansas; B.S., 1951, Washington

CHRISTIAN, DORIS COWLES, 1957 (1958), Instructor in Public Health Nursing; Diploma, 1944, Springfield Hospital School for Nurses, Massachusetts; B.S.S., 1950, Chicago; M.A., 1957, Washington

CLAYPOOL, JANET, 1961, Acting Instructor in Maternal-Child Nursing; B.S.N., 1959, M.N., 1960, Washington

COBB, MARGUERITE, 1953 (1958), Assistant Professor of Public Health Nursing; B.S.N., 1959, M.N., 1957, Washington

COLIN, LOUISE A., 1961, Instructor in Medical-Surgical Nursing; Diploma, 1947, Brooklyn Hospital School of Nursing; B.S., 1958, Columbia; M.N., 1959, Washington

CRITCHLEY, DEANE, 1962, Instructor in Psychiatric Nursing; B.S., 1957, M.S., 1959, California

CROSS, HARRIET, 1932 (1941), Assistant Professor of Public Health Nursing; Diploma, 1921, Columbia Hospital School of Nursing, Wisconsin; B.S., 1925, Minnesota; C.P.H.N., 1938, M.N., 1940, Washington

ENOS, LUCY DE REID,* 1954 (1958), Assistant Professor of Medical-Surgical Nursing; Diploma, 1942, Pennsylvania Hospital School of Nursing; B.S., 1946, M.A., 1954, Minnesota

FATKA, VADA J., 1961, Instructor in Psychiatric Nursing; Diploma, 1952, Iowa Methodist Hospital School of Nursing; B.S., 1955, Iowa; M.S., 1958, Colorado

FISHER, ALICE L., 1961, Lecturer in Public Health Nursing; B.S.N., 1930, Minnesota; M.S.P.H., 1936, Michigan

GIBLIN, ELIZABETH C.,* 1951 (1959), Associate Professor of Medical-Surgical Nursing; B.S.N., 1943, M.N., 1954, Washington; Ed.D., 1959, Colorado

GRAY, FLORENCE,* 1945 (1959), Associate Professor of Nursing; B.S.N., 1945, M.S., 1950, Washington

GUICHON, SHEILA M., 1963, Acting Instructor in Medical-Surgical Nursing; B.S., 1954, Boston College School of Nursing; M.Ed., 1957, Boston College Graduate School

HASTIE, ELIZABETH M., 1960, Instructor in Medical-Surgical Nursing; B.S.N., 1958, British Columbia; M.N., 1961, Washington

HAY, STELLA, 1955 (1958), Assistant Professor of Medical-Surgical Nursing; Diploma, 1942, Eitel Hospital School of Nursing, Minnesota; B.S., 1944, M.A., 1951, Minnesota

HEINEMANN, EDITH,* 1954 (1956), Assistant Professor of Medical-Surgical Nursing; B.S.N., 1945, Seattle; M.N., 1954, Washington

HEWITT, HELON, 1961, Research Instructor in Psychiatric Nursing; Diploma, 1955, Emanuel Hospital School of Nursing, Oregon; B.S.N., 1959, M.N., 1961, Washington

HOFFMAN, KATHERINE,* 1942 (1956), Professor of Nursing; A.B., 1929, College of Puget Sound; Diploma, 1934, Tacoma General Hospital School of Nursing; M.N., 1941, Ph.D., 1956, Washington

JARROTT, SHIRLEY A., 1963, Instructor in Psychiatric Nursing; Diploma, 1958, Tacoma General Hospital School of Nursing; B.S.N., 1962, M.N., 1963, Washington

JENKIN, SHIRLEY ANN, 1961, Acting Instructor in Medical-Surgical Nursing; B.S.N., 1956, Washington State; M.N., 1961, Washington

JULIAN, JOSEPH, 1961, Research Instructor in Nursing; A.B., 1958, San Francisco State; M.A., 1961, Washington

KLEMER, MARGARET G., 1962, Instructor in Maternal-Child Nursing; Diploma, 1937, St. Margaret Memorial Hospital School of Nursing, Pennsylvania; B.S.N.E., 1942, Pittsburgh; M.S., 1962, Alabama

KLUTAS, EDNA MAY,* 1960, Assistant Professor of Occupational Health Nursing and Public Health Nursing; Diploma, 1940, Columbia-Presbyterian Hospital School of Nursing, New York; B.S., 1951, Washington; M.P.H., 1957, Yale

LEAHY, KATHLEEN M., 1935 (1961), Professor Emeritus of Public Health Nursing; Diploma, 1921, Stanford School of Nursing; A.B., 1926, C.P.H.N., 1927, Oregon; M.S., 1931, Washington

LITTLE, DOLORES,* 1951 (1958), Assistant Professor of Medical-Surgical Nursing; B.S.N., 1946, M.N., 1957, Washington

LUCAS, PAULINE, 1963, Lecturer in Psychiatric Nursing; Diploma, 1937, Newark Beth Israel Hospital School of Nursing; B.S.N., 1952, M.N., 1954, Washington

MANSFIELD, LOUISE,* 1951 (1952), Assistant Professor of Medical-Surgical Nursing; Diploma, 1937, Samaritan Hospital School of Nursing, Idaho; B.S., 1947, Ohio State; M.A., 1951, Teachers College, Columbia

MARTIN, FLORENCE E., 1961, Instructor in Public Health Nursing; B.S.N., 1956, M.N., 1962, Washington

MIDTHUN, ALINE, 1957, Instructor in Medical-Surgical Nursing; Diploma, 1932, Tennessee; B.S., 1956, Oregon

MURRAY, B. LOUISE,* 1951 (1962), Associate Professor of Maternal-Child Nursing; B.S., 1938, Portland University; M.N., 1950, Washington; Ed.D., 1962, Columbia

NASH, SHIRLEY ISTAS,* 1952 (1957), Assistant Professor of Nursing; Diploma, 1941, Virginia Mason Hospital School of Nursing; B.S., C.N.S., 1949, M.N., 1956, Washington

NEHREN, JEANETTE, 1959, Assistant Professor of Psychiatric Nursing; Diploma, 1945, St. Vincent's Hospital School of Nursing, Indiana; B.S., 1956, Indiana; M.S., 1958, Colorado

NITE, GLADYS, 1963, Associate Professor of Medical-Surgical Nursing; Diploma, 1937, Baylor University Hospital, School of Nursing, Texas; B.S., 1946, M.A., 1951, Teachers College, Columbia

NIVEN, E. ELAINE, 1961, Assistant Professor of Medical-Surgical Nursing; B.S., 1949, Colorado; M.N., 1958, Washington; C.P.H.N., 1960, California



- OLCOTT, VIRGINIA,* 1931 (1945), *Associate Professor of Medical-Surgical Nursing; Diploma, 1926, Peter Brent Brigham Hospital School of Nursing, Massachusetts; B.S., 1927, M.S., 1931, C.P.H.N., 1949, Washington*
- PATRICK, MAXINE I.,* 1955 (1961), *Assistant Professor of Medical-Surgical Nursing; B.S.N., 1948, Colorado; M.N., 1953, Washington*
- PEDERSEN, ROMA KITTELSBY,* 1953 (1961), *Associate Professor of Medical-Surgical Nursing; B.S.N.E., 1943, Minnesota; M.N., 1955, Washington*
- PESZNECKER, BETTY HART, 1958 (1960), *Research Assistant Professor of Psychiatric Nursing; Diploma, 1948, St. Luke's Hospital School of Nursing, Spokane; B.S., 1951, M.N., 1957, Washington*
- RADEMACHER, MELBA, 1963, *Research Instructor in Nursing; B.S.N., 1959, M.N., 1964, Washington*
- RISLEY, JOAN F., 1963, *Instructor in Psychiatric Nursing; Diploma, 1953, B.S., 1956, C.P.H.N., 1956, Oregon; M.N., 1959, Washington*
- ROSE, PATRICIA, 1952 (1962), *Assistant Professor of Maternal-Child Nursing; Diploma, 1946, St. Joseph's Hospital School of Nursing, Tacoma; B.S.N., 1949, M.N., 1958, Washington*
- SCHULTZ, FRANCES, 1960, *Instructor in Psychiatric Nursing; B.S., 1944, M.S., 1960, California*
- SCHUMANN, DELORES M., 1961, *Instructor in Medical-Surgical Nursing; Diploma, 1951, Miami Valley Hospital School of Nursing, Ohio; B.S., 1954, Ohio State; M.S., 1961, Boston*
- SHARP, LAWRENCE L., 1962, *Research Instructor in Nursing; B.S., 1957, Gonzaga; M.A., 1959, Washington State*
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- SORENSEN, KAREN MAE, 1959, *Instructor in Medical-Surgical Nursing; B.S.N., 1958, M.N., 1959, Washington*
- SPLITS, IRENE N., 1964, *Research Instructor in Nursing; B.S., 1954, M.S., 1963, Washington*
- SOULE, ELIZABETH STERLING, 1920 (1950), *Professor Emeritus of Nursing; Diploma, 1907, Malden Hospital School of Nursing, Massachusetts; B.A., 1926, M.A., 1931, Washington; D.Sc. (Hon.), 1944, Montana State*
- SPARROW, ALMA, 1962 (1963), *Assistant Professor of Public Health Nursing; B.S., 1937, Hamline University, Minnesota; M.S., 1943, Diploma, 1944, C.P.H.N., 1945, M.P.N., 1953, Minnesota*
- STANKIEWICZ, BARBARA D., 1961, *Instructor in Psychiatric Nursing; Diploma, 1957, St. Vincent's Hospital School of Nursing, Florida; B.S.N.E., Florida State; M.S., 1961, Colorado*
- STEPHENS, MARGO D., 1964, *Research Instructor in Nursing; B.S., 1956, Utah; M.A., 1963, Washington*
- STEWART, LUCILLE B., 1954, *Instructor in Maternal-Child Nursing; Diploma, 1949, Evanston Hospital School of Nursing, Illinois; B.S., 1952, Washington*
- STOCKWELL, MARTHA L., 1962, *Instructor in Psychiatric Nursing; Diploma, 1944, Pennsylvania Hospital School of Nursing; B.S.N.E., 1958, Akron*
- TJELTA, TOMINE, 1963, *Instructor in Medical-Surgical Nursing; Diploma, 1946, Swedish Hospital School of Nursing, Minnesota; B.S., 1954, M.A., 1958, Washington*
- TSCHUDIN, MARY STICKELS,* 1942 (1955), *Professor of Nursing; Dean, School of Nursing; B.S.N., 1935, C.P.H.N., 1936, M.S., 1939, Ph.D., 1959, Washington*
- VAIL, BARBARA, 1961, *Instructor in Public Health Nursing; Diploma, 1948, Good Samaritan Hospital School of Nursing, Oregon; B.S.N., 1955, Oregon; M.P.H., 1958, Johns Hopkins*
- WALLACE, ESTHER R., 1951 (1962), *Instructor in Nursing; Diploma, 1948, Swedish Hospital School of Nursing; B.S., 1950, Minnesota; M.N., 1960, Washington*

College of Pharmacy

- BRADY, LYNN R.,* 1959 (1963), *Associate Professor of Pharmacognosy; B.S., 1955, M.S., 1957, Nebraska; Ph.D., 1959, Washington*
- 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*
- 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*
- HALL, NATHAN A.,* 1952 (1962), *Professor of Pharmacy; B.S., 1939, Ph.D., 1948, Washington*
- HAMMARLUND, E. ROY,* 1960 (1962), *Professor of Pharmacy; B.S., 1944, M.S., 1949, Ph.D., 1951, Washington*
- HUITRIC, ALAIN C.,* 1955 (1960), *Associate Professor of Pharmaceutical Chemistry; B.S., 1950, Loyola; M.S., 1952, Ph.D., 1954, California*
- KRUPSKI, EDWARD,* 1944 (1962), *Professor of Pharmaceutical Chemistry; B.S., 1939, M.S., 1941, Ph.D., 1949, Washington*
- MCCARTHY, WALTER C.,* 1949 (1957), *Associate Professor of Pharmaceutical Chemistry; B.S., 1943, Massachusetts Institute of Technology; Ph.D., 1949, Indiana*
- ORR, JACK E.,* 1956, *Professor of Pharmacy; Dean, College of Pharmacy; State Chemist; B.S., 1940, Purdue; Ph.D., 1943, Wisconsin*
- PLEIN, ELMER M.,* 1938 (1951), *Professor of Pharmacy; Coordinator of Pharmaceutical Services; Ph.C., 1929, B.S., 1929, M.S., 1931, Ph.D., 1936, Colorado*
- RISING, L. WAIT,* 1934 (1936), *Professor of Pharmacy; Chairman, Department of Pharmacy and Pharmacy Administration; Director, Pharmacy Extension Services; Ph.G., 1924, B.S., 1924, Oregon State; M.S., 1926, Ph.C., 1928, Ph.D., 1929, Washington*

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School of Law

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- CROSS, HARRY M., 1943 (1949), *Professor of Law (on leave Autumn Quarter, 1964); B.A., 1936, Washington State; LL.B., 1940, Washington*
- FLETCHER, ROBERT L., 1956 (1960), *Professor of Law; A.B., 1939, LL.B., 1947, Stanford*
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- HARSCH, ALFRED, 1930 (1940), *Professor of Law; A.B., 1926, LL.B., 1928, Washington; LL.M., 1940, Columbia*
- HARVITH, BERNARD E., 1963, *Assistant Professor of Law; B.A., 1960, Rochester; LL.B., 1963, Harvard*
- HENDERSON, DAN FENNO, 1962, *Professor of Law; Director, Law of Asian Countries Program; B.A., 1944, Whitman College; B.A., 1945, Michigan; LL.B., 1949, Harvard; Ph.D., 1955, California (Berkeley)*
- HJORTH, ROLAND L., 1964, *Assistant Professor of Law; A.B., 1957, Nebraska; Fulbright Certificate, 1958, Heidelberg; LL.B., 1961, New York University*
- JOHNSON, RALPH W., 1955 (1961), *Professor of Law; Diploma, 1945, Lehigh; B.S. in Law, 1947, LL.B., 1949, Oregon*
- KUMMERT, RICHARD O., 1964, *Visiting Associate Professor of Law; B.S., 1953, Illinois Institute of Technology; M.B.A., 1955, Northwestern; LL.B., 1961, Stanford*
- LEVY, ERNST, 1937 (1952), *Professor Emeritus of History, Political Science and Law; LL.D., 1906, Berlin*
- MEISENHOLDER, ROBERT, 1954, *Professor of Law; A.B., 1936, South Dakota; J.D., 1939, S.J.D., 1942, Michigan*
- MORRIS, ARVAL, 1955 (1961), *Professor of Law; B.A., 1951, Colorado College; M.A., 1952, LL.B., 1955, Colorado; LL.M., 1958, Yale*
- NOTTELMANN, RUDOLPH H., 1927 (1961), *Professor Emeritus of Law; B.A., 1912, LL.D., 1952, Monmouth College; M.A., 1913, Illinois; LL.B., 1922, Yale*
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SHATTUCK, WARREN L., 1935 (1941), Professor of Law; B.A., 1934, LL.B., 1934, Washington; J.S.D., 1936, Yale

STEVENS, GEORGE NEFF, 1952, Professor of Law; A.B., 1931, Dartmouth College; LL.B., 1935, Cornell; M.A., 1941, Louisville; S.J.D., 1951, Michigan

TAYLOR, ROBERT L., 1941 (1945), Professor of Law; B.A., 1927, Yale; J.D., 1930, Northwestern

TRAUTMAN, PHILIP A., 1956 (1961), Professor of Law; B.A., 1952, LL.B., 1954, Washington

TUNKS, LEHAN K., 1963, Professor of Law; Dean, School of Law; A.B., 1935, Nebraska; J.D., 1938, Northwestern; J.S.D., 1947, Yale

VERNON, DAVID H., 1964, Professor of Law; Associate Dean; A.B., 1949, Harvard College; LL.B., 1952, Harvard; LL.M., 1953, J.S.D., 1960, New York University

School of Librarianship

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BEVIS, LEURA D.,* 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

GALLAGHER, MARIAN G.,* 1944 (1953), Professor of Law; Law Librarian; B.A., 1935, LL.B., 1937, B.A. in L.S., 1939, Washington

LIEBERMAN, IRVING,* 1956, Professor of Librarianship; Director, School of Librarianship; B.S., 1935, New York; B.S. (L.S.), 1939, Ed.D., 1955, Columbia

PETERSON, MARION ELIZABETH,* 1951 (1958), Associate Professor of Librarianship; B.A., 1930, B.A. in Librarianship, 1941, M.A., 1957, Washington

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WHEELER, SARA H.,* 1955 (1960), Associate Professor of Librarianship, B.A., 1936, Nebraska; B.S.(L.S.), 1940, Columbia; M.A., 1954, Chicago

Graduate School of Public Affairs

DENNY, BREWSTER C.,* 1961 (1964), Professor of Public Affairs; Director, Graduate School of Public Affairs; A.B., 1945, Washington; M.A., 1948, Ph.D., 1959, Fletcher School of Law and Diplomacy

LYDEN, FREMONT JAMES,* 1962, Assistant Professor of Public Affairs, B.A., 1950, M.P.A., 1952, Ph.D., 1960, Washington

SHIPMAN, GEORGE ANDERSON,* 1946, Professor of Public Affairs and Political Science; Director, Institute of Administrative Research, Graduate School of Public Affairs; B.A., 1925, M.A., 1926, Wesleyan (Connecticut); Ph.D., 1931, Cornell

School of Social Work

ABRAHAMSON, ARTHUR CLARENCE,* 1956 (1963), Associate Professor of Social Work; B.A., 1942, Augustana College; M.A., 1947, Minnesota

BRINK, CHARLES B.,* 1963, Professor of Social Work; Dean, School of Social Work; A.B., 1932, Missouri; M.Sc., 1941, Western Reserve

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CITRIN, EVELYN B., 1963, Lecturer in Social Work; B.A., 1950, M.S.W., 1952, Wayne State

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HUNT, MARGUERITE,* 1949 (1960), Professor of Social Work; A.B., 1929, Brown; M.S., 1936, Western Reserve

JUSTICE, ROBERT S., 1960, Clinical Instructor in Social Work; B.A., 1949, University of Puget Sound; M.S.W., 1955, Washington

KELLEY, JERRY L.,* 1962, Assistant Dean and Assistant Professor of Social Work; B.A., 1944, Reed; A.M., 1949, Chicago

KESSEL, ROBERT WILLIAM, 1963, Assistant Professor of Social Work; A.B., 1955, Boston University; M.S.W., 1961, Michigan

MACDONALD, CATHERINE J.,* 1945 (1954), Assistant Professor of Social Work; B.A., 1936, Washington

MACDONALD, ROBERT W.,* 1960, Assistant Professor of Social Work; B.A., 1948, Manitoba; B.S.W., 1949, M.S.W., 1956, British Columbia

MAIER, HENRY W.,* 1959, Associate Professor of Social Work; A.B., 1947, Oberlin College; M.S.Sc., 1949, Western Reserve; Ph.D., 1959, Minnesota

MUNDT, LENORA B., 1957 (1960), Associate Extension Lecturer in Social Work; B.S., 1944, Utah; M.S.W., 1950, Washington

MYKUT, MARGARET C., 1951 (1960), Clinical Associate Professor of Social Work; B.S., 1938, Oregon; M.S.W., 1944, Washington

NORTHWOOD, LAWRENCE K.,* 1959, Associate Professor of Social Work; B.A., 1947, Wayne University; Ph.D., 1953, Michigan

PARSONS, JACK R.,* 1955 (1957), Associate Professor of Social Work; B.A., 1935, M.A., 1940, College of the Pacific; M.S., 1943, Columbia; Ph.D., 1958, Chicago

REISS, GRACE DEWEY,* 1947 (1959), Associate Professor of Social Work; B.A., 1932, Iowa; M.A., 1940, Minnesota

SMITH, EDMUND ARTHUR,* 1957 (1962), Associate Professor of Social Work; B.A., M.A., 1954, Washington; Ph.D., 1957, Harvard

STUTSMAN, LOUISE M.,* 1956 (1959), Assistant Professor of Social Work; B.A., 1940, Cornell College; A.M., 1949, Chicago

TAKAGI, CALVIN Y.,* 1961, Assistant Professor of Social Work; B.A., 1950, M.S.W., 1952, Ph.D., 1958, Minnesota

THOMPSON, JOSEPH V., 1963, Assistant Professor of Social Work; B.A., 1950, B.S.W., 1953, Manitoba; M.S.W., 1957, Washington

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APPENDIXES

APPENDIX A

Explanation of Tuition, Special Fees, and Service Charges

All tuition, special fees, and service charges are payable in United States dollars at the time of registration, except that new 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, per quarter \$35.00
A resident student is one who has been domiciled in the state of Washington for at least a year immediately prior to registration. The domicile of a minor is that of his parents or his legal guardian. The children of federal employees residing within the state of Washington and the children and spouses of staff members of the University are considered as residents for tuition purposes.

Nonresident students, per quarter \$105.00
Prospective students are classified as non-residents when their credentials come from schools outside Washington. If they believe they are residents, they may petition the Residence Classification Office, 205A Administration Building, for a change of Classification.

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

Special Fees and Service Charges

Incidental Fee, per quarter:
Full-time resident students \$56.50

Part-time resident students*	\$39.00
Full-time nonresident students	86.50
Part-time nonresident students*	69.00
Student Activities Fee†	2.50
Building Fund Fee†	6.00

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 by action of the Registration Appeal Board. 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: (1) Advanced Critic Teaching requires an additional fee of \$6.00 per credit, bringing the average total cost to \$36.00. (2) Physical Education Activity quarterly fees—bowling, \$5.00; canoeing, \$3.00; golf instruction, \$1.50.

Athletic Admission Fee. A ticket which admits its owner to all athletic events during the quarter or quarters covered is

*Registered for 6 credits or less, exclusive of ROTC.

†Optional for part-time students.

available to those students who are eligible for ASUW membership and who pay one of the following Student Activities fees: 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 Sheet Fee. One grade sheet is furnished each quarter without charge; a fee of 50 cents, payable in advance, is charged for each additional sheet.

Transcript Fee. A charge of \$1.00, payable in advance, is made for each mechanically reproduced transcript. Typewritten 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.

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. In the case of examinations for *advanced credit*, a fee of \$2.00 per credit is charged. The fee for the foreign language examination is \$6.00.

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 Registrar's Office and must pay a fee of \$5.00.

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.

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

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.

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.

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.

General Locker Fee. Lockers for wraps and books in Thomson Hall may be obtained at a rental of 75 cents per quarter from the Physical Plant Department.

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 during the first three calendar days; 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 requirement concerning return of ASUW card and athletic ticket has been satisfied. 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, as no withdrawal will be honored until this requirement has been met. 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 this 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 (June 22 to August 21):	
Full time (more than 6½ credits)	\$105.00
Part time (6½ credits or less but not more than 3½ credits in either term)	75.00*
First term (June 22 to July 22):	
Full time (more than 3½ credits)	\$77.50
Part time (3½ credits or less)	42.50*

*ASUW fee of \$2.50, which is not included in any of the above part-time fees, but is included in the full-time fees, is optional for part-time students.



Second term (July 23 to August 21):

Full time (more than 3½ credits) \$77.50
Part time (3½ credits or less) 42.50*

Addition of second term (before July 23):

Full time (if full time first term) \$27.50
Full time (if part time first term) 62.50
Part time (if full time first term) 27.50
Part time (if part time first term) 32.50*
(Either term may be taken separately.)

Auditors. There is no reduction in fees for auditors. The Student Activities fee of \$2.50 is optional.

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 course fee is \$10.00 for taking courses at Pack Forest. The subsistence fee is approximately \$130.00 for meals during the quarter 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).

Refund of Summer Quarter Fees

Students who withdraw for satisfactory reasons may, on application made at the time of withdrawal, receive a refund as follows:

1. If registered for the full quarter or for either term alone, but withdrawing during

the first two calendar days†—refund, entire fee.

2. If registered for either term alone, but withdrawing between the third and tenth calendar days—refund:

Full time \$37.25
Part time 21.25

3. If registered for the full quarter, but withdrawing after the tenth calendar day in the first term and previous to the third calendar day in the second term—refund:

Full time \$27.50
Part time 32.50

4. If registered for the full quarter, but withdrawing from both terms between the third and tenth calendar days—refund:

Full time \$64.75
Part time 50.00

5. If registered for the full quarter, but withdrawing between the third and tenth calendar days in the second term—refund:

Full time \$13.75
Part time 16.25

Refunds during the second term when students have paid full-time fee during the second term and part-time fee during the first term, or vice-versa:

1. Refunds during the first two days—full refund.

2. Refunds between the third and tenth calendar days will be 50 per cent of the fee paid for the second term.

Refunds of special fees will be at the discretion of the Comptroller's Office, but so far as is practicable, the rule governing the refund of tuition fees will be applied.

At least two weeks must elapse between payment and refund of fees if payment was made by check.

Change-of-Status Refunds

When a student changes his second-term registration (change-of-status), he may be entitled to one of the following refunds:

†In determining refund fees, *calendar days* are counted from the first day University instruction begins; late registration does not affect the calendar day count.

1. If registered for the full quarter, full time, with change-of-status occurring not later than the second calendar day of the quarter—refund, \$30.00.

2. If registered for the full quarter, full time, with change-of-status occurring after the second calendar day in the first term but prior to the third calendar day in the second term—refund, \$27.50.

3. If registered for the second term only, full time, with change-of-status occurring not later than the second calendar day of the second term—refund, \$35.00.

Students requesting a change-of-status refund will be charged the required change-of-registration fee. At least two weeks must elapse between payment and refund of fees if payment was made by check. See Miscellaneous Fees.

Financial Delinquencies

Students failing to pay promptly amounts due the University may be excluded from classes and their credits withheld.

APPENDIX B

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

*ASUW fee of \$2.50, which is not included in any of the above part-time fees, but is included in the full-time fees, is optional for part-time students.

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.

APPENDIX C

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 1960¹ 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 Policy² 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.

¹ *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.

² *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.